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Analyzing The Development of Cashless Society Using the Structural Equation Modeling

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Abstract

Payment systems continue to evolve alongside advancements in information technology, driving the digitization of financial services and payment instruments. This study examines the influence of Psychological, Socio-Cultural, and Personal Factors on adopting electronic money and the growth of a cashless society, with Financial Technology as a moderating variable. The research involved 1,000 Bank BNI customers in the Jabodetabek area (Jakarta, Bogor, Depok, Tangerang, and Bekasi) actively using BNI Mobile Banking services. The analytical methods employed include Discourse Network Analysis and Structural Equation Modeling to develop a comprehensive analysis model. The results indicate that psychological and personal factors—such as motivation, perception, learning, positive attitude, modern lifestyle, and openness to change—significantly influence electronic money usage. However, socio-cultural factors do not exhibit a significant impact, primarily due to persistent cash usage habits and a lack of trust in technology. This study highlights the need for financial education to promote awareness of electronic money benefits and security, develop tailored financial products, and enhance regulatory collaboration between the government and relevant institutions

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INTRODUCTION

Payment systems have evolved alongside information technology advancements and financial services' digitalization. Traditionally, people made payments manually by carrying cash and waiting in line at banks. This later shifted to non-cash methods like ATMs, debit cards, and credit cards. The latest development is digitalizing payment systems through electronic money (e-money). In the digital era, banking services have expanded rapidly with the introduction of digital banking, offering a different experience from traditional banking. Digital banking enables customers to complete transactions independently through smartphone applications, eliminating needing to visit a bank branch. According to Financial Services Authority Regulation (POJK) Number 12/POJK.03/2018 on Digital Banking Services by Commercial Banks, digital banking is defined as an electronic banking service designed to process customer data quickly and efficiently while meeting customer needs and enhancing the user experience.

Bank Negara Indonesia (BNI), a state-owned bank, is one of Indonesia's leading financial institutions offering digital banking services. One of its flagship services, BNI Mobile Banking, allows customers to perform a wide range of transactions conveniently, securely, and efficiently through their smartphones. Through BNI Mobile Banking, users can check their account balance, transfer funds, pay bills, settle credit card payments, book airline tickets, purchase mobile credit, and even open Taplus or Time Deposit accounts.

A cashless economy offers various benefits, including faster transactions, enhanced security, and greater convenience, as digital alternatives replace traditional cash-based transactions (Kamal et al., 2024). In a fully cashless society, alternative tax reforms, such as an Automated Payment Transaction Tax, may also have potential benefits (Achord et al., 2017). This research examines the key factors driving the transition toward a cashless economy, including technological advancements, increasing trust in digital payments, government policies, changing consumer behavior, and greater financial inclusion.

The study explores the influence of psychological, sociocultural, and personal factors in shaping the growth of a cashless society driven by increasing digital payment literacy and the global adoption of non-cash payment methods (Hidayah et al., 2023). These factors influence consumer decisions to use banking services, often motivated by the desire to save time and follow social trends. According to Fernandes et al. (year missing), trust in technology plays a crucial role in adoption. In digital payments, confidence in the security of personal data and the system's reliability are key motivators. Similarly, Aziz et al. (2024) found that perceptions of convenience and trust significantly impact users' interest in cashless payment methods. Psychological and behavioral factors are essential in developing a cashless society, as people naturally seek convenience and efficiency in financial transactions (Azzahroo et al., 2021). The transition toward a cashless society involves multiple transformation stages, as demonstrated by global usage trends of digital payment instruments (Berkimbayeva, 2019).

A cashless society offers numerous advantages, including transaction efficiency, enhanced security, and ease of use. This research explores the factors driving the transition to a cashless society, focusing on technological advancements, improved security and trust, government policies, shifts in consumer behavior, and financial inclusion. The study examines the influence of Psychological, Socio-Cultural, and Personal Factors, which reflect consumers' motivation to engage with banking facilities due to time constraints and social trends.

To systematically analyze the discourse surrounding cashless societies, this study employs Discourse Network Analysis (DNA) to extract keywords from news articles and reports, enabling the identification of interconnected themes and relationships within a large corpus of text data (Fernandes et al., 2022). Despite the increasing relevance of digital payment systems,

academic literature applying DNA to the study of cashless societies remains limited.

Therefore, this research addresses the following key questions: What are the prevailing discourses concerning the transition to a cashless society? Who are the key actors shaping these discourses? How are these actors and discourses interconnected? This study uses DNA to provide novel insights into the narratives shaping public perception and policy development regarding cashless societies. It highlights the impact of technological advancements, policy decisions, and societal trends while elucidating the complex interplay of factors influencing cashless adoption.

Furthermore, Structural Equation Modeling (SEM) examines relationships among the identified variables. SEM is a robust analytical approach resistant to outliers, allowing for reliable model estimations. Multigroup SEM analysis is applied to models derived from DNA, facilitating the simultaneous testing of variable relationships and causal connections. This combined approach provides a comprehensive framework to analyze multidimensional relationships, yielding robust conclusions on the factors influencing the transition to a cashless society.

The transition toward a cashless society has garnered significant global attention due to the rapid advancement of financial technology (fintech) and the expansion of electronic payment systems. However, despite the widespread availability of digital payment options, Indonesia faces challenges in achieving nationwide adoption, particularly in rural areas where cash transactions remain dominant. This discrepancy highlights a critical gap in the adoption rate of digital payments across different demographic and socio-economic groups.

While urban populations, particularly in Greater Jakarta (Jabodetabek), are more likely to embrace cashless systems, rural communities experience slower adoption due to limited financial infrastructure, lower digital literacy, and cultural preferences for cash transactions. The rise of fintech innovations has significantly facilitated digital transactions, aligning with government initiatives, such as the Gerakan Nasional Non-Tunai (GNNT) launched by Bank Indonesia in 2014 to promote digital payment adoption and financial accessibility (Nurohman et al., 2022).

This research aims to provide valuable insights for policymakers, financial institutions, and the public by examining the behavioral, cultural, and personal factors influencing cashless adoption. The findings are expected to support the expansion of electronic money and contribute to a more inclusive and efficient cashless society.

Several gaps in existing literature justify the need for this study. First, there is limited research on the influence of psychological and personal factors in urban communities, particularly in Greater Jakarta (Jabodetabek). Second, insufficient analysis of government regulations and policies affects understanding how policy decisions influence cashless adoption. Third, socio-cultural influences on digital payment behavior in Indonesia remain underexplored.

Previous studies, such as "The Dynamics of Cashless Society: A Systematic Review" (Hidayah et al., 2023) and "Analisis Kepuasan Gen Z dalam Menggunakan QRIS di Kota Pematangsiantar" (Nainggolan et al., 2022), have explored various aspects of the cashless society. However, research examining the development of a cashless society in Indonesia remains scarce, highlighting a significant research gap.

Furthermore, studies integrating SEM analysis with DNA are even rarer, making this study unique in its methodological approach. This research aims to fill that gap by comprehensively analyzing the cashless society using a combined SEM and DNA framework. Through this integrated methodology, the study enables a more in-depth exploration of the psychological, socio-cultural, and personal factors driving cashless adoption in Indonesi.

RESEARCH METHODS

This study adopts a quantitative research approach with a structured design, incorporating clearly defined methods for data collection, analysis, and variable measurement. The research was conducted on a specific population and sample to ensure the accuracy and generalizability of the findings. All technical aspects are transparently described to allow replication by other researchers.

This study adopts a quantitative research approach with a structured design, including clearly defined methods for data collection, analysis, and measurement of variables. The research was conducted on a specific population and sample to ensure the results' accuracy and generalizability. All technical aspects are transparently described to allow replication by other researchers.

This study employs a survey method to collect data efficiently from a large respondent pool. Surveys were distributed to Bank BNI customers at branches across the Greater Jakarta area, including Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek). A total of 1,000 customers participated, with 200 respondents from each city. The sampling process followed a two-stage approach: first, five branch offices were randomly selected in each region; second, 200 customers actively using Bank BNI's Mobile Banking services were purposively chosen.

The focus on Jabodetabek was based on its diverse digital banking user base, making it an ideal setting for studying mobile banking adoption. This two-stage sampling process ensured diversity and representativeness, enhancing the reliability and robustness of the findings.

To analyze public discourse on cashless societies, this research also employs Discourse Network Analysis (DNA), a technique used to extract keywords and map relationships from textual data, such as news articles and media reports. DNA systematically identifies interconnected themes and relationships within large text datasets (Fernandes et al., 2022). Despite the growing importance of digital payment systems, the application of DNA in the context of cashless societies remains limited in academic research.

Therefore, this study aims to answer the following research question: "What are the prevailing discourses concerning the transition to a cashless society? Who are the key actors, and how are these discourses and actors interconnected?" This study uses DNA to uncover dominant narratives, key influencers, and thematic patterns within the discourse of a cashless society. Specifically, the data analyzed using DNA includes news articles, government publications, and public opinion pieces discussing digital payment adoption in Indonesia.

This approach provides novel insights into the role of technological advancements, policy initiatives, and societal trends in shaping public perception and influencing policy decisions regarding cashless systems. Ultimately, the findings will contribute to a comprehensive understanding of the complex factors driving the transition toward a cashless society.

This study's data analyzed using Discourse Network Analysis (DNA) includes several sources. First, news articles provide reports covering government policies, the rise of a cashless society, and financial technology adoption from national media outlets such as Kompas and Tempo. Second, policy documents consist of official government publications, including POJK Regulation No. 12/2018 on digital banking services, emphasizing initiatives like the National Cashless Movement (*Gerakan Nasional Non-Tunai* or GNNT). Third, public opinion and social media data include feedback and discussions from the public on platforms such as Twitter and Facebook, reflecting their experiences and perspectives on digital payment systems. Lastly, media reports feature analytical publications from research organizations and media discussing the adoption of financial technologies.

Discourse Network Analysis (DNA) combines qualitative and quantitative approaches to examine the relationships between themes, actors, and narratives in public discussions. In this

study, DNA is applied through several stages. The first stage is data collection, where textual data from news articles, policy documents, and public opinion pieces is gathered, focusing on narratives related to the "Cashless Society" and the "Digitalization of Electronic Money." The second stage is keyword identification, highlighting critical terms such as "Cashless Society" and "Digitalization of Electronic Money" that represent core themes related to digital payment adoption. The third stage is relationship analysis, in which connections between keywords are examined to identify interaction patterns, such as the influence of exogenous variables on the development of a cashless society, using specialized analytical tools to create network maps. The fourth stage is actor recognition, where key contributors in the discourse, including governments, financial institutions, and the public, are identified. Governments are often linked to regulatory policies, while financial institutions are associated with technological advancements. The final stage is network visualization, which presents findings through graphical representations, illustrating how actors, themes, and keywords are interconnected. This visualization aids in understanding complex relationships in public discourse.

A structured questionnaire was the primary tool for collecting survey data. The questionnaire was designed, validated, and tested for reliability to ensure high-quality responses. Respondents could complete the survey in person or online, improving accessibility and removing geographic barriers. This flexible approach allowed participants to respond conveniently, enhancing response accuracy and participation rates.

For data analysis, this study employed Descriptive Statistics and Structural Equation Modeling (SEM) using WarpPLS software alongside Discourse Network Analysis (DNA) to strengthen the research framework. Descriptive statistics were used to summarize respondents' questionnaire responses from the five regions. SEM, a powerful multivariate analysis technique, was chosen for its ability to handle complex models involving multiple variables while assessing direct and indirect relationships. The SEM approach consists of two main components: the outer model, which defines how latent variables are measured by their indicators, and the inner model, which specifies the relationships among latent variables.

Meanwhile, DNA was employed to analyze textual data from news articles and official reports on digital payment adoption. This method identifies and maps relationships between key terms, actors, and themes, providing a systematic overview of the discourse surrounding cashless society adoption.

By integrating SEM and DNA, this research offers a comprehensive framework to examine the interconnections between discourse, policies, and public behavior, ultimately contributing to a deeper understanding of the factors driving the transition to a cashless society. The DNA data analyzed include keywords, phrases, and patterns frequently appearing in media coverage and policy documents. These insights were used to identify variables and inform the construction of the SEM model, ensuring the variables selected were grounded in real-world discourse. By combining DNA with SEM, the study provides a robust analytical framework that integrates qualitative insights with quantitative modeling.

To check how well the model fits, several measures were used, including the Average Path Coefficient ($p < 0.05$), Average R-squared ($p < 0.05$), and Tenenhaus GoF, with specific benchmarks to determine if the model quality is acceptable. Other measures, like the Average block VIF and Sympson's Paradox Ratio, were also monitored to ensure the model is reliable and address any potential multicollinearity issues. Measurement errors were considered to provide a more realistic assessment of the relationships between the variables. The calculations for latent variables are further explained using structural equations.

$$x = \lambda_x X + \delta$$
$$y = \lambda_y Y + \zeta \quad \text{..... (1)}$$

Where, x is exogenous manifest variable vector, y is endogenous manifest variable vector, X is exogenous latent variable indicator matrix, Y is matrix of endogenous latent variable indicators, λ_x is matrix loading exogenous latent variables, λ_y is matrix Loading Endogenous latent variables, δ: is error in measuring manifest variables from exogenous latent variables, ζ is error in measuring manifest variables of endogenous latent variables.

The study also explored the role of Financial Technology as a moderator, using SEM to analyze its impact on the relationship between predictor variables and the response variable. Moderation analysis was performed with regression analysis to understand better how financial technology affects the development of a cashless society and aids in economic recovery following the pandemic.

The study's materials included validated survey instruments, textual data for Discourse Network Analysis (DNA), and WarpPLS software for SEM analysis, ensuring data collection's reliability and the analytical process's precision. DNA was employed to analyze textual data from news articles and policy documents, identifying relationships among key themes, actors, and keywords within the digital payments discourse. This approach enabled the extraction of variables grounded in societal trends and public narratives, which were then incorporated into the SEM model. By combining DNA with SEM, this methodological framework ensures comprehensive data analysis and the derivation of insightful conclusions regarding the factors driving the adoption of cashless systems in the banking sector.

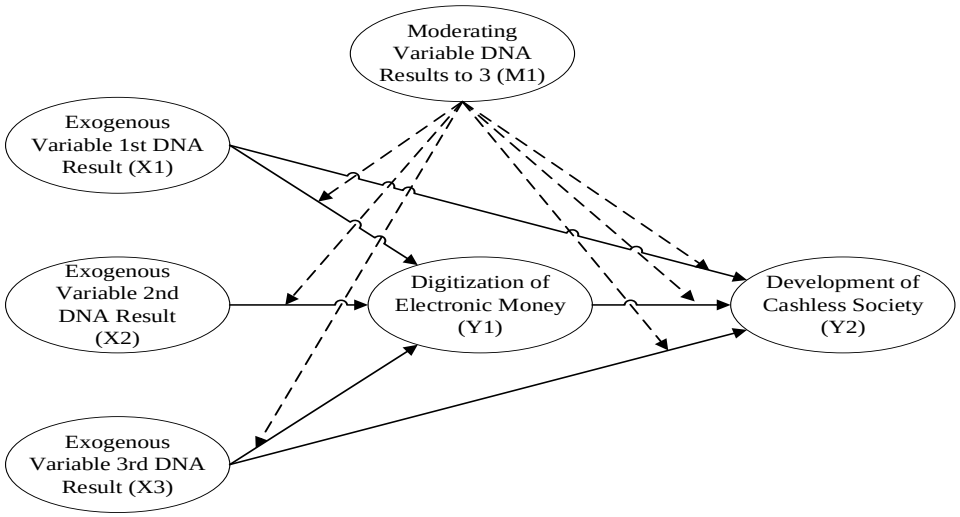

Figure 1. Research Model

RESULTS AND DISCUSSION

Discourse Network Analysis (DNA) is an analytical technique used to identify dominant themes, key actors, and patterns of relationships in discourses related to adopting a cashless society. In this study, DNA is applied through several steps. First, Keyword Extraction involves analyzing data from news articles and policy documents to identify keywords, namely "Cashless Society" and "Digitization of Electronic Money." Next, Relationship Mapping identifies connections between these keywords to uncover relevant interaction patterns. Then, Key Actor Identification focuses on recognizing significant contributors, such as the government, financial institutions, and the public, based on their roles in shaping the discourse. Finally, Network Visualization presents the DNA results through graphical representations that illustrate connections between themes and actors, providing a clear overview of the discourse structure. The Discourse Network Analysis (DNA) identifies key factors important for understanding digital transactions and the workings of a cashless society, as illustrated in Figure 2.

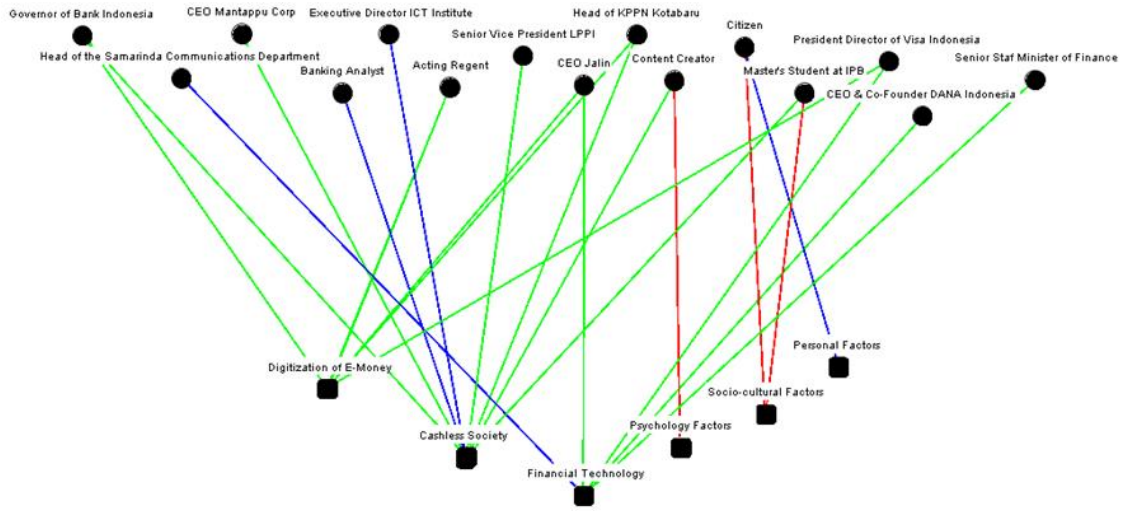

Figure 2. Discourse Network Analysis
Source: Data Processed, 2024

The Discourse Network Analysis (DNA) identifies critical factors essential for understanding digital transactions and the dynamics of a cashless society. These factors are categorized into Psychological, Socio-Cultural, and Personal Factors as independent variables, Electronic Money Digitalization and the Cashless Society as dependent variables, and Financial Technology as a moderating variable.

Psychological factors involve perceptions of trust, security, and ease of use when adopting digital financial systems. These align with the Technology Acceptance Model (TAM), which highlights perceived usefulness and ease of use as key predictors of technology adoption. Socio-cultural factors pertain to societal norms and cultural acceptance of digital payment systems. These factors build upon Hofstede's cultural dimensions theory, emphasizing how societal values influence technology adoption across different cultural contexts. Personal factors include demographic characteristics such as age, education, and digital literacy, as shown in Rogers' Diffusion of Innovation Theory, which posits that individual traits shape the rate of innovation adoption. Collectively, these variables help explain the adoption of electronic money and the transition to a cashless society, which is characterized by increased transparency, financial inclusion, and convenience.

Financial Technology (Fintech) serves as a moderating variable, enhancing the relationships between independent and dependent variables by addressing psychological barriers, facilitating socio-cultural adaptation, and supporting individual users through innovative, secure, and accessible platforms. For instance, Fintech solutions integrate advanced encryption and intuitive interfaces to alleviate concerns about security and usability, aligning with previous research on the role of perceived risk in inhibiting digital adoption. The visualization of the DNA result variables is shown in Figure 3.

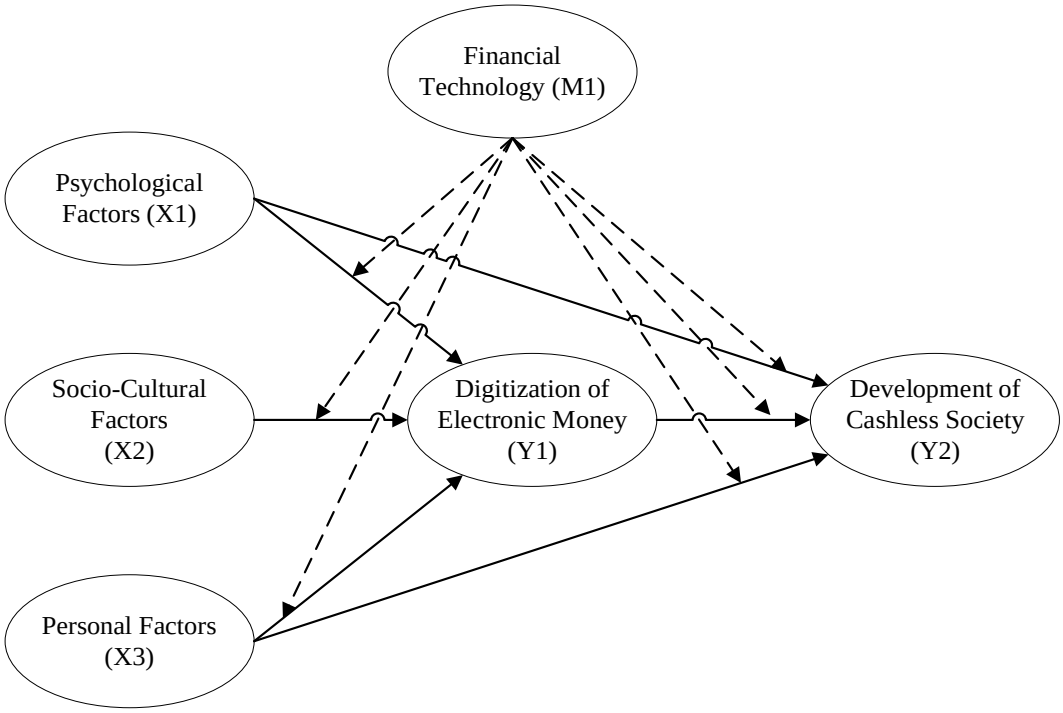

Figure 3. DNA Outcomes Research Model
Source: Data Processed, 2024

The chart below provides a descriptive statistical summary of the results of the average data collected from 200 respondents in each region, illustrating the distribution of responses across variables such as Psychological Factors (X1), Socio-Cultural Factors (X2), Personal Factors (X3), Digitization of Electronic Money (Y1), Financial Technology (M1), and Development of Cashless Society (Y2).

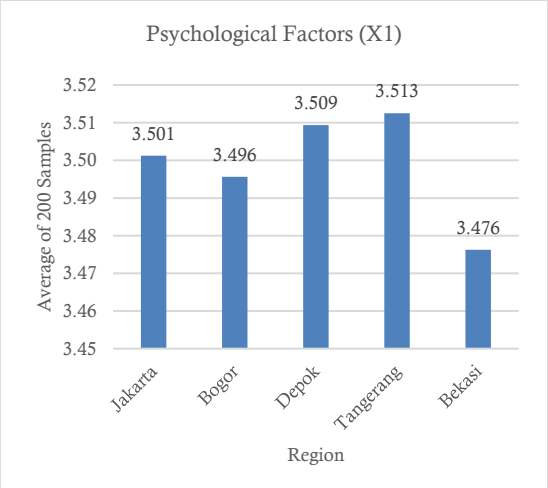

Figure 4. Descriptive Statistics of Psychological Factors Variables
Source: Data Processed, 2024

The chart Psychological Factors (X1) above shows the average scores of psychological factors across five regions. Tangerang has the highest average of 3.513, indicating more positive perceptions than other regions. Conversely, Bekasi has the lowest average of 3.476, suggesting an area requiring more attention regarding psychological factors

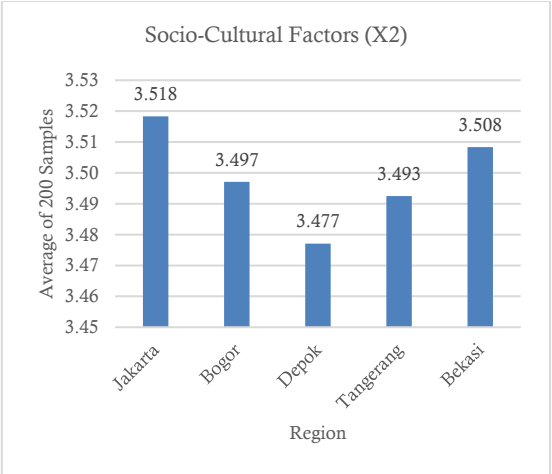

Figure 5. Descriptive Statistics of Socio-Cultural Factors Variables
Source: Data Processed, 2024

The second chart Socio-Cultural Factors (X2) above shows that Jakarta records the highest average score of 3.518, followed by Bekasi with 3.508. This indicates that these two regions have a strong perception of socio-cultural factors. Depok, with the lowest average of 3.477, may need improvements

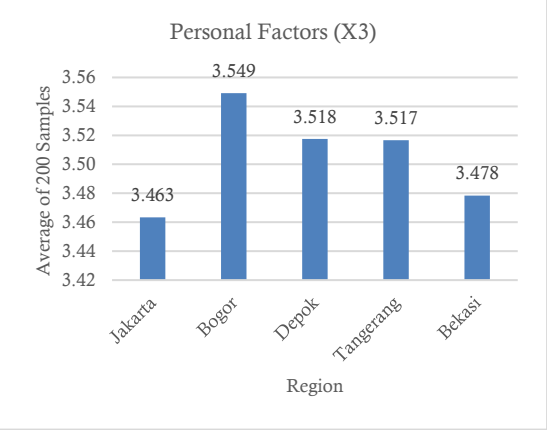

Figure 6. Descriptive Statistics of Personal Factors Variables
Source: Data Processed, 2024

The third chart above shows that Bogor leads with the highest average score of 3.549, reflecting a significant influence of personal factors. Meanwhile, Jakarta and Bekasi have lower averages, 3.463 and 3.478, respectively, which may indicate differing personal preferences in these regions.

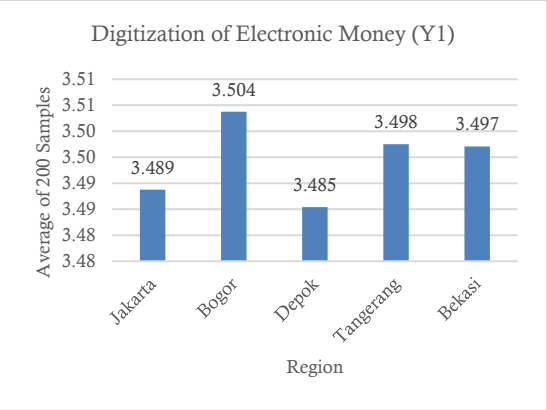

Figure 7. Descriptive Statistics of Digitization of Electronic Money Variables
Source: Data Processed, 2024

The digitization of electronic money factor in the chart above has the highest average score in Bogor at 3.504. Jakarta and Tangerang record lower averages, 3.489 and 3.498, respectively, showing regional differences in adoption or understanding of digitalization.

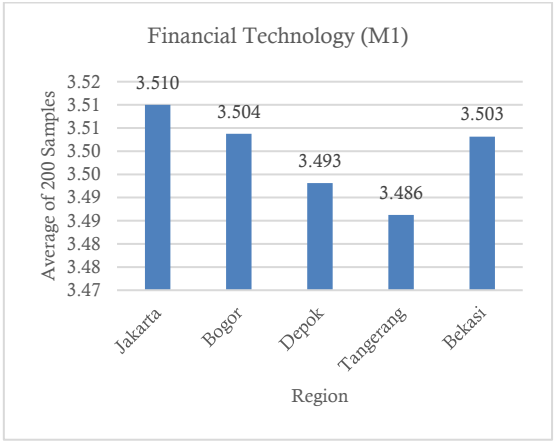

Figure 8. Descriptive Statistics of Financial Technology Variables
Source: Data Processed, 2024

The chart above shows Jakarta leads with an average score of 3.510, followed by Bekasi with 3.503. This indicates a more substantial acceptance or influence of financial technology in these regions than others, such as Tangerang, which has a lower average of 3.486.

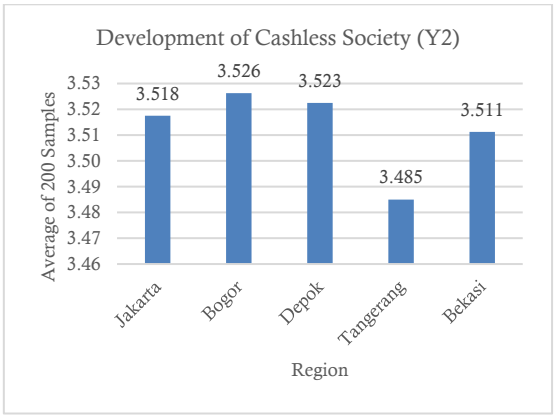

Figure 9. Descriptive Statistics of Development of Cashless Society Variables
Source: Data Processed, 2024

The chart above shows that Bogor records the highest score of 3.526, indicating a significant level of development towards a cashless society. With the lowest score of 3.485, Tangerang may require interventions to enhance the adoption of cashless systems in the region.

The relationships in this model are further examined using Structural Equation Modeling

(SEM), which provides a robust framework to quantify the strength of these interactions and explore indirect effects. The model emphasizes the interplay between human behavior, cultural dynamics, and technological innovation by comparing this approach with prior research. Unlike earlier models focusing primarily on technological or economic aspects, this framework integrates psychological and socio-cultural variables, offering a more comprehensive understanding of the transition to a cashless society. This holistic approach underscores the need for tailored interventions, combining insights from behavioral theories and advanced Fintech innovations to foster widespread adoption and accelerate the digital transformation of financial systems.

Before using SEM, the linearity assumption was tested across several regions, with the results shown in Table 1. The p-values for the relationships between variables in each region (Jakarta, Bogor, Depok, Tangerang, Bekasi) are above 0.05, confirming linearity at a 95% confidence level. This means the linearity assumption holds in each region, making SEM suitable for further analysis

Table 1. Linearity Test Results

Variable	P-value				
	Jakarta	**Bogor**	**Depok**	**Tangerang**	**Bekasi**
X1-Y1	0.5488	0.8874	0.5749	0.5508	0.4957
X2-Y1	0.8862	0.5269	0.1568	0.2674	0.2135
X3-Y1	0.5281	0.4174	0.8867	0.8060	0.5664
X1-Y2	0.7580	0.9255	0.3384	0.5656	0.2118
X2-Y2	0.7828	0.2004	0.4300	0.4309	0.3236
X3-Y2	0.5137	0.2843	0.5798	0.0565	0.6806
Y1-Y2	0.1062	00815	0.2795	0.8225	0.1510

Source: Data Processed, 2024

To check how well the SEM model fits, a set of evaluation criteria was calculated for two groups based on data values in relation to the mean. Table 2 shows key model fit measures, such as the Average Path Coefficient, Average R-squared, and Tenenhaus GoF values. All criteria meet the necessary standards for the model to be accepted, including p-values below 0.05 for APC, ARS, and AARS, as well as values indicating low collinearity (AVIF and AFVIF ≤ 3.3). As a result, the model is considered to fit well and is suitable for SEM analysis.

Table 2. Model Feasibility Testing

No	Model Fit/ Quality Index	Group	Value				
			Jakarta	**Bogor**	**Depok**	**Tangerang**	**Bekasi**
1	Average path coefficient	Group 1	P = 0.028	P = 0.017	P = 0.048	P = 0.028	P = 0.028
		Group 2	P = 0.029	P = 0.046	P = 0.032	P = 0.045	P = 0.029
2	Average R-squared	Group 1	P < 0.001	P < 0.001	P < 0.001	P < 0.001	P < 0.001
		Group 2					
3	Average adjusted R-squared	Group 1	P < 0.001	P < 0.001	P < 0.001	P < 0.001	P < 0.001
		Group 2					
4	Average block VIF	Group 1	AVIF = 2.132	AVIF = 1.982	AVIF = 1.894	AVIF = 1.965	AVIF = 2.132
		Group 2	AVIF = 1.866	AVIF = 1.870	AVIF = 1.909	AVIF = 1.705	AVIF = 1.866
5	Average full collinearity VIF	Group 1	AFVIF = 2.283	AFVIF = 2.182	AFVIF = 1.926	AFVIF = 2.309	AFVIF = 2.283
		Group 2	AFVIF = 2.098	AFVIF = 2.034	AFVIF = 1.930	AFVIF = 1.893	AFVIF = 2.098
6	Tenenhaus GoF	Group 1	GoF = 0.601	GoF = 0.591	GoF = 0.489	GoF = 0.521	GoF = 0.601
		Group 2	GoF = 0.512	GoF = 0.554	GoF = 0.539	GoF = 0.536	GoF = 0.512
7	Sympson's paradox ratio	Group 1	SPR = 0.957	SPR = 1.000	SPR = 0.870	SPR = 0.913	SPR = 0.957
		Group 2	SPR = 0.870	SPR = 0.913	SPR = 0.913	SPR = 0.957	SPR = 0.870

No	Model Fit/ Quality Index	Group	Value				
			Jakarta	Bogor	Depok	Tangerang	Bekasi
8	R-squared contribution ratio	Group 1	RSCR = 0.995	RSCR = 1.000	RSCR = 0.954	RSCR = 0.960	RSCR = 0.995
		Group 2	RSCR = 0.898	RSCR = 0.980	RSCR = 0.985	RSCR = 0.997	RSCR = 0.898
9	Statistical suppression ratio	Group 1 Group 2	SSR = 1.000	SSR = 1.000	SSR = 1.000	SSR = 1.000	SSR = 1.000
10	Nonlinear bivariate causality direction ratio	Group 1	NLBCDR = 1.000	NLBCDR =1.000	NLBCDR =1.000	NLBCDR = 1.000	NLBCDR= 1.000
		Group 2	NLBCDR = 1.000	NLBCDR =1.000	NLBCDR =1.000	NLBCDR = 1.000	NLBCDR= 1.000

Source: Data Processed, 2024

The SEM model's predictive relevance (Q-squared) was assessed across all regions. Table 3 shows that the model feasibility analysis demonstrates exceptional performance across all testing aspects. The path coefficients show consistent significance across all regions with P-values below 0.05. The model exhibits high reliability, evidenced by highly significant R-squared and Adjusted R-squared values ($P < 0.001$). As optimal VIF and AVIF values indicated, no substantial multicollinearity issues were found. The model's fitness is proven robust through satisfactory Tenenhaus GoF values. Additional parameters such as SPR, RSCR, SSR, and NLBCDR all show ideal results, confirming the overall model quality. Most impressively, the model's predictive capability reaches near perfection, as demonstrated in Jakarta with a 99.72% accuracy rate.

Table 3. Multivariate Determination Coefficient

Region	Q-Squared		
	Group 1	Group 2	Total
Jakarta	94.53%	94.83%	99.72%
Bogor	94.89%	91.42%	99.56%
Depok	81.96%	93.13%	98.76%
Tangerang	87.93%	90.46%	98.85%
Bekasi	95.99%	94.73%	99.79%

Source: Data Processed, 2024

The outer model's reliability and validity were assessed by analyzing the outer loading (reflective indicators) or weights (formative indicators) for each group and region, as presented in Table 4. To support the research findings, the Discourse Network Analysis (DNA) technique can be applied to map the relationships between these indicators and their latent variables, visualizing how factors such as Psychological, Socio-Cultural, Financial Technology, and the Cashless Society interact within specific regions. For example, DNA can highlight the strong connections of indicators like Motivation, Attitude, or Convenience in influencing community decisions to adopt financial technology.

DNA particularly illustrates how these factors are intertwined within regional contexts. In regions with higher technological infrastructure and financial access, like Jakarta or Bekasi, factors such as Convenience and Trust often overshadow socio-cultural influences. DNA allows researchers to trace these connections more clearly, showing the predominant factors in the adoption of financial technology. Through network maps, we can see how individual psychological factors (like attitudes toward digital payment methods) and regional technological readiness form a more cohesive network that promotes adoption. The insignificance of Socio-Cultural Factors may stem from the population's unique

characteristics, where individual and technical factors like Convenience and Trust play a more prominent role than social norms. Additionally, regional differences, such as the prevalence of individualism in urban areas like Jakarta, could diminish the impact of collective socio-cultural factors like Reference Groups or Social Class.

Further studies are needed to explore the potential significance of socio-cultural factors in regions with stronger cultural and social values. This detailed explanation clarifies how Discourse Network Analysis (DNA) contributes to identifying the underlying dynamics and regional variations in the adoption of financial technology. It also helps explain why socio-cultural factors might not be as influential in certain urban areas, especially when individual and technological factors take precedence.

Psychological factors such as motivation, perception, learning, and positive attitudes have been shown to influence the adoption of electronic money significantly. In this context, the Technology Acceptance Model (TAM) explains that two key factors influence individuals' decisions to adopt technology: their perceptions of ease of use and the perceived benefits of the technology. When individuals feel that a technology is easy to use and offers tangible benefits, they are more likely to incorporate it into their lives. Research by Fernandes et al. (2022) further emphasizes that psychological factors, such as trust and comfort with technology, play an essential role in predicting the success of financial technologies. Trust is especially crucial in digital financial transactions, where personal and financial data are often exchanged online. The higher the level of trust in the security of the technology and the entities facilitating the transactions, the more likely individuals are to adopt digital payment systems. Additionally, comfort with using the technology, often influenced by past experiences or exposure to similar technologies, can encourage adoption. This study expands on TAM by highlighting the roles of intrinsic and extrinsic motivation and learning processes in accelerating adoption, particularly in urban areas with higher levels of digital literacy and greater exposure to new technologies.

Although socio-cultural factors are generally considered significant in technology adoption, their reduced importance in this study can be explained by the dominant influence of individual and technical factors, particularly in urban settings such as Greater Jakarta. In rural areas, studies like those conducted by Aziz et al. (2024) suggest that social norms, group influences, and peer reference groups play a larger role in decision-making. For example, individuals in rural communities are more likely to adopt new technologies if they see their peers doing the same or there is social pressure to conform to group behavior. However, in urban areas, where people are more independent and have higher exposure to technology, the influence of social norms becomes weaker. In large cities like Jakarta, individual trust in technology becomes a stronger determinant of adoption than collective influences from peer groups. This finding suggests that financial technology adoption in urban areas is influenced by social norms and factors like infrastructure readiness, technological literacy, and the broader availability of technology-related information, which are more prevalent in urban environments. With more advanced technological infrastructure, urban populations are better equipped to adapt to new technologies and are more open to changes in conducting financial transactions.

Personal factors such as lifestyle, openness to change, and digital literacy also play significant roles in influencing an individual's decision to adopt digital financial services. In this context, Rogers' Diffusion of Innovation Theory explains why some individuals are early adopters of new technologies. According to this theory, individuals who are more open to innovation and have a positive attitude toward change are likelier to adopt new technologies. This study extends Rogers' theory by showing that modern lifestyles, such as the increasing reliance on digital applications for daily activities, support the preference for cashless payments. The more people rely on digital platforms for shopping,

working, communicating, and socializing, the more likely they will transition to digital payment systems. For example, millennials, known for their fast-paced and practical lifestyles, are more likely to adopt digital transactions. This is consistent with the findings of Marlina et al. (2020), who found that millennials are quicker to adopt digital payments due to the alignment of such systems with their fast-paced, technology-driven lives. Thus, modern lifestyles prioritizing convenience and efficiency are key factors accelerating the adoption of financial technology, particularly among younger generations accustomed to using digital applications.

Compared to previous research, such as Dewi et al. (2022), which emphasized the importance of regulation and policy in technology adoption, this study offers a fresh perspective by demonstrating that the adoption of financial technology is primarily determined by personal and psychological factors, especially in urban areas. While policies and regulations certainly play an important role in creating an environment that supports adopting digital financial services, this study highlights that individuals' perceptions of it influence the decision to adopt technology. Although government policies and initiatives may serve as catalysts for introducing new technologies in urban areas, the final decision to adopt them is largely based on individuals' perceptions and attitudes. This finding suggests a shift in the dynamics of technology adoption, where external factors such as regulations act as catalysts, while the ultimate decision is driven more by individual perceptions and attitudes toward the technology.

Table 4. Indicator Value Loading Measurement Model (Outer Model)

Variable	Indicators	Group	Loading				
			Jakarta	Bogor	Depok	Tangerang	Bekasi
Psychological Factors (X1)	Motivation (X1.1)	Group 1	0.713	0.732	0.638	0.575	0.644
		Group 2	0.651	0.160	0.359	0.643	0.762
	Perception (X1.2)	Group 1	0.527	0.634	0.536	0.588	0.535
		Group 2	0.715	0.520	0.721	0.147	0.599
	Learning (X1.3)	Group 1	0.611	0.500	0.536	0.657	0.671
		Group 2	0.686	0.739	0.747	0.647	0.310
	Attitude (X1.4)	Group 1	0.709	0.442	0.603	0.588	0.600
		Group 2	0.729	0.669	0.399	0.615	0.612
Socio-Cultural Factors (X2)	Reference Group (X2.1)	Group 1	0.611	0.664	0.413	0.585	0.487
		Group 2	0.777	0.531	0.708	0.567	0.639
	Family (X2.2)	Group 1	0.617	0.528	0.641	0.549	0.649
		Group 2	0.663	0.619	0.657	0.719	0.636
	Roles and Statuses (X2.3)	Group 1	0.725	0.659	0.705	0.621	0.723
		Group 2	0.675	0.604	0.598	0.479	0.393
	Culture (X2.4)	Group 1	0.587	0.645	0.461	0.665	0.477
		Group 2	0.632	0.578	0.580	0.496	0.686
	Sub Culture (X2.5)	Group 1	0.639	0.557	0.549	0.640	0.405
		Group 2	0.685	0.626	0.545	0.514	0.618
	Social Class (X2.6)	Group 1	0.624	0.627	0.625	0.675	0.539
		Group 2	0.653	0.702	0.475	0.520	0.639

Variable	Indicators	Group	Loading				
			Jakarta	Bogor	Depok	Tangerang	Bekasi
Personal Factors (X3)	Age and Life Cycle Stages (X3.1)	Group 1	0.790	0.705	0.692	0.761	0.645
		Group 2	0.775	0.784	0.724	0.591	0.768
	Lifestyle (X3.2)	Group 1	0.748	0.739	0.769	0.722	0.804
		Group 2	0.825	0.748	0.745	0.735	0.538
	Personality and Self-Concept (X3.3)	Group 1	0.741	0.775	0.730	0.701	0.824
		Group 2	0.764	0.775	0.660	0.790	0.733
Digitization of Electronic Money (Y1)	Convenience (Y1.1)	Group 1	0.634	0.594	0.637	0.589	0.488
		Group 2	0.668	0.523	0.426	0.729	0.593
	Complementarity (Y1.2)	Group 1	0.585	0.606	0.648	0.668	0.631
		Group 2	0.626	0.645	0.647	0.640	0.688
	Network Effects (Y1.3)	Group 1	0.655	0.660	0.574	0.595	0.672
		Group 2	0.699	0.599	0.547	0.594	0.528
	Security (Y1.4)	Group 1	0.605	0.698	0.623	0.561	0.732
		Group 2	0.697	0.482	0.679	0.341	0.562
	Regulation (Y1.5)	Group 1	0.672	0.571	0.683	0.562	0.708
		Group 2	0.692	0.670	0.554	0.502	0.524
	Trust (Y1.6)	Group 1	0.583	0.472	0.644	0.663	0.467
		Group 2	0.729	0.653	0.648	0.651	0.698
Development of Cashless Society (Y2)	Digital Payments (Y2.1)	Group 1	0.833	0.837	0.826	0.837	0.839
		Group 2	0.864	0.834	0.849	0.851	0.849
	Ease of Transaction (Y2.2)	Group 1	0.833	0.837	0.826	0.837	0.839
		Group 2	0.864	0.834	0.849	0.851	0.849

Source: Data Processed, 2024

CONCLUSION

The study demonstrates that psychological and personal factors are crucial in encouraging the adoption of electronic money and the transition to a cashless society. Psychological elements, such as motivation, perception, learning, and attitudes, are key to promoting digital financial behavior. For instance, positive perceptions of convenience and security and strong motivation can lead to greater acceptance of digital payments. Likewise, personal factors like lifestyle, life stages, and personality traits have a significant impact, with flexible and innovation-driven lifestyles being vital to facilitating this change.

The results have both theoretical and practical implications. Theoretically, they help deepen our understanding of how personal motivations and characteristics influence the adoption of digital financial systems, expanding consumer behavior theories in the digital age. They also emphasize the role of psychological factors in technology acceptance models, particularly in financial innovation. On a practical level, the findings suggest that financial service providers should create customized products that align with various life stages and

lifestyle preferences. For example, offering simple and user-friendly digital payment solutions for older users or rewarding frequent digital transactions among young professionals could significantly increase adoption rates.

The study highlights the need for more targeted socio-cultural interventions, particularly in regions where social norms still hinder digital finance adoption. Collaborative efforts between financial institutions, government bodies, and community leaders are critical in addressing socio-cultural gaps. For instance, organizing digital literacy campaigns in rural areas and showcasing community leaders who endorse digital transactions could gradually reshape cultural perceptions. Additionally, strategic policies such as tax incentives for digital transactions, subsidized technology infrastructure, and expanding internet access in underserved regions are recommended to accelerate the transition to a cashless society.

Future research should explore the dynamic interplay of socio-cultural factors in various demographic settings to understand their evolving role in digital finance adoption. The insignificance of socio-cultural factors observed in this study may reflect regional differences, such as the prevalence of individualism in urban areas like Jakarta, where personal and technical factors such as convenience and trust dominate. Financial service providers are also encouraged to prioritize building trust in digital systems by offering robust security measures, user testimonials, and transparent communication to address any lingering hesitancies. By integrating these strategies, the findings of this study can contribute to a more comprehensive framework for advancing the cashless society agenda.

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