

Integration of the UTAUT 2 Model and Awareness of Cybercrime as the Moderating Variable of Cashless Adoption in Indonesia

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— *Review of* —
**Integrative
Business &
Economics**
— *Research* —

ABSTRACT

This study analyzes people's behavior in using cashless payments in the midst of rampant cybercrime. In explaining user behavior regarding the use of cashless transactions, the unified theory of acceptance and use of technology (UTAUT2) model is used and integrated with the awareness of cybercrime in Indonesia. Questionnaires were distributed both online and offline to users of cashless platforms. Purposive Sampling was used due to the large population. The sample has 208 people. The data were analyzed using a Structural Equation Model (SEM). The results show that, in the UTAUT2 model, all the variables, including Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, and Habit, have an impact on the Use of Cashless. Additionally, all these relationships are moderated by Awareness of Cybercrime.

Keywords: Cashless; unified theory of acceptance and use of technology (UTAUT2); awareness cybercrime.

Received 22 April 2023 | Revised 20 August 2023 | Accepted 21 September 2023.

1. INTRODUCTION

Financial transactions utilizing technology have become a growing phenomenon among the general public. Technology is changing rapidly, resulting in the popularity of new payment technologies replacing traditional methods and attracting increasing attention (Flavian *et al.*, 2020). People's habits are shifting, with more individuals carrying less cash in their wallets. By relying on smartphones and stable internet connections, all transactions

can be conducted within seconds. Non-cash transactions that enable users to make payments using electronic money are referred to as cashless transactions. However, the use of cashless transactions also comes with risks. In the era of increasingly rampant cybercrime, mobile payment transactions may face the risk of financial and data loss (Chen & Lai (2023)).

Cybercrime is reported to exist worldwide. As seen in Figure 3, global cybercrime data for the year 2021 shows that cybercrime was growing rapidly and had reached 1.5 trillion USD annually. (www.bing.com). Cybercrime enables criminals to steal money from bank accounts and exploit personal data. Cyberattacks resulting in data breaches have made people fearful of conducting cashless transactions. A survey revealed that 64% of respondents expressed that their fear of their bank accounts being illegally accessed, was greater than the fear of losing their jobs. To explain user behavior toward information technology, the Unified Theory of Acceptance and Use of Technology (UTAUT) model has been used by several researchers. UTAUT is a model that explains user behavior toward information technology (Venkatesh *et al.*, 2003). The UTAUT model has been further developed into the UTAUT2 model (Venkatesh *et al.*, 2003), which indicates that behavioral intention and use behavior are influenced by performance expectancy, effort expectancy, social influence, facilitating conditions, habits, price value, hedonic motivation, and moderating variables such as gender, age, and experience. Empirical studies adopting this model have yielded diverse findings and it has been widely applied and tested for a variety of themes (Ramos & Cartala (2023); Namahoot & Jantasri (2022); Munikrishnan & Naznen (2022); Gupta, K. P., Manrai, R., & Goel, U. (2019); Wang & Saleem (2022); Bouteraa & Zainol (2022); Iqbal & Tahir (2022), Chen, C.L & Lai W.H (2023); Shaikh, I.M. and Amin, H. (2023); Teng and Khong, (2021); Chawla and Joshi, (2019); Moorthy *et al.*, (2021); Esawe, 2022); Ramli and Hamzah (2021)).

Based on the an existing research gap and the observation of current phenomena, the researchers formulated a research idea with the aim of analyzing people's behavior in using cashless payment methods amidst the prevalence of cybercrime. In the findings of Sanchez & Tanpoco (2023), it is revealed that FinTech companies must establish a solid trust image, as well as enhance security and user-friendliness features, to reassure users so they continue using mobile wallet services. The UTAUT2 model was integrated with cybercrime to examine users' behavior in adopting cashless transactions.

The urgency of this research lies in the phenomenon of cybercrime that influences the behavior of cashless users. The perceived security issues have become a serious concern that needs attention from each country's perspective (Panda, *et al.*, 2022). Many cases of misuse of cashless systems remain unresolved through legal means, causing losses for users. However, when cashless users feel secure and comfortable in conducting transactions, it has the potential to contribute to economic recovery efforts (Amilan, 2020). The convenience provided by cashless transactions can lead to an increase in consumerism among the public, thereby fostering the development of businesses, both small and large, and ultimately increasing government tax revenue.

Furthermore, according to a report by the United Nations Environment Program (UNEP), digital transformation has helped reduce carbon dioxide emissions by at least 20%, resource exploitation related to products by up to 90%, and waste in supply chains and detoxification processes by between 10 and 100 times.

Based on these phenomena that occurs, the purpose of this study is to analyze people's behavior in using cashless in the midst of rampant cybercrime. To explain user behavior regarding the use of cashless platforms, the unified theory of acceptance and use of technology (UTAUT2) model is used and integrated with cybercrime in Indonesia.

Indonesia has become a subject of research because the data from Bank Indonesia show that cashless transactions have been steadily increasing. In 2020, it amounted to IDR 204.9 trillion; in 2021 it reached IDR 305.4 trillion; and in 2022, it surged to IDR 399.6 trillion. The growth in cashless usage is not proportional to the security provided by the country.

Throughout 2020-2021, data breaches in Indonesia occurred frequently. It can be said that this means the state of cyber security in Indonesia is unsafe (<https://ids.ac.id>). The National Cyber Security Index (NCSI) report recorded Indonesia's cyber security index score as 38.96 out of 100 in 2022. This places Indonesia among the lowest three G20 countries and sixth in Southeast Asia. When Indonesia's score 38.96 is compared to the cybersecurity performance in other Southeast Asian nations, we can see that Malaysia takes the first position with a score of 79.22, followed by Singapore with 71.43, and Thailand with 69.94. NCSI makes this assessment based on several indicators, such as the country's legal regulations related to cyber security, the presence of government agencies in the field of cyber security, government cooperation concerning cyber security, as well as public evidence like official government websites or related programs. (<https://ncsi.ega.ee/country/id/>). From the data, it is evident that the standard of cyber security in Indonesia is still relatively low.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 *Unified theory of acceptance and use of technology 2 (UTAUT2)*

UTAUT is one of the latest technology acceptance models developed by Venkatesh *et al.* It combines successful features from eight leading technology acceptance theories into one unified theory. The eight prominent theories integrated into UTAUT are the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planned behavior (TPB), a combination of TAM and TPB, the model of PC utilization (MPTU), the innovation diffusion theory (IDT), and the social cognitive theory (SCT). UTAUT has proven to be more successful than the other eight theories in explaining up to 70 percent of user variance (Venkatesh *et al.*, 2003).

After evaluating the eight models, Venkatesh *et al.* identified seven constructs that appeared to be significant direct determinants of behavioral intention or use behavior in one or more of the models. These constructs are performance expectancy, effort expectancy, social influence, facilitating conditions, attitude toward using technology, and self-efficacy. Through further testing, four key constructs were identified as important direct determinants of behavioral intention and use behavior: performance expectancy, effort expectancy, social influence, and facilitating conditions. The other constructs were found to be not significant as direct determinants of behavioral intention. Additionally, there are four moderators: gender, age, voluntariness, and experience, positioned to moderate the impact of the four key constructs on behavioral intention and use behavior. More recently, UTAUT has been further developed from an organizational context to an individual consumer context, known as the UTAUT2 Model, where habit, hedonic motivation, and price value have been added as new constructs.

2.2 CASHLESS TRANSACTIONS

The development of money has followed technological innovations in the era of online transactions, leading to the emergence of digital currency that still serves the same purpose as a medium of exchange. The introduction of cashless systems has transformed people's payment behavior toward a cashless society. The term cashless society refers to a social or community life that primarily uses electronic money. This concept arises from the

movement towards a cashless economy, where physical currency is increasingly being replaced by digital transactions.

The implementation of cashless systems provides convenience for users. Optimizing cashless transactions greatly aids in the functioning of the economy as it opens up opportunities for organizations, businesses, and government institutions to expand their reach and enhance productivity and service delivery. Cashless transactions shape a society driven by hedonism and consumerism, as the ease of conducting transactions without leaving home, carrying physical cash, and accessing payment methods solely through smartphones encourages continuous shopping. With just a few clicks, payment is made, and goods are delivered right to the doorstep.

The optimization of cashless transactions not only impacts the economy but also the environment. According to the United Nations Environment Program (UNEP), digital transformation has helped reduce carbon dioxide emissions by at least 20%, resource exploitation in products by up to 90%, and waste in supply chains and detoxification has reduced significantly processes by 10 to 100 times.

However, the emergence of cashless systems is not without risks. Cybersecurity remains a challenging task as the threat landscape and vulnerabilities continue to evolve (Lallie *et al.*, 2020; Weil and Murugesan, 2020; Perwej *et al.*, 2021). Furthermore, customers continued to demand better security services as the COVID-29 environmental crisis (COVID-19) was ongoing had generated more threats and vulnerabilities for individuals and organizations (Cremer *et al.*, 2022). As businesses and individuals increasingly rely on digital technology and cloud services, the risks and impact of cyber attacks continue to escalate (Weil and Murugesan, 2020; Dalal *et al.*, 2022).

2.3 CYBERSPACE SECURITY

Cyberspace has become a target for crimes due to inadequate security, including a lack of security awareness and knowledge, and a disregard regulations. Cybersecurity poses a significant global challenge as cyber threats continue to evolve rapidly. Juniper Research (Morrow and Crabtree, 2019) estimates that the cost of cybercrime related to data breaches around the world will skyrocket to over USD 5 trillion by 2024, up from USD 3 trillion annually (Kerner, 2022).

Kaspersky (2020) and Perwej *et al.* (2021) define cybersecurity as the practice of protecting computers, mobile devices, electronic systems, servers, networks, and data from unauthorized access, malicious attacks, and destruction. This term also applies to the context of business and mobile computing, which can be divided into network, application, information, operational, business continuity, disaster recovery, and end-user education security. According to Rouse (2020), "The goal of implementing cybersecurity is to provide good security for computers, servers, networks, mobile devices, and the data stored on these devices from attackers with malicious intent." Therefore, it is crucial to proactively monitor evolving threats in the business environment, such as malware, phishing attacks, man-in-the-middle attacks, ransomware, and social engineering, to meet security needs and protect businesses in worst-case scenarios (Deloitte, 2019; Kaspersky, 2022; Pawar dan Palivela, 2022).

Fundamentally, the NCSA suggests that organizations should be prepared to respond to inevitable cyber incidents, recover operations, and ensure the protection of organizational assets and reputation. Additionally, organizations should pay attention to regulations or standards that will impact how data are collected, stored, and secured to protect individuals, citizens, companies, and government institutions.

2.4 Hypothesis Development

Empirical studies that adopted this model have found diverse findings, including Ramos & Cartala (2023); Namahoot & Jantasri (2022); Munikrishnan & Naznen (2022); Gupta, K. P., Manrai, R., & Goel, U. (2019); Wang & Saleem (2022); Bouteraa & Zainol (2022); Iqbal & Tahir (2022), Chen, C.L & Lai W.H (2023); Shaikh, I.M. and Amin, H. (2023); Teng and Khong, (2021); Chawla and Joshi, (2019); Moorthy *et al.*, (2021); Esawe, 2022); Ramli and Hamzah (2021)

- H1. Performance Expectancy has a positive effect on Use of Cashless.
- H2. Effort Expectancy has a positive effect on Use of Cashless.
- H3. Social Influence has a positive effect on Use of Cashless.
- H4. Facilitating Conditions have a positive effect on Use of Cashless.
- H5. Hedonic Motivation has a positive effect on Use of Cashless.
- H6. Price Value has a positive effect on Use of Cashless.
- H7. Habit has a positive effect on Use of Cashless.
- H8. Awareness of Cybercrime moderates the correlation between Performance Expectancy and Use of Cashless.
- H9. Awareness of Cybercrime moderates the correlation between Effort Expectancy and Use of Cashless.
- H10. Awareness of Cybercrime moderates the correlation between Social Influence and Use of Cashless.
- H11. Awareness of Cybercrime moderates the correlations between Facilitating Condition and Use of Cashless.
- H12. Awareness of Cybercrime moderates the correlation between Hedonic Motivation and Use of Cashless.
- H13. Awareness of Cybercrime moderates the correlation between Price Value and Use of Cashless.
- H14. Awareness of Cybercrime moderates the correlation between Habit and Use of Cashless.

3. RESEARCH METHODOLOGY

This research is a quantitative study conducted in Indonesia by distributing online questionnaires. The population in this study is the Indonesian general public. The sample selection technique used is purposive sampling. Purposive sampling is one of the non-random sampling techniques where the researcher selects the sample by specifying specific characteristics that align with the research objectives in order to address the research questions. The certain characteristics determined by the researcher for sample selection are as follows:

1. Members of the Indonesian general public
2. Individuals who have conducted transactions using cashless methods.

According to Heir *et al.* (2017), the minimum sample size that should be used is ideally 10 times the number of latent variables or 10 times the number of indicators. In this study, a sample of 208 Indonesian citizens was obtained, which means that the requirement for a minimum sample size has been met.

The data collection method used in this research is the questionnaire, which is a data collection method obtained by presenting a list of statements in the form of an online questionnaire. The steps involved include distributing the questionnaire online to respondents and asking them to rate the statements presented using the provided response options: strongly disagree, disagree, somewhat disagree, agree, and strongly agree. Once

the data have been collected in the form of interval data, it is then grouped based on the predetermined criteria, followed by data analysis.

The data analysis technique employed in this study is Structural Equation Modeling (SEM). SEM is chosen because it is widely used in research that employs complex models. While regression analysis and path analysis can be used to analyze these types of models individually, in practice, it may be inefficient because each sub-structure would have to be analyzed separately before combining them into a comprehensive model. SEM allows for the simultaneous examination of multiple variables and their relationships within a unified framework, making it a more efficient and comprehensive approach for complex models.

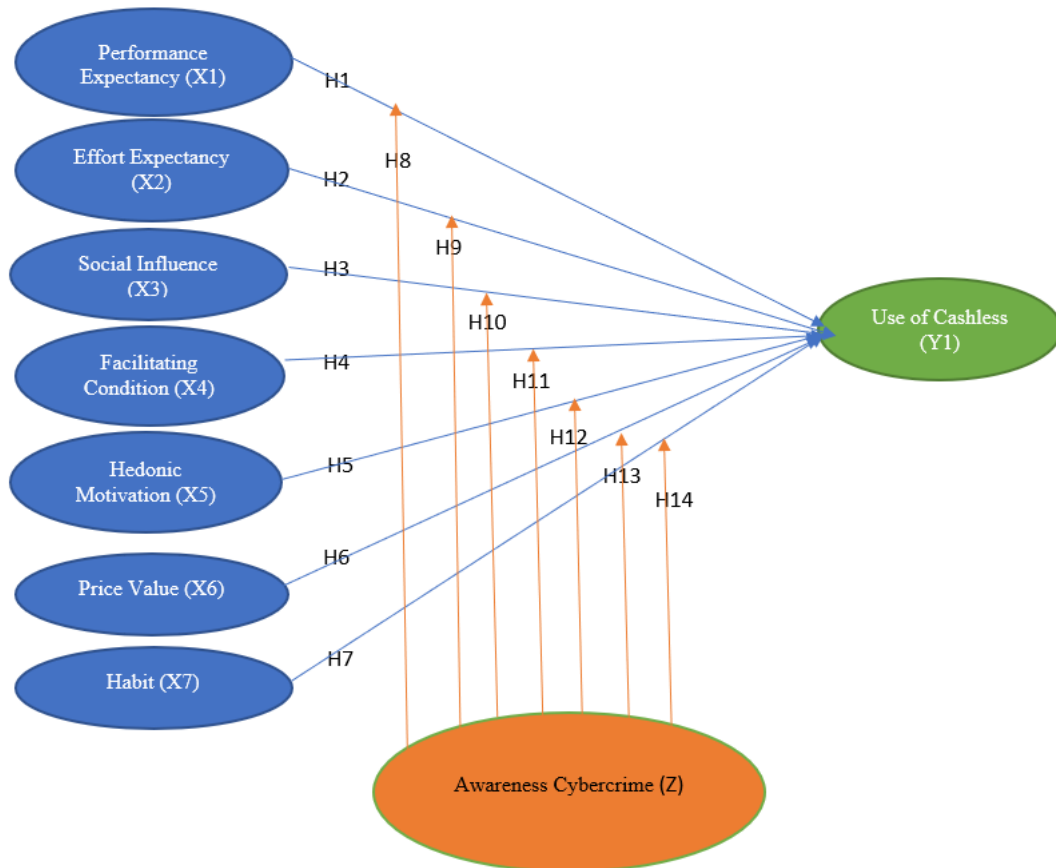


Figure 1. Research Model

4. RESULTS

4.1 Respondent Profile

The percentages of respondents based on gender, age, and educational level are presented in Table 1. In terms of gender, the number of female respondents is higher than males, with females accounting for 73.6 percent, while males represent was 26.4 percent were males. As for age characteristics, the majority of respondents were younger than 21 years old. The educational level was predominantly high school graduates (61.1 percent)

Table 1. Frequency of Respondent Characteristics

		Frequency	Percentage
GENDER	Female	153	73.6%
	Male	55	26.4%
AGE	<21 years old	165	79.3%
	21-31 years old	31	14.9%
	>31	12	5.8%
EDUCATION	Secondary Level	127	61.1%
	Graduate Level	81	38.9%

Source: Data compilation

4.2 Goodness of Fit Model

The model fit requirements are assessed based on the chi-square, CMIN, AGFI, TLI, CFI, NFI, and RMSEA. The results are presented in Table 2, summarizing the fulfillment of the model fit requirements.

Table 2. Model FIT Test Results

Index	Threshold	Results	Description
Chi-square	Prob value up to	54.372	Met
Prob value	0.05	0.052	
CMIN	< 2.0	1.394	Met
GFI	Up 0.90	0.964	Met
AGFI	Up 0.90	0.917	Met
TLI	Up 0.90	0.988	Met
CFI	Up 0.90	0.944	Met
NFI	Up 0.90	0.979	Met
RMSEA	Up 0.05	0.044	Met

- a. Chi-square statistic, where a model is considered good or satisfactory when the chi-square value is low. The smaller the chi-square value, the better the model, and it is accepted based on the probability with a cutoff value of $p > 0.05$ or $p > 0.10$.
- b. CMIN/DF, which stands for the Minimum Sample Discrepancy Function divided by the Degrees of Freedom, is essentially the chi-square statistic. CMIN/DF is considered an indication of an acceptable fit between the model and the data when it is relatively less than 2.0 or 3.0.
- c. GFI (Goodness of Fit Index) is a measure of the overall fit of a model, calculated by comparing the squared residuals of the predicted model to the actual observed data. GFI is a non-statistical measure with a range of values between 0 (poor fit) and 1.0 (perfect fit). A high value in this index indicates a better fit.
- d. AGFI (Adjusted Goodness of Fit Index), where the recommended acceptance level is when AGFI has a value equal to or greater than 0.90.
- e. TLI (Tucker Lewis Index) is an incremental index that compares a tested model to a baseline model, with the recommended reference value for accepting a model being > 0.90 . A value approaching 1 indicates a very good fit.
- f. CFI (Comparative Fit Index) is a fit index criterion that compares and measures the comparison difference between the hypothesized model and the null model. The recommended CFI value for fit assessment is > 0.90 .

- g. RMSEA (The Root Mean Square Error of Approximation) indicates the goodness of fit expected when a model is estimated in the population (Heir *et al.*, 1998). A smaller RMSEA value suggests a close fit of the model based on the degrees of freedom.

Table 3. Summary of Hypothesis Testing Results

Hypothesis	Variable	Result	Hypothesis
H1	performance expectancy (X1) → Use of Cashless (Y1)	Positively Influential	Accepted
H2	Effort expectancy (X2) → Use of Cashless (Y1)	Positively Influential	Accepted
H3	Effort expectancy (X3) → Use of Cashless (Y1)	Positively Influential	Accepted
H4	Facilitating Condition (X4) → Use of Cashless (Y1)	Positively Influential	Accepted
H5	Price value (X5) → Use of Cashless (Y1)	Positively Influential	Accepted
H6	Hedonic Motivation (X6) → Use of Cashless (Y1)	Positively Influential	Accepted
H7	Habit (X7) → Use of Cashless (Y1)	Positively Influential	Accepted
H8	Moderate (X1*Z) → Use of Cashless (Y1)	Quasi Moderate	Accepted
H9	Moderate (X2*Z) → Use of Cashless (Y1)	Pure Moderate	Accepted
H10	Moderate (X3*Z) → Use of Cashless (Y1)	Pure Moderate	Accepted
H11	Moderate (X4*Z) → Use of Cashless (Y1)	Pure Moderate	Accepted
H12	Moderate (X5*Z) → Use of Cashless (Y1)	Pure Moderate	Accepted
H13	Moderate (X6*Z) → Use of Cashless (Y1)	Pure Moderate	Accepted
H14	Moderate (X7*Z) → Use of Cashless (Y1)	Pure Moderate	Accepted

5. DISCUSSION

5.1 Performance Expectancy has a positive effect on Use of Cashless.

The research results show that H1 is accepted. In the UTAUT2 model, Performance Expectancy refers to the extent to which individuals believe that using certain technology, such as cashless payment systems, will help enhance their performance or accomplish their

tasks more effectively. According to this model, Performance Expectancy has a positive effect on Use of Cashless, which means that when individuals perceive that using cashless payment systems will result in better performance outcomes or benefits such as convenience, efficiency, or improved financial management, they are more likely to adopt and use such systems.

5.2 Effort Expectancy has a positive effect on Use of Cashless.

The research results show that H2 is accepted. In the context of the UTAUT2 model, Effort Expectancy has a positive effect on Use of Cashless. Effort Expectancy reflects individuals' perceptions of how difficult or easy it is to use cashless payment methods. The findings of this study demonstrate that when individuals perceive that using cashless payment methods does not require excessive effort or is not difficult, such as fast, simple, and intuitive processes, they are more likely to adopt and use cashless payments in their financial activities.

5.3 Social Influence has a positive effect on Use of Cashless.

The research results show that H3 is accepted. In the context of the UTAUT2 model, Social Influence has a positive effect on Use of Cashless. This means that individuals' perceptions of social influence or pressure from others can significantly impact their adoption and use of cashless payment methods.

Social Influence, as a variable in the UTAUT2 model, refers to the extent to which individuals perceive that people who are important to them think they should use cashless payments. It encompasses the influence of family, friends, colleagues, and other social networks in shaping individuals' attitudes and behaviors towards cashless payment adoption.

When individuals perceive that their social circle values and encourages the use of cashless payments, they are more likely to adopt and use cashless payment methods themselves. This influence can come from various sources, such as recommendations, positive experiences shared by others, or societal norms that emphasize the convenience and benefits of cashless transactions.

The positive effect of Social Influence on Use of Cashless implies that social factors play a crucial role in shaping individuals' intentions and behaviors regarding cashless payments. Therefore, to promote the adoption and use of cashless payment methods, it is important to consider strategies that leverage social influence, such as targeted marketing campaigns, positive word-of-mouth, and social proof, to create a favorable perception of cashless payments among individuals and encourage wider adoption in the society.

5.4 Facilitating Conditions have a positive effect on Use of Cashless.

The research results show that H4 is accepted. In the context of the UTAUT2 model, Facilitating Conditions have a positive effect on the use of cashless payment methods. This indicates that conditions that facilitate or support the use of cashless payment methods significantly influence the adoption and usage of these methods.

Facilitating Conditions in UTAUT2 include factors such as the availability of technological infrastructure, accessibility of electronic devices, availability of internet services, network speed and quality, and the availability of adequate technical support. When individuals perceive these conditions to be sufficient and they enable the easy use of cashless payment methods, they are more likely to accept and use these methods.

It is important to create an environment that supports the use of cashless payment methods by providing adequate infrastructure, ensuring accessibility of electronic devices and internet services, and providing necessary technical support. This will help eliminate

practical and technical barriers that individuals may face in using cashless payment methods.

With the positive influence of Facilitating Conditions on the use of cashless payment methods, companies, governments, and service providers need to play a role in creating conditions that support the adoption and usage of cashless payment methods. Efforts to improve infrastructure, accessibility, and technical support will strengthen positive perceptions and facilitate wider usage of cashless payment methods in society.

5.5 Hedonic Motivation has a positive effect on Use of Cashless.

The research results show that H5 is accepted. In the context of the UTAUT2 model, Hedonic Motivation refers to the pleasure or enjoyment that individuals derive from using cashless payment methods. It represents the degree to which individuals perceive the use of cashless payment methods as enjoyable, entertaining, or satisfying.

The positive effect of Hedonic Motivation on Use of Cashless suggests that individuals who perceive cashless payment methods as enjoyable or pleasurable are more likely to adopt and use them. When individuals associate positive emotions and experiences with using cashless payment methods, it increases their motivation to use them in their financial transactions.

5.6 Price Value has a positive effect on Use of Cashless.

The research results show that H6 is accepted. In the context of the UTAUT2 model, Price Value refers to an individual's perception of the benefits and value derived from using cashless payment methods. It includes factors such as financial advantages, discounts, price reductions, and ease of managing financial transactions.

The positive effect of Price Value on Use of Cashless indicates that individuals who perceive non-cash payment methods as providing high value in terms of financial benefits or other advantages are more likely to accept and use these methods. When individuals see significant economic incentives or clear financial benefits in using non-cash payment methods, they are more motivated to adopt and use them.

Price Value is an important factor influencing the adoption and use of cashless payment methods in the UTAUT2 model. This factor interacts with other variables such as Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, and Habit.

To increase the adoption and use of cashless payment methods, it is important for businesses and service providers to offer competitive value and emphasize financial benefits to users. Strategies such as special discounts, cashback, and loyalty programs can help enhance the perception of Price Value and encourage the use of cashless payment methods. Additionally, service providers should ensure that ease of use and expected performance are also met so that users feel the value they receive is proportional to the use of cashless payment methods.

5.7 Habit has a positive effect on Use of Cashless.

The research results show that H7 is accepted. In the UTAUT2 model, Habit refers to the automatic and unconscious behavioral patterns that individuals develop over time. It reflects the degree to which individuals have incorporated the behavior of using cashless payment methods into their daily routines.

The positive effect of Habit on Use of Cashless indicates that individuals who have developed a habitual tendency to use cashless payment methods are more likely to continue using them. Habit plays a crucial role in shaping and sustaining behavior, as it reduces the need for conscious decision-making and effort when engaging in a particular behavior.

To promote the adoption and use of cashless payment methods, it is important to encourage the development of positive habits related to their usage. This can be achieved through repeated exposure, providing incentives, and creating a supportive environment that reinforces the habit. By incorporating cashless payment methods into individuals' daily routines and making them a familiar and effortless part of their lives, the likelihood of continued and increased usage can be enhanced.

5.8 Awareness of Cybercrime moderates the correlation between Performance Expectancy and Use Cashless.

The research results show that 8 is accepted. The statement that Awareness of Cybercrime moderates the correlation between Performance Expectancy and Use of Cashless can be related to the extended version of the Unified Theory of Acceptance and Use of UTAUT2. According to which moderating factors are considered to influence the strength or direction of the correlations between the key determinants and the use cashless platforms.

Awareness of Cybercrime refers to individuals' knowledge and understanding of the risks and threats associated with cybercrime, such as online fraud, hacking, or identity theft. It reflects their awareness of the potential negative consequences that may arise from using technology.

In the context of UTAUT2, the moderating effect of Awareness of Cybercrime implies that the correlation between Performance Expectancy (the perceived usefulness and benefits of using technology) and Use of Cashless (the actual usage of technology) can be influenced by individuals' level of awareness and concern about cybercrime. When individuals are more aware of cybercrime and its potential risks, it may impact their perception of the benefits and expected performance of using technology, subsequently affecting their use of cashless platforms.

The moderating role of Awareness of Cybercrime in the correlation between Performance Expectancy and Use of Cashless suggests that individuals' level of awareness of cybercrime acts as a contextual factor that shapes how the perceived benefits of technology usage translate into actual usage behavior. This highlights the importance of considering individuals' awareness of cybercrime as a factor that may influence their decision-making and behavior regarding technology use.

5.9 Awareness of Cybercrime moderates the correlation between Effort Expectancy and Use of Cashless.

The research results show that 9 is accepted. Awareness of Cybercrime moderates the correlation between Effort Expectancy and Use of Cashless and this can be related to the extended version of UTAUT2 which proposes that various factors, including moderating factors, influence the acceptance and use of technology.

In this context, Awareness of Cybercrime refers to individuals' knowledge and understanding of the risks and threats associated with cybercrime specifically related to cashless transactions. It reflects their awareness of potential security issues, such as unauthorized access, identity theft, or financial fraud, when using cashless payment methods. Effort Expectancy refers to individuals' perception of the ease of using cashless payment systems. It encompasses factors such as the simplicity of transactions, user-friendliness of the interfaces, and convenience of the overall process.

The moderating effect of Awareness of Cybercrime suggests that the correlation between Effort Expectancy and Use of Cashless can be influenced by individuals' level of awareness and concern about cybercrime. When individuals have a higher awareness of cybercrime risks associated with cashless transactions, it may affect their perception of the ease of

using such payment systems. Their concerns about security and privacy may impact their willingness to adopt and use cashless methods.

Therefore, individuals who are more aware of cybercrime and its implications for cashless transactions may have a stronger moderation effect. Their awareness may heighten their scrutiny of the security features and measures provided by cashless payment systems, influencing their overall acceptance and use of those systems.

5.10 Awareness of Cybercrime moderates the correlation between Social Influence and Use of Cashless.

The research results show that H10 is accepted. In the context of the UTAUT2 model, Awareness of Cybercrime refers to individuals' knowledge and understanding of the risks and threats associated with cybercrime in the context of using cashless payment methods. It represents the level of awareness individuals have regarding the potential security and privacy concerns related to their financial transactions in the digital realm.

The statement suggests that Awareness of Cybercrime acts as a moderator in the correlation between Social Influence and Use of Cashless. This means that the impact of Social Influence on the adoption and usage of cashless payment methods is influenced by individuals' level of awareness of cybercrime.

When individuals have a high level of Awareness of Cybercrime, they are more likely to be cautious and vigilant about the potential risks and vulnerabilities associated with using cashless payment methods. This heightened awareness can moderate the influence of Social Influence on their decision to use cashless payment methods. Individuals may be more inclined to critically evaluate and consider the opinions and recommendations of others in their social networks regarding the adoption of cashless payments, taking into account the potential risks and security measures associated with such transactions.

On the other hand, when individuals have a low level of Awareness of Cybercrime, they may be more susceptible to the influence of social factors in their decision-making process. They may be less concerned about the potential risks and may rely heavily on the recommendations and experiences of others in their social networks when deciding to use cashless payment methods.

Therefore, the level of Awareness of Cybercrime can moderate the correlation between Social Influence and Use Cashless, shaping the extent to which social factors impact individuals' adoption and usage behavior in the context of cashless payments.

5.11. Awareness of Cybercrime moderates the correlation between Facilitating Conditions and Use of Cashless.

The research results show that H11 is accepted. In the context of the UTAUT2 model, Awareness of Cybercrime refers to individuals' knowledge and understanding of the risks and threats associated with cybercrime in the context of using cashless payment methods. It reflects individuals' awareness of security and privacy issues related to their financial transactions in the digital world.

The statement suggests that Awareness of Cybercrime acts as a moderator in the correlation between Facilitating Conditions and Use of Cashless. This means that the influence of Facilitating Conditions on the adoption and usage of cashless payment methods is influenced by individuals' level of awareness of cybercrime.

When individuals have a high level of Awareness of Cybercrime, they are more likely to be cautious and vigilant about the risks and vulnerabilities associated with using cashless payment methods. This high awareness can moderate the influence of Facilitating Conditions on their decision to use cashless payment methods. Individuals may critically

evaluate and consider the facilitating conditions such as ease of use, accessibility, and reliability, taking into account the associated security measures and precautions.

On the other hand, when individuals have a low level of Awareness of Cybercrime, they may be more susceptible to the influence of facilitating conditions in the decision-making process. They may be less concerned about potential risks and rely more on the ease and convenience provided by the facilitating conditions when deciding to use cashless payment methods.

Therefore, the level of Awareness of Cybercrime can moderate the correlation between Facilitating Conditions and Use Cashless, shaping the extent to which facilitating conditions influence individuals' adoption and usage behavior in the context of cashless payments.

5.12 Awareness of Cybercrime moderates the correlation between Hedonic Motivation and Use of Cashless.

The research results show that H12 is accepted. In the context of the UTAUT2 model, Awareness of Cybercrime refers to individuals' knowledge and understanding of the risks and threats associated with cybercrime in the context of using cashless payment methods. It reflects individuals' awareness of security and privacy issues related to their financial transactions in the digital world.

The statement suggests that Awareness of Cybercrime acts as a moderator in the correlation between Hedonic Motivation and Use of Cashless. This means that the influence of Hedonic Motivation on the adoption and use of cashless payment methods is influenced by individuals' level of awareness of cybercrime.

When individuals have a high level of Awareness of Cybercrime, they are more cautious and vigilant about the risks and vulnerabilities associated with using cashless payment methods. This heightened awareness can moderate the impact of Hedonic Motivation on their decision to use cashless payment methods. Individuals may critically evaluate and consider the hedonic benefits, such as enjoyment, convenience, and pleasure, while taking into account the security measures and precautions associated with cashless transactions.

On the other hand, when individuals have a low level of Awareness of Cybercrime, they may be more susceptible to the influence of hedonic motivations in the decision-making process. They may be less concerned about potential risks and rely more on the enjoyment and convenience offered by cashless payment methods when deciding to adopt and use them.

Therefore, the level of Awareness of Cybercrime can moderate the correlation between Hedonic Motivation and the Use of Cashless, shaping the extent to which hedonic motivations influence individuals' adoption and usage behavior in the context of cashless payments.

5.13. Awareness of Cybercrime moderates the correlation between Price Value and Use of Cashless.

The research results show that H13 is accepted. In the context of the UTAUT2 model, Awareness of Cybercrime refers to individuals' knowledge and understanding of the risks and threats associated with cybercrime in the context of using cashless payment methods. It reflects individuals' awareness of security and privacy issues related to their financial transactions in the digital world.

The statement suggests that Awareness of Cybercrime acts as a moderator in the correlation between Price Value and Use Cashless. This means that the influence of Price Value on

the adoption and use of cashless payment methods is influenced by individuals' level of awareness of cybercrime.

When individuals have a high level of Awareness of Cybercrime, they are more cautious and conscious of the security and privacy aspects of using cashless payment methods. They consider the value they receive in relation to the price they pay, taking into account the potential risks and vulnerabilities associated with cybercrime. The perceived value of using cashless methods, such as convenience, efficiency, and cost-effectiveness, is weighed against the potential risks of financial fraud or data breaches.

On the other hand, when individuals have a low level of Awareness of Cybercrime, they may be less concerned about the security aspects and more focused on the perceived price value of using cashless payment methods. They may prioritize the cost savings, discounts, or rewards associated with cashless transactions without fully considering the potential risks involved.

Therefore, the level of Awareness of Cybercrime can moderate the correlation between Price Value and Use of Cashless payment methods, shaping the extent to which price considerations influence individuals' adoption and usage behavior in the context of cashless payments.

5.14. Awareness of Cybercrime moderates the correlation between Habit and Use of Cashless.

The research results show that H14 is accepted. In the UTAUT2 model, Awareness of Cybercrime refers to individuals' knowledge and understanding of the risks and threats associated with cybercrime in the context of using cashless payment methods. It reflects individuals' awareness of security and privacy issues related to their financial transactions in the digital world.

This statement suggests that Awareness of Cybercrime acts as a moderator in the correlation between Habit and Use of Cashless. This means that the influence of Habit on the adoption and use of cashless payment methods is influenced by individuals' level of awareness of cybercrime.

Habit, in the UTAUT2 model, represents the individual's tendency to engage in automatic and routine behaviors based on their previous experiences. It reflects the ingrained behavioral patterns and preferences that individuals develop over time.

When individuals have a high level of Awareness of Cybercrime, it can impact their habitual use of cashless payment methods. Their awareness of the potential risks associated with cybercrime may lead them to be more cautious and deliberate in their cashless payment habits. They may develop safer practices, such as regularly updating their security settings, using strong passwords, and being vigilant about fraudulent activities. As a result, their habitual use of cashless payment methods becomes more informed and security-conscious.

On the other hand, when individuals have a low level of Awareness of Cybercrime, their habitual use of cashless payment methods may be less influenced by security concerns. They may rely more on their existing habits and routines without considering the potential risks involved in using cashless methods.

Therefore, the level of Awareness of Cybercrime can moderate the correlation between Habit and Use of Cashless payment methods, shaping the extent to which individuals' habitual behaviors are influenced by their awareness of cybercrime risks. Individuals with a higher awareness of cybercrime are likely to incorporate security-conscious habits into their cashless payment practices, while those with lower awareness may rely more on their existing habits regardless of potential security implications.

6. CONCLUSION

In the UTAUT2 model, all variables, including Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, and Habit, have an impact on the Use of Cashless. Additionally, all these correlations are moderated by Awareness of Cybercrime. This means that individuals' perceptions of expected performance, ease of use, social influence, facilitating conditions, hedonic motivation, price value, and habit all play a role in influencing the use of cashless transactions. However, the impact of these variables can be influenced by individuals' level of awareness of cybercrime, which is referred to as awareness of cybercrime.

Therefore, Awareness of Cybercrime functions as a moderating factor that affects the correlation between UTAUT2 variables and the use of cashless transactions. Individuals' level of awareness of cybercrime can strengthen or weaken the influence of other variables on the use of cashless transactions. Awareness of the risks and threats of cybercrime in cashless transactions can influence individuals' perceptions and behaviors in using such payment methods.

It's important to note that Awareness of Cybercrime not only affects the correlation between a single variable and the use of cashless, but also moderates the correlation between all UTAUT2 variables and the use of cashless. This indicates that awareness of cybercrime is a crucial factor that influences the overall adoption and use of cashless payment methods.

7. IMPLICATIONS

The implications of these findings are important in understanding the factors influencing the adoption and usage of cashless payment methods. Awareness of cybercrime emerges as a key factor that needs to be considered in efforts to enhance the adoption and usage of such payment methods.

Firstly, it is crucial for cashless service providers and governments to increase public awareness about the risks and threats of cybercrime in cashless transactions. Educational and awareness campaigns that highlight security measures to be taken can help alleviate potential fears and concerns among potential users.

Secondly, technology companies and cashless service providers should integrate robust security features into their platforms. Users need to feel confident that their transactions are secure and their privacy is protected. Investing in security technologies and adhering to stringent industry standards can enhance user trust.

Furthermore, stakeholders should advocate for the development of policies and regulations that support the security of cashless transactions. This may include protection of personal data, law enforcement against cybercrime, and collaboration between general public and the private sector in combating cyber threats.

Lastly, further research can delve into a deeper understanding of how awareness of cybercrime influences cashless usage and other factors within the UTAUT2 model. With a better understanding of these factors, more effective strategies can be developed to encourage the adoption and usage of secure and reliable cashless payment methods.

8. RECOMMENDATIONS FOR FURTHER

Based on the findings and implications, here are some recommendations for further actions:

- **Enhance Public Education:** Develop comprehensive educational programs to raise awareness about cybercrime risks and prevention measures among the general public.

This can be done through partnerships with educational institutions, government agencies, and cybersecurity organizations.

- **Collaborative Efforts:** Foster collaboration between stakeholders including technology companies, financial institutions, government agencies, and cybersecurity experts to address the challenges related to cybercrime in cashless transactions. Sharing best practices, conducting joint research, and developing industry standards can help create a safer environment for cashless payments.
- **Security Enhancements:** Continuously invest in technological advancements and security measures to improve the protection of cashless payment platforms. Regular security audits, encryption protocols, and multi-factor authentication can enhance user trust and confidence.
- **User Support and Assistance:** Provide accessible and reliable customer support channels to assist users in addressing any security concerns or issues related to cashless transactions. Promptly addressing user inquiries and providing timely assistance can build trust and encourage adoption.
- **Policy Development:** Work closely with policymakers and regulators to develop and enforce robust regulations and guidelines related to cashless transactions. These policies should address data privacy, cybersecurity standards, consumer protection, and enforcement measures against cybercrime.
- **Research and Innovation:** Encourage further research and innovation in the field of cashless payments and cybersecurity. This can include exploring new technologies, studying user behaviors and preferences, and identifying emerging cyber threats to stay ahead of potential risks.

By implementing these recommendations, stakeholders can collectively contribute to a safer and more secure cashless payment ecosystem, fostering greater adoption and usage among users.

ACKNOWLEDGMENTS

The research funding for this study was obtained from an international collaborative grant organized by LP3M Universitas Muhammadiyah Makassar, Indonesia, in collaboration with Manipal International University, Malaysia. The authors would also like to express their gratitude to the reviewers who provided suggestions and comments to improve this article.

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