The Influence of Theory of Planned Behavior and Technology Acceptance Models on Behavioral Intentions in Online Grocery Shopping in Pekanbaru City

Oky Primaroni
Magister of Management, Faculty of Economics and Business, Riau University
*Email : primaroni.oky@gmail.com

Gatot Wijayanto
Magister of Management, Faculty of Economics and Business, Riau University
Email : gatot.wijayanto@lecturer.unri.ac.id

Samsir
Magister of Management, Faculty of Economics and Business, Riau University
Email : samsir@lecturer.unri.ac.id

ARTICLE INFO :

ABSTRACT

This study was carried out to investigate the impact of integrating two theories on consumer behavior, namely the Theory of Planned Behavior (TPB) and Technology Acceptance Models (TAM), on the consumer behavior intention in online food shopping in the city of Pekanbaru. A descriptive quantitative method was employed in this research, utilizing purposive sampling techniques. The study involved 174 female respondents aged 18 and above, residing in the city of Pekanbaru, who had previously engaged in online food shopping. The analysis of data was performed utilizing the Structural Equation Modeling-Partial Least Squares (SEM-PLS) approach. The results indicated that both the perceived usefulness (PU) and perceived ease of use have a notable impact on attitude (ATT). Furthermore, behavioral intention was significantly influenced by attitude (ATT), subjective norm (SN), and perceived behavioral control (PBC). The originality of this study resides in combining the Theory of Planned Behavior (TPB) and Technology Acceptance Models (TAM) within the specific context of online food shopping in the city of Pekanbaru. This study is expected to contribute to the field of consumer behavior, especially the behavior of consumers in Pekanbaru regarding online food shopping.

INTRODUCTION

The way consumers buy and use products has changed to online due to the influence of technological advances (Singh &; Söderlund, 2020; Kim, 2020; Puengwattanapong &; Leelasantitham, 2022). This change in consumer choice is also felt in Indonesia, especially with the phenomenon of online shopping. The swift advancement of Indonesia's electronic commerce sector is significantly driven by the growing enthusiasm of the public for purchasing goods and services online (Warganegara &; Hendijani, 2022). This lifestyle shift to online shopping can even be felt in grocery sales in Indonesia. Around the world, technological developments as a result of this digitalization have resulted in the online grocery market developing rapidly (Badenhop &; Frasquet, 2021; Singh &; Söderlund, 2020; Driediger &; Bhatiasevi, 2019). At this time, where people have a high level of busyness, so online shopping is considered more profitable. Online grocery stores offer different types of services, including the ability to compare prices, place orders, view menus, and so on (Handayani et al.,

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2020; Inthong et al., 2022; Warganegara &; Hendijani, 2022). Positive customer response will increase towards online grocery shopping as a result of these benefits offered.

In Indonesia, there are many online grocery stores. The number of online grocery stores is quite large, but the distribution has not been evenly distributed. Online grocery shopping in Indonesia is still considered a new thing by Indonesian consumers, even though consumers are familiar with online grocery stores (Annisa Islam &; Ezni Balqiah, 2021; Handayani et al., 2020; Warganegara &; Hendijani, 2022). The increase in online grocery shopping can be felt during the COVID-19 pandemic. However, the trend has again decreased with customers switching back to shopping by visiting grocery stores. This trend is not developing because consumers do not understand product characteristics and consumer behavior when using grocery online shopping as a means to meet grocery needs (Frank &; Peschel, 2020; Klepek &; Bauerová, 2020).

Online grocery stores can also be found in Pekanbaru City, although they are still startups. For stock fulfillment, sellers also still depend on traditional markets. This can certainly be a new business opportunity. The benefits are not only felt by sellers and consumers. The increase in online food sales will automatically also be felt by farmers in the area around Pekanbaru City. The demand for food to farmers will increase due to the need for new sources of supply as a result of competition among online stores. This mutual benefit is in line with the hadith of the Prophet SAW: "The best of man is the most beneficial for man" (HR. Ahmad).

To determine the inclination of consumers towards online grocery shopping in the city of Pekanbaru, a pre-research survey was conducted to 43 female respondents in the city of Pekanbaru. The information gathered is presented in Table 1. According to the preliminary survey findings, it is evident that respondents show a preference for shopping at physical grocery stores or stalls rather than opting for online purchases. Shopping for groceries online was considered by most respondents to be beneficial, but the quality and availability of online grocery stores were a little doubtful by respondents. Many consumers do not choose to shop for groceries online. Finally, respondents are willing to shop for groceries online if the price is competitive. Consumer behavior towards online grocery shopping needs to be explored further because of its great potential.

Tabel 1. The Tendency of Online Food Shopping in Pekanbaru City

Indicator	Question	Mean	Information
Choice	I choose to buy groceries at the market or grocery store	4.14	Good
	I choose to buy groceries *online*	3.42	Good
	I would take the time to shop at the market or grocery store	4.16	Good
Benefit	Shopping at vegetable/grocery stores *online* is more efficient and time-saving	4.02	Good
Quality	I believe in the quality of products in online vegetable/grocery stores	3.42	Good
Price	I will shop at the vegetable/grocery store *online* if the price is competitive	4.14	Good
Availability	Product variants in complete online vegetable/grocery stores	3.33	Enough
	There is a large selection of online vegetable/grocery stores in my area	3.19	Enough
Facilities	The online vegetable/grocery store app is very clear and understandable	3.60	Good
	Delivery in the online vegetable store is flexible and to my expectations	3.65	Good

Source: Processed Data, 2023

Currently, there is limited research on the factors that influence consumer attitudes and behaviors concerning online grocery shopping in Indonesia (Rayesa et al., 2020; Warganegara &; Hendijani, 2022). Various theories are commonly employed to evaluate consumer behavior, particularly in the realm of online grocery shopping. One extensively utilized theory in consumer behavior research is the Theory of Planned Behavior (TPB) (Ajzen, 2020; Ashraf et al., 2019; Khan & Khan, 2022). In this theoretical framework, three primary components play a crucial role in shaping behavioral intentions—these include attitudes, subjective norms, and perceived behavioral control (Ajzen, 2020; Ismagilova et al., 2020; Qi et al., 2021). Attitude is an

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important factor that is the main determinant of behavioral intentions for online grocery shopping case (Chen et al., 2020; H. Kim, 2021; al Amin et al., 2022; Inthong et al., 2022).

Another determinant that also determines behavioral intentions in the TPB construct is subjective norms. Subjective norms mainly refer to the influence of individuals or groups on a person's behavior (Xin et al., 2019). Subjective norms represent social pressures influencing individuals to either adopt or abstain from a particular behavior (Ajzen, 1991; Ashraf et al., 2019; H. Kim, 2021). The greatest social influence on subjective norms is from the closest people who provide input to individuals or often called referral groups. Alongside these two factors, another element influencing behavioral intentions is perceived behavioral control. This aspect reflects an individual's self-regulation capability to partake in specific behaviors (Ajzen, 2002; Chakraborty, 2019). A strong desire to perform a behavior, in this case buying food online, is strongly influenced by high behavioral perceptual control (Ajzen, 2020; Chakraborty, 2019).

Another theory that is often used for the context of online grocery shopping is Technology Acceptance Models (TAM). TAM can explain user reception behavior across many types of computing technologies (Davis et al., 1989; Marangunić &; Granić, 2015; Rosli et al., 2022). The user's intention in the Technology Acceptance Model (TAM) is shaped by three influencing factors: perceived ease of use, perceived usefulness, and attitude (Bauerová &; Klepek, 2018; Driediger &; Bhatiasevi, 2019; Granić &; Marangunić, 2019; Nguyen et al., 2019; Tyrväinen &; Karjaluoto, 2022). Several scholars contend that the initial elements of TAM may have limited predictive capability for individual technology acceptance behavior in diverse contexts and may lack additional variables that contribute to determining behavioral intention (Venkatesh & Davis, 2000; Bagozzi, 2007). Similarly, numerous studies have demonstrated that the Theory of Planned Behavior (TPB) is less effective in elucidating behavior related to the utilization of information technology (IT), which is characterized by specificity and tends to involve more psychological factors (Ajzen, 2020). Hence, researchers integrate models from both theories to obtain a more comprehensive understanding of factors that could potentially influence consumer behavioral intentions in the context of online grocery shopping, focusing on the psychological aspects of consumer behavior and their technology acceptance.

LITERATURE REVIEW

A. Behavioral Intention

In the TPB model, the inclination to participate in a specific behavior is influenced by three factors: attitudes toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 2020; Ismagilova et al., 2020). These three elements collectively shape a robust intention to execute a behavior. A more pronounced intention to act is correlated with heightened influence from subjective norms (SN), and a lower perception of obstacles increases the likelihood that individuals will embrace the behavior (Vasseur et al., 2019). By examining intention, one can ascertain an individual's inclination to engage in a behavior and identify the motivational factors that impact their actions (Ajzen, 1991). If a person's assessment of a behavior is positive and they have a strong intention for it, it is more likely that the behavior will be chosen to do (Poon &; Tung, 2022; Ulker-Demirel &; Ciftci, 2020). In addition, through TPB can also be known the direct influence of intention on purchase intention or actual behavior (Ajzen, 1991; in Virgilio &; Antonelli, 2017).

B. Perceived Usefulness (PU)

Perceived usefulness (PU) refers to users' perception that the utilization of a specific technology has the potential to enhance their productivity and overall experience (Davis, 1989; Alokgaddi et al., 2021; S.-C. Chen et al., 2011, Qi et al., 2021). Perceived usability is directly related to belief in the benefits obtained by users from the technology. According to the TAM model, perceived usability is the main determining factor, even more important than perceived ease of use (Habib &; Hamadneh, 2021). This shows how important perceived usability is in influencing users' decisions to adopt new technologies. When customers have a strong intention to adopt a new form of a particular technology, it is usually because they expect greater benefits from that technology (al Amin et al., 2022; Davis et al., 1989). These benefits can be in the form of increased productivity, comfort, time efficiency, and others. As an illustration, within the realm of online shopping, perceived usefulness is intricately linked to perceived advantages, such as optimal time efficiency and a sense of convenience (Warganegara &; Hendijani, 2022).

When utilizing online grocery shopping applications, users exhibit a more favorable attitude towards purchasing grocery items online when they perceive these apps as beneficial (al Amin et al., 2022). They believe

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that these benefits can increase their productivity (Kurnia &; Chien, 2003). The favorable reaction to the perceived usefulness of online grocery shopping is directly associated with user attitudes. This aligns with results from numerous other studies that indicate a positive impact of perceived usefulness on attitude (Nguyen et al., 2019; Qi et al., 2021; Inthong et al., 2022). Building upon this, hypotheses can be formulated regarding the impact of perceived usefulness and attitudes as outlined below:

H1: Perceived usefulness has a positive effect on attitudes towards online grocery shopping in Pekanbaru.

In addition to having an influence on attitudes, perceived usefulness will also affect the intention of users of online grocery shopping applications. User expectations of the greater benefits of a technology, drive a strong desire to use new forms of technology (al Amin et al., 2022; Davis et al., 1989). The positive relationship between perceived usefulness and behavioral intention can be seen in many previous studies (Ruangkanjanases et al., 2021; Driediger &; Bhatiasevi, 2019; Chakraborty, 2019). The hypotheses developed concerning the correlation between perceived usefulness and behavioral intention are as follows:

H3: Perceived usefulness has a positive effect on behavioral intentions in online grocery shopping in Pekanbaru.

C. Perceived Ease of Use (PEU)

Perceived ease of use (PEU) pertains to the user's perception of the ease with which a particular information technology can be utilized, without necessitating substantial physical or mental effort (Venkatesh & Bala, 2008; Md Johar & Ahmad Awalluddin, 2011; Olushola et al., 2017). This ease of use is connected to the user's judgment of the ongoing process. This notion has an impact on the behavior of information system users when opting for a specific information system. Perceived ease of use is evaluated based on the user's perception of the steps involved in reaching their ultimate outcome (Perea Y Monsuwé et al., 2004). A heightened perception of ease of use will lead to an increased inclination to use a technology.

In the TAM model, attitudes are shaped by perceived ease of use. For technologies that are novel to a significant number of consumers, the simplicity and advantages of making purchases through a technology will positively influence online grocery shopping behavior (Nguyen et al., 2019; Alshammari & Rosli, 2020; Tyrväinen & Karjaluoto, 2022). In the research results reported by Nguyen et al. (2019), it was identified that perceived ease of use stands out as the primary factor influencing attitude. Numerous other studies reveal a positive association between perceived ease of use and attitude (Qi et al., 2021; Inthong et al., 2022; Warganegara & Hendijani, 2022). The hypothesis that can be posited regarding the connection between perceived ease of use and attitude is as follows:

H2: Perceived ease of use has a positive effect on attitudes towards online grocery shopping in Pekanbaru.

In addition to shaping attitudes towards a technology, perceived ease will also enhance the inclination to use the technology. The perceived ease of using online food shopping applications by users will amplify their intention to utilize these applications (Driediger & Bhatiasevi, 2019). The positive correlation between perceived ease of use and behavioral intention is evident in numerous prior studies (Warganegara & Hendijani, 2022; al Amin et al., 2022; Driediger & Bhatiasevi, 2019). For this reason, the hypothesis that can be formulated is as follows:

H4: Perceived ease of use has a positive effect on behavioral intention on online grocery shopping in Pekanbaru.

D. Attitude

Attitude refers to the degree to which an individual favors or opposes a specific course of action (Qi et al., 2021; Adiyoso & Wilopo, 2021; Tyrväinen & Karjaluoto, 2022). Attitude is connected to an individual's evaluation of a behavior and their inclination to engage in that particular behavior (Qi et al., 2021). A person will determine their own attitude towards a behavior. They will calculate the advantages and disadvantages of a behavior performed, then they will determine their intention to do it or not (H. S. Chen et al., 2020). In the TAM

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model, individual attitudes toward adopting a technology are shaped by both perceived usefulness (PU) and perceived ease of use (PEU), subsequently influencing behavioral intentions (Davis, 1989).

In the context of online grocery shopping, the decision to purchase a product is contingent upon one's attitude. Previous research has shown that attitudes exert a positive impact on behavioral intentions (H. Kim, 2021). The positive correlation between attitude and behavioral intention is also evident in various earlier studies (Hansen et al., 2004; Piroth et al., 2020; Qi et al., 2021). Based on the explanation of the connection between attitude and behavioral intention, the following hypothesis can be articulated:

H5: Attitude has a positive effect on behavioral intention on online grocery shopping in Pekanbaru.

E. Subjective Norm

Subjective norm (SN) refers to the perceived social pressure to either engage in specific actions or refrain from certain behaviors, taking into account the potential consequences that may result from these actions (Alwi & Murad, 2018; Barbera & Ajzen, 2020; Peña García et al., 2020). Normative expectations from others and an individual's desire to conform to these expectations can influence their perception of subjective norms (Kulviwat et al., 2009). Social influence according to a person's view of the behavior they want to do can come from family members, relatives, friends, and other important people (Nhat Vuong, 2021). The people involved in this decision making are often called reference groups. Subjective norms in the context of online shopping refer to the way customers judge their experience based on the views of their friends or environment (H. F. Lin, 2007).

Social tension that encourages a person to do or not do a behavior can be considered a form of subjective norm (Ajzen, 1991). This social pressure can influence a person to make a decision to perform or not perform a behavior. Consumers who are in a social environment where they have experience shopping for groceries via the internet may be more likely to be interested in continuing to use the service (Piroth et al., 2020). The relationship between subjective norms and behavioral intentions was found in previous research (Piroth et al., 2020; Troise et al., 2021; H. Kim, 2021). The hypothesis that can be formulated based on this explanation is:

H6: Subjective norms have a positive effect on behavioral intentions in online grocery shopping in Pekanbaru.

F. Perceived Behavioral Control

Perceived behavioral control can be defined as an assessment of perceptions regarding the ease or difficulty, as well as the effectiveness, of engaging in a desired behavior (Ajzen, 1991; Llauger et al., 2021; Inthong et al., 2022). The individual's confidence and belief in their capacity to execute or abstain from a particular behavior play a crucial role in perceived behavioral control (PBC). Individuals strategize their actions, and successful execution stems from the intention to manage factors that may impede the behavior (Inthong et al., 2022). Behavioral control encompasses the values and beliefs regarding the presence of influences that can impact individual performance (al Amin et al., 2021). A person's ability to control actions towards a particular behavior is often referred to as control beliefs. The view of variables that can help or prevent the emergence of a behavior is called control beliefs (Chakraborty, 2019).

A person's belief in their ability and capability to perform or not a behavior plays an important role in PBC. Someone who does not have the ability to control circumstances will tend to have doubts about performing certain behaviors (Chakraborty, 2019). The positive impact of perceived behavioral control on behavioral intention is evident in prior research (Qi et al., 2021; Troise et al., 2021; H. Kim, 2021; Poon & Tung, 2022). Drawing from the elucidation of the association between perceived behavioral control and behavioral intention, the formulated hypothesis is as follows:

H7: Perceived behavioral control has a positive effect on behavioral intentions in online grocery shopping in Pekanbaru.

Having detailed the impact of the relationships between each variable in this study, the formulated research model is depicted in the following figure:

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Figure 1. Research Model
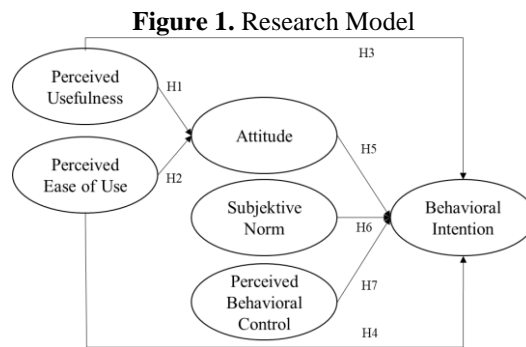
Source: Qi *et al*. (2021)

METHODOLOGY

This research was conducted from August 2023 - October 2023 with a sample of women aged 18 years and over who live in Pekanbaru City. The sampling method employed was non-probability sampling, specifically utilizing purposive sampling. Respondents were deliberately chosen from individuals who had engaged in online grocery shopping. The respondents obtained totaled 174 people and were given questions with a total of 25 questions. The obtained results were analyzed through the Structural Equation Modeling-Partial Least Squares (SEM-PLS) method, utilizing SmartPLS 3 software. The choice of PLS-SEM was made to prioritize comprehending the relationships between constructs rather than optimizing the model (Hair *et al*., 2017), as PLS-SEM does not rely on the assumption of item distribution (Reinartz *et al*., 2009), the assumption of item distribution in other analytical tools will make it difficult to modify a research model based on theory. The variables utilized in this study are outlined as follows:

Table 2. Variable Operational Definition

Variables	Definition	Indicator	Scale
Perceived usefulness (X1)	Perceived usefulness is the perception of functional benefits in the form of perceived time savings, application usefulness, effectiveness, efficiency and suitability of a technology to their needs.	1. Time saving 2. Effectiveness 3. Efficiency 4. App usefulness 5. Compatibility (Qi *et al*., 2021; Inthong *et al*., 2022; al Amin *et al*., 2022; Troise *et al*., 2021; Driediger & Bhatiasevi, 2019)	Likert
Perceived ease of use (X2)	Perceived ease of use refers to perceptions about the ease of use of the online grocery shopping system, the complexity of system operations, the ease of learning the system and the level of skills required.	1. Ease of Use 2. Complexity 3. Ease of Learning 4. Required Skills (Qi *et al*., 2021; Inthong *et al*., 2022; al Amin *et al*., 2022; Troise *et al*., 2021; Driediger & Bhatiasevi, 2019)	Likert
Attitude (X3)	Attitudes in this study show belief in the perceived benefits, individual assessments regarding how wise the behavior is, feelings or emotions such as pleasure and individual beliefs about the possible results or consequences that will occur when using the online grocery store application.	1. Trust in Benefits 2. Wisdom 3. Fun 4. Confidence in Results (Qi *et al*., 2021; Inthong *et al*., 2022; al Amin *et al*., 2022; Troise *et al*., 2021; H. Kim, 2021)	Likert
Subjective norm (X4)	Subjective norms show social influence, adherence to norms, especially those	1. Social Influence 2. Norm Obedience	Likert

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	believed by the closest people, support from the closest people and perceptions of consensus or mutual agreement on shopping behavior using online grocery store applications.	3. Social Support 4. Joint Agreement (Qi *et al*., 2021; Inthong *et al*., 2022; al Amin *et al*., 2022; Troise *et al*., 2021; Driediger & Bhatiasevi, 2019; H. Kim, 2021)	
Perceived behavioral control (X5)	Perceived behavioral control is closely related to personal abilities and resources, control in overcoming obstacles and confidence in personal abilities and ease of behavior in shopping using online grocery store applications.	1. Personal Skills 2. Resource Capability 3. Controlled Behavior 4. Ease of Behavior (Qi *et al*., 2021; Inthong *et al*., 2022; Troise *et al*., 2021; H. Kim, 2021)	Likert
Behavioral intention (Y1)	Behavioral intentions relate to respondents' motivation which can be seen from the strength of desire, the tendency to perform behavior, the clarity of intention which is reflected in the individual's tendency to actually perform behavior and planned intentions in the form of routine use.	1. Strong Desire 2. Action Tendency 3. Clarity 4. Routine (Qi *et al*., 2021; Inthong *et al*., 2022; al Amin *et al*., 2022; Troise *et al*., 2021; H. Kim, 2021)	Likert

Source: Processed Data (2023)

The tests carried out in this study are outer model testing and structural model testing (inner model). Outer model testing in this study was tested with validity and reliability tests. The validity assessment comprises examinations of convergent validity (loading factor, average variance extracted) and discriminant validity (Fornell-Larcker criterion, cross-loading, Heterotrait-Monotrait Ratio (HTMT)). Simultaneously, the reliability assessment involves evaluating the composite reliability and Cronbach's alpha. This examination is grounded in (Hair *et al*., 2017). Meanwhile, the inner model test consists of the R-square, f-square and Predictive Relevance ($Q^2> 0$) tests.

RESULTS AND DISCUSSION
Research Results

The Theory of Planned Behavior (TPB) is frequently employed to examine the psychological factors impacting an individual's intention to engage in specific behaviors. In contrast, the Technology Acceptance Models (TAM) theory is utilized to gauge an individual's acceptance of a broad information technology system. The choice of respondents who have engaged in online grocery shopping is intended to gather insights into their experiences regarding the system's ease of use (Venkatesh & Davis, 2000). Meanwhile, women were chosen as respondents because they are related to their role in shopping for groceries in a household (Gomes & Lopes, 2022; Hansen et al., 2004; Naseri & Elliott, 2011). However, women also have a tendency not to shop for food online (Frank & Peschel, 2020). The majority of respondents, 43% (26% employees and 17% government employees) are working women who have activities outside the home and earn their own income. The education of respondents was dominated by undergraduate degrees (57%). Most of the sample is highly educated. A total of 203 sample of 208 people are women who live in Pekanbaru City. Out of the 203 samples collected, 174 individuals who engaged in online grocery shopping were chosen to participate as respondents.

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Table 3. Demographic Characteristics of Respondents

Characteristics	Category	Frequency	Percentage
Age	18 – 24 years old	69	33%
	25 – 34 years old	89	43%
	35 – 44 years old	37	18%
	45 – 55 years old	11	5%
	Above 55 years old	2	1%
	Total	**208**	**100%**
Education	High School	24	12%
	Diploma	17	8%
	Bachelor	119	57%
	Master/Doctor	48	23%
	Total	**208**	**100%**
Jobs	Housewife	39	19%
	Employees	54	26%
	Student	60	29%
	Public Servant	36	17%
	Self-employed	19	9%
	Total	**208**	**100%**
Pekanbaru Domicile	Yes	203	98%
	No	5	2%
	Total	**208**	**100%**
Have used an online grocery shopping app before	Yes	174	84%
	No	34	16%
	Total	**208**	**100%**

Source: Processed Data (2023)

Descriptive analysis is conducted to understand the position of a variable without making comparisons or investigating correlations between it and other variables. This analysis is done by converting raw data from the questionnaire results into a more representative form, such as averages and percentages. The outcomes of the descriptive analysis are presented in Table 4.

Table 4. Variable Descriptive Averages

VARIABLES	MEAN	CATEGORIES
PU	4.02	**GOOD**
PEU	4.02	**GOOD**
ATT	3.82	**GOOD**
SN	3.68	**GOOD**
PBC	3.90	**GOOD**
BI	3.48	**GOOD**

Source: Processed Data (2023)

The results obtained based on the average respondent's answers to each variable, the average is obtained in the good category. The variables of perceived usefulness (PU) and perceived ease of use (PEU) received the highest average responses from the participants, each scoring 4.02. Respondents think that this online grocery shopping application is useful for them and easy to use in meeting their daily needs. Participants express agreement with the advantages and user-friendliness of online grocery shopping applications. This alignment is noteworthy considering that 43% of the respondents are individuals employed outside the home, and 76% fall within the 18-34 age group. Most respondents work outside the home, so online grocery shopping is considered to help them with their busy lives. In terms of ease of use, most respondents are young. This makes it possible for respondents to use and learn this application easily. As many as 57% of respondents are undergraduates. The behavioral intention (BI) variable is the variable with the lowest average answer of 3.48. Respondents were

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found to have the intention to shop for groceries online. However, respondents do not have a strong desire to do so in the near future on a regular basis.

Outer Model Testing

The loading factor value of each indicator can be seen in table 5. PEU4, SN1 and SN2 indicators with loading values below 0.7 should be removed from the calculation because they are invalid, this is considered to be done in order to increase the composite reliability value (Hair et al., 2017). Nevertheless, it is common to encounter factor loading values below 0.7 in social science research (Hulland, 1999). Factor loading with a limit of 0.6 can still be considered (Chin et al., 1998; Henseler et al., 2009) because the composite reliability value obtained is good. So, the three indicators that have a loading value smaller than 0.7 are still retained with the above considerations to get a more real correlation between variables. At the same time, the AVE value for the six tested variables exceeds 0.5, indicating the validity of these variables for utilization. To assess discriminant validity, three methods are employed: the Fornell-Larcker criterion, cross-loading analysis, and the heterotrait-monotrait ratio (HTMT). The outcomes of the discriminant validity assessment are presented in tables 6, 7, & 8.

To assess reliability, examination involves evaluating composite reliability and Cronbach's alpha. Table 5 displays the results of composite reliability testing, where the CR value exceeding 0.7 indicates the model's reliability. Overall, the research model can be said to be reliable. The composite reliability values for all variables range from 0.70 to 0.95, indicating a satisfactory outcome. Table 5 provides the Cronbach's alpha values, which fall within the range of approximately 0.70 to 0.90, indicating a satisfactory outcome (Hair et al., 2017). Drawing from these findings, one can deduce that the employed variables demonstrate reliability.

Table 5. Validity and Construct Reliability Test

Variables	Indicator	Loading	AVE	CR	Cronbach's Alpha
ATT	ATT1	0.821	0.705	0.905	0.861
	ATT2	0.867			
	ATT3	0.831			
	ATT4	0.841			
BI	BI1	0.888	0.786	0.936	0.909
	BI2	0.900			
	BI3	0.866			
	BI4	0.892			
PBC	PBC1	0.841	0.688	0.898	0.849
	PBC2	0.824			
	PBC3	0.802			
	PBC4	0.850			
PEU	PEU1	0.813	0.545	0.824	0.714
	PEU2	0.751			
	PEU3	0.825			
	PEU4	**0.525**			
PU	PU1	0.752	0.639	0.898	0.858
	PU2	0.841			
	PU3	0.814			
	PU4	0.828			
	PU5	0.756			
SN	SN1	0.662	0.595	0.853	0.772
	SN2	0.695			
	SN3	0.865			
	SN4	0.844			

Source: Processed Data (2023)

In the Fornell-Larcker criterion test, it is essential for the square root of the Average Variance Extracted (AVE) to surpass the correlation with other latent variables. According to the outcomes presented in Table 6, the

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square root AVE values for all variables exceed the correlations of these variables with others. The results of this test can be concluded that the variables used are valid. The indicator's outer loading on a variable should surpass its cross-loading on other variables (Hair *et al.*, 2017). Based on these outcomes, one can infer that the utilized indicators are valid and suitable for this study.

Table 6. Fornell-Larcker Criterion

	ATT	BI	PBC	PEU	PU	SN
ATT	0.840					
BI	0.703	0.887				
PBC	0.628	0.596	0.829			
PEU	0.676	0.523	0.553	0.739		
PU	0.733	0.606	0.530	0.628	0.799	
SN	0.714	0.650	0.575	0.551	0.599	0.772

Source: Processed Data (2023)

Table 7. Cross Loading Value

	ATT	BI	PBC	PEU	PU	SN
ATT1	0.821	0.549	0.530	0.569	0.645	0.553
ATT2	0.867	0.632	0.538	0.502	0.604	0.589
ATT3	0.831	0.580	0.541	0.600	0.618	0.602
ATT4	0.841	0.599	0.501	0.599	0.596	0.653
BI1	0.656	0.888	0.527	0.436	0.542	0.643
BI2	0.606	0.900	0.466	0.471	0.548	0.565
BI3	0.592	0.866	0.576	0.454	0.524	0.553
BI4	0.635	0.892	0.542	0.495	0.533	0.539
PBC1	0.504	0.505	0.841	0.483	0.485	0.468
PBC2	0.541	0.458	0.824	0.463	0.444	0.505
PBC3	0.527	0.486	0.802	0.423	0.370	0.477
PBC4	0.515	0.523	0.850	0.464	0.459	0.460
PEU1	0.542	0.464	0.536	0.813	0.569	0.480
PEU2	0.544	0.314	0.368	0.751	0.450	0.412
PEU3	0.537	0.473	0.451	0.825	0.530	0.428
PEU4	0.349	0.257	0.225	0.525	0.244	0.283
PU1	0.476	0.376	0.347	0.465	0.752	0.364
PU2	0.593	0.502	0.376	0.525	0.841	0.441
PU3	0.568	0.455	0.407	0.471	0.814	0.478
PU4	0.657	0.534	0.483	0.496	0.828	0.541
PU5	0.608	0.526	0.485	0.545	0.756	0.541
SN1	0.443	0.394	0.300	0.297	0.387	0.662
SN2	0.453	0.386	0.516	0.365	0.400	0.695
SN3	0.690	0.612	0.498	0.516	0.575	0.865
SN4	0.574	0.565	0.460	0.482	0.462	0.844

Source: Processed Data (2023)

In the heterotrait-monotrait ratio (HTMT) testing, it is crucial for the value to be less than 0.85. Henseler et al. (2015) suggested a threshold of 0.90 for the heterotrait-monotrait ratio (HTMT) when the variables in the research model share conceptual similarities. This assertion is employed due to the conceptual similarity between the variables of perceived usefulness (PU) and perceived ease of use (PEU). Therefore, the threshold value of 0.90 is adopted in this study. To diminish the heterotrait-monotrait ratio (HTMT) value, it is essential to eliminate one of the problematic indicators (Hair et al., 2017). Nevertheless, excluding this indicator would compromise the validity of the measured content. Hence, opting to retain the problematic indicator is a more favorable choice.

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Table 8. Heterotrait-Monotrait Ratio (HTMT)

	ATT	BI	PBC	PEU	PU	SN
ATT						
BI	0.793					
PBC	0.736	0.676				
PEU	0.858	0.639	0.692			
PU	0.845	0.678	0.614	0.778		
SN	0.859	0.756	0.712	0.720	0.717	

Source: Processed Data (2023)

Table 9. Mediation Effect of Attitude Variable (ATT)

	P Values	Indirect Effect		P Values	Direct Effect	Mediation Effect
PEU → ATT → BI	0.009	Significant	**PEU -> BI**	0.823	Not Significant	**Full Mediation**
PU → ATT → BI	0.005	Significant	**PU -> BI**	0.066	Not Significant	**Full Mediation**

Source: Processed Data (2023)

Inner Model Testing

The evaluation of the inner model involves testing R-square, f-square, and predictive relevance ($Q^2 > 0$). According to the outcomes of the R-Square test, it can be inferred that 61.4% of the variance in attitude (ATT) is influenced by the variables of perceived usefulness (PU) and perceived ease of use (PEU). In contrast, the variables of perceived usefulness (PU), perceived ease of use (PEU), attitude (ATT), subjective norms (SN), and perceived behavioral control (PBC) collectively contribute to a 57% influence on behavioral intention (BI). ATT and BI are affected by additional variables beyond those incorporated in the research model. Regarding the assessment of predictive relevance, it is crucial for the value to exceed 0. A Q^2 value surpassing 0 signifies that the model holds predictive relevance for other endogenous constructs (Hair *et al*., 2017).

Table 10. R-square and Predictive Relevance

	R Square	%	Q² (=1-SSE/SSO)
ATT	0.614	61.4%	0.426
BI	0.570	57%	0.436

Source: Processed Data (2023)

Table 11. f-square

	f-square	Effect Size
EFEK ATT		
PEU → ATT	0.199	Medium
PU → ATT	0.407	Large
EFEK BI		
ATT → BI	0.074	Small
PBC → BI	0.048	Small
PEU → BI	0.000	No Effect
PU → BI	0.017	No Effect
SN → BI	0.058	Small

Source: Processed Data (2023)

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The outcomes of the f-square test are presented in the above Table 11. The f-Square value is utilized to assess the extent of the impact of exogenous variables on endogenous variables. The results indicate that concerning the influence on attitude (ATT), the perceived usefulness variable (PU) has a more significant effect compared to the perceived ease of use (PEU), which has only a moderate effect. In terms of the impact on behavioral intention (BI), no effect is observed from the variables of perceived usefulness (PU) and perceived ease of use (PEU). Additionally, for the variables of attitude (ATT), subjective norm (SN), and perceived behavioral control (PBC), the effect on behavioral intention (BI) is identified as small. Detailed results using the SEM-PLS method are depicted in Figure 2 below.

Figure 2. Testing Results Model
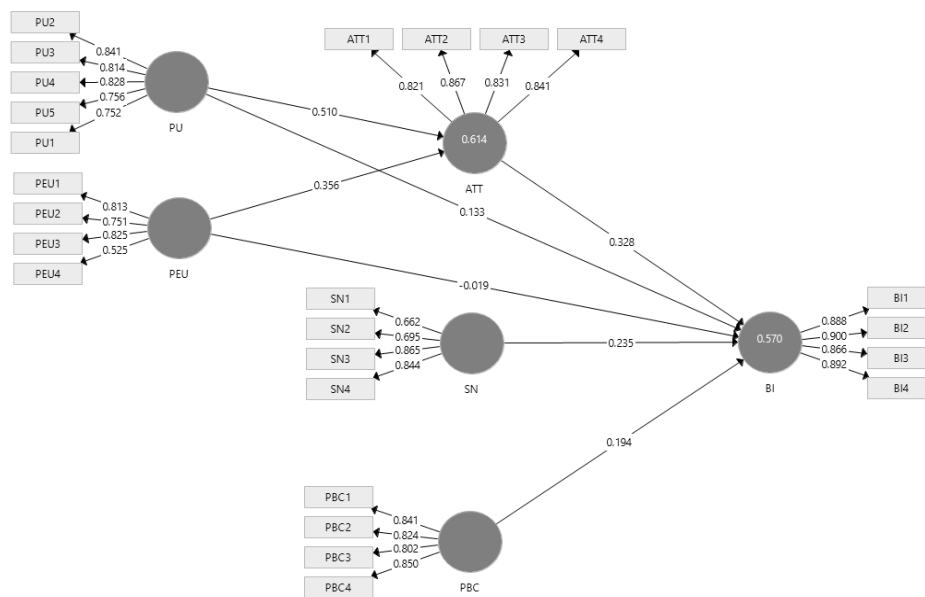
Source: Processed Data (2023)

Table 12. Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	T Statistics (|O/STDEV|)	P Values	Note
PU → ATT	0.510	0.511	9.555	**0.000**	**Significant**
PEU → ATT	0.356	0.356	6.629	**0.000**	**Significant**
PU → BI	0.133	0.132	1.840	**0.066**	**Not Significant**
PEU → BI	-0.019	-0.015	0.224	**0.823**	**Not Significant**
ATT → BI	0.328	0.323	2.950	**0.003**	**Significant**
SN → BI	0.235	0.242	2.556	**0.011**	**Significant**
PBC → BI	0.194	0.192	2.225	**0.026**	**Significant**

Source: Processed Data (2023)

Discussion

For the Technology Acceptance Models (TAM) theory model, the results are as follows significant relationship between perceived usefulness (PU) and attitude (ATT). This significant relationship can be found in several previous studies (al Amin *et al*., 2021; Nguyen *et al*., 2019; Troise *et al*., 2021). Positive consumer attitudes will increase in line with the perceived benefits. According to the study conducted by Nguyen et al. (2019), it is asserted that the consumer attitudes toward online food shopping are likely to rise as a result of the impact of perceived benefits and ease of use. Consumers will be helped by the benefits that will be obtained from shopping for groceries online, resulting in a positive response. Positive consumer attitudes towards online

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grocery shopping can be triggered by factors such as time savings, effectiveness and efficiency.

Following the theoretical framework of the Technology Acceptance Models (TAM), this study emphasizes that perceived usefulness (PU) plays a primary role as a determinant in influencing attitude (ATT), as opposed to perceived ease of use (PEU). Usability holds greater significance for online grocery shoppers than ease of use, and it serves as the primary catalyst for consumers to engage in online food shopping (Loketkrawee & Bhatiasevi, 2018; Qi *et al*., 2021). The level of perceived usefulness (PU) is influenced by perceived ease of use (PEU), meaning that the easier a system is to use, the greater the benefits perceived by users. Consumers who find online shopping applications easy to use, or think that they can easily become skilled in using them, tend to find them useful (Driediger & Bhatiasevi, 2019).

A notable impact was identified in the association between perceived ease of use (PEU) and attitude (ATT). This relationship strengthens the results of previous research (al Amin *et al*., 2022; Qi *et al*., 2021; Warganegara & Hendijani, 2022). Consumers' positive attitude toward online grocery shopping grows when the online platform is both easy to use and provides utility. Easy-to-use technology and application benefits perceived by consumers to order, receive food, and view food details will form a positive attitude (Inthong *et al*., 2022; Warganegara & Hendijani, 2022). Ease of use will trigger feelings of pleasure because less effort must be spent in using this application.

People have become accustomed to the use of information technology devices. Most of the consumers involved in this study are young consumers. When consumers perceive information technology as more user-friendly, they are more inclined to embrace it (Davis *et al*., 1989). Application providers have also developed user-friendly systems with low complexity. This allows the app to be used and learned by many people without requiring much skill. A successful marketing strategy and a carefully designed online shopping platform are crucial to enhance consumers' favorable perception of purchasing certified food products through the internet (Qi *et al*., 2021). There is no direct impact observed in the connection between perceived usefulness (PU) and behavioral intention (BI). The outcomes regarding the association between perceived usefulness (PU) and behavioral intention (BI) deviate from prior research, which identified a significant effect (Chakraborty, 2019; Driediger & Bhatiasevi, 2019). However, in some other studies, insignificant effects can also be found (Jasti & Syed, 2019; Nguyen *et al*., 2019). Consumers who perceive online grocery shopping as beneficial may not necessarily shop for it (Jasti & Syed, 2019). In this case, the benefits of online grocery shopping have been realized by consumers. Consumers agree on the usefulness of this application. However, consumers do not have a strong desire to use it regularly in the near future.

A similar non-significant outcome was reported in another study conducted by Klepek & Bauerová (2020), aligning with the results of this study. In accordance with the original TAM model, perceived ease of use (PEU) is asserted to exert a substantial influence on perceived usefulness (PU). When consumers perceive an app for grocery shopping as easy to use, it is more likely that they also consider it useful (Shukla & Sharma, 2018). Furthermore, perceived ease of use will affect intention through perceived usefulness (Sreeram *et al*., 2017; Klepek & Bauerová, 2020). This study did not conduct an examination of the impact of perceived ease of use (PEU) on perceived usefulness (PU) and its subsequent indirect influence on behavioral intention (BI). It is hypothesized that the influence of perceived ease of use (PEU) on perceived usefulness (PU) could potentially affect the relationships between other variables and behavioral intention (BI) in the context of online grocery shopping in Pekanbaru City.

The outcomes of the examination on indirect effects demonstrate an amplified significance, indicating the impact of perceived usefulness (PU) and perceived ease of use (PEU) on behavioral intention (BI) through attitude (ATT). The mediating role of attitude is evident from the results of the testing for indirect effects. If online purchases are perceived as useful, usability will shape consumer attitudes and intentions will be influenced through attitudes (Nguyen *et al*., 2019; Saleem *et al*., 2022). Attitude serves as a mediator in the positive and statistically significant impact of these factors on intentions to make online purchases (Saleem *et al*., 2022). The findings of this study indicate that the attitude variable fully mediates the relationship between perceived usefulness and perceived ease of use with behavioral intentions. So that by continuing to increase consumers' positive attitudes towards online grocery shopping, they will be more accustomed to it and a strong desire will be formed.

Among the TPB constructs, attitude emerged as the most influential determinant, followed by subjective norms and perceived behavioral control. This outcome reinforces the assertion that the TPB model is applicable across various research contexts, particularly within the realm of online grocery shopping (Khan & Khan, 2022). The favorable outcomes regarding the influence of attitude on behavioral intention support the findings of prior

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research (H. Kim, 2021; Qi *et al*., 2021; Rayesa *et al*., 2020). The attitudes of consumers toward applications for online grocery shopping play a crucial role in the domain of grocery commerce (H. Kim, 2021). Positive attitudes in the form of trust in benefits, pleasure, confidence in results and wisdom can be seen in this study. This positive attitude plays a role in increasing consumer intention to shop for groceries online. If consumers have a positive attitude towards online grocery shopping, it can influence their interest in shopping for groceries online (Rayesa *et al*., 2020). The mediation ability possessed by attitudes has also been proven to be very crucial. Behavioral intentions can be shaped by perceived usefulness and perceived ease of use through attitudes. Despite the significant impact of attitude on behavioral intention, the magnitude of this effect remains limited. In such instances, a robust inclination from consumers is required to engage in online grocery shopping. This strong inclination is further influenced by perceived behavioral control, which is closely associated with consumers' capabilities.

Subjective norm (SN) exerts a significant influence on behavioral intention (BI). This notable impact aligns with findings from several preceding studies (Piroth *et al*., 2020; Hansen *et al*., 2004). Input from one's social environment in this case will affect behavioral intentions to shop for groceries online. Individuals immersed in a social environment where online grocery shopping is familiar and experienced are more inclined to show interest in its usage (Piroth *et al*., 2020). Although a significant effect is obtained, the magnitude of the effect obtained is still small. Online grocery shopping is a new experience, especially for consumers in Pekanbaru City. With the lack of experience of using this application in the consumer environment, subjective norms will have a small value as the results obtained. The input obtained from the surrounding environment in providing encouragement to shop for groceries online will not be too much (Kurnia & Chien, 2003). Consumers will tend to study first and try to find the right references related to online food shopping due to the lack of input from the surrounding environment. The use of this application will be massive if references are easily obtained, especially input from the surrounding environment. Consumers' positive attitude towards online grocery shopping will also have an effect. If this positive attitude towards online grocery shopping continues to be improved, as well as increased support from the surrounding environment, consumer behavioral intentions will increase.

The positive impact of perceived behavioral control on behavioral intention (BI) was also identified, affirming the results reported in earlier studies (Poon & Tung, 2022; Qi *et al*., 2021; Rayesa *et al*., 2020). Elevated perceptions of the accessibility and convenience of purchasing food online significantly contribute to motivating individuals' intentions (Qi *et al*., 2021). Consumers are generally perceived to have the ability so that there are no barriers to their accessibility to shop for groceries online. The capabilities referred to here are consumers' personal capabilities and resource (financial) capabilities. The majority of consumers are employed and well-educated, implying that their capabilities are deemed essential in determining whether a behavior can be executed. Perceived behavioral control is intricately tied to an individual's capacity to manage challenges by leveraging their resources. Individuals plan their behavior, and successful achievement results from the intention to control factors that hinder behavior (Inthong *et al*., 2022). The role of perceived behavioral control is crucial in shaping a strong desire to perform a behavior. Positive attitudes and encouraging subjective norms serve as motivation for participating in a behavior. However, the actual intention to engage in the behavior materializes only when there is a robust sense of perceived control over it (Ajzen, 2020). Consumers' personal abilities and financial capabilities will make it easier for this behavior to be carried out and controlled. In this case, the behavioral intention of online grocery shopping for consumers in Pekanbaru City is influenced by perceived behavioral control.

CONCLUSION

In light of the findings of this study, several conclusions can be drawn. Notably, perceived usefulness significantly impacts attitudes toward online grocery shopping in Pekanbaru. The primary factor influencing a positive attitude toward online grocery shopping applications in Pekanbaru is perceived usefulness, specifically in terms of the application's utility and time-saving features. This perceived usefulness serves as the key determinant of attitude. Additionally, perceived ease of use significantly impacts attitudes toward online grocery shopping, generating positive consumer attitudes due to the ease of use and quick learning associated with the applications. Consumers consider online grocery shopping applications to be user-friendly. However, no significant effect was observed in the relationship between perceived usefulness and behavioral intention in online grocery shopping in Pekanbaru. Perceived usefulness does not have a direct influence on behavioral

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intentions but indirectly through attitudes. Perceived usefulness plays a role in forming positive consumer attitudes, and it is these positive attitudes that elevate the intention of consumers to engage in online grocery shopping. However, no significant impact on behavioral intentions in online grocery shopping in Pekanbaru was identified regarding perceived ease of use. Nevertheless, perceived ease of use contributes to enhancing consumers' positive attitudes toward online grocery shopping. This good response from consumers determines whether or not online grocery shopping behavior is carried out.

Attitude significantly impacts behavioral intentions in online grocery shopping in Pekanbaru. Positive attitudes, stemming from trust in benefits, enjoyment, confidence in outcomes, and perceived usefulness and ease of use, contribute to an increased intention to use the application. Subjective norms also wield a noteworthy influence on behavioral intentions in online grocery shopping in Pekanbaru. Despite online grocery shopping being a relatively new concept for consumers in Pekanbaru City, consumer intentions are still influenced by subjective norms, particularly factors like adherence to norms and support from the environment. Additionally, perceived behavioral control significantly affects behavioral intentions in online grocery shopping in Pekanbaru. Consumers have selfability so that they are able to access behavioral control over online grocery shopping. In general, the amalgamation of the Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM) frameworks proves effective in elucidating the factors that can impact consumer behavioral intentions. These two theories can be used to determine the behavioral intentions of consumer behavior in the context of online grocery shopping in Pekanbaru City. This study can serve as valuable input and an additional reference for research in the broader field of consumer behavior, particularly within the context of online grocery shopping. In future research endeavors, it is advisable to examine the indirect impact of perceived usefulness and perceived ease of use on behavioral intentions through attitudes. Additionally, exploring the influence of perceived ease of use on behavioral intentions through perceived usefulness is recommended. Conducting such tests is anticipated to enhance the understanding of how other variables may exert an increased influence on the behavioral intentions of online grocery shopping.

In addition, this research can be used as input for business actors regarding the assessment of consumer behavior. Assessment of consumer behavior can be used as a reference for business development, especially for online grocery stores. The market share of online groceries is quite large in connection with the increasing level of consumer mobility. Online grocery stores can be used as one solution for consumers who have a lot of busyness in fulfilling their daily needs. Online grocery stores can also be used as an alternative form of food business to advance the economy of farmers and the ummah. The originality of this research lies in combining Theory of Planned Behavior (TPB) and Technology Acceptance Models (TAM) in the context of online grocery shopping in Pekanbaru City. This study aims to make a contribution to the realm of consumer behavior, particularly focusing on the behavior of consumers in Pekanbaru City concerning online grocery shopping.

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Corresponding Author : Oky Primaroni

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Corresponding Author : Oky Primaroni