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Toward Platform-Economy Continuity: Do Descriptive Norms and Perceived Product Attributes Matter to Youths who Use Ride-Hailing Apps?

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Abstract. *This study investigates how descriptive norms and perceived product attributes (utilitarian and hedonic benefits) influence the intention of young consumers to continue to adopt ride-hailing apps. We developed a conceptual model drawing upon the socio-technical theory by involving 333 Indonesian users of ride-hailing apps and estimating the model using the statistical tool of PLS-SEM-based software. The findings showed that social aspects (descriptive norms) and technical aspects (utilitarian and hedonic benefits) significantly influence young consumers to adopt ride-hailing apps. Intriguingly, a positive perception of the apps' benefits is instrumental for encouraging young consumers to continue to adopt ride-hailing apps when descriptive norms appear, when peers in their social circle widely adopt similar apps. This study highlights the unique behavior of young consumers in adopting ride-hailing apps by accentuating the role of descriptive norms and perceived product attributes from the perspective of socio-technical theory. This study provides practical recommendations for digital platform providers, particularly TNCs (Transportation Network Companies), which offer ride-hailing services to address the young consumer segment with a community-based marketing approach to maintain their continued adoption.*

Keywords: *Continuation intention, platform economy, digital platform, ride-hailing services, socio-technical theory, young consumers*

1. Introduction

Due to the internet's widespread advancement, more than two-thirds (around 67.1%) of the world's population now uses a mobile phone (We Are Social and Hootsuite, 2022), implying that mobile phones have become an integral part of billions of people's daily lives worldwide (Dwivedi et al., 2020). The phenomenon has engendered an ideological shift in business activities and consumer preferences, leading to the emergence of the so-called "platform economy", in which digital platforms (mobile apps) serve as the primary channels for serving consumers (Chen et al., 2020). Digital platforms are flourishing, generating a hypercompetitive market with platform providers' various services. In this regard, platform providers are no longer confronted with the challenge of acquiring new users but, rather, with the equally thorny issue of retaining existing users, as devoted customers are the lifeblood of many technology-based enterprises (Bhattacherjee, 2001). Several academics have examined the substantial factors influencing users' intentions to continue to use a variety of platforms (Nabavi et al., 2016; Yan et al., 2021), including ride-hailing apps (Weng et al., 2017; Aw et al., 2019; Fauzi & Sheng, 2021; Rizki et al., 2021), various mobile apps (Tam et al., 2020), mobile banking (Susanto et al., 2016; Yuan et al., 2016; Foroughi et al., 2019; Poromatikul et al., 2019), mobile food services (Kang & Namkung, 2019), mobile health (Chen et al., 2018; Zhang et al., 2018; Kim et al., 2019), mobile shopping (Lu et al., 2017; Shang & Wu, 2017), social media (Chaouali, 2016; Ashraf et al., 2019), mobile communication (Wang et al., 2019), peer-to-peer accommodation (Wang et al., 2020), mobile wallets (Kumar et al., 2018), and mobile payments (Cao et al., 2018; Shao et al., 2019; Humbani & Wiese, 2019; Handarkho, 2020; Liébana-Cabanillas et al., 2021). While previous research has been instrumental in confirming the essential drivers of users' intentions to continue using digital platforms, we identified three primary gaps in the previous literature.

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First, the scientific evidence supporting social influences as primary determinants of digital-platform use remains tenuous and inconsistent. Social influences, such as subjective norms (Lin & Filieri, 2015), social capital (Chang & Zhu, 2012), peer influences (Lin & Lu, 2011; Zhang et al., 2017), and the need for status (Cova & Cova, 2002), have been identified as essential drivers of individuals' decision to continue using digital technologies. By contrast, several other researchers presented the opposite findings (e.g., Chiu and Wang, 2008; Chopdar *et al.*, 2018; Tam, Santos and Oliveira, 2020). Given the ubiquitous nature of social interactions in contemporary culture (Harley et al., 2018), the inconsistent results concerning the effects of social influences on users' technological continuation call for further analysis. On the other hand, most of the existing literature still underplays the social influence on technology-continuation intention (Yan et al., 2021), indicating that the prominent role of social influence remains unclear.

Second, when discussing the long-term intention to use technology-based services, the technological characteristics cannot be overlooked (Lu, 2014; Nabavi et al., 2016; Yan et al., 2021). The ways in which existing theoretical models related to technology-continuation intention, such as IS continuation theory (Bhattacherjee et al., 2008), address technological characteristics are limited to post-usage usefulness. However, Fauzi and Sheng (2021) argued that evaluating the post-usage usefulness of particular mobile apps is irrelevant once the apps have gained widespread adoption and suggested other technological characteristics, such as utilitarian and hedonic benefits. Given that both utilitarian and hedonic benefits are important product attributes in the context of the mobile environment (Sheng & Teo, 2012; Kim & Hwang, 2012), incorporating product attributes into explanations for continuation intention is critical. Nevertheless, to the best of our knowledge, such product attributes have traditionally been posited as direct factors in the influences on the intention to continue adopting technologies, and the empirical evidence regarding the mediatory role of the product attribute is scant (Yan et al., 2021).

Third, although young consumers have received considerable attention from scholars regarding the consistency with which they embrace technology (Kumar, Adlakaha and Mukherjee, 2018; Luqman *et al.*, 2019; Buda, Pethes and Lehota, 2020; Martínez-gonzález, Parra-López and Barrientos-báez, 2021), exhaustive research exploring the role of social influences in inducing young consumers' decisions to continue using technology-based services has not been widely carried out. Given that young consumers are commonly thought to possess strong IT skills (Foroughi et al., 2019), they are not only subjected to the pervasive influence of digital and mobile communications (Ying Wang & Genç, 2019) but they are also immersed in a hyperconnected society and relish intense social exposure digitally. In this regard, we assume that young consumers' behavior might by driven by their peers' effects, mainly through technological innovation (Buda et al., 2020).

This study aims to fill these gaps by theoretically proposing and empirically examining a conceptual model that incorporates perceived product attributes, consisting of the utilitarian and hedonic benefits that mediate the relationship between descriptive norms and the continued intention to use digital platforms. To this end, we developed a conceptual model drawing upon the socio-technical theory (Bostrom & Heinen, 1977). Therefore, the current study seeks to contribute to the existing body of knowledge in at least four ways. First, this study adds to the debate over the essential role of social influence, namely descriptive norms, in customers' intention to continue using digital platforms. Second, this study extends the previous literature by accentuating the mediating role of digital product attributes

(utilitarian and hedonic benefits) in explaining how descriptive norms influence the intention to continue using digital platforms. Third, this study contributes to the understanding of the essential factors affecting young consumers' intention to continue using digital platforms. Fourth, this study adds to the theoretical applicability of socio-technical theory with descriptive norms and examines how these influence the perception of product attributes and technology-continuation intention. In addition to its theoretical contributions, this study's results can help digital-platform providers to develop strategies for enhancing users' continued intention to use their platforms, especially their young customers, who represent the most promising market segment in the platform-economy landscape.

We primarily focus on ride-hailing apps in this study for justifiable reasons. The ride-hailing services, such as Gojek, Grab, Uber, Lyft, Didi-Chuxing, Ola, and BlaBlacCar offered by the Transportation Network Companies (TNCs), have gained growing attention among the urban population globally, both in developed and in developing countries (Wadud, 2020, Li et al., 2021; Irawan et al., 2022), and have disrupted a sloppy, sleepy, and expensive taxi market worldwide (Henao & Marshall, 2019, Wirtz et al., 2019; Jang et al., 2020, Fielbaum & Tirachini, 2021). An equity analyst at DBS Group Research, Mittal (2019), reported that the market size of the ride-hailing business is worth as much as USD 5.7 trillion in 175 countries across the globe. The potential market growth of ride-hailing services has created fierce competition among TNCs. The intensely competitive business environment among TNCs has made many TNCs lose their market share and disappear from the market. For instance, particularly in Indonesia, which has the highest market value in the Southeast Asian ride-hailing industry (Google et al., 2022), only two TNCs have been able to compete in seizing a niche market until now, namely Grab and Gojek. Other TNCs, such as Bangjek, Blujek, Call Jack, Ojekkoe, Topjek, Ojek Argo, Taxi Motor, Ladyjek, and Smartjek, have appeared briefly only to disappear from the market (Fauzi & Sheng, 2021; Irawan et al., 2022; Chalermpong et al., 2022). In other words, these circumstances make it a challenging task for TNCs to develop a proper strategy to maintain their business. Consequently, maintaining the business sustainability of TNCs, associated with the extent to which the TNCs can retain continuation intention among ride-hailing app users, has become a vital issue.

2. Literature Study / Hypotheses Development

The Emergence of Ride-Hailing Apps

Ride-hailing services are part of the sharing-economy business model, which supports individuals who need transportation through real-time-transportation mobile apps (Brown & LaValle, 2021; Sirait et al., 2021; Almunawar et al., 2021). Belgiawan et al. (2022) noted that individuals who need transportation services can effortlessly access ride-hailing apps installed on their smartphones, share their location and desired destination, and wait for the nearest driver to pick them up. The emergence of ride-hailing apps is in line with the convergence of several digital technologies, namely wireless networks, GPS technology, and software applications, along with the astonishing popularity of smartphones (Brail, 2022).

Theoretical foundation

Socio-technical theory

Sony and Naik (2020) proposed that, in pursuing a common goal in industrial revolution 4.0, the industry 4.0 framework must emphasize the implementation of two values, namely social value (human-related) and technical value (nonhuman-related), in a balanced manner in integrating the physical and cyber worlds through the use of technology. At this point, we consider a socio-technical theory proposed by Bostrom & Heinen (1977) as the theory underpinning the current conceptual research model.

According to the framework of socio-technical theory, a technology-based product can achieve commercial success if the product can integrate two critical subsystems: the social subsystem and the technical subsystem (Bostrom & Heinen, 1977). The social subsystem of a technology-based product accommodates the user's perspective by considering several aspects, including user skills or readiness, user knowledge, user values, user-expected reward systems, and relationships between users. Meanwhile, the technical subsystem of a technology-based product encompasses the technology's technical capabilities, which include the available features, the advantages of the technology used, and ease of processing, which enables users to process multiple orders (Bostrom & Heinen, 1977; Wang et al., 2020). Therefore, technology-based-product developers must ensure that the two subsystems are incorporated in product development and that both can operate optimally to produce the desired outputs (Bostrom & Heinen, 1977). In other words, the socio-technical theory suggests that if mobile apps offer significant social or technical benefits to their users, they can be successful, because users have a significantly greater opportunity to continue using the mobile apps.

Referring to the socio-technical theory, we view mobile apps, particularly ride-hailing apps, as a socio-technical system. The ride-hailing-app technical subsystem consists of the product attributes' technical benefits. Sheng and Teo (2012) explained that product attributes consist of the utilitarian (functional) and hedonic (enjoyment) benefits of products. From a functional perspective, ride-hailing apps offer a useful and user-friendly platform that allow users (drivers) to offer services to others (riders). From the perspective of enjoyment, ride-hailing apps offer entertainment value to their users. These two product attributes allow users to fulfill their various needs. Furthermore, the social relationships and interactions between users are critical aspects associated with the social subsystem of ride-hailing apps. Considering the high potential for market growth in ride-hailing services, ride-hailing apps have transformed beyond their core business objectives as transportation services (Fauzi, 2018), offering a variety of services, such as transportation and logistics, daily needs, food-delivery services, digital payments, and news and entertainment (Fauzi & Sheng, 2022). The transformation of the ride-hailing apps is likely to strengthen the relationships and interactions between users because they can share mutual benefits with other users while using the apps. In conclusion, we consider the inclusion of the social and technical aspects of mobile apps in ascertaining users' continuation intention.

Construct Conceptualization

Continuation Intention

Several scholars have defined continuation intention as a decision of the individual user, after the adoption stage, to continue using technology-based products or services (Bhattacherjee, 2001; Lu, 2014; Nabavi et al., 2016). However, compared to the numerous studies on the pre-adoption stage, continuation intention has received a relatively minor amount of attention (Yuan et al., 2016). On the other hand, given the agile nature of digital technologies, it is critical for practitioners and scholars alike to understand the motivations behind users' continuation intentions (Yan et al., 2021), as retaining existing users is significantly more costly than acquiring new users (Nabavi et al., 2016). Moreover, Bhattacherjee et al. (2008) observe that although the initial adoption of technology-based products is an essential signal of a technology's success, continuation usage is critical in determining the technology's long-term success.

The IS continuation theory proposed by Bhattacherjee et al. (2008) is the most prominent theoretical model explaining users' continuation-intention behavior related to technology-based products or services. Although the theory offers a comprehensive model covering several essential aspects, such as disconfirmation, post-usage usefulness,

satisfaction, and IT self-efficacy, it still has two noteworthy drawbacks. First, the theory rules out the role of social factors in explaining continuation-intention behavior, even though the inclusion of social aspects while discussing technology adoption is essential (Lu, 2014). Moreover, Yan et al. (2021) confirmed that social factors are underplayed in the current literature on technology continuation intention. Second, although the theory shows the significant effect of post-usage usefulness on continuation intention, post-usage usefulness is only applicable in situations in which no intense competition exists against the apps, and the situation might change when competitors emerge (Fauzi & Sheng, 2021). At this point, extending the post-usage usefulness related to utilitarian and hedonic product attributes is essential for these apps to be widely adopted in fiercely competitive business environments. Hence, this study offers valuable insights regarding users' continuation behavior, based on the socio-technical theory, which are intended to compensate for the drawbacks of the existing theory

Descriptive Norms

Descriptive norms have been defined as individual beliefs or perceptions about the prevalence of a particular behavior in a society (Cialdini et al., 1990; Verkijika, 2020). These perceptions arise in individuals due to exposure to information from various sources, including media depictions of particular issues, peer behavior, or discussions of specific behaviors with peers (Lapinski, 2005). Since there are several variations in the labeling of descriptive norms' conceptualization in several previous studies, such as critical mass, visibility, and the number of peers (Graf-Vlachy et al., 2018), we presumed that, in the context of this study, the descriptive norms would emerge as a result of solid incentives for general behavior carried out by friends or peers.

Peer behavior has a significant impact on individual behavior. Ajzen (1991) and Rivis and Sheeran (2003) stated that individuals have a greater tendency to engage in a behavior when they perceive that essential people in their lives (including friends) approve of this behavior and believe that they have also engaged in the same behavior. Additionally, given that social values or norms cannot be separated from any individual's daily life, DiMaggio and Powell (2000) postulated that individuals are subject to normative pressure and feel discomfort when their peers have already engaged in a particular behavior in which they have not engaged themselves. At this very point, Kim & Han (2011) asserted that when involved in specific behavior, individuals obey social norms, alluding to the considerable effect of their social circles, such as friends, colleagues, and classmates. In other words, individuals consider descriptive norms as a reference when engaging in particular behaviors (Carcioppolo et al., 2017; Thøgersen & Ebsen, 2019; Yeoh et al., 2022). Within the specific context of this study, the increasing usage by friends or peers of ride-hailing applications might be perceived as a descriptive norm that strongly induces individuals to adopt similar applications.

Perceived Product Attributes

A prominent theory in IS continuation intention proposed by Bhattacherjee et al. (2008), who conceptualize the attributes of technology-based services in terms of perceived usefulness. However, the usefulness of technology-based services is no longer an essential factor for users if these services are widely adopted, unless other alternative services offer more attractive benefits (Fauzi & Sheng, 2021). As a result, users continue to use technology-based services when they offer beneficial features beyond usefulness. Furthermore, product attributes in the mobile domain have further been associated with products' utilitarian and hedonic benefits (Sheng & Teo, 2012; Kim & Hwang, 2012; Lee & Kim, 2018; Fauzi & Sheng, 2021).

Utilitarian benefit refers to the accomplishment of the functional purpose

for which a product or service is used or consumed (Dhar & Wertenbroch, 2000), such that consumers can feel the utilitarian benefit following a post-consumption evaluation of the product's functionality and costs (Overby & Lee, 2006). Additionally, the outcomes of consumers' perceived utilitarian benefits result in consumer perceptions that the effective and efficient use of a product or service can resolve their problems (Venkatesh & Brown, 2001; Hartman et al., 2006). In the context of ride-hailing apps, users perceive utilitarian benefits if they believe that using ride-hailing apps will facilitate their daily mobility by providing convenient and fast online transportation services. Transportation service needs have been satisfactorily addressed by utilizing ride-hailing apps, and the use of the technology-based services provided by ride-hailing apps is perceived to be both effective and efficient.

Hedonic benefit consumers' perception of enjoyment while utilizing or consuming a product or service (Dhar & Wertenbroch, 2000). In addition, consumers can perceive hedonic benefit after conducting a comprehensive evaluation in the post-consumption period by comparing the enjoyment they experienced with the product's costs (Overby & Lee, 2006). Additionally, the hedonic benefits consumers perceive in a particular product or service are associated with a phenomenological consumption experience (Holbrook & Hirschman, 1982), eliciting a sense of pleasure or joy during the consumption period (Hirschman, 1983). Therefore, the hedonic benefits perceived by users of ride-hailing apps refer to users' enjoyment of the business processes offered by ride-hailing apps in using transportation services. Compared to conventional transportation-business models, the distinct experiences offered by ride-hailing apps create novel phenomenological experiences for users, allowing them to easily and quickly access online-transportation services through mobile-phone-based applications. By utilizing ride-hailing apps, users are not only able to meet their transportation needs but also acquire a unique service experience that is strikingly different from that of the collaborative-economy business model (sharing economy) offered by ride-hailing apps.

Hypothesis Development

The Direct Effect of Descriptive Norms on Perceived Product Attributes

Verkijika (2020) associated descriptive norms with the increasing usage by friends of technology-based products or services. Empirically, Lin and Bhattacherjee (2008) found that if people perceive that their peers are in the majority in adopting innovative practices, they also perceive utilitarian (usefulness) and hedonic (enjoyment) benefits. Regarding the utilitarian benefits, if the use of ride-hailing apps becomes widespread among individuals in a social circle, these individuals form an initial favorable judgment that ride-hailing apps are helpful as a means of transportation and can be utilized as an alternative transportation service for daily-life activities. Furthermore, the initial perception of the utilitarian value of ride-hailing apps may emerge from the recommendations obtained through social-network interaction (Ryan & Deci, 2000). For the hedonic benefit, if ride-hailing apps have become a standard alternative transportation service among the critical mass, they also generate an initial positive evaluation from those who believe that ride-hailing apps could be an enjoyable type of transportation. In other words, people would not widely use ride-hailing apps unless they gave them such enjoyment or excitement. Thus, we strongly hypothesize that:

H1a. Descriptive norms significantly influence perceived utilitarian benefit.

H1b. Descriptive norms significantly influence perceived hedonic benefit.

The Direct Effect Of Descriptive Norms On Continuation Intention

DiMaggio and Powell (2000) state that if innovate products are commonly used by

most people, individuals will engage in the same behavior with these products as the general public. Cialdini et al. (1990) and Verkijika (2020) stated that descriptive norms indicate individual beliefs about the prevalence of a particular behavior, and these norms have been shown to be a strong impetus for individuals to commit to particular behaviors (Carcioppolo et al., 2017; Thøgersen & Ebsen, 2019; Yeoh et al., 2022). On the other hand, increasing the number of users of a particular innovative technology will produce an external benefit that encourages more users to use the technology (Lin & Bhattacherjee, 2008; Chiu et al., 2013). Yang & Mai (2010) asserted that when we perceive that the use of similar applications among peers increases (for example, ride-hailing apps), this creates a broader market that also increase the utility of these apps for users, encouraging users to continue using them. Accordingly, we strongly hypothesize that:

H2. Descriptive norms significantly influence continuation intention.

The Direct Effect of Perceived Product Attributes On Continuation Intention

Based on the socio-technical theory, the technical subsystem is another crucial aspect through which to ascertain that technology users can process multiple orders during product usage (Bostrom & Heinen, 1977; Wang et al., 2020). In this study, the technical subsystem in ride-hailing apps is associated with the product attributes comprising utilitarian (functional) and hedonic (enjoyment) benefits (Sheng & Teo, 2012) because these two attributes are essential in mobile environments (Kim & Hwang, 2012). If ride-hailing apps functionally support their users with useful and user-friendly features while offering entertaining benefits, users can use these apps to their maximum potential and use them to complete various tasks. Subsequently, when ride-hailing app users perceive no technical issues during the consumption period because they can utilize the apps to their maximum potential, they are more likely to continue using them. Consequently, we hypothesize that:

H3a. *The perceived utilitarian benefit significantly influences continuation intention.*

H3b. *The perceived hedonic benefit significantly influences continuation intention.*

The Mediating Effect Of Perceived Product Attributes On Continuation Intention

According to the socio-technical theory, social and technical subsystem availability is an excellent combination supporting a technology's success (Bostrom & Heinen, 1977). The technology's success is determined by the extent to which its users continue to use it (Bhattacherjee et al., 2008). As we argued previously, the direct-effects arguments for the effect of descriptive norms on continuation intention are convincing. However, further analysis shows the implicit role of product attributes comprising utilitarian and hedonic benefits in transmitting the impact of descriptive norms on continuation intention. Indeed, descriptive norms might increase the utility of the apps, which encourages users to retain them. However, perceiving utilitarian and hedonic benefits while using ride-hailing apps is technically vital for users because they can utilize and enjoy the apps as part of their daily activities. In other words, once the technical concerns of the user regarding the apps have been well addressed through the offer of gratifying utilitarian and hedonic benefits, the influence of descriptive norms is significantly stronger. Hence, we hypothesize that:

H4a. *The perceived utilitarian benefit mediates the relationship between descriptive norms and continuation intention.*

H4b. *The perceived hedonic benefit mediates the relationship between descriptive norms and continuation intention.*

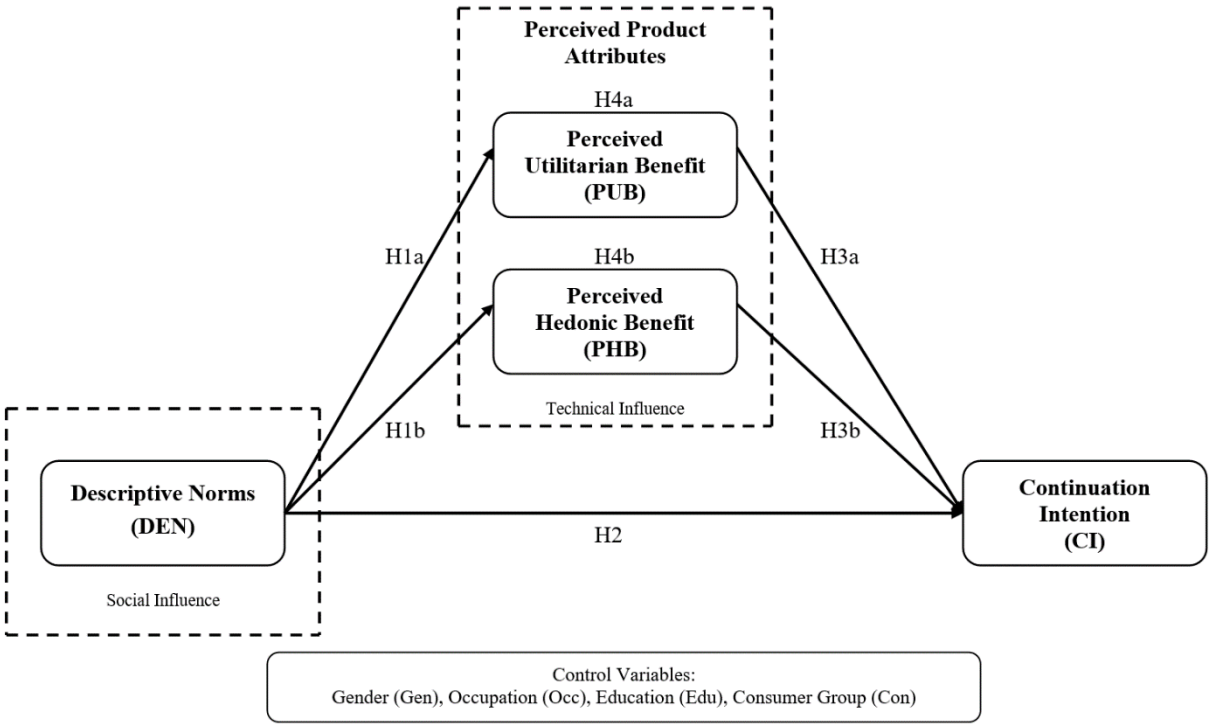

Figure 1.
The Conceptual Framework

3. Methodology

In this study, we applied a quantitative method to estimate the relationship between descriptive norms, product attributes comprising utilitarian and hedonic benefits, and continuation intention in adopting ride-hailing apps.

We developed the research instrument in four stages. We began with an in-depth literature review of the relevant prior studies. In this stage, we collected several related research instruments consisting of 24 test items. Secondly, we adjusted all the test items following the current research context. Thirdly, emulating several prior studies (e.g., Bansal & Voyer, 2000; Hajli, 2015; Lu et al., 2017; Min et al., 2018; Iramani et al., 2018), we conducted a preliminary study involving 100 undergraduate students of the Universitas Hayam Wuruk Perbanas in Surabaya, Indonesia. This stage was essential to ensure that all the measurement items were accurate, functional, and understood by representative respondents (Hulland et al., 2018), and to examine the indicator reliability of the adjusted research instrument. Indicator loadings of all indicators were accepted for the final research instrument if the indicator loadings were above 0.70 (Hair et al., 2019). Fourthly, we reviewed the pilot-test results and made the second adjustment to ascertain that the test items precisely measured the research constructs. As a result, we adapted 14 test items for further processing, as presented in Appendix 1. Finally, considering that the target respondents were Indonesian, we translated the test items into Bahasa Indonesia using a back-translation method. All test items were rated on a five-point Likert-type scale, ranging from "strongly disagree" (1) to "strongly agree" (5).

Regarding the questionnaire composition, we designed a closed-ended questionnaire consisting of four sections: a brief introduction to the survey, a screening question, demographic questions to respondents, and primary questions for research-construct measurement. We composed a closed-ended questionnaire,

since this would not force us to apply more coding formats using qualitative approaches (Westland, 2014). We also considered implementing several procedural protocols in the questionnaire to minimize common method bias (CMB) and nonresponse bias. To control CMB, we composed a simple questionnaire, allowed respondents to respond anonymously, and tested the questionnaire through a pilot study before applying a final data collection process (Podsakoff et al., 2003; Reio, 2010). In controlling nonresponse bias, we adhered to Lynn's suggestions (2008), whereby we provided a brief introduction to the survey on the first page of the questionnaire form and ensured that the questionnaire consisted of understandable and non-offensive questions that made the questions easy to answer.

We managed the likelihood of heterogeneity sources or alternative explanations for young consumers' continuing intention to use ride-hailing apps by incorporating several control variables: gender, occupation, education, and consumer group. We controlled gender since different genders show different attitudes toward digital-technology usage (Twenge & Martin, 2020), different decision-making processes for online purchases (Lin et al., 2019), and distinct levels of digital-technology literacy (Gnambs, 2021). We controlled occupation by considering prior empirical research findings indicating that different types of occupations show different levels of involvement of individuals with technological products and the internet (Mesch & Talmud, 2011). We incorporated education as a control variable as consumers' education levels relate to different perceptions of the usefulness of technology adoption (Tavitiyaman et al., 2022). We also included consumer groups as a control variable since two different consumer groups, metropolitan and nonmetropolitan, show different behaviors, mainly in dealing with technology usage (Khandelwal & Bajpai, 2013; Fauzi & Sheng, 2021). To measure the control variables, we treated them as dummy variables, and we coded males "1" and females "0" for gender and metropolitan "1" and nonmetropolitan "0" for the consumer group. On the other hand, we also classified occupation and education as dummies, in which students and high school served as the reference categories, respectively.

Regarding this study's sampling design, we defined the population involved as young users of ride-hailing apps in Indonesia to ascertain whether descriptive norms directly or indirectly affected their continuation intention. We paid considerable attention to young consumers in this study because young consumers serve as a promising consumer segment with a vast potential for consumption of digital-technology-based products and services. This argument is difficult to reject, since young consumers are well known to possess strong IT skills (Foroughi et al., 2019). They are heavily influenced by the advancement of digital and mobile communication technology (Ying Wang & Genç, 2019), immersed in a hyperconnected society, and relish intense social exposure digitally. In collecting the data, the questionnaire was administered offline by a professional surveyor agency. To ensure that this study involved the most advantageous respondents capable of giving the required information (Sekaran & Bougie, 2016), we used a purposive sampling procedure to select the respondents from the population. In determining the sample size for this study, we used the G*Power analysis program (Hair et al., 2017; Memon et al., 2020). G*Power analysis showed that the minimum sample size of the current research was 119 samples to predict an effect size f^2 value of around 0.15, assuming a significance level of 0.05 and statistical power of 95%.

In this study, we performed the measurements and structural-model evaluations using Partial Least Square based on Structural Equation Modeling (PLS-SEM) with WarpPLS software (Kock, 2020b). We employed the PLS-SEM because it offers robust results for confirmatory and exploratory research (Gefen et al., 2000).

Furthermore, PLS-SEM has higher composite reliability and convergent validity values while requiring less effort to achieve gratifying model fit (Hair Jr. et al., 2017).

4. Findings and Discussion

Respondent Overview

We eventually collected 338 complete responses during the data collection period from October to November 2018, and the collected data surpassed the required minimum sample size for this study. However, after conducting outlier identification, we only included 333 responses for further analysis. Table 1 presents the current research respondents in detail.

Table 1.
The Research Respondent Overview

Demographic Characteristics	Nominal (*n*=333)	Percentage (%)
Gender		
Male	101	30.33
Female	232	69.67
Occupation		
Student	277	83.18
Employee	41	12.31
Businessman	14	4.20
Professional	1	0.30
Education		
High school	195	58.56
Undergraduate	136	40.84
Graduate	2	0.60
Consumer Group		
Metropolitan	168	50.45
Nonmetropolitan	165	49.55

Controlling Common Method Bias (CMB)

This study statistically controlled CMB through Harman's single-factor test, proposed by Kock (2020). Kock (2020) explained that if we combine all indicators of latent variables into a single latent variable and conduct either a composite-based or a factor-based analysis, the "total variance explained" represented by the AVE score is lower than a threshold of 0.5, the study does not suffer from CMB. Based on the factor-based PLS-SEM test, the AVE score of a single latent variable was 0.367 < 0.5, and we can conclude that this study was free from the CMB problem.

Measurement-Model Evaluation

We followed the guidelines recommended by Hair et al. (2019) to analyze the measurement model of this study (as exhibited in Table 2), in which we scrutinized several components comprising the indicator reliability (all indicator loadings were > 0.7, except PUB1), internal consistency reliability (Cronbach's alpha and composite reliability were > 0.7), and convergent validity (AVE was > 0.5). Although the indicator loadings of PUB1 (0.672) were lower than the minimum required threshold of > 0.7, we kept them for further analysis, since the values of other components for the perceived-utilitarian-benefit construct (Cronbach's alpha, composite reliability, and AVE) were acceptable (Hair *et al.*, 2017; Hair *et al.*, 2019). Moreover, the discriminant-validity test referred to the HTMT evaluation, in which the HTMT score (as presented in Table 3) indicated a satisfactory level of discriminant validity

because it was below 0.85 (Hair et al., 2019). Finally, we can confidently infer that the measurement model used in this study was reliable and valid.

Table 2.
The Measurement Model Evaluation

Construct	Code	Reliability Assessment			Validity Assessment	
		Indicator Reliability	Internal Consistency Reliability		Convergent	Discriminant
		Indicator Loadings	Cronbach's Alpha	Composite Reliability	AVE	HTMT
Descriptive Norms	DEN1	0.813				
	DEN2	0.833	0.728	0.847	0.805	Valid
	DEN3	0.768				
Perceived Utilitarian Benefit	PUB1	0.672				
	PUB2	0.801				
	PUB3	0.774	0.790	0.857	0.738	Valid
	PUB4	0.700				
	PUB5	0.739				
Perceived Hedonic Benefit	PHB1	0.884				
	PHB2	0.883	0.845	0.907	0.874	Valid
	PHB3	0.855				
Continuation Intention	CI1	0.886				
	CI2	0.913	0.880	0.926	0.898	Valid
	CI3	0.869				

Note: HTMT = Heterotrait-Monotrait Ratio, AVE = Average Variance Extracted

Table 3.
The Discriminant Validity Assessment Using the HTMT Method

	DEN	PUB	PHB	CI	Gen	Occ	Edu	Con
DEN								
PUB	0.462							
PHB	0.332	0.674						
CI	0.399	0.627	0.756					
Gen								
Occ								
Edu								
Con								

Structural-Model Evaluation

Direct Effect

We tested the direct effects of descriptive norms on perceived product attributes and continuation intention. As shown in Table 4 (Model 1 and Model 2), the descriptive norms had positive and significant effects on the perceived utilitarian benefit (β = 0.347, t-value = 5.692) and perceived hedonic benefit (β = 0.262, t-value = 4.603). These results supported **H1a** and **H1b**. Model 3 shows that descriptive norms (β = 0.333, t-value = 6.077) had positive and significant effects on continuation intention. These results supported **H2**.

Table 4.
The Hypotheses Analysis

	Model 1	Model 2	Model 3	Model 4	Model 5
	PUB	PHB	CI	CI	CI
	β (t)	β (t)	β (t)	β (t)	β (t)
Gen	0.029	0.020	0.013	0.000	0.001

	(0.571)	(0.394)	(0.251)	(0.005)	(0.029)
Occ	0.025	0.067	0.072	0.061	0.032
	(0.522)	(1.293)	(1.421)	(1.273)	(0.781)
Edu	0.010	0.157	0.144	0.140	0.050
	(0.174)	(2.473) *	(2.468) *	(2.118) *	(1.257)
Con	0.121	0.350	0.215	0.161	0.004
	(2.194) *	(6.613) ***	(3.880) ***	(3.132) **	(0.096)
DEN	0.347	0.262	0.333	0.177	0.175
	(5.692) ***	(4.603) ***	(6.077) ***	(3.315) **	(3.541) ***
PUB				0.449	
				(9.439) ***	
PHB					0.603
					(12.770) ***
R^2	0.139	0.188	0.158	0.331	0.453
Adjusted R^2	0.126	0.176	0.145	0.319	0.443
Q^2	0.142	0.190	0.156	0.329	0.451

Note: ***t-value 3.30 (p<0.001), **t-value 2.58 (p<0.01), *t-value 1.96 (p<0.05), †t-value 1.65 (p<0.1)

Mediating effect

In assessing the mediating effect of perceived product attributes comprising utilitarian and hedonic benefits, we referred to the three-step regression procedure suggested by Baron & Kenny (1986). As we previously argued, the descriptive norms positively and significantly affected the perceived utilitarian and hedonic benefits. Additionally, the descriptive norms had a direct positive and significant effect on continuation intention. When the perceived utilitarian and hedonic benefits were included in Model 4 and Model 5 (Table 4), they demonstrated a positive and significant effect on continuation intention, which supported **H3a** (β = 0.449, t-value = 9.439) and **H3b** (β = 0.603, t-value = 12.770). The inclusion of the perceived utilitarian (from 0.333 to 0.177) and hedonic benefits (from 0.333 to 0.175) led to a slight decrease in the path coefficient of the descriptive norms but remained significant, suggesting partial mediation. This meant that the descriptive norms directly affected (through the perceived utilitarian and hedonic benefits) the continuation intention. When mediating the impact of the descriptive norms on the continuation intention, the hedonic benefit in Model 5 (β = 0.603) showed a higher coefficient value than the utilitarian benefit in Model 4 (β = 0.449). Finally, the results supported **H4a** and **H4b**.

Regarding the control variables (gender, occupation, education, and consumer group), only the education and consumer groups significantly affected the intention to continue using ride-hailing apps (as presented in Model 4 in Table 4), which accounted for only 14 and 16 percent of the variance, respectively.

Model-Fit Evaluation

We also conducted a model-fit evaluation to ascertain the robustness of the current research framework. We referred to several indices suggested by Kock (2020b), as summarized in Table 5. The current research framework was an excellent model fit for the conventional indices, as all ten indices met the minimum required threshold. Specifically, the current research model did not entirely suffer from collinearity problems, as indicated by the ideal scores of AVIF (1.154 $\leq$ 3.3) and AFVIF (1.354 $\leq$ 3.3). Furthermore, the GoF score (0.568 $\geq$ 0.36) showed that the present research framework had solid exploratory power. Furthermore, all the new additional indices were also satisfactory, indicating that the empirical indicator correlation matrices and the implied model were well fitted (Kock, 2020b). Thus, this study offered a good model fit.

Table 5.
Model Fit Evaluation

Indices	Rule of Thumb	Score	Status
Conventional indices			
APC	*p*-value<0.001	*p*-value<0.001	Satisfactory
ARS		*p*-value<0.001	Satisfactory
AARS		*p*-value<0.001	Satisfactory
AVIF	≤5, Ideally ≤3.3	1.154	Ideal
AFVIF		1.354	Ideal
GoF	Small ≥0.1, Medium ≥0.25, Large ≥0.36	0.568	Large
SPR	≥0.7, Ideally 1	1	Ideal
RSCR	≥0.9, Ideally 1	1	Ideal
SSR	≥0.7	1	Satisfactory
NLBCDR		1	Satisfactory
New Additional Indices			
SRMR	≤0.1	0.112	Satisfactory
SMAR		0.079	Satisfactory
SChs	*p*-value <0.05	*p*-value<0.001	Satisfactory
STDCR	≥0.7, Ideally 1	0.933	Satisfactory
STDSR		0.744	Satisfactory

Note: APC= Average Path Coefficient, ARS= Average R-Squared, AARS= Average Adjusted R-Squared, AVIF= Average Block VIF, AFVIF= Average Full Collinearity, GoF= Tenenhaus GoF, SPR= Sympson's Paradox Ratio, RSCR= R-Squared Contribution Ratio, SSR= Statistical Suppression Ratio, NLBCDR= Nonlinear Bivariate Causality Direction Ratio, SRMR= Standardized Root Mean Squared Residual, SMAR= Standardized Mean Absolute Residual, SChs= Standardized Chi-Squared, STDCR= Standardized Threshold Difference Count Ratio, STDSR= Standardized Threshold Difference Sum Ratio

5. Conclusion

Theoretical contributions

While discussing technology-usage continuation, a few studies have examined social factors. However, the findings are frequently tenuous and inconsistent. Although previous research extensively addressed technology-continuation intention, this research undervalues social influence as an essential factor influencing technology-continuation intention (Yan et al., 2021). On the other hand, the prominent theoretical model of technology-continuation intention proposed by Bhattacherjee et al. (2008) only focused on the usefulness of products. This is now less relevant, due to the current development of digital technology, which increases competition among technology-based products or services (Fauzi & Sheng, 2021). To address this gap, we examined the effect of descriptive norms (as the social factors) and product attributes, including utilitarian and hedonic benefit (as the technical factors), on continuation intention using the socio-technical theory. We invited 333 young active users of ride-hailing apps in Indonesia and analyzed them using the PLS-SEM approach to determine the research framework.

This study contributes two primary aspects to the literature on mobile-app-continuation-intention literature. First, in this study. social factors were shown to influence users' intention to continue using mobile apps through descriptive norms. Although social factors are still underplayed in the existing literature (Yan et al., 2021), especially in the prominent IS continuation theory (Bhattacherjee et al., 2008), this study confirms that descriptive norms must be seen as an essential factor in maintaining users' intention to continue using mobile apps. Prior researchers confirmed the effect of descriptive norms or the number of peers on continuation intention on SNS apps (Lin & Lu, 2011; Zhang et al., 2017). These results are reliable because when the number of users increases, the external benefits of the apps perceived by the user increase. In this case, the external benefits refer to the comprehensive benefits obtained by users from other users using the same apps; users can share benefits with other users, such as exchanging information (video-sharing and photo-sharing) and

establishing communication (video calls, phone calls, and messenger) through SNS apps.

The external benefits of ride-hailing apps allow users to share mutual benefits by offering services to other users. Ride-hailing apps are now equipped with various services, namely digital payments, news, and other entertainment services (Fauzi & Sheng, 2022). In this respect, we believe that when the features of the ride-hailing apps are increasingly valuable for users and, at the same time, the number of users increases, the application's usefulness also increases. For instance, once the number of user peers increases in ride-hailing apps, users can share benefits, such as transferring digital money or gaming. In short, when mobile apps allow users to share benefits with other users, descriptive norms are easily perceived among individuals and, subsequently, influence users to continue utilizing the mobile apps.

Second, this study shows that perceived product attributes, including utilitarian and hedonic benefits, play an essential role in the intention to continue using mobile apps by partially mediating the effect of descriptive norms on continuation intention. The partial mediating role of perceived utilitarian and hedonic benefits in continuation intention indicates that descriptive norms contribute directly to continuation intention. However, perceived utilitarian and hedonic benefits strengthen the relationship between descriptive norms and continuation intention. This is a crucial finding, as it indicates that perceived product attributes, which are related to perceived utilitarian and hedonic benefits (showing higher impact), are essential mediators of the relationship between descriptive norms and continuation intention. These findings can be associated with the fact that when the use of ride-hailing apps becomes a prevalent behavior (a descriptive norm), individuals assume that ride-hailing apps offer significant benefits because so many people use them. This eventually encourages customers to use ride-hailing apps in a sustainable manner.

These findings also expand the IS continuation theory proposed by Bhattacherjee et al. (2008), in which the only product attributes associated with technology continuation intention are post-usage usefulness or utilitarian benefits. This study offers fresh empirical evidence concerning the importance of strengthening product attributes in terms of hedonic benefit to ascertain the intention to continue using technology among existing users, and it is in line with the prior findings of Fauzi and Sheng (2021). Indeed, for the increasing number of companies offering technology-enabled services through mobile apps, the provision of functional (utilitarian) benefits is a core service. However, the provision of hedonic (enjoyable) benefits to IS users is often neglected. Therefore, the findings in this study demonstrate the hedonic benefits of being another essential product attribute in ensuring the continued use of mobile apps by their users.

Additionally, this study successfully expands the applicability of the socio-technical theory in explaining consumer behavior in adopting technology, particularly ride-hailing apps. Furthermore, the study's findings corroborate the previous study by Wang et al. (2020), which uses the same theoretical foundation to reveal the underlying factors that enhance the intention of hosts to continue using Airbnb apps. Accordingly, this study provides novel insights into how this theory can be employed as an essential alternative theoretical perspective in investigating how people intend to continue using technology-based products.

Managerial Implications

The findings of this study provide solid managerial recommendations for companies, particularly TNCs, which offer technology-enabled services to maintain the use of their mobile apps by considering the social aspect (the social influences of users through descriptive norms) and the technical aspect (the product attributes of mobile apps). Descriptive norms directly influence

users' intention to continue using mobile apps (as well as indirectly, their through perceived utilitarian and hedonic benefits). In other words, the new insight for companies is that while descriptive norms are inherently valuable to the analysis of users' continuation intentions, emphasizing the utilitarian and hedonic benefits of apps might also be advantageous in this regard. In terms of the social aspect, considering that descriptive norms are related to the influence of mobile app users' social circles, this study suggests that companies implement a community-based marketing approach to maintain their existing users. This approach could help companies to encourage community members to earn more benefits by sharing them amongst themselves. In terms of the technical aspect, ensuring high-quality user experiences while using mobile apps is vital. Therefore, this study highly recommends that companies develop apps that offer functionality (utilitarian benefits) and enjoyable experiences (hedonic benefits). Furthermore, this study underlines the relative importance of product attributes, in which hedonic benefits offer outweigh utilitarian benefits in the extent to which they mediate descriptive norms in terms of continuation intention. In this regard, the strengthening of the hedonic benefits within mobile apps is critical in maintaining users' continuation intention.

Limitations And Future Research Directions

Regardless of this study's noteworthy contributions, three primary limitations should be acknowledged, as they may pave the direction for future research. First, the data collection was conducted before the COVID-19 outbreak, which led to extreme changes in customer behavior, and the results might have changed when the data were collected during or after the pandemic. Second, although there are several types of mobile apps, this study only emphasizes investigated continuation intention in ride-hailing apps among a particular consumer segment (young consumers); therefore, the findings of this study might be difficult to generalize. Finally, in response to the several research limitations, future research should consider customer behavior changing due to the COVID-19 pandemic to see whether there is a different pattern of continuation behavior using ride-hailing apps in times of or post-pandemic. The recommendation is related to a report issued by Nekko Capital (2020) that there was a decreased growth of the ride-hailing market worldwide during the outbreak of COVID-19. Next, even though the current research framework is generally convincing, future research is encouraged to a replication study by involving more heterogenous respondents with different mobile apps to minimize generalization issues.

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Appendix 1.
Research instrument

Construct	Construct Definition	Test Item	Reference
Descriptive Norms	Customers follow the thinking of influential persons or references to use ride-hailing apps.	I believe that many of my friends around me use ride-hailing apps.	Thøgersen (2006); Lin & Lu (2011); Lin & Lu (2015); Zhang et al. (2017)
		I believe that the majority of my friends use ride-hailing apps.	
		I anticipate that many of my friends will eventually use ride-hailing apps.	
Perceived Utilitarian Benefit	Customers perceive the functional benefit of utilizing ride-hailing apps.	By utilizing ride-hailing apps, I can easily order transportation services.	Lin & Lu (2015); Hong et al. (2017); Wu et al. (2018); Fauzi & Sheng, (2020a)
		I can efficiently order online transportation through ride-hailing apps.	
		By utilizing ride-hailing apps, I can save time waiting for online transportation to arrive.	
		By utilizing ride-hailing apps, I can increase my mobility between locations.	
		I can save time and money by utilizing ride-hailing apps to obtain online transportation.	
Perceived Hedonic Benefit	Customers perceive the enjoyable experience of utilizing ride-hailing apps.	Ride-hailing apps are something I enjoy using.	
		Utilizing ride-hailing apps provides me with a great deal of enjoyment.	
		Ride-hailing apps are not only helping me with ordering transportation but also entertaining me.	
Continuation Intention	Customer's intention to continuously utilize ride-hailing apps.	As a user, I intend to continue utilizing ride-hailing apps in the future.	Lin & Lu (2011); Lu (2014); Fauzi & Sheng (2020a)
		I will heavily rely on using ride-hailing apps in the future.	
		I will strongly recommend others use ride-hailing apps.	