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Swipe, Shop, Repeat: Investigating Technology Acceptance In Indonesia's Leading E-Commerce

Geser, Belanja, Ulangi: Menyelidiki Penerimaan Teknologi Di E-Commerce Terkemuka Di Indonesia

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ABSTRACT
With the rapid growth of e-commerce in Indonesia, understanding the factors influencing user acceptance is crucial for both platform developers and policymakers. This study examines the acceptance of Tokopedia, one of Indonesia's leading e-commerce platforms, using Davis' Technology Acceptance Model (TAM). It aims to explore the relationships between perceived ease of use, perceived usefulness, attitude toward use, behavioral intention to use, and actual use within the TAM framework. A quantitative descriptive and correlational research design was adopted, utilizing an online survey distributed to 201 active Tokopedia users in North Sulawesi, Indonesia. The collected data were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) via SmartPLS 3. The results indicate that attitude toward use and behavioral intention to use significantly influence actual use of e-commerce. Additionally, perceived ease of use positively affects both perceived usefulness and attitude toward use, while behavioral intention has the strongest impact on actual use. Furthermore, perceived ease of use and perceived usefulness influence actual use indirectly through attitude toward use and behavioral intention to use. These findings provide valuable insights for e-commerce practitioners seeking to enhance user engagement and platform adoption. By understanding the key determinants of e-commerce acceptance, businesses can develop more effective marketing strategies, improve user experience, and optimize product offerings to encourage sustained platform use.
Keywords: Technology Acceptance Model; E-Commerce; Tokopedia; Structural Equation Modelling

ABSTRAK
Dengan pesatnya pertumbuhan e-commerce di Indonesia, memahami faktor-faktor yang mempengaruhi penerimaan pengguna menjadi sangat penting bagi para pengembang platform dan pembuat kebijakan. Studi ini meneliti penerimaan Tokopedia, salah satu platform e-commerce terkemuka di Indonesia, dengan menggunakan Technology Acceptance Model (TAM) dari Davis. Penelitian ini bertujuan untuk mengeksplorasi hubungan antara persepsi kemudahan penggunaan, persepsi kegunaan, sikap terhadap penggunaan, niat perilaku untuk menggunakan, dan penggunaan aktual dalam kerangka kerja TAM. Desain penelitian deskriptif kuantitatif dan korelasional diadopsi, dengan menggunakan survei online yang didistribusikan kepada 201 pengguna aktif Tokopedia di Sulawesi Utara, Indonesia. Data yang terkumpul dianalisis menggunakan Structural Equation Modeling-Partial Least Squares (SEM-PLS) melalui SmartPLS 3. Hasil penelitian menunjukkan bahwa sikap terhadap penggunaan dan niat perilaku untuk menggunakan secara signifikan mempengaruhi penggunaan aktual e-commerce. Selain itu, persepsi kemudahan penggunaan berpengaruh positif terhadap persepsi kegunaan dan sikap terhadap penggunaan, sedangkan niat perilaku memiliki dampak terkuat terhadap penggunaan aktual. Lebih lanjut, persepsi kemudahan penggunaan dan persepsi kegunaan mempengaruhi penggunaan aktual secara tidak langsung melalui sikap terhadap penggunaan dan niat perilaku untuk menggunakan. Temuan ini memberikan wawasan yang berharga bagi para praktisi e-commerce yang ingin meningkatkan keterlibatan pengguna dan adopsi platform. Dengan memahami faktor penentu utama penerimaan e-commerce, bisnis dapat mengembangkan strategi pemasaran yang lebih efektif, meningkatkan pengalaman pengguna, dan mengoptimalkan penawaran produk untuk mendorong penggunaan platform yang berkelanjutan.
Kata kunci: Model Penerimaan Teknologi; E-Commerce; Tokopedia; Pemodelan Persamaan Struktural

1. **Introduction**

The rapid advancement of technology and increasing internet penetration have significantly transformed global commerce, particularly in emerging markets like Indonesia. E-commerce platforms have revolutionized consumer shopping behavior, shifting transactions from traditional brick-and-mortar stores to digital marketplaces (Habibillah & Hadjri, 2023). The convenience of online shopping, diverse product offerings, and competitive pricing have contributed to the expansion of digital commerce (Sinaga & Rivani, 2020; Septa & Hoirul, 2022). Among the dominant players in Indonesia's e-commerce sector, Tokopedia has played a pivotal role in shaping the digital economy. However, despite the rapid adoption of e-commerce, there is a pressing need to explore the evolving dynamics of digital commerce in emerging markets. Key challenges such as digital literacy, trust in online transactions, and infrastructure disparities continue to influence consumer behavior and market development (Indarso et al., 2024). Addressing these challenges is critical for businesses and policymakers aiming to maximize e-commerce potential while ensuring inclusive digital participation.

. The Covid-19 pandemic further accelerated the shift towards digital transactions, pushing both businesses and consumers to embrace online marketplaces as a necessity rather than an alternative (Yusuf et al., 2024). In response, major e-commerce platforms like Tokopedia, Shopee, Lazada, and Bukalapak have continuously innovated to enhance customer experience and expand their reach (Adha, 2022). The rapid expansion of digital commerce has also been fueled by social commerce, where platforms integrate with social media to facilitate shopping experiences (Farunik & Ginny, 2023; Mandagi & Aseng, 2021; Sijabat et al., 2022; Warbung et al., 2023). For instance, Tokope3dia's recent collaboration with TikTok represents a growing trend in hybrid e-commerce models, where entertainment and online shopping converge. However, while these innovations have transformed the e-commerce landscape, their effectiveness and impact on consumer adoption patterns in emerging markets remain underexplored.

The urgency of this research lies in addressing critical gaps in understanding e-commerce adoption within emerging markets. Unlike developed economies, where digital commerce has reached maturity, emerging markets like Indonesia face distinct challenges and opportunities that shape consumer behavior. Factors such as logistical barriers, digital payment security concerns, regulatory uncertainties, and socio-economic disparities significantly impact the effectiveness of e-commerce platforms (Indarso et al., 2024). Businesses operating in these markets must tailor their strategies to local contexts to remain competitive. Additionally, as social commerce continues to evolve, understanding how consumers in emerging markets interact with these platforms is crucial for predicting future digital commerce trends (Mandagi, 2023; . Without addressing these pressing issues, businesses may struggle to optimize their strategies, and policymakers may lack the insights needed to create an inclusive digital economy.

Several research gaps exist in the study of e-commerce adoption, particularly within the context of emerging markets. The first gap pertains to the limited exploration of digital commerce adoption in economies like Indonesia. While previous studies have widely applied Davis' Technology Acceptance Model (TAM) to analyze technology adoption (Kasidi, 2024), most research focuses on developed economies or generalized national trends. Few studies specifically examine how factors like digital literacy, trust, and economic disparities influence e-commerce adoption in emerging markets (Nurfauzi, 2023). Given Indonesia's vast geographical and socio-economic diversity, a deeper understanding of these unique adoption barriers is essential for crafting more effective digital strategies.

The second research gap involves the evolving role of social commerce and its impact on e-commerce adoption in emerging markets. Tokopedia's partnership with TikTok, alongside similar collaborations by other e-commerce platforms, highlights a shift in digital shopping

experiences. While social commerce is widely studied in developed markets, there is limited research on how it influences consumer decisions in emerging economies, where social media penetration is high but digital purchasing confidence may still be developing (Mandagi et al., 2024; Manggopa et al., 2023; Marhareita et al., 2022). Understanding these dynamics is critical for assessing the effectiveness of social commerce strategies and their potential to drive e-commerce adoption in Indonesia and similar markets (Wantah et al., 2024).

The significance of this research extends to both theoretical and practical contributions. Theoretically, this study enriches existing knowledge on technology adoption by applying TAM within the specific context of an emerging market. It provides empirical insights into how perceived usefulness and ease of use influence consumer adoption in markets with unique economic and infrastructural conditions. Furthermore, it expands the understanding of social commerce by analyzing its role in shaping consumer behavior within developing digital economies. Practically, this research offers valuable insights for e-commerce platforms, digital marketers, and policymakers seeking to optimize e-commerce adoption strategies. Businesses can leverage these findings to refine their digital marketing approaches, improve customer engagement, and enhance trust in online transactions. Additionally, policymakers can use these insights to inform regulatory frameworks that support digital commerce growth while addressing barriers such as cybersecurity risks and digital literacy gaps.

2. LITERATURE REVIEW
2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Davis (1989), is a theoretical framework designed to explain and predict user acceptance of new technologies. The model posits that individuals' adoption of technology is primarily influenced by two key perceptions: perceived usefulness (PU) and perceived ease of use (PE). PU refers to the extent to which a person believes that using a particular system will enhance their job performance, while PE denotes the degree to which a person perceives that using the system will be free of effort. These two factors shape an individual's attitude (AT) toward technology, which subsequently influences their behavioral intention (BI) to use it and ultimately leads to actual usage (AU). TAM is widely used in various fields, including e-commerce, healthcare, education, and banking, to assess how users adopt digital platforms and innovations. The model has been extensively validated and extended by researchers, incorporating additional factors such as trust, social influence, and perceived risk (Venkatesh & Bala, 2008). Studies have shown that TAM is particularly relevant in analyzing technology adoption in emerging markets, where digital transformation is rapidly changing consumer behavior and business operations (Alalwan et al., 2018).

TAM is crucial for understanding technology adoption because it provides a structured approach to evaluating the factors influencing user behavior. It helps businesses and policymakers design better user experiences, improve technology adoption rates, and address barriers to digital transformation. Previous studies have demonstrated its applicability in various contexts, such as mobile banking (Rahi et al., 2019), e-learning platforms (Park, 2009), and e-commerce adoption (Alzubi et al., 2023). In emerging markets, where technological infrastructure and digital literacy levels vary significantly, TAM helps explain how users develop trust and confidence in digital services. Research indicates that factors such as perceived security, digital payment convenience, and cultural attitudes toward technology significantly impact adoption (Santos & Laureano, 2021).

Perception of usefulness (PU)

PU is one of the fundamental determinants of technology adoption in TAM, defined as the degree to which an individual believes that using a particular technology will enhance their

productivity or effectiveness (Davis, 1989). It plays a crucial role in shaping users' attitudes toward a technology and their intention to adopt it. If users perceive a system as beneficial in fulfilling their needs or improving their work efficiency, they are more likely to integrate it into their routine activities. In emerging markets, PU is particularly significant due to rapid digital transformation and the growing reliance on e-commerce, mobile banking, and other digital services (Lebo, T. C., & Mandagi. Given that technological infrastructure and digital literacy levels vary across these markets, the usefulness of a technology is often assessed based on its ability to solve everyday problems, such as facilitating financial transactions, improving access to products, or streamlining communication. For instance, in the e-commerce sector, a platform that provides a wide product range, competitive prices, and personalized recommendations is likely to be perceived as more useful by consumers, thereby increasing adoption rates (Alalwan et al., 2018).

Several studies have demonstrated the impact of PU on technology adoption across various industries. Research on mobile payment adoption found that users were more likely to adopt digital wallets if they believed the technology made transactions faster and reduced dependence on cash (Chandra & Sijabat, 2022). Similarly, a study on online learning platforms highlighted that students were more inclined to use e-learning tools if they perceived them as enhancing their academic performance and learning flexibility (Park, 2009). Indicators used to measure PU typically include efficiency, productivity improvement, convenience, and enhanced decision-making (Napitupulu, 2024). In the context of e-commerce, consumers evaluate PU based on factors such as ease of product search, transaction speed, and access to customer reviews. A study by Khairial (2024) confirmed that PU significantly influences purchase decisions in online marketplaces, particularly in emerging markets, where access to physical stores may be limited.

Perceived Ease of Use (PE)

PE refers to the extent to which an individual believes that using a particular technology will be free from effort (Davis, 1989). It is a key determinant of user acceptance because a system that is difficult to use can create frustration and reduce the likelihood of adoption. PE is particularly important in emerging markets, where varying levels of digital literacy and technological exposure can impact user confidence in adopting new platforms. If consumers find an e-commerce platform easy to navigate, with clear product categories, a seamless checkout process, and accessible customer support, they are more likely to continue using it. Conversely, a complex or unintuitive interface can deter potential users, even if the technology offers significant benefits. Studies have shown that simplifying user interfaces, minimizing technical jargon, and incorporating localized language options can enhance PE and drive adoption (Amalia, 2022). This is especially relevant for businesses targeting first-time digital consumers who may not be accustomed to online transactions.

Previous research has extensively validated the role of PE in technology adoption. In a study on mobile banking adoption, Prasetya and Lestari (2024) found that users preferred apps with minimal technical complexity, as ease of use fostered trust and encouraged regular usage. Another study on e-commerce platforms by Putri and Iriani (2021) emphasized that consumers are more likely to adopt online shopping if the platform offers clear navigation, intuitive search functions, and a user-friendly checkout system. The key indicators of PE include system clarity, learnability, ease of navigation, and perceived effort (Nauval, 2024). For instance, platforms that require fewer steps to complete a transaction tend to be perceived as easier to use, increasing user engagement. The findings from Cassandra and Bernanda (2024) further support the notion that reducing cognitive load and simplifying platform design significantly enhances adoption rates in emerging markets.

Attitude toward the use of (AT)

AT refers to a user's overall evaluation of a technology, influenced by their perceptions of its usefulness and ease of use (Davis, 1989). It serves as a bridge between PU, PEOU, and behavioral intention, meaning that users who develop a positive attitude toward a technology are more likely to adopt it. A favorable AT is often shaped by factors such as previous experiences, trust, and social influence . In emerging markets, AT plays a crucial role in determining whether consumers will engage with digital services, especially in industries such as e-commerce and mobile banking. If consumers perceive a platform as reliable, secure, and beneficial, they are more likely to develop a positive attitude, which increases their willingness to use it. Conversely, concerns about fraud, privacy, or technical difficulties can result in negative attitudes and lower adoption rates (Andrew & Ardianti, 2022). The growing importance of trust in digital transactions further highlights the need for companies to enhance transparency and customer support to shape positive attitudes toward technology adoption.

Empirical studies have demonstrated the strong influence of AT on technology adoption. For example, research on e-commerce platforms found that consumers who had positive experiences with online shopping, such as fast deliveries and secure payment options, were more likely to develop a favorable attitude toward digital purchases (Darman, 2024). Similarly, a study on digital banking adoption indicated that a positive AT toward mobile banking significantly increased users' willingness to use online financial services (Sundoro et al., 2024). Key indicators of AT include user satisfaction, trust, perceived security, and emotional response (Trisnawati, 2021). Research suggests that platforms that integrate robust customer service, user-friendly interfaces, and secure payment methods foster more positive attitudes, ultimately driving higher adoption rates.

Behavioral Intention to Use (BI)

BI reflects a user's willingness to engage with a technology and is one of the strongest predictors of actual usage (Ajzen, 1991). It is directly influenced by PU, PEOU, and AT, meaning that users who perceive a technology as useful, easy to use, and favorable are more likely to intend to use it. BI is particularly important in emerging markets, where adoption barriers such as trust issues, infrastructure limitations, and digital illiteracy can impact user decisions. Companies often focus on enhancing BI through marketing strategies, incentives, and user education. For example, promotional discounts, referral programs, and free trials can increase BI by reducing perceived risks and encouraging initial engagement (Santos & Laureano, 2021). Additionally, social influence plays a crucial role in shaping BI, as users are more likely to adopt a technology if they see others in their community using it successfully.

Studies have confirmed the impact of BI on technology adoption across various sectors. In a study on digital payments, Rinday (2023) found that consumers were more likely to use mobile wallets when they saw others in their social network adopting them (Pasuhuk & Mandagi, 2023; Poluan et al., 2022). Similarly, research on ride-hailing applications suggested that users' BI was strengthened by positive experiences, such as reliable service, transparent pricing, and safety features (Cassandra & Bernanda, 2024). Key indicators of BI include purchase intention, likelihood of future use, and willingness to recommend (Meisari et al., 2024). In e-commerce, for instance, platforms that consistently deliver positive customer experiences see higher BI, as satisfied users are more inclined to make repeat purchases and recommend the service to others (Inaray et al., 2024; Kelejan et al., 2022).

Actual Usage (AU)

AU represents the real engagement of users with a technology, translating BI into concrete actions (Venkatesh et al., 2003). It is the ultimate outcome in TAM, as successful adoption is measured by how frequently and effectively users engage with a platform. In emerging markets, AU is influenced by external factors such as internet accessibility, payment

infrastructure, and perceived risks associated with digital transactions. Even if users have a strong BI, poor infrastructure, unreliable networks, or security concerns can hinder actual adoption. Therefore, businesses must focus on reducing barriers and enhancing user confidence to ensure sustainable technology use.

Research on e-commerce adoption indicates that users are more likely to engage in online shopping when platforms provide secure payment options, fast delivery services, and responsive customer support (Sutisna, 2023). Similarly, a study on mobile banking adoption found that AU increased when users had positive prior experiences and found the service reliable (Rinday, 2023). Key indicators of AU include frequency of use, transaction volume, and engagement level (Cassandra & Bernanda, 2024). Platforms that continuously improve user experiences and address barriers tend to achieve higher AU rates, leading to long-term adoption and customer retention.

2.2 Conceptual Framework and Hypothesis Development

Perceived ease of use is crucial as it reduces the cognitive burden on users, making them more likely to perceive the system as useful. The ease of use of an application significantly enhances user perceptions of its usefulness, ultimately influencing their adoption decisions (Koutromanos et al., 2024). A user-friendly application interface allows individuals to efficiently accomplish their tasks, thereby increasing their perception of the application's overall utility. Studies indicate that ease of use is a fundamental determinant of perceived usefulness, affecting how individuals evaluate the advantages of technology adoption.

Empirical research has confirmed the positive relationship between perceived ease of use and perceived usefulness. Koutromanos et al. (2024) found that the usability of e-commerce platforms significantly impacts user perceptions of their usefulness. Similarly, Walean et al. (2024) demonstrated that an intuitive and easy-to-use interface enhances user satisfaction, reinforcing its perceived benefits. Based on these findings, the following hypothesis is proposed:
H1: Perceived ease of use positively and significantly affects perceived usefulness**.**

Perceived usefulnes is the extent to which a person believes that using a system will enhance their performance. This perception is critical in shaping user attitudes toward technology adoption. Users who recognize substantial benefits from a system are more inclined to develop a favorable attitude toward its use. Perceived usefulnes is an essential factor in fostering a positive attitude toward digital platforms, as it directly impacts user satisfaction and engagement (Wulandari et al., 2022).

Several studies have examined the relationship between perceived usefulnes and attitudes toward technology adoption. Wulandari et al. (2022) found that perceived usefulnes positively influences attitudes toward metaverse applications in Oman, leading to a higher likelihood of continued usage. Similar results were reported in research on mobile health applications, where users who perceived tangible benefits exhibited more favorable attitudes toward their usage (Zhang, 2023). Wang et al. (2023) further emphasized the importance of perceived usefulnes in digital learning platforms, noting its role in increasing user engagement. Based on these studies, the following hypothesis is formulated:
H2: Perceived usefulness positively and significantly influences attitudes toward technology adoption**.**

Attitudes toward technology is influenced by its usability. When users perceive a system as easy to use, their attitude toward the system improves, making them more willing to engage with it. A positive attitude is crucial in determining user satisfaction and adoption behavior (An et al., 2023). Attitude formation is largely dependent on users' ease of interaction with the technology, thereby making ease of use a critical determinant of technology acceptance. Empirical findings highlight the significance of perceived usefulness in shaping attitudes toward technology adoption. Liesa-Orús et al. (2023) found that users who perceived mobile

applications as easy to use had a more positive attitude toward them. Similarly, Nguyen et al. (2023) reported that applications designed with user-friendly interfaces led to improved attitudes toward their adoption. Based on these findings, the following hypothesis is proposed:

H3: Perceived ease of use positively and significantly affects attitudes toward technology**.**

Behavioral Intention captures individual's readiness to use a particular technology. Perceived usefulness plays a key role in determining behavioral intention, as users are more likely to intend to use a technology if they perceive it as useful. A strong positive perception of usefulness increases the likelihood of behavioral engagement with the system (Tian et al., 2023; Songkram et al., 2023). Studies have consistently demonstrated the positive effect of perceived usefulness on behavioral intention. Research by Al-Adwan et al. (2023) found that users with higher perceived usefulness scores exhibited greater intention to adopt e-learning platforms. Similarly, Zhang et al. (2023) showed that perceived usefulness positively influenced behavioral intention in mobile commerce applications. Based on these findings, the following hypothesis is developed:

H4: Perceived usefulness positively and significantly affects behavioral intention.

Attitude toward technology adoption is a significant predictor of behavioral intention. A positive attitude fosters a stronger intention to engage with a technology, leading to higher adoption rates. Consumers who develop a favorable perception of an application are more likely to incorporate it into their daily activities (Macheka et al., 2024; Nugroho et al., 2024). Several studies support this relationship. Awal et al. (2023) found that consumer attitudes significantly influenced online shopping behavior. Similarly, Nugroho et al. (2024) demonstrated that a positive attitude toward digital platforms increased users' intention to continue using them. Based on these findings, the following hypothesis is proposed:

H5: Attitude toward technology adoption positively and significantly affects behavioral intention.

Actual use is the ultimate outcome of TAM, where Behavioral Intention (BI) translates into real-world adoption. BI serves as a strong predictor of AU, as individuals who express a high intention to use technology are more likely to follow through with their actions (Tannady & Dewi, 2024; Hasan et al., 2024). Empirical research has validated the impact of BI on AU. Studies by Jin et al. (2023) and Xie et al. (2023) found that BI significantly influenced the actual adoption of mobile applications. Similarly, Brookman et al. (2023) reported that strong behavioral intentions translated into consistent technology usage patterns. Based on these findings, the following hypothesis is proposed:

H6: Behavioral intention positively and significantly affects actual use**.**

The conceptual framework, illustrated in Figure 1 below, summarizes the relationships among variables and the corresponding hypotheses.
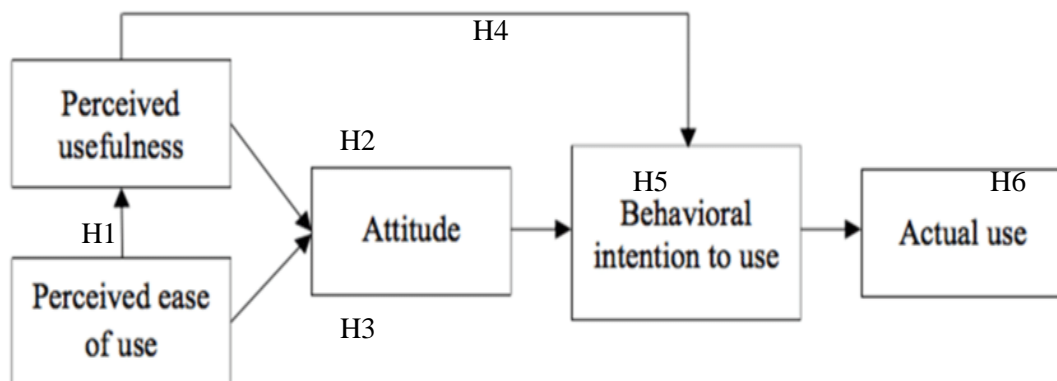

Figure 1. Research conceptual framework

3. Methodology

This study employs a quantitative descriptive and correlational research design, chosen to analyze relationships between variables within the Technology Acceptance Model (TAM) and assess the level of acceptance of an application. The research utilizes convenience sampling, allowing researchers to select respondents based on predefined criteria that align with the study's objectives. The respondents consisted of individuals aged 17 years or older who had previously used either the Tokopedia or TikTok Shop application for shopping.

The five variables in TAM, initially developed by Fred Davis in 1989 and later expanded by Richard Warshaw (Rotib et al., 2021), were modified to fit this study. The final questionnaire consisted of 25 items, measuring five constructs: six items for perceived usefulness, four for perceived ease of use, five for attitude toward use, five for intention to use, and five for actual use. A five-point Likert scale was utilized, ranging from "strongly agree" to "strongly disagree," to measure respondents' perceptions accurately. Data collection was conducted online via WhatsApp and Facebook using Google Forms to ensure accessibility and efficiency. This digital distribution method enabled immediate data collection upon submission while ensuring that respondents met the inclusion criteria of having made purchases through Tokopedia or TikTok Shop. A total of 201 respondents participated in the study, with a demographic breakdown of 43% (N = 86) male and 57% (N = 115) female. The majority of respondents were between the ages of 17 and 25, indicating that this age group represents the dominant user base for these applications.

Table 1. Respodent Profile

Description		Total	%
Gender			
	Male	86	43%
	Female	115	57%
Age			
	17-25	117	58%
	26-35	25	12%
	36-45	28	14%
	46-55	24	12%
	56-65	7	3%
	>65	0	0%

The data analysis process began with an evaluation of data completeness and consistency using descriptive statistics in SPSS. This step ensured the accuracy of data entry, verified that the sample size matched the returned questionnaires, and confirmed that the data were recorded according to the intended measurement scale. Descriptive statistics were also employed to examine respondents' demographic profiles, including age, gender, and occupation. Following this, the study utilized Structural Equation Modeling (SEM) as the primary analytical method. According to Hair et al. (2017), SEM provides advantages over other analytical methods, such as path analysis, factor analysis, and regression, by modeling simultaneous relationships, examining both direct and indirect effects, and addressing multicollinearity issues. The ability of SEM to handle complex models has proven useful in explaining theoretical relationships between variables, making it an appropriate method for analyzing TAM constructs in this study.

The data analysis was performed using SPSS version 27 and SmartPLS version 3.9. SPSS was used for demographic analysis and reliability testing of each variable and its indicators, while

SmartPLS was used to assess the measurement model, structural model, and hypothesis testing. The practicality and flexibility of these software tools provided significant advantages in data analysis. Following Tabachnick (2019), the SEM-based data analysis process followed a structured sequence: preprocessing data, data description, inferential analysis, and multivariate analysis. First, based on the theoretical framework and research objectives, a conceptual model was developed to outline the relationships between the study variables, as illustrated in Figure 1 of Chapter 1. Second, literature review findings in Chapter 2 were used to identify indicators for each variable. Third, during model estimation, validity and reliability tests were conducted.

The validity analysis consisted of convergent and discriminant validity assessments. Convergent validity was evaluated by examining factor loadings, with a threshold of ≥0.50 for acceptable validity (Hair et al., 2017). Discriminant validity was tested using three criteria: (1) Fornell-Larcker Criterion, which compares the square root of the Average Variance Extracted (AVE) with inter-variable correlations, ensuring that AVE values exceed inter-variable correlations; (2) Cross-loading, ensuring that indicators have a higher correlation with their respective constructs than with other constructs; and (3) Heterotrait-Monotrait (HTMT) Ratio, where discriminant validity is confirmed if the ratio is below 0.90.

Reliability testing was conducted using Cronbach's Alpha (CA), Composite Reliability (CR), and AVE. A construct was considered reliable if CA and CR values exceeded 0.70, and AVE was above 0.50. Once validity and reliability were confirmed, structural model testing proceeded using PLS bootstrapping in SmartPLS. This involved evaluating the significance of path coefficients to test the study's hypotheses. Statistical significance was determined using t-values or z-values, with hypotheses considered significant if the p-value was below the chosen significance level (Hair et al., 2017). Lastly, model fit assessment was performed to compare the empirical model with the theoretical model and ensure overall model validity through Goodness-of-Fit (GoF) testing

4. Result And Discussion
4.1 Measurement Model Evaluation (Outer Model)
Before testing the hypothesis, the analysis begins with a measurement model test. The purpose of this test is to assess the validity and reliability of all variables. In this study, the measurement model was analyzed using the Partial Least Squares (PLS) Algoritm method in the the SmartPLS.

Convergent Validity
After testing for convergent validity, six indicators—PU1, AT5, BI3, AU2, AU3, and AU4— did not meet the validity requirements and were eliminated. The remaining indicators in the table are those that met the validity criteria and are considered valid. A detailed overview of the valid indicators is presented in Table 2 below.

Table 2. Convergent Validity

Indicator	AU	AT	BI	PE	PU	AVE	Description
AU						0,846	Valid
AU1	0,924						Valid
AU5	0,916						Valid
AT						0,771	Valid
AT1		0,884					Valid
AT2		0,828					Valid
AT3		0,890					Valid
AT4		0,908					Valid

BI			0,757	Valid
BI1		0,850		Valid
BI2		0,860		Valid
BI4		0,886		Valid
BI5		0,882		Valid
PE			0,717	Valid
PE1		0,899		Valid
PE2		0,858		Valid
PE3		0,850		Valid
PE4		0,776		Valid
PU			0,621	Valid
ꞌU2			0,753	Valid
ꞌU3			0,795	Valid
ꞌU4			0,857	Valid
ꞌU5			0,785	Valid
ꞌU6			0,748	Valid

Discrimimant Validity

Furthermore, the measurement model includes an assessment of Discriminant Validity, which is evaluated using the Fornell-Larcker criterion and cross-loading values. The Fornell-Larcker criterion is considered acceptable if the coefficient value of each indicator within a variable is greater than its correlation with other indicators in the model. This indicates that the indicators are more strongly associated with their respective variables than with other variables. The Fornell-Larcker criterion values are presented in Table 3 below**.**

Table 3. Fornell-Larcker Criterion

	AU	AT	BI	PE	PU
AU	**0,920**				
AT	0,725	**0,878**			
BI	0,805	0,768	**0,870**		
PE	0,558	0,654	0,557	**0,847**	
PU	0,590	0,667	0,571	0,549	**0,788**

The results above indicate a high level of correlation among the variables, as reflected in the following coefficient values: AU (0.920), AT (0.878), BI (0.870), PE (0.847), and Perceived Usefulness (0.788). These values confirm that all indicators are valid and the results are acceptable.

To further assess discriminant validity, the cross-loading values of the indicators must be examined. The cross-loading values measure the strength of the relationship between each indicator and its respective variable compared to its relationship with other variables. If an indicator's correlation with its assigned variable is greater than its correlation with any other variable, the measurement model demonstrates good discriminant validity.

Table 4. Cross-Loading

	AT	AU	BI	PE	PU
AT1	**0.884**	0.646	0.673	0.584	0.565
AT2	**0.828**	0.610	0.603	0.599	0.595
AT3	**0.890**	0.594	0.669	0.535	0.579
AT4	**0.908**	0.691	0.744	0.578	0.603

AU1	0.649	**0.924**	0.757	0.475	0.544
AU5	0.685	**0.916**	0.722	0.554	0.541
BI1	0.702	0.766	**0.850**	0.514	0.549
BI2	0.645	0.610	**0.860**	0.426	0.467
BI4	0.643	0.649	**0.886**	0.453	0.455
BI5	0.673	0.755	**0.882**	0.531	0.504
PE1	0.582	0.494	0.471	**0.899**	0.533
PE2	0.467	0.452	0.449	**0.858**	0.407
PE3	0.476	0.420	0.411	**0.850**	0.405
PE4	0.647	0.504	0.531	**0.776**	0.484
PU2	0.452	0.470	0.434	0.294	**0.753**
PU3	0.441	0.408	0.352	0.430	**0.795**
PU4	0.568	0.547	0.513	0.521	**0.857**
PU5	0.579	0.445	0.449	0.529	**0.785**
PU6	0.562	0.445	0.483	0.350	**0.748**

Reliability

Composite Reliability (CR) assesses the consistency and reliability of each indicator. Additionally, Cronbach's Alpha is used to evaluate whether the questions or indicators in this study consistently measure the intended constructs. By utilizing both Cronbach's Alpha and Composite Reliability, the reliability of variables and indicators can be effectively measured and validated. A reliability value is considered acceptable if both CR and Cronbach's Alpha exceed 0.70, as presented in Table 5 below.

Table 5. Construct Reliability

Variable	Cronbach's Alpha	Composite Reliability	Description
AU	0,817	0,819	Reliable
AT	0,900	0,902	Reliable
BI	0,893	0,896	Reliable
PE	0,869	0,876	Reliable
PU	0,848	0,856	Reliable

4.2 Structural Model Evaluation (Inner Model)

Measurement Coefficient (R^2)

Coefficient of determination or R2 (R squares) that we can analyze, based on the results of table 6 we can say that AU is moderately influenced by BI by 64.8%, AT of moderately influenced by PE and PU by 56.3%, BI is influenced by PU and AT moderately by 59.6% and finally PU is also weakly influenced by PE by 30.1%.

Table 6. Coeffiicient of Determination

Variable	R Square
AU	0,648
AT	0,563
BI	0,596
PU	0,301

Effect size (F^2)

Effect size f2 is used by researchers to determine the goodness of variables that are temporarily examined with the following requirements if the value of f2 is equal to 0.02 or

smaller is categorized as small if the value of f2 0.15 is categorized as medium and if the value above 0.35 is categorized as large. The results of this study are as shown in table 7 below.

Table 7. Effect size (F²)

	AU	AT	BI	PE	PU
AU					
AT			0.667		
BI	1.840				
PE		0.271			0.431
PU		0.311	0.015		

Effect size in the large category can be found in AT->BI, BI->AU, PE->PU, Moderate can be found in PE->AT, PU->AT, and small pa PU->BI according to the criteria mentioned above.

Model Fit (NFI)

A standardized fit index, or NFI, value closer to 1 indicates that the model fit is better. In this case, the NFI value of the model is 0.815, which indicates a good fit. Since an SRMR (Standardized Root Mean Square Residual) below 0.08 indicates a good fit, the SRMR value of 0.072 also indicates that this model meets the acceptable threshold. With a chi-square value of 531.994, the model is still considered adequate despite some misfit. As shown in table 8 below.

Table 8. Model Fit

Model Fit	Value
NFI	0.815
SRMR	0.072
Chi-square	531.994

Predictive Relevance (Q²)

Based on the data presented in Table 9 as follows AU=0.282, AT=0.416, BI=0.299 and PU=0.285 where the value of Q2 is greater than 0, when the Q2 model value is more than 0, it can be concluded that the endogenous variable has a significant predictive value and vice versa if it is less than zero, it means that it shows that the endogenous value is not significant.

Table 9. Predictive Relevance Q²

	Q²
AU	0,282
AT	0,416
BI	0,299
PU	0,285

Hypothesis Test

There is a substantial correlation between the variables "Perceived Ease of Use" and "Perception of usefulness", as indicated by the p-value in Table 10 of 0.00 < 0.05 and the T-value of 10.118 > 1.96. This   leads to the adoption of hypothesis (Ha1), which states that perceived ease of use has a positive and   significant impact on Perception of usefulness. Based on the research results, it can be concluded that users of the Tokopedia application are more likely to see the usefulness of the application positively, which gives   birth to the belief that using the application is beneficial. Indicators that support this perspective include   controllability, flexibility, clarity, understanding, ease of use, and ease of skill improvement.

Table 10 Hypothesis Testing

T Statistics (|O/STDEV|)	P Values	Description

PE -> PU	10,118	0,000	Significant
PU -> AT	6,538	0,000	Significant
PE -> AT	5,577	0,000	Significant
PU -> BI	1,249	0,212	Not Significant
AT -> BI	9,676	0,000	Significant
BI -> AU	30,506	0,000	Significant

A significant correlation between the variables "*Perception of usefulness*" and "*attitude toward the use of*", which is indicated by a p-value of 0.00 < 0.05 and a T-value of 6.538 > 1.96, is shown in Table 10. The T-value is a measure of the difference between the actual value observed in the data sample and the expected value (based on the zero hypothesis). The stronger the evidence to reject the null hypothesis, the larger the absolute T-value and the smaller the corresponding p-value (probability value). Therefore, it can be said that *Perception of usefulness* has a positive and considerable impact on *attitude toward the use of*, which results in the acceptance of Hypothesis (Ha2). It can be concluded from the research results that respondent who use the Tokopedia application have a positive attitude towards using it and a positive assessment of its usefulness. This finding is in line with research conducted on the Shopee application where the usefulness of a product can determine the intention to use (Walean et al., 2024).

Between the variables "Perceived Ease of Use" and "attitude toward the use of", Table 10 shows a substantial correlation (p-value 0.00 < 0.05, T-value 5.577 > 1.96). Therefore, it can be said that Perceived Ease of Use has a positive and significant impact on attitude toward the use of, which results in the hypothesis (Ha3) being accepted. According to the research findings, respondents who use the Tokopedia app have a favorable opinion of the app's usability, which helps them develop a favorable attitude towards using it.

With a T-value of 1.249 > 1.96 and a p-value of 0.212 < 0.05, the data in Table 10 clearly shows that the Perception of usefulness variable does not have a considerable influence on behavioral intention to use. Therefore, it can be said that behavioral intention to use is not significantly influenced by Perception of usefulness, this confirms to reject the hypothesis (Ha4). The conclusion of this study shows that consumers who are responsive to e-commerce services have a tendency not to return to Tokopedia and look for other applications such as Shopee, Lazada, this is in line with research on the Shopee application where behavioral intention to use is significantly influenced by Perception of usefulness (walean et all, 2024).

There is a strong correlation between "Behavioral Intention to Use" and the "attitude toward the use of" measure, as shown by the p-value in Table 10 which is 0.00<0.05 and the T-value of 9.676>1.96. Thus, it can be said that attitude toward the use of has a positive and significant influence on behavioral intention to use, which results in the acceptance of Hypothesis (Ha5). The results showed that, after they received the Tokopedia application, respondents who used e-commerce services generally had a behavioral tendency to continue using it. Positive encounters with the system, pleasant sensations, and an attitude of acceptance or rejection of the system are signs of this tendency.

With a p-value of 0.00<0.05 and a T-value of 30.506>1.96, the results from Table 10 clearly show that the Behavioral Intention to Use variable significantly affects Actual Use. Thus, it can be concluded that behavioral intention to use has a positive and significant impact on actual usage, supporting the hypothesis (Ha6). Based on the findings of this study, respondents are more likely to use an e-commerce platform if they express a desire to continue using the Tokopedia application and if they accept the research questions. Indicators such as the number of times a system is used in a certain period, its use in daily work, the user's environment when using the Tokopedia application, and the extent to which the Tokopedia application is used for its intended purpose are examples of how this is seen in frequency of use.

Table 11. Total, Direct, and Indirect Effects

Relationship	Total Effects	Direct Effects	Indirect Effects
PE -> PU	0.549	0.549	
PU -> AT	0.441	0.441	
PE -> AT	0.654	0.412	0.242
PU -> BI	0.414	0.106	0.307
PU -> AT	0.441	0.441	
PU -> BI	0.414	0.106	0.307

Based on the information in Table 11, this research shows that AU (Actual Usage) of the Tokopedia platform is significantly influenced by AT (Attitude Toward the Use) and BI (Behavioral Intention to Use). With a Total Effects value of 0.805, BI has the largest direct impact on AU. This indicates how the actual usage of the platform by users is directly influenced by their intention to use it.

Additionally, PE (Perceived Ease of Use) is a significant factor. AT (0.412) and PU (Perception of Usefulness) (0.549) are directly influenced by PE, which also significantly affects overall AU through indirect paths. The PE -> AT -> BI -> AU path has an indirect effect of 0.231, while the PU -> BI -> AU path has an indirect effect of 0.086. This implies that positive attitudes and behavioral intentions are influenced by PE, which in turn increases AU.

Overall, these results highlight the importance of enhancing usability and shaping positive consumer opinions to encourage broader acceptance and increase user activity on Tokopedia. By understanding these relationships, marketing tactics and product development can focus on user-friendliness and fostering positive mindsets to maximize results.

5. Conclusions

The results of the hypothesis testing for this research can be summarized as follows. First, it states that Perceived Ease of Use has a positive and significant impact on Perception of Usefulness. It can be concluded that Tokopedia users are more likely to perceive the application as useful, which leads to the belief that using the application is beneficial. Second, Perception of Usefulness has a positive and substantial impact on Attitude Toward the Use, indicating that Tokopedia users have a positive attitude towards using the application and a favorable assessment of its usefulness. Third, Perceived Ease of Use has a positive and significant impact on Attitude Toward the Use, suggesting that Tokopedia users have a favorable opinion of the application's ease of use, which helps them develop a positive attitude toward using it. Four, Behavioral Intention to Use is not significantly influenced by Perception of Usefulness. The conclusion from this research shows that consumers responsive to e-commerce services tend not to return to Tokopedia and seek other applications. Fifth, Attitude Toward the Use has a positive and significant influence on Behavioral Intention to Use. This shows that once they accept the application, respondents using e-commerce services generally have a behavioral tendency to continue using it. Sixth Behavioral Intention to Use has a positive and significant impact on Actual Usage. Users are more likely to use the e-commerce platform if they express an intention to continue using the Tokopedia application.

This study provides significant contributions to the academic literature in the fields of consumer behavior and information technology, particularly the application of the Technology Acceptance Model (TAM) to e-commerce applications like Tokopedia. The findings show that perceived usefulness and ease of use significantly influence users' attitudes, which in turn affect their behavioral intention to use and actual usage of the application. The study also reveals that the perceived usefulness variable has a low determination coefficient, indicating the presence of other factors that influence the use of the application. Therefore, this research opens

opportunities for further exploration of other factors that might play a role in the adoption of e-commerce technology. Additionally, this study can serve as a reference for future studies that compare various technology acceptance models or integrate other theories for a more comprehensive understanding.

Thus, the results of this study are not only beneficial for academics but also have significant practical implications for technology development and adoption in society. This research provides insights into the factors that influence the adoption and use of e-commerce applications like Tokopedia. Knowing that perceived usefulness and ease of use play significant roles in shaping users' attitudes and intentions to use the application, users can better understand how their experiences with the application affect their decisions to continue using it. beneficial for academics but also have significant practical implications for technology development and adoption in society.

Therefore, this research opens opportunities for further exploration of other factors that might play a role in the adoption of e-commerce technology. Additionally, this study can serve as a reference for future studies that compare various technology acceptance models or integrate other theories for a more comprehensive understanding.

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