Journal of International Conference Proceedings (JICP) Vol. 7 No. 2, pp. 496-506, November, 2024
P-ISSN: 2622-0989/E-ISSN: 2621-993X
https://www.ejournal.aibpmjournals.com/index.php/JICP

The Analysis of Factors Influencing Online Shopping Behavior in COVID-19 Pandemic: The Study of Indonesian Millenial Generation

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ARTICLE INFORMATION

Publication information

Research article

HOW TO CITE
Abdi, T. R., Ismail, M., & Satria, D. (2024). The analysis of factors influencing online shopping behavior in COVID-19 pandemic: The study of Indonesian Millenial Generation. *Journal of International Conference Proceedings, 7*(2), 496-506.

DOI:
https://doi.org/10.32535/jicp.v7i2.3325

Received: 21 September 2024
Accepted: 23 October 2024
Published: 25 November 2024

ABSTRACT

The COVID-19 pandemic has led to significant shifts in consumer behavior, particularly in terms of shopping preferences and behavior, with a marked increase in online shopping. This study aims to re-examine the factors influencing online shopping behavior during the COVID-19 pandemic by integrating the framework of the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and Cognitive Biases. The study focuses on Indonesian Millennials as the target population. Data analysis is conducted using Structural Equation Modeling-Partial Least Squares (SEM-PLS) with SmartPLS 3.0 software. The results show that cognitive bias, perceived usefulness, perceived ease of use, and subjective norms influence individuals' intentions to shop online. However, attitudes toward use and perceived behavioral control (PBC) do not influence individuals' intentions to shop online. Finally, the results indicate that individuals' intentions to shop online impact actual online shopping behavior. The higher the individual's intention to shop online, the more certain they are to do so during the pandemic.

Keywords: Cognitive Bias; COVID-19; Customer Behavior; Millenial Generation; Online Shopping

INTRODUCTION

The outbreak of the novel coronavirus disease in late 2019, with its associated movement restrictions and social limitations, has driven a shift in consumption behavior patterns among Indonesian consumers. This shift has seen a move away from physical stores and towards digital platforms for purchases. Additionally, factors such as health concerns, limited physical access to stores, and changing work patterns have further influenced how Indonesians select products and services. A study by Rustariyuni (2022) found that consumers preferred online shopping to minimize virus exposure and maintain their health. Data by Google on consumer behavior in Indonesia during the pandemic aligns with global trends, showing increased reliance on online stores and shopping apps to meet consumption needs in an uncertain and risky environment.

Building on the Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM), Salem and Nor (2020) identified perceived usefulness, risk tolerance, controllability, limited alternatives, and government support as significant factors influencing Saudi Arabian consumers' e-commerce adoption during COVID-19. Interestingly, factors like ease of use, social influence, and perceived risks were not impactful. Similarly, Warganegara and Hendijani's (2022) research in Indonesia suggests the TAM framework's effectiveness in understanding online grocery shopping behavior. These findings highlight perceived usefulness and specific contextual factors, like pandemics, as powerful drivers of e-commerce adoption.

Yan and Basri (2022), in their article, emphasized the importance of psychological factors, alongside economic ones, in understanding community behavior in time of pandemic. They noted that addressing a pandemic requires a different strategy compared to dealing with a natural disaster, which is typically a singular event. In contrast, a pandemic is a prolonged crisis that demands a multifaceted approach considering health, economic, sociological, and psychological dimensions. Due to cognitive limitations, individuals often do not make decisions based on a comprehensive analysis of all available information, particularly in the context of the uncertainties brought by the COVID-19 pandemic. In such uncertain times, people tend to rely on cognitive biases or heuristics as decision-making shortcuts. Kahneman and Tversky (1984) define cognitive bias as systematic patterns of deviation from norm or rationality in judgment, which can influence decision-making. Samson and Gigerenzer (2016) argue that these biases can be seen as intelligent adaptations to human limitations when managing complex situations. Applying cognitive biases to decision-making throughout the COVID-19 pandemic offers a unique perspective on how individuals navigate uncertainty.

Extending Khare et al. (2012) research on the influence of age, this study tries to find out the factors that trigger Indonesian Millennials to use online shopping coinciding with Industry 4.0. Drawing from existing frameworks, this research tries to integrate TPB and TAM, while also considering variables from Cognitive Bias theory. This combined approach aims to explain why consumers, particularly during uncertain times like the pandemic, may make irrational decisions.

LITERATURE REVIEW

Behavioral economics acknowledges that individuals do not always make decisions based on rational thinking, contrary to the assumptions of classical economics. Decisions are influenced by emotional, cognitive, psychological, motivational, and social factors (Darnton, 2008). Cognitive bias, a concept introduced by Kahneman & Tversky (1984) and expanded by Samson & Gigerenzer (2016) and Gigerenzer (2015), describes how irrational thought patterns can affect decision-making, reflecting human adaptation to complex information. Preliminary analyses from several studies (Adiwinata et al., 2021;

Islam et al., 2021; Moon et al., 2021) suggest that TPB by Ajzen (1985) includes components such (1) attitude behavior, (2) societal norms, (3) PBC (Perceived Behavioral Control, and (4) individual intention to use. However, TPB is primarily used to explain individual behavior under normal conditions. To account for behavior in non-normal conditions, additional predictors are necessary, as TPB allows for the inclusion of other variables (Ajzen, 1985; 1991; 2020). TAM is commonly to analyze technology acceptance or adoption, focusing on factors like intention, need, and user emotions, primarily from the perspective of individual self-efficacy (Ciriello & Loss, 2023; Croonen et al., 2022). Many prior studies on behavior have integrated TPB and TAM models in the context of technology usage. This integration is used to analyze behavioral intentions to use technology (e.g., online food delivery, e-commerce), with some studies incorporating constructs related to personal characteristics and prevailing social systems (Salem & Nor, 2020; Troise et al., 2021).

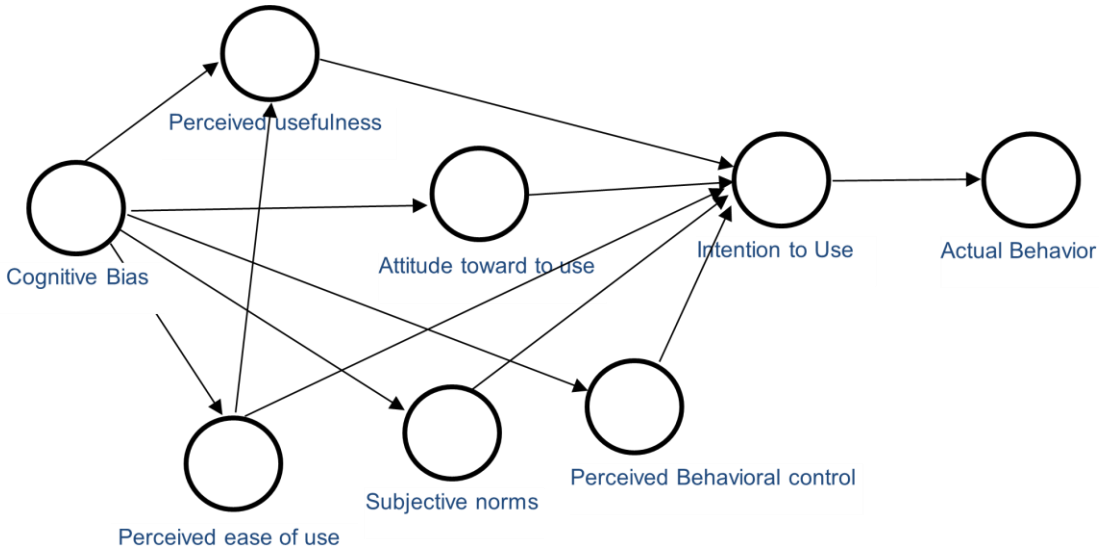
In decision-making, humans are influenced by various thought patterns, not always leading to perfectly rational choices. Cognitive bias theory explores these patterns and their impact on individual decision-making (Darnton, 2008; Gigerenzer, 2015; Kahneman & Tversky, 1984; Wilke & Mata, 2012). Cognitive bias stems from limitations in how we process information, evaluate risks, and adapt to complex environments (Gigerenzer, 2015; Kahneman & Tversky, 1984). One way to understand these biases is by dividing them into internal and external categories (Wilke & Mata, 2012).

Internal biases originate from within ourselves. For instance, present bias describes our tendency to favor immediate rewards over future ones (Nickerson, 1998). Confirmation bias, another internal bias, leads us to seek information that confirms our existing beliefs while overlooking contradictory evidence (O'Donoghue & Rabin, 1999; Soofi et al., 2020). External biases are influenced by the external environment and affect how individuals process information related to decision-making. The Framing Effect, for example, describes how the presentation of information can shape individuals' perceptions of options, evidence, and decisions, often based on how information is framed in terms of gains or losses (Kahneman & Tversky, 1984; Trout, 2005). These three types of biases—Present Bias, Confirmation Bias, and the Framing Effect—illustrate different kinds of cognitive biases that can indirectly impact actual behaviors, such as online shopping during the COVID-19 outbreak.

The combined application of the TPB and the TAM is a well-established research approach. This integration has proven valuable in understanding individual motivations across diverse contexts, including online food delivery and e-commerce adoption During the coronavirus (Salem & Nor, 2020; Troise et al., 2021). While the combination of TAM and TPB provides a detailed framework for understanding individual behavioral intentions, it is considered insufficient to fully explain actual usage behaviors during the period of the COVID-19 crisis. To address this gap, we propose incorporating aspects of Cognitive Bias into the combined TPB and TAM framework. By expanding upon existing frameworks, this model seeks to provide a more holistic understanding of individual decision-making processes related to online shopping decisions during the COVID-19 era. Furthermore, the integration of these three elements can be understood through the concept of Triadic Reciprocal Determinism, which states that human behavior is based on three factors: personal factors, behavioral factors, and environmental factors (Abdullah, 2019; Bandura, 1999; Vancic & Pärson, 2020).

Figure 1 below presents the framework of this research.

Figure 1. Research Framework



H1: Cognitive Bias Influences Online Shopping Intentions
Several studies support this claim, including research by Lockton (2012), O'Donoghue & Rabin (1999), Suh (2021), and the foundational work of Kahneman & Tversky (1984). These studies collectively demonstrate that cognitive biases significantly impact both the intention to shop online and the subsequent behavior of consumers in the digital marketplace.

H2a: Perceived Usefulness Influences Online Shopping Intentions
Salem and Nor (2020) emphasize that perceived usefulness has a crucial role in predicting the intention to adopt e-commerce. Furthermore, Iriani and Andjarwati (2020) highlight a significant positive effect of perceived usefulness to shop online decisions. These findings underline how consumers' perception of online shopping platforms' usefulness shapes their intentions to engage in e-commerce activities.

H2b: Perceived Ease of Use Has an Influence on Online Shopping Intentions
Aligned with Troise et al. (2021), this study posits that a user's perception of ease of use is likely to influence their online shopping intentions. Their research found that perceived ease of use offers valuable insights into understanding user behavior.

H3a: Attitude Toward Behavior Has an Influence on Online Shopping Intentions
Ajzen (1991) in his findings revealed that attitude has a significant effect on the intention to take an action. Pavlou and Chai (2002) also show that the relationship between attitude and transactional intentions has a significant role.

H3b: Subjective Norms Have an Influence on Online Shopping Intentions
Islam et al. (2021) investigate the role of social influence (subjective norms) in shaping online shopping intentions. Their work emphasized the considerable role social norms play in an individual's choice to engage in online purchases.

H3c: PBC Has an Influence on Online Shopping Intentions
Islam et al. (2021) in their research results reveal that PBC has a significant relationship with consumer intention to make online purchases in developing markets.

H4: Intention Has an Influence on Actual Online Shopping Behavior
Alamanda et al. (2021) and Venkatesh et al. (2003) mentioned through their research that behavioral intention is the key determinant and has a significant effect on actual usage. People who have the intention to use technology are more likely to use it.

RESEARCH METHOD

This study employs a variance-based PLS (Partial Least Square) approach to SEM (Structural Equation Model) using SmartPLS 3. It can also be called PLS path modeling is basically used to develop theory in exploratory research, which focuses on explaining variation in the dependent variable when testing the model. Several previous studies have used SEM-PLS (Troise et al., 2021). The choice of SEM-PLS in this study is because there are no distribution assumption rules, and also the main objective of this research is to study the relationship between indicators and latent variables (Leguina, 2015).

The survey was conducted through a questionnaire survey of the Millennial generation group which was born between 1981 and 2000. Using a non-probability sampling approach that specifically leads to convenience sampling and snowball sampling methods. Using a Likert scale with a 7-point measurement scale format (Chyung et al., 2017; Kusmaryono et al., 2022; Taherdoost, 2019).

RESULTS

The result shows that the outer model has a VIF value <5 so it does not indicate a multicollinearity problem and the model is valid to continue. As for the inner model, testing is done by looking at the R^2, F^2, and Q^2.

Table 1. Coefficient of Determination (R^2)

Construct	R^2	Annotation
X1 → X3	0.379	Moderate
X1, X3 → X2	0.620	Moderate
X1 → X4	0.337	Moderate
X1 → X5	0.335	Moderate
X1 → X6	0.289	Moderate
X2, X3, X4, X5, X6 → Y1	0.720	Moderate
Y1 → Z	0.552	Moderate

Source: PLS Test Result

Overall, the R^2 value (Table 1) for each variable ranges from 0.25 to 0.50, indicating a moderate influence.

Table 2. Effect size (F^2)

Variables		X2	X3	X4	X5	X6	Y1	Z
X1	Cognitive Bias	0.192	0.610	0.507	0.504	0.407		
X2	Perceived of Usefulness						0.074	
X3	Perceived Ease of Use	0.456					0.005	
X4	Attitude Towards Use						0.006	
X5	Subjective Norm						0.258	
X6	PBC						0.019	
Y1	Intention to Use							1.233

Source: PLS Test Result

In Table 2, the effect sizes for each variable differ. The Cognitive Bias variable (X1) has a large effect on Perceived Ease of Use (X3), Attitude Toward Use (X4), Subjective Norms (X5), and PBC (X6). However, the effect size of Cognitive Bias (X1) on Perceived Usefulness (X2) is moderate. Perceived Usefulness (X2) has a small effect on Intention to Use (Y1). Perceived Ease of Use (X3) has a large effect on Perceived Usefulness (X2), but Intention to Use (Y1) has a very small impact. Similarly, Attitude Toward Use (X4) and PBC (X6) have a very small effect on Intention to Use (Y1). The Subjective Norms variable (X5) has a moderate effect on Intention to Use (Y1). Finally, Intention to Use (Y1) has a large effect on Actual Use Behavior (Z).

Table 3. Predictive Relevance (Q^2)

Variables		SSO	SSE	Q^2 (=1-SSE/SSO)	Annotation
X1	Cognitive Bias	820.000	820.000		
X2	Perceived of Usefulness	1025.000	657.897	0.358	Substantial
X3	Perceived ease of use	1025.000	853.873	0.167	Moderate
X4	Attitude toward use	1025.000	855.630	0.165	Moderate
X5	Subjective norms	1025.000	792.179	0.227	Moderate
X6	PBC	1025.000	904.087	0.118	Minor
Y1	Intention to use	1025.000	605.384	0.409	Substantial
Z	Actual Consumer Behavior	615.000	378.409	0.385	Substantial

Source: PLS Test Result

Q^2 values greater than 0, as shown in Table 3, indicate good predictive relevance. This suggests that the exogenous latent variables function effectively as explanatory variables, capable of predicting the endogenous variables. The results of the Q^2 calculation show that all variables in the model have a predictive relationship with a value above 0.

Table 4. Total Effect

Construct	Original Sample (O)	T-Statistics (|O/STDEV|)	P Values
X1 CB -> Y1 INT	0.572	8.717	0.000
X2 PU -> Y1 INT	0.241	2.161	0.031
X3 PEOU -> Y1 INT	0.199	2.419	0.016
X4 ATTU -> Y1 INT	0.088	0.877	0.381
X5 SN -> Y1 INT	0.438	6.198	0.000
X6 PBC -> Y1 INT	0.116	1.689	0.092
Y1 INT -> Z ACTUAL	0.743	18.944	0.000

Table 4 provides a comprehensive overview of the relationships examined in the study. The analysis supports Hypothesis H1, indicating that cognitive biases do indeed influence online shopping intentions. Additionally, Hypothesis H2a, which posits that perceived usefulness affects online shopping intentions, is accepted. Similarly, Hypothesis H2b, which suggests that perceived ease of use influences online shopping intentions, is also accepted. However, Hypothesis H3a, which asserts that attitude toward use impacts online shopping intentions, cannot be conclusively accepted or rejected. The analysis also accepts Hypothesis H3b, confirming that subjective norms have an influence on online shopping intentions. On the other hand, Hypothesis H3c, which states that PBC affects online shopping intentions, also cannot be definitively accepted or rejected. Lastly, Hypothesis H4, which proposes that intention to use influences consumer behavior, is accepted, highlighting its significant impact.

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DISCUSSION

The Effect of Cognitive Bias, Perceived Usefulness, Perceived Ease of Use, Attitude of Use, Subjective Norms, and PBC on Online Shopping Intentions

The results show that cognitive bias has an influence on online shopping intentions. In this study, a cognitive bias is indicated through three main indicators, namely present bias, confirmation bias, and framing effect. In observing the influence through the total effect, cognitive bias has a role in indirectly influencing a person's intention to shop online. As the model illustrates the effect of cognition bias on one's intention does not have a direct path. Present bias in this study is described through the statement item "The COVID-19 pandemic makes me choose online shopping", as the outcome of the research states that overall cognitive bias has an indirect influence on the intention of the Millennial generation to do online shopping in the COVID-19 pandemic situation. When conditions become uncertain and there are physical restrictions (social distancing), the level of individual saturation increases so individuals will try to find ways to divert this saturation by looking for momentary pleasure, one of which is online shopping which ultimately causes impulse buying. Confirmation bias and framing effect are in line with research by Lockton (2012) and Wang et al. (2022), where each research result shows an influence on online shopping activities. In the end, the research results also validate the previous theory put forward by Kahneman and Tversky (1984).

The results show that the usefulness of online shop perception has a significant positive effect on online shopping intentions, which indicates that the better a person's level of perception and trust in the benefits obtained by doing online shopping activities will increase his intention to shop online. Perceived usefulness of online shopping activities that are most felt by respondents is that online shopping is felt to be effective to use, especially during the COVID-19 outbreak. Studies have identified perceived ease of use as a key factor determining acceptance of the use of shopping technology on websites (Shih, 2004). Likewise, Salem and Nor (2020) found that perceived usefulness is a determining factor for predicting the intention to adopt e-commerce. In addition, according to Iriani and Andjarwati (2020), perceived usefulness has a significant impact on e-commerce transactions (online shopping) decisions.

The results showed that perceived ease of use did not significantly affect the intention of the Millennial generation to shop online amid the pandemic outbreak. Dhanapal et al. (2015) found that the Millennial generation or what can be called Generation Y is more involved in online activities than other generations, so it is a common thing for them. Therefore, the findings indicate a non-significant association between perceived ease of use and online shopping intentions.

Attitude towards behavior has no influence on online shopping intentions contrary to research conducted by Ajzen (1991) which found that Attitude or attitude has an influence on the intention to take an action. However, the findings of this study differ from previous studies (Ajzen, 1991; Pavlou & Chai, 2002) which show a relationship between attitude and online shopping intention.

Subjective norms have a significant influence on online shopping intentions, meaning that the better the respondent's perception of the use of e-commerce technology, which is in line with the opinions of those around him, will increase his intention to shop online during a COVID-19 pandemic situation. The positive influence of subjective norms on online shopping intentions supports previous research by Islam et al. (2021).

The results show that PBC has a positive but insignificant effect on online shopping intentions. This indicates that while better PBC behavior may increase one's intention to shop online, the effect is not significant. The statement item used in the questionnaire,

"online shopping is not difficult for me," suggests that individual consumers have a sufficient understanding of using applications that support online shopping. As a result, ease of use is no longer a significant factor influencing online shopping intentions. The findings regarding the effect of PBC on online shopping intentions differ from those reported by Islam et al. (2021).

The Effect of Behavioral Intention on Actual Online Shopping Behavior

The results indicate that online shopping intentions have a positive effect on the actual online shopping behavior of the Millennial generation. A greater intention to shop online increases the likelihood of engaging in online shopping activities. High intention is a sign of strong motivation; when consumers are highly motivated to shop online, they are more likely to search for products, make purchases, and complete transactions. This motivation helps them overcome any barriers or challenges encountered during the online shopping process. Additionally, accessible and user-friendly online shopping technologies and platforms support the relationship between intention and behavior. When consumers find the online shopping process simple and requires minimal effort, their intentions are more likely to be translated into actual actions. Millennial individuals with strong intentions are generally more motivated, planned, and prepared to follow through with their intentions, thus increasing the likelihood of making online purchases. These results support the findings of Aryani et al. (2021) and Moon et al. (2021), which suggest that as people consider shifting from physical stores to online shopping, their likelihood of engaging in actual online purchases increases.

CONCLUSION

This study investigates the determinants of online shopping behavior among Millennials in the context of the COVID-19 pandemic. Results show that cognitive bias affects Millennials' intention to shop online, albeit indirectly. The perceived utility, ease of use, and social influences have a positive impact on online shopping intentions, while attitude towards use and perceived control over the shopping experience did not have a major effect. Additionally, this research highlights that intention to use, reflecting Millennials' willingness to shop online during the pandemic, has a direct influence on actual shopping behavior. This indicates that a stronger intention to shop online correlates with a higher likelihood of engaging in online shopping.

Research Implication

Theoretically, this research enhances the understanding of factors influencing Millennials' online shopping behavior during the COVID-19 pandemic. The study reveals that cognitive bias impacts Millennials' intention to shop online, adding new insights to the TPB model. While the TPB model was previously used to understand behavior under conditions of certainty, incorporating cognitive factors enriches its application, particularly under uncertain conditions. Additionally, perceived usefulness, perceived ease of use, and subjective norms continue to significantly influence online shopping intentions, as supported by research from Iriani & Andjarwati (2020), Islam et al. (2021), Salem & Nor (2020), and Shih (2004). This suggests that even in uncertain times, these variables remain crucial for understanding individual behavior.

Practically, cognitive bias can be approached from two perspectives: mitigating its effects and leveraging it strategically. While cognitive bias often leads to errors in thinking, efforts to reduce its impact on decision-making are common. Conversely, cognitive bias can be harnessed in marketing strategies, such as the use of live streaming and e-commerce interactions during the pandemic. Sellers can frame product benefits through friendly, need-oriented interactions, creating a comfortable and persuasive environment that encourages purchases (Wang et al., 2022).

Furthermore, the importance of perceived usefulness and perceived ease of use underscores the need for user-friendly online shopping platforms. An intuitive interface enhances user satisfaction and increases the likelihood of engaging in online shopping. Social factors also play a crucial role, with social media influencers shaping follower behavior. Influencers with large followings can frame information in ways that resonate with their audience, leveraging cognitive bias to influence purchasing decisions. Overall, the integration of these factors highlights the importance of understanding behavior in the context of online shopping.

Research Suggestion

Based on the results of this study, there are several areas for improvement in future research. Although the Cognitive Bias variable shows an indirect influence, it would benefit from a more robust theoretical foundation, incorporating insights from behavioral economics, psychology, emotions, and social factors. Additionally, integrating perspectives from Neuroeconomics could further enrich the understanding of decision-making processes. The concepts of perceived usefulness, perceived ease of use, attitude towards behavior, subjective norms, PBC, intention to perform a behavior, and actual behavior, which form the basis of the TAM and TPB, also require a deeper exploration of their relationship with decision-making, particularly in the economic domain. Future research should consider employing different methodological approaches and models, while also including moderating effects from socioeconomic factors such as gender, age, and income. This will help achieve more accurate and insightful results.

ACKNOWLEDGMENT

With all the limitations that this study has, the author would like to thank the supervisors who have provided insight and direction in this research.

DECLARATION

The authors declared no potential conflicts of interest.

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