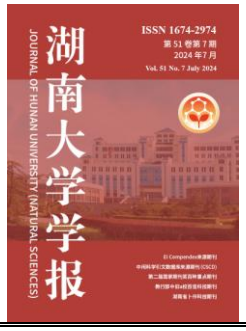

湖南大学学报（自然科学版）
Journal of Hunan University (Natural Sciences)

第 51 卷 第 7 期
2024 年 7 月

Available online at http://jonuns.com/index.php/journal/index

Vol. 51 No. 7
July 2024

Open Access Article

https://doi.org/10.55463/issn.1674-2974.51.7.7

Motivated Consumer Innovativeness and Intention to Adopt Drone Delivery: An Empirical Study in Indonesia

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Received: May 1, 2024 / Revised: May 31, 2024 / Accepted: June 10, 2024 / Published: July 31, 2024

Abstract: Motivation serves as the foundation for innovativeness and predicts consumer responses to technological adoption. The purpose of this research is to empirically analyze the factors motivating Indonesian e-commerce users to adopt drone delivery, a disruptive technology with the potential to revolutionize logistics. Utilizing the Motivated Consumer Innovativeness (MCI) scale, we assess the applicability of this scale within the Indonesian context and assess its predictive power on consumer adoption of drone delivery, a disruptive technology with the potential to revolutionize logistics. This instrument was recently developed to measure the underlying motivation related to consumers' orientation in acquiring innovations. Moreover, the Indonesian version of the scale, translated and adapted from the original version, is composed of 22 items rated on a 7-point Likert scale. The scale was administered to equally distributed 207 participants. A confirmatory factor analysis proved that the scale's theoretical framework was supported, confirming its suitability for the Indonesian context. The results showed that MCI scale had strong psychometric properties, making it a valuable tool for experts and marketers to investigate motivation basis of consumers innovativeness that drives consumers attitude and behavioral intention toward innovations. In addition, the Indonesian version of MCI can be used to assess consumers' motivation toward innovations, providing valuable insights for product development and marketing strategies.

Keywords: consumer innovativeness, motivation, attitude, intention, drone delivery.

激励消费者创新力和态度塑造采用无人机送货的意愿：印度尼西亚的一项实证研究

摘要：动机是创新的基础，可以预测消费者对技术采用的反应。本研究的目的是实证分析激励印尼电子商务用户采用无人机送货的因素，无人机送货是一项具有彻底改变物流的颠覆性技术。利用消费者创新动机(MCI)量表，我们评估了该量表在印尼环境下的适用性，并评估了其对消费者采用无人机送货的预测能力，无人机送货是一项具有彻底改变物流的颠覆性技术。该工具是最近开发的，用于衡量与消费者获取创新的取向相关的潜在动机。此外，该量表的印尼语版本是从原版翻译和改编而来的，由 22 个项目组成，采用 7 点李克特量表评分。该量表对分布均匀的 207 名参与者进行了测试。验证性因素分析证明该量表的理论框架得到了支持，证实了它适合印尼环境。结果表明，MCI 量表具有很强的心理测量特性，使其成为专家和营销人员研究消费者创新动机基础的宝贵工具，这些动机基础推动了消费者对创新的态度和行为意图。此外，印尼语版 MCI 可用于评估消费者对创新的动机，为产品开发和

营销策略提供宝贵的见解。

关键词： 消费者创新能力, 动机, 态度, 意向, 无人机送货

1. Introduction

The rapid growth of e-commerce in Indonesia has caused increased interest in understanding consumers behavior in the market. With a value of approximately 62 billion US Dollars, Indonesia's e-commerce has become the largest in Southeast Asia [1]. These data are supported by the growing number of users, forecasted to reach approximately 131 million by 2028. Moreover, e-commerce has an impact on both individuals and the movement of goods. With increasing consumers demand for faster delivery, it becomes a new normal [2]. Delivery technologies are expected to transform the last mile. The rapid growth of e-commerce has increased the challenges of last-mile delivery in cities, making drone delivery a promising solution with significant potential [3]. With the introduction of innovative technologies such as drone for delivery, there is a need to analyze the impact of motivated consumers innovativeness (MCI) on behavioral intention. Therefore, this study aimed to investigate the mediating role of consumers attitude toward innovations in influencing the behavioral intention of e-commerce users in Indonesia. Innovations are dynamic attributes of markets and enterprises. In the current era of innovations, the popularity of unmanned aerial vehicles (UAVs), popularly known as ‘drone’, is rising. UAVs are used in several fields, namely agriculture, rescue activity, firefighting, as well as transportation and logistics [4]–[6]. Focusing on transportation and logistics, drone can be used for package delivery [7]. However, study on drone delivery from consumers' perspective has not been widely conducted, despite its importance for businesses. There is still a dearth of study incorporating the relationship of behavior and motivation as well as the mediating role of consumers attitude in the context of drone delivery, specifically in Indonesia. The current study filled the gap in drone delivery study in Indonesia by providing factors of motivational basis through the concept of MCI. Consumers have basic needs, preferences, and motivation driving the use of innovativeness. Therefore, businesses need to have a complete knowledge of its usage and the motives underlying consumers innovativeness. Companies that produce innovations are interested in knowing whether a particular area is conducive for innovations. There are several factors that determine the innovative potential of a territory. Some of the factors pertain to the “supply side,” such as the availability of venture capital, potential competition, rule of law, and enforcement of intellectual property rights. There are also important factors on the “demand side,” which are related to the often-neglected consumers in the innovation process as well as consumers adoption of new technology. Previous studies have shown that innovativeness is the extent to which individuals adopt innovations relatively earlier than others [8]. Accordingly, the concept of innovativeness can be applied to a wide range of processes, such as the ability of businesses to launch new products, the degree to which products can be seen as innovative or individuals are inclined to adopt the products. The latter aspect is defined as “consumers innovativeness” and, in this paper, the term “innovativeness” refers exclusively to consumers innovativeness. Due to its propensity toward innovations, consumers innovativeness has generally been described as individuals trait or characteristic that differentiates people on the basis of the probability to purchase new products [9]. However, the concept of consumers innovativeness is still not well defined and a substantial agreement about the meaning of this construct remains unreached [10]. This study aimed to analyze the basis of motivating e-commerce users in Indonesia to adopt drone delivery as a means of transport, with MCI serving as a theoretical framework. The findings of this research can help e-commerce businesses and drone delivery companies understand consumer preferences, enabling them to tailor services and marketing strategies for successful drone delivery adoption.

1.1. Motivated Consumer Innovativeness (MCI)

Motivation is defined as an individual’s psychological pressure to behave and think in order to reach a specific objective (satisfy personal needs) in a situational state [11]. Maslow theory of human needs recognizes the importance of motivation to fulfill human needs as a determinant of behavior. Attitude and behavior are motivated processes supported by psychological needs. Consumers innovativeness study [12] stressed that motivation is crucial to humans attitude toward an innovative product. Products and innovations in particular, help people achieve public or private objectives, shape identities, and provide desired characteristics [13]. Therefore, products perception is a socially shared and interactional process where people build and share meanings about the use, role, and function (social and private) of a particular class of products.

Innovativeness is defined as the degree to which individuals are relatively earlier in adopting new ideas than the average members of their social system [14].

This concept is further analyzed as the relative speed at which individuals adopt innovations than other members of their social system [8], [14]. Those with this inclination actively pursue and obtain cutting-edge products in their preferred categories, often striving to be among the first to possess and use the innovations before others [15]. Innovativeness can be conceptualized as "the tendency to buy new products in particular category soon after appearance in the market and relatively earlier than most other consumers in the market segment" [15].

Drone implementation in e-commerce industry demands a customer-centric experience. This requires companies to ensure that consumers are the focus of all digital initiatives [16]. When introducing innovative products, market players need to identify whether consumers are interested in learning more, purchasing more, or using the products [17].

The importance of consumers preferences in last-mile delivery is embraced in the urban last-mile distribution strategy framework by Janjevic & Winkenbach [18]. This framework considers consumers/users preferences from the socio-economic scope as an external aspect, along with service performance and product/service offerings as aspects of the design of goods delivery services. According to [19]–[22], consumers motivation underlies the formation of individuals behavior and desires to obtain, use, and purchase products or service. Despite exploring the importance of consumers preferences, businesses have not conducted a comprehensive analysis of this issue. Therefore, the current study aimed to investigate and analyze these drivers or motives. Consumers adoption of new innovations is a form of innovativeness. Understanding behavior in adopting innovations is crucial for companies to effectively implement new technologies.

MCI is a new scale that considers accounts for multiple motivation when purchasing innovations. This measurement is made up of four consumers innovativeness dimensions, including functional, hedonic, social, and cognitive [12]. Moreover, MCI is an extended Technology Acceptance Model (TAM) theory that utilizes motivation to adopt new technologies [20]. The concept of MCI combines both motivation and innovativeness to represent internal and external factors, leading to innovative buying behavior [12], [20], [23]. MCI also comprises four key motivation, including functional, hedonic, cognitive, and social, which relate to established theories of goal-oriented behavior. Motivation facilitates consumers to adopt innovative products or services. MCI is defined as the motivation for consumers' willingness to explore, adopt, and invent new products or services.

The first dimension of MCI is Functionally Motivated Consumers Innovativeness (FMCI), which refers to "consumers innovativeness motivated by the functional performance of innovations and focuses on task management as well as accomplishment improvement" [12]. FMCI refers to a measure of consumers' self-reported innovativeness facilitated by the functional performance of innovations and focuses on task management and accomplishment improvement. The second dimension is Hedonic Motivated Consumers Innovativeness (HMCI), defined as "consumers innovativeness motivated by affective or sensory stimulation and gratification" [12]. In essence, FMCI includes both practical and task-specific dimensions [24], meaning that the more individuals' motivation is based on functional capability, the more likely it is to generate positive attitude toward innovations. In the context of drone delivery, functional capability includes time savings performance, convenience, and usefulness [23].

HMCI reflects the desire for excitement and enjoyment found in affective objectives driven by sensory stimulation and gratification [12]. It is related to sensual and emotional aspects, referring to the possibility of adopting novel products or services facilitated by affective or sensory stimulation and the fulfillment of personal desires. Meanwhile, HMCI includes stimulus of life enjoyment, pride and satisfaction, as well as purpose of joy creation.

The third dimension of MCI is Cognitively Motivated Consumers Innovativeness (CMCI), which reflects a pursuit of knowledge and intellectual expansion, similar to the exploration and understanding objectives outlined by [25]. It refers to self-reported innovativeness motivated by mental stimulation [12]. Therefore, consumers with high CMCI are characterized by their desire for knowledge and intellectual growth. This is evident in their pursuit of intelligence acquisition and constant exploration to expand understanding of innovations. The consumers are more likely to show a positive attitude toward new technology products or services after carefully considering the potential for intellectual stimulation and the opportunity to learn and grow through new technologies adoption [23].

The fourth dimension is Socially Motivated Consumers Innovativeness (SMCI), which is defined as self-reported consumers innovativeness motivated by the self-assertive social need for differentiation. It is the desire to impress or connect with others through innovative methods, reflecting the concept of self-assertive social relationship objectives. Previous studies examining MCI in the context of drone food delivery found that the dimensions helped consumers form favorable attitude [20]. Correlation of new products or services with underlying motivation drives consumers' willingness to embrace innovations and form a positive evaluation. Regarding MCI with attitude, it is important that consumers attitude toward particular products or services is not random but driven by underlying motivation. Therefore, motivation acts as the main factor that encourages individuals to choose

products or services. The following hypotheses were proposed:

H1a: Functionally Motivated Consumer Innovativeness (FMCI) positively impacts Consumers Attitude to Innovation.

H1b: Hedonically Motivated Consumer Innovativeness (HMCI) positively impacts Consumers Attitude to Innovation.

H1c: Cognitively Motivated Consumer Innovativeness (CMCI) positively impacts Consumers Attitude to Innovation.

H1d: Socially Motivated Consumer Innovativeness (SMCI) positively impacts Consumers Attitude.

Individuals are driven to learn about and purchase new products and services with the aim of achieving certain objectives. Similar to consumers with a high level of functional motivation, those with performance expectancy factor toward specific products or services have a behavioral intention [26]. In the context of new technology-based services, the attributes of perceived ease of use and usefulness play a crucial role in shaping behavioral intention [27]. Regarding social motivation, the more individuals believe products improve or preserve their social image, the more intrigued the individuals are by innovative developments related to the products [28]. Innovativeness driven by hedonic objectives has also proven to influence behavioral intention [29], [30]. Studies have shown that cognitively motivated consumers are more inclined toward innovations [31]. Cognitive innovation is crucial for generating behavioral intention [32]. Consumers with stronger behavioral intention are more likely to actually make a purchase or use specific services, as intention is shaped by evaluations of the products or services. Therefore, the following hypotheses were proposed:

H2a: Functionally Motivated Consumer Innovativeness (FMCI) positively impacts Behavioral Intention to switch.

H2b: Hedonically Motivated Consumer Innovativeness (HMCI) positively impacts Behavioral Intention to Switch.

H2c: Cognitively Motivated Consumer Innovativeness (CMCI) positively impacts Behavioral Intention to Switch.

H2d: Socially Motivated Consumer Innovativeness (SMCI) positively impacts Behavioral Intention to Switch.

1.2. Consumers Attitude to Innovations

Attitude is defined as an action that leads to a behavior, comprising positive or negative perceptions about performing certain actions. It is the level of self-evaluation when assessing whether individuals' behavior will be favorable or unfavorable [33]. Consumers attitude can reflect whether products are valuable or invaluable, have a positive or negative impact, and are useful or not [34]. Attitude-behavior relationship has been examined, showing that attitude is positively related to purchase intention [35].

Individuals' general attitude or tendency toward innovations includes a spectrum of evaluations, ranging from positive to negative, favorable to unfavorable, and beneficial to detrimental [20], [37]. According to Schiffman and Kanuk [37] tri-component model, attitude is not merely singular evaluations but is composed of three distinct and interconnected dimensions, namely cognitive, affective, and conative. These dimensions interplay and interact to shape individuals' opinions and behaviors. In the context of the current study, consumers' attitude toward innovations is described as a general evaluation of innovations.

The cognitive dimension refers to an individuals' evaluations about attitude object. This dimension includes beliefs and judgments about the object. Beliefs can be facts, information, or stereotypes held by individuals, while judgments reflect the evaluation of the object, either positive or negative. The affective dimension deals with individuals emotional response to a particular object, either feelings of like or dislike. These feelings can be spontaneous or ingrained in experiences and memories. Moreover, affective responses are often related to personal values and past experiences, shaping general attitude toward products or services. The conative dimension represents the tendency to act toward attitude object, including verbal and non-verbal behaviors associated with particular products or services. These behaviors can either benefit or affect the object. The affective dimension explores the emotional aspect and the feelings of like or dislike toward an innovation. In addition, positive affective responses might originate from perceived benefits or positive associations. The conative component relates to the behavioral tendencies associated with products or services. This component promotes how individuals act upon thoughts and feelings, translating attitude into behavior in relation to innovations. These actions can either benefit or affect innovations.

The cognitive, affective, and conative attitude dimensions are fundamental components in understanding individuals opinions and behaviors. These three dimensions are interconnected, forming a complex construct that underlies attitude toward various objects and entities. The relationship between attitude and behavioral intention has been verified by the Theory of Planned Behavior, stating that attitude is an important factor that explains individuals behavioral intention [33]. Empirical studies have provided evidence on the significant role of attitude in shaping consumers behavior. A prominent example is the construct of MCI, which examines consumers intention to embrace and adopt new products and technologies. Studies have also shown that MCI is a powerful predictor of attitude toward new technologies, such as drone [20], [38]. Therefore, individuals with high MCI

levels are more likely to have positive attitude toward cutting-edge innovations. The following hypothesis was proposed:

H3: Consumers Attitude positively impacts Behavioral Intention to Switch.

1.3. Behavioral Intention

This study analyzed the formation of consumers behavioral intention to switch to innovative and new products or services. The variables refer to two major theories in the marketing area, namely the Technology Acceptance Model (TAM) [39] and Consumers Innovativeness [8], [40], [41]. Consumers behavior study focuses on understanding how individuals develop interest and decide to purchase products or services. These decisions are influenced by perceptions about choices, purchase locations, reasons for purchasing locations, and reasons for purchasing, and are also closely related to several elements, namely psychology, sociology, anthropology and economics [42]. Studies on consumers behavior are crucial for companies aiming to understand the characteristics of consumers or markets and in formulating appropriate strategies.

Behavioral intention describes the strength of individuals' intention to show a specific behavior [43]. In TAM, it describes intention of individuals to continuously adopt certain behaviors. Several empirical models were investigated to predict and analyze the behavioral intention of consumers [12], [43]–[46].

In the current study, consumers intention to switch was explained as a strong tendency or decision to move from an old or pre-existing products to new innovations [20], [46]. Positive behavior toward particular products or services includes favorable actions, attitude, or perceptions characterized by repeat purchases, positive word-of-mouth recommendations, high satisfaction ratings, or active engagement with the brand's marketing efforts.

Intention to switch is the tendency to move from a current method of delivery to new products or services, specifically new innovations like drone delivery. It is also the degree to which consumers express a willingness or desire to transition from current products or services to a new alternative. This intention is often influenced by perceived benefits, dissatisfaction with the current services, curiosity about the new innovation, or social influences. Therefore, plan to use describes the actions of consumers to obtain and adopt new products or services. This includes analyzing the products, comparing to alternatives, budgeting for the purchase, or planning how to integrate into personal lives. A clearly formed plan to use often signals a high level of commitment to the new innovation.

2. Methods

Multi-item scales validated by existing literature were used to assess each construct. MCI was assessed using 16 items adapted from [12]. Consumers attitude toward innovations was measured with 6 items adapted from CAC model [47]. Furthermore, behavioral intention was measured using 6 items adapted from. The items were based on a 7-point Likert Scale ranging from (1) “Strongly Disagree” to (7) “Strongly Agree”. A quantitative method was used to obtain and analyze data from a large sample of Indonesian consumers, specifically targeting e-commerce users. Due to the significant concentration of e-commerce activity on Java and Bali Islands [48], these regions were selected as the target population. A minimum of 140 sample was targeted, based on a 5:1 ratio [49], [50]. Moreover, Structural Equation Modeling (SEM) was used to test the hypotheses and explore the relationships between the various MCI components, and to assess the impacts of the subvariables on attitude toward drone delivery, typically generating behavioral intention to switch. Covariance-based SEM was also used to assess how theories fit the observed data [51], [52]. The questionnaires were distributed through an online survey. The target population for this study was Indonesian e-commerce users. The study focused on residents of Java and Bali Islands due to the high concentration of e-commerce activity in these regions. Only respondents who were aware of drone delivery were included in the analysis, indicating that this knowledge was a key criterion. A total of 207 eligible responses were successfully collected, exceeding the minimum required for analysis [53]. Only those who had knowledge of drone delivery were proceeded to analysis. The hypothesized model, presented in Fig. 1, was tested using Structural Equation Modeling (SEM) with LISREL 8.8 software.

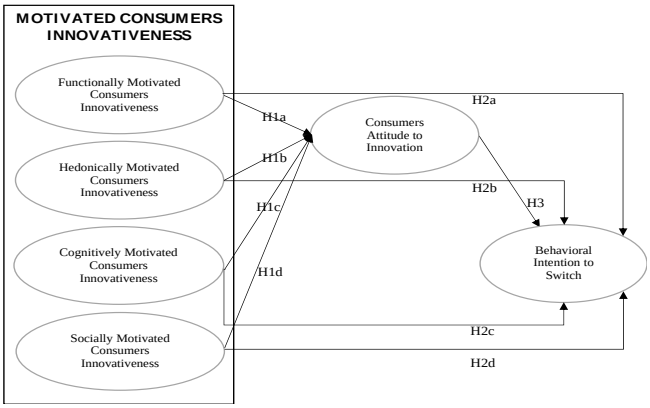

Fig. 1 Study model (Developed by the authors)

Table 1 Construct and scale item (Developed by the authors)

Construct and Scale Item	Item
FMCI	
I use the innovations of drone delivery service because it can save delivery time	FMCI 1
I choose delivery services using drone because it is more practical	FMCI 2
I would not hesitate to choose innovations such as drone delivery which seem to be convenient to use	FMCI 3
I will choose the innovative drone delivery because it is easier to use	FMCI 4
HMCI	
Using innovative products makes my life exciting	HMCI 1

and stimulating	
Using innovations of drone delivery can create a feeling of pride in me	HMCI 2
Using innovations of drone delivery can create a feeling of satisfaction in me	HMCI 3
The invention of an innovative drone delivery makes me feel personal enjoyment	HMCI 4
CMCI	
I tend to choose innovative products like drone delivery because it satisfies my analytical mind.	CMCI 1
I have a willingness to understand new innovations such as drone delivery logically because I find them interesting	CMCI 2
I tend to explore a new innovations	CMCI 3
I tend to use innovations of drone delivery to challenge my intellectual skills	CMCI 4
SMCI	
I enjoy using innovative products to impress others	SMCI 1
I like to use innovative products to keep up with unique trends to distinguish me from others.	SMCI 2
I like to try innovative products to create a better self-image to friends and neighbors.	SMCI 3
I deliberately use new innovative products that are visible for people to respect me	SMCI 4
Consumers Attitude to Innovation	
I prefer to use innovative products because I value it as a good service.	cogCAI.1
I prefer to use innovative products because I feel wise when I use them.	cogCAI.2
I prefer to use innovations because I really want the product.	Aff-CAI.1
I prefer to use innovations because I enjoy the product.	Aff-CAI.2
I prefer to use innovations because I feel the usefulness of the product.	conCAI.1
I prefer to use drone delivery innovations when the product gives me a positive value.	conCAI.2
Behavioral Intention to Switch	
I have a positive perspective on using innovative products such as drone delivery	BI 1
I give positive comments on innovative products such as drone delivery	BI 2
I intend to switch to innovative methods of delivering goods, such as drone	BI 3
I decided to switch to more innovative delivery methods, such as drone delivery	BI 4
I have a strong determination to use drone delivery whenever it is provided on e-commerce platforms	BI 5

3. Results

3.1. Demographics

The survey demographics confirmed that only responses from individuals familiar with drone were included in the analysis. Data were categorized by gender distribution, age, occupation, education, job title, and residence.

Table 2 Sample characteristics (n = 207) (Developed by the authors)

Criteria	*n*	Percentage
Sex		
Female	120	58.0%
Male	87	42.0%
Age		
< 17 years of age	2	1.0%
17-26 years of age	124	59.9%
27-41 years of age	56	27.1%
42-61 years of age	24	11.6%
62-77 years of age	1	0.5%
Occupation		
Private employees	61	29.5%
Students	94	45.4%
Entrepreneur	16	7.7%
Civil Servants	15	7.2%
Housewives	7	3.4%
Others/Professional	14	6.8%
Education		
Secondary education, high school/or equivalent	49	23.7%
Diploma	69	33.3%
Bachelor's Degree	60	29.0%
Master's Degree	26	12.6%
Doctoral's Degree	3	1.4%
Job Titles		
Manager	10	4.8%
Supervisor	23	11.1%
Business Owners	15	7.2%
General Manager/Senior Manager	3	1.4%
Staff	49	23.7%
Others	107	51.7%
Domicile (Province)		
Banten	24	11.6%
DI Yogyakarta	8	3.9%
DKI Jakarta	96	46.4%
Bali	4	1.9%
East Java	8	3.9%
Central Java	12	5.8%
West Java	55	26.6%

The analysis showed a slight majority of female participants with 58.0%, and males comprising the remaining 42.0% (*n*=87). The largest age group fell between 17 and 26 years old, representing 59.9% (*n*= 124) of the population. Those under 17 years old accounted for a small portion (1.0%, *n*=2). The remaining age groups were spread across 27-41 years (27.1%, *n*=56), 42-61 years (11.6%, *n*=24), and 62-77 years (0.5%, *n*=1). In terms of occupation, students were the most prominent category (45.4%, *n*=94), followed closely by private sector employees (29.5%, *n*=61). Other occupations included entrepreneurs (7.7%, *n*=16), civil servants (7.2%, *n*=15), and homemakers (3.4%, *n*=7). Regarding educational background, the majority held diplomas (33.3%, *n*=69), followed by Bachelor's degrees (29.0%, *n*=60), and high school completion (23.7%, *n*=49). A smaller percentage held Master's degrees (12.6%, *n*=26) and Doctoral degrees (1.4%, *n*=3). "Staff" was the most common job title (23.7%, *n*=49). A significant number of respondents selected "Others" (51.7%, *n*=107), potentially reflecting a diverse range of positions not explicitly listed. The analysis also showed Jakarta as the primary area of residence (46.4%, *n*=96). The remaining participants were scattered across various provinces, namely Banten (11.6%, *n*=24), Yogyakarta (3.9%, *n*=8), Bali (1.9%, *n*=4), East Java (3.9%, *n*=8), Central Java (5.8%, *n*=12), and West Java (26.6%, *n*= 55).

Table 3 Sample criteria (*n* = 207) (Developed by the authors)

Criteria	n	Percentage
How often do you make online purchases through the platform?		
At least once a week	52	25.1%
At least once a month	115	55.6%
Once in the last six months	40	19.3%
Do you know what a Drone is?		
Yes, I Know	207	100.0%
Types of delivery of goods that are often chosen		
Instant Delivery	16	7.7%
Same-day Delivery	31	15.0%
Regular courier	124	59.9%
Economy courier	36	17.4%
How quickly do you want the item you bought online to arrive?		
In the next day	88	42.5%
As soon as possible after purchase is made or on the same day	78	37.7%
In a few days	40	19.3%
In more than 7 days	1	0.5%
Do you know that Drone/UAVs/unmanned aircraft can be used as a means of delivering goods/packages?		
Yes, I know	193	93.2%
No, I do not know	14	6.8%

The survey questions focused on online shopping users in Indonesia, who were familiar with choosing shipping options. All 207 respondents (100%) reported shopping online through an e-commerce platform. Most respondents (55.6%, *n*=115) shopped online at least once a month, while a quarter (25.1%, *n*=52) shopped at least once a week. Delivery speed was a major consideration for online shoppers, as nearly half (42.5%, *n*=88) wanted items delivered the next day, with another third (37.7%, *n*=78) wanting delivery as soon as possible or on the same day. Almost a fifth (19.3%, *n*=40) were willing to wait a few days for items. This showed high consumers expectation for speedy parcel delivery.

The survey also showed a high proportion of respondents (93.2%, *n*=193) were aware that drone could be used to deliver goods. Regular courier delivery was the most popular choice (59.9%, *n*=124), followed by economy courier (17.4%, *n*=36). Same-day delivery (15%, *n*=31) and instant delivery (7.7%, *n*=16) were less popular options.

Table 4 Goodness of fit result (Developed by the authors)

Goodness of fit indices	Cut off value	Result	Conclusion
Chi -Square	< Chi table (pada df=335; Chi-square table=378.68)	374.79	Good fit
Significance Probability	> 0.05	0.066	Good fit
Absolute Fit Measure			
GFI	≥ 0.90	0.88	Marginal fit
RMSEA	<=0.08	0.24	Good fit
Incremental Fit Indices			
NFI	≥ 0.90	0.94	Good fit
NNFI	≥ 0.90	0.99	Good fit
CFI	≥ 0.90	0.99	Good fit
RFI	≥ 0.90	0.93	Good fit
Parsimony Fit Indices			
AGFI	0-1	0.86	Good fit
PGFI	0-1	0.73	Good fit

The model under evaluation showed a good fit to the observed data, evidenced by various goodness-of-fit indices. Despite a slightly lower Goodness-of-Fit Index (GFI) of 0.88, the Chi-square test, Root Mean Square Error of Approximation (RMSEA), and Incremental Fit Indices all showed a good fit. This confirmed that the model's predictions were consistent with the data and represented a significant improvement over a baseline model. In addition, Parsimony Fit Indices showed that the model achieved a good balance between simplicity and accuracy in representing the relationships between the variables. The model could be considered a valid and reliable representation of the studied phenomenon. The analysis results presented in Table 5 showed that the convergent and discriminant validity of the proposed model were statistically supported, as the average variance extracted (AVE) was greater than 0.50. Furthermore, the composite reliability scores exceeded 0.7, showing a strong degree of internal consistency within the data.

Table 5 Convergent validity and reliability assessment (Developed by the authors)

Item	λ	λ^2	e	CR	AVE
FMCI 1	0,68	0,462	0,538	0,81	0,518
FMCI 2	0,69	0,476	0,524		
FMCI 3	0,81	0,656	0,344		
FMCI 4	0,69	0,476	0,524		
HMCI 1	0,75	0,563	0,438	0,831	0,553
HMCI 2	0,68	0,462	0,538		
HMCI 3	0,76	0,578	0,422		
HMCI 4	0,78	0,608	0,392		
CMCI 1	0,59	0,348	0,652	0,807	0,518
CMCI 2	0,9	0,81	0,19		
CMCI 3	0,65	0,423	0,578		
CMCI 4	0,7	0,49	0,51		
SMCI 1	0,74	0,548	0,452	0,803	0,505
SMCI 2	0,72	0,518	0,482		
SMCI 3	0,72	0,518	0,482		
SMCI 4	0,66	0,436	0,564		
cogCAI.1	0,84	0,706	0,294	0,861	0,513
cogCAI.2	0,76	0,578	0,422		
Aff-CAI.1	0,55	0,303	0,698		
Aff-CAI.2	0,66	0,436	0,564		
conCAI.1	0,69	0,476	0,524		
conCAI.2	0,76	0,578	0,422		
BI 1	0,79	0,624	0,376	0,878	0,546

Continuation of Table 5

BI 2	0,75	0,563	0,438
BI 3	0,79	0,624	0,376
BI 4	0,77	0,593	0,407
BI 5	0,64	0,41	0,59
BI 6	0,68	0,462	0,538

The results of the CFA showed that the model had a good fit to the data ($\chi 2$ = 374.79, df = 335, $\chi 2$/df = 1.118, p < .001, NFI = 0.94, NNFI = 0.99, CFI = 0.99, and RMSEA = 0.024). Table 6 presents SEM results with standardized coefficient, confirming the acceptance of all proposed hypotheses.

Table 6 Structural model results (Developed by the authors)

Path Testing	Hypotheses	Std. Est.	*t*-Values	Results
(FMCI→CAI)	H1a	0.26	3.55 > 1.96	Supported
(HMCI→CAI)	H1b	0.32	4.58 > 1.96	Supported
(CMCI→CAI)	H1c	0.24	3.58 > 1.96	Supported
(SMCI→CAI)	H1d	0.28	3.78 > 1.96	Supported
(FMCI→BI)	H2a	0.18	2.45 > 1.96	Supported
(HMCI→BI)	H2b	0.19	2.54 > 1.96	Supported
(CMCI→BI)	H2c	0.17	2.49 > 1.96	Supported
(SMCI→BI)	H2d	0.18	2.37 > 1.96	Supported
(CAI→BI)	H3	0.29	3.04 > 1.96	Supported

The model showed that all four types of MCI had a positive and significant effect on behavioral intention. Therefore, consumers who were more innovative in functional, hedonic, cognitive, or social motivation also tended to form intention of switching to new innovations. There were correlations among the four types of MCI, showing the constructs were not entirely independent. The chi-square test statistic and associated p-value showed the model fit the data reasonably well and confirmed that the hypothesized relationships between the variables were supported by the observed data. RMSEA (Root Mean Square Error of Approximation) value of 0.024 also showed a good model fit.

3.2. Hypothetical Testing

H1a: Functionally Motivated Consumer Innovativeness (FMCI) Positively Impacts Consumers Attitude (CAI)

The path coefficient of 0.26 was positive, showing that FMCI and CA were dependent on each other. Significant *t*-value of 3.55 exceeded the critical value of 1.96 at 0.05 significance level. Therefore, the observed relationship between FM and CA was unlikely to occur by chance and was statistically significant. The results showed a significant positive relationship between FMCI and CA, supporting the proposed hypothesis H1a. Moreover, FMCI played a crucial role in shaping consumers attitude toward innovations. Consumers whose innovativeness was motivated by functional aspects tended to have positive comments and perceived innovations as desirable, enjoyable, and beneficial. In technology adoption study [23], [31], functional aspects had a significant effect on consumers' attitude. The positive relationship between FMCI and CA showed a promising future for drone delivery.

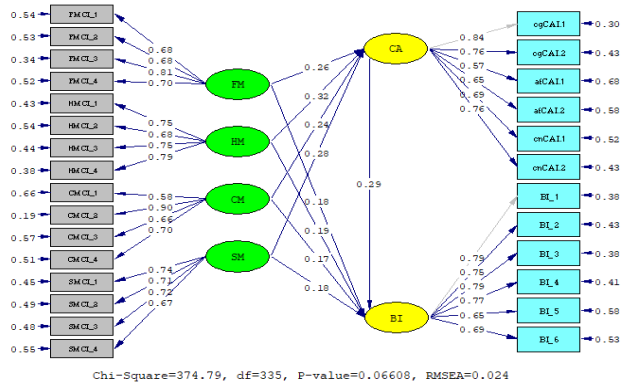

Fig. 2 Results of estimated standardized coefficient (Developed by the authors)

H1b: Hedonically Motivated Consumer Innovativeness (HMCI) Positively Impacts Consumers Attitude (CAI)

The results found a positive path coefficient of 0.32 and statistically significant relationship between HMCI and Consumers Attitude to Innovations (CAI) for online shoppers in Indonesia considering drone delivery options with significant *t*-value 4.58 > 1.96. When presented with an innovative service like drone delivery, individuals with high HMCI were more likely to have a positive attitude. These results were in accordance with [20], [54], where individuals with higher HMCI had better CAI scores. This relationship was also emphasized in the context of drone delivery [31]. Therefore, individuals motivated by the pleasure of trying new things and unique experiences perceived drone delivery favorably. This could be a form of enjoying life, emotional value of pride, satisfaction, and joy. Drone delivery represented a new method to receive online purchases, potentially appealing to individuals with high HMCI. The innovation of receiving a package through a drone created a unique and potentially thrilling experience, correlating with the hedonistic motivation of HMCI individuals. Consumers expecting unique experience was the background of this positive attitude. Those motivated by the enjoyment and excitement of trying new things were more likely to perceive drone delivery positively, leading to the observed positive and statistically significant relationship between HMCI and CAI.

H1c: Cognitively Motivated Consumer Innovativeness (CMCI) Positively Impacts Consumers Attitude (CAI)

The results showed a positive and statistically significant relationship between CMCI and Consumers Attitude to Innovations (CAI) for online shoppers in Indonesia considering drone delivery options with a path coefficient of 0.24 and *t*-value of 3.58 > 1.96. Individuals with high CMCI were motivated by the desire for mental stimulation, learning, and understanding new things, tending to view drone delivery favorably. These individuals were intrinsically motivated to seek knowledge and engage with complex or new concepts. Drone delivery offered a unique

method to receive online purchases, fulfilling the desire for innovation and exploration. The curiosity to explore new technologies positively contributed to the new experience, fostering a favorable attitude toward innovations. These results corresponded with previous studies, stating that individuals with higher CMCI also had better CAI scores toward drone delivery [23]. Furthermore, those with high CMCI were motivated by the desire for intellectual stimulation and knowledge acquisition. The positive attitude originated from the perceived opportunity for intellectual engagement and the chance to learn about a new technology. Drone delivery, as a new and complex technology, corresponded with intrinsic motivation. By providing opportunities for learning, exploration, and intellectual engagement, drone delivery could generate positive attitude among individuals with high CMCI.

H1d: Socially Motivated Consumer Innovativeness (SMCI) Positively Impacts Consumers Attitude (CAI)

The results showed a positive and statistically significant relationship between SMCI and Consumers Attitude to Innovations (CAI) for online shoppers in Indonesia considering drone delivery options with a significant *t*-value of 3.78 > 1.96. SMCI fostered a positive attitude toward innovative products like drone delivery due to its association with achieving social objectives. Individuals with high SMCI were motivated by the desire for social superiority, trendsetting, and a positive public image. Those driven by social superiority were perceived as better and advanced than others. Drone delivery, as a new technology, presents an opportunity to showcase this perceived superiority in adopting cutting-edge advancements, leading to a positive attitude. SMCI individuals were attracted to unique and trendy products or services that set apart from the mainstream [12]. These individuals also actively cultivate a public image of being innovative and forward-thinking, contributing to a positive attitude toward innovations. Studies on drone food delivery supported this notion by showing a positive and statistically significant relationship between SMCI and CAI [20]. In this context, there was an effect of SMCI on attitude. The desire to be seen as innovative and trendsetting within social circles fostered the perception as early adopters and trendsetters. Consumers with higher score of SMCI were motivated to adopt new products or services that improve social image and sense of belonging to a group perceived as innovative. Drone delivery, being a relatively new and uncommon delivery method, aligned with this type of motivation, allowing to showcase perceived "newness". This association with fulfilling social needs like gaining respect and being seen as innovative basically led to a more favorable attitude toward innovations.

H2a: Functionally Motivated Consumer Innovativeness (FMCI) Positively Impacts Behavioral Intention to Switch (BI)

The results showed a positive and statistically significant relationship between FMCI and Behavioral Intention to Switch (BI) for online shoppers in Indonesia considering drone delivery option with a significant *t*-value of 2.45 > 1.96. In this context, BI referred to the tendency of online shoppers switching to drone delivery over traditional methods. Individuals with high FMCI had a generally positive outlook on innovative products due to perceived usefulness and problem-solving capabilities. This positive outlook could foster positive comments and expression of enthusiasm about drone delivery, showing its potential benefits such as speed and convenience. FMCI motivates individuals to form strong intention to switch to innovative products like drone delivery when significant functional advantages are perceived [23]. This behavioral intention to switch could translate into a willingness to adopt drone delivery for future online purchases instead of traditional methods. Individuals with high FMCI not only form intention but also actively plan to acquire and use innovative products when readily available. This included concrete actions like studying drone delivery services, understanding availability, and potentially making arrangements for future online orders. Recognizing the functional benefits of drone delivery, such as speed and convenience, led to a generally positive outlook on innovations. This could translate into a strong intention to switch from traditional delivery methods to drone delivery. Studies have found that individuals with higher FMCI scores also had a higher BI toward drone delivery [20], [55].

H2b: Hedonically Motivated Consumer Innovativeness (HMCI) Positively Impacts Behavioral Intention to Switch (BI)

The results showed a positive and statistically significant relationship between HMCI and Behavioral Intention to Switch (BI) for online shoppers in Indonesia considering drone delivery options with a significant *t*-value of 2.54 > 1.96. This strong relationship showed that the pursuit of pleasure, innovation, and excitement played an important role in motivating consumers to embrace drone delivery options. Indonesian online shoppers were not merely demanding functional benefits like faster delivery times but were also drawn to the unique and enjoyable experience of drone delivery. These results corresponded with broader trends in consumers behavior where the "experience economy" was gaining prominence. Hedonically motivated consumers perceive innovations as source of enjoyment and were excited by the potential novelty or stimulation of new products. This could create a positive predisposition or inclination to recommend and discuss products that

fostered pleasure and excitement.

H2c: Cognitively Motivated Consumer Innovativeness (CMCI) Positively Impacts Behavioral Intention to Switch (BI)

The results showed a positive and statistically significant relationship between CMCI and Behavioral Intention to Switch (BI) for online shoppers in Indonesia considering drone delivery options with a significant t-value of 2.49 > 1.96. Individuals driven by the desire for knowledge and to understand new things tended to embrace innovative solutions like drone delivery. This intellectual curiosity fostered interest in exploring cutting-edge technologies and staying ahead of the curve. Studies also found that cognitive innovativeness included engaging in new innovations with the aim of stimulating the mind [56]. These results were supported by MCI measurement [12]. Consumers who actively demanded novel experiences and willing to expand intellectual capabilities were particularly drawn to drone delivery, perceiving it as a futuristic and exciting option that correlated with fondness for embracing new technologies. This group of intellectually curious individuals might be the early adopters of drone delivery, setting a trend for others to follow and potentially accelerating its adoption across the market.

H2d: Socially Motivated Consumer Innovativeness (SMCI) Positively Impacts Behavioral Intention to Switch (BI)

The results showed a positive and statistically significant relationship between SMCI and Behavioral Intention to Switch (BI) for online shoppers in Indonesia considering drone delivery options with a significant *t*-value of 2.37 > 1.96. Therefore, social proof played an important role in influencing drone delivery adoption in Indonesia. Studies have shown that social influence was positively related to purchase intention for novel inventions [57]. This supported literature on innovativeness, stating that individuals motivated by social factors tended to adopt new technologies [12], [23]. This could create a virtuous cycle, accelerating adoption of drone delivery. The results also showed a strong relationship between social motivation and adoption of drone delivery.

H3: Consumers Attitude to Innovations (CAI) Positively Impacts Behavioral Intention to Switch (BI)

The results showed a positive and statistically significant relationship between Consumers Attitude to Innovations (CAI) and Behavioral Intention to Switch (BI), with t-values (3.04 > 1.96) confirming a significant relationship between the variables. Therefore, consumers attitude to innovations mediated MCI and BI. The positive and statistically significant relationship between CAI and BI showed positive attitude toward innovations significantly influenced willingness to switch to drone delivery. These results were supported by previous studies, stating that attitude positively influenced intention to use innovations [38]. Therefore, businesses need to focus on cultivating positive attitude toward this new delivery method. The mediating role of CAI in relationship between MCI and BI showed a complex understanding of consumers behavior [20]. It also revealed that while personal motivation basis toward innovations (MCI) were important, they could translate into intentional behavior (BI) when mediated by a positive attitude (CAI).

4. Discussion

Firstly, this study showed consumers high in FMCI prioritized adopting innovations that offer tangible and practical advantages (H1a and H2a). E-commerce industry as well as courier express parcel businesses should emphasize the practical benefits of drone delivery, such as faster shipping times, reduced delivery constraints, and increased convenience. Companies were expected to target early adopters advocating for functional motivation of products and contributing to the mainstream adoption of drone delivery in Indonesia. In terms of product performance, drone delivery corresponded with this by potentially providing faster delivery times compared to traditional methods. This was appealing to FMCI-driven consumers demanding time efficiency. Consumers perceived drone as a means to address traditional delivery constraints and solutions to simplify lives. These individuals tended to view delivery as a more convenient and hassle-free way to receive goods, as well as valuable innovations that addressed the need for speed, convenience, and ease of use. Despite the novelty of drone delivery, consumers were open to the innovations as the perceived functional benefits outweighed potential apprehensions. By focusing on these functional benefits, drone delivery services could attract consumers high in FMCI.

Secondly, e-commerce and delivery companies should focus on creating a sense of excitement and novelty around drone delivery services (H1b and H2b). Businesses were also expected to tap into consumers' excitement for new experiences. By showing the unique and thrilling aspects of drone delivery, companies could cultivate positive attitude and encourage adoption among consumers motivated by novelty and enjoyment. This emotional appeal, combined with the practical benefits of drone delivery, would differentiate the service and foster a strong brand image in the Indonesian market. E-commerce platforms and retailers in Indonesia could leverage this insight to tailor marketing strategies. Showing the fun, futuristic, and "cool" aspects of drone delivery might appeal directly to consumers' hedonic motivation. Marketing campaigns tended to showcase the thrill of receiving packages via drone, the convenience of bypassing traffic congestion, or the novelty of

witnessing drone landing at doorsteps.

Thirdly, understanding cognitive motivation (H1c and H2c) was crucial for businesses operating in the e-commerce space. Recognizing that consumers were not merely demanding functional benefits but also intellectual stimulation, companies could tailor marketing strategies and products offerings accordingly. Educational content, detailed information about the technology, and interactive experiences could be leveraged to appeal to the intellectually curious consumers.

Fourthly, the desire for social status motivated consumers to embrace drone delivery as a means of elevating social standing and showcasing technological savviness (H1d and H2d). In the era of social media, the appeal of being trendsetter motivated consumers to adopt this innovative service as a way to express individuality and be part of an exclusive group. Indonesia, which ranked third in social media users in Asia Pacific [36], is home to 139 million social media users in 2024, equating to 49.9 percent of the total population. This widespread usage means Indonesians tended to showcase social lives online. The desire to present a modern, innovative image also played a role, with drone delivery serving as a status symbol of affluence and technological advancement. Finally, the pursuit of respect and admiration from peers further motivated adoption, as consumers viewed drone delivery as a way to show forward-thinking approach. Understanding and catering to social motivation could unlock significant opportunities for courier express and parcel businesses in the e-commerce sector. Therefore, by understanding the mediating role (H3) of CAI, ecommerce and courier express parcel businesses could develop more effective strategies to foster positive attitude toward innovations, typically increasing the tendency of consumers switching to innovative means of delivery.

5. Conclusion

In conclusion, MCI is proven as a key driver for Indonesian consumers to adopt drone delivery due to its focus on functional benefits, hedonic benefits, social benefits, and cognitive reasons. Importantly, consumer attitude emerges as a crucial mediator, influencing the transition towards innovative delivery methods. By comprehending and strategically addressing these multifaceted motivations, e-commerce and courier express parcel businesses can develop comprehensive strategies that cultivate positive attitudes and drive the widespread adoption of drone delivery in Indonesia. This proved how MCI potentially influenced attitude of online shoppers in Indonesia toward a novel technology like drone delivery. The result had practical implications for businesses aiming to develop a suitable strategy to commercialize drone delivery in Indonesia. This study serves as a valuable roadmap for navigating the complexities of consumer behavior, offering actionable insights for businesses aiming to thrive in the dynamic and evolving e-commerce landscape. It also showed the importance of investing in marketing and communication strategies that cultivated positive attitude toward innovations among consumers. Moreover, businesses were expected to show benefits of innovation, address potential concerns, showcase successful adoption stories, and strive to understand the specific aspects of consumers that were most influential in the target markets.

Acknowledgment

The authors are grateful to Mts Arief (MA), Asnan Furinto (AF) and Lim Sanny (LS) for contributing to this study paper.

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