To grab or not to grab? The role of trust and perceived value in on-demand ridesharing services

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Abstract
Purpose – The purpose of this paper is to empirically test the antecedents and outcome of perceived value and trust toward on-demand ridesharing services (ODRS). The antecedents are perceived innovativeness, perceived personalization, perceived usefulness of rating system and service personal values. The outcome is the continuance intention toward ODRS. This study also aims to uncover the mediating role of trust and the moderating role of technology readiness.

Design/methodology/approach – The ODRS considered in this research are Grab and Uber in the context of Malaysia. A questionnaire was constructed, and responses were obtained from 280 Malaysian consumers who have experienced ODRS. The authors tested the framework using partial least square structural equation modeling technique.

Findings – The result indicates several significant relationships: perceived personalization, perceived usefulness of rating system and service personal values significantly influence perceived value and trust; trust mediates the relationships between perceived personalization, perceived usefulness of rating system, service personal values and perceived value; perceived value significantly influences continuance intention; and technology readiness moderates the relationship between perceived personalization and perceived value.

Originality/value – The current study adds significantly to the body of knowledge about ODRS by examining the direct determinants of trust and perceived value, and exhibiting how trust mediates the mechanism. This study also illustrates the interplay of moderator (technology readiness) and perceived value.

Keywords Malaysia, Trust, PLS-SEM, Continuance intention, Perceived value, On-demand ridesharing services

Paper type Research paper

Introduction
Following the rise of digital technology, the sharing economy has expanded to an unprecedented scale, with many businesses either transforming or emerging into this novel business model. Frentken and Schor (2017, pg. 4) define sharing economy as a phenomenon where “consumers granting each other temporary access to under-utilized physical assets (‘idle capacity’), possibly for money.” One of the most popular kinds of shared services, on-demand ridesharing services (ODRS), which is an alternative to traditional taxi and private vehicles, has engendered a spree of “drive less, ride more” behavior. ODRS are taxi-like services that leverage the use of mobile applications to match available drivers and passengers. Several known advantages of ODRS include a reduction in dependency on car ownership and traffic congestion rates, cost savings, convenience and environmental care (Belk, 2014).

Reports by Google revealed that the estimated worth of the on-demand ridesharing market in Southeast Asia was $13.1bn in 2025 (Minter, 2017), positioning Malaysia as a significant potential market. To date, Malaysia’s ODRS industry is dominated by two firms,
Grab and Uber, which are locked in fierce priced-based competition (Lim, 2016) that is likely unsustainable in the long run. Concurrently, several new e-hailing companies, such as MyCar and JomRides, have emerged in the market. Despite enjoying the first-mover advantage, Uber can no longer hold its monopolistic position in the market since Grab's entry. Most recently, Grab claimed a 95 percent market share in third-party taxi-hailing apps and over 50 percent in private vehicle-hailing in Southeast Asia (Grab, 2017a), posing an obvious threat to Uber. From the environmental and societal perspectives, ODRS has been a potential solution for excessive car ownership (third highest level of car ownership globally) as well as an alternative that complements public transportation networks in Malaysia (Hsien, 2017; Nielson, 2014). Hence, researching consumer behavior in relation to ODRS in the context of a developing country like Malaysia is indeed needed for business, environmental and societal sustainability.

For ODRS firms to remain competitive and sustainable, critical performance factors other than price must be understood. Devising marketing policies based solely on perceived quality and satisfaction has obvious limitations (Mencarelli and Riviere, 2015); therefore, capitalizing on perceived value is a viable alternative for ODRS firms to achieve competitive advantage. Perceived value, a concept covering both utilitarian and affection elements, has been deemed as the foundation of all relational exchange activities, including acceptance of app-based technology services (Fullerton et al., 2017; Wu et al., 2014). Meanwhile, ODRS have been involved in several trust-breaching issues, such as data privacy and passenger safety, which continue to plague this emerging industry (Chee, 2018; Papadopoulou et al., 2001). However, trust, as a key determinant of sharing economy participation, is largely overlooked in the current sharing economy literature (Cheng, 2016; Mohlmann, 2015), making it crucial for ODRS firms to understand how to build trust and deliver greater perceived value in order to sustain customer acquisition and retention.

A literature review suggested that studies pertinent to the sharing economy can be classified into two different streams, namely, organizational-level studies and individual-level studies. Generally, the former focuses on the application, practice and integration of sharing economy concept in organizations as well as the traditional business model (Mair and Reischauer, 2018; Dreyer et al., 2017; Pedersen and Netter, 2015). Thus, so far, organizational-level studies have raised ample attention from researchers but individual-level studies remain under-researched (Lee et al., 2018). In particular, few studies have been dedicated to consumer behavior in shared services due to the phenomenon’s short history (Min et al., 2018). Currently, existing studies have built on theoretical models from the technology field, such as the technology acceptance model (TAM) in examining intention to use shared services (Wang et al., 2018; Min et al., 2018). Although these studies are theoretically sound and valuable as pioneering studies in related areas, further work is needed to examine the continuance intention instead of the initial intention to participate in the sharing economy. Recent studies have shown that trust and perceived benefits/values are important predictors for shared services’ adoption and loyalty (Hawlitschek et al., 2018; Yang et al., 2017; Zhu et al., 2017; Hamari et al., 2016; Mohlmann, 2015). However, previous studies did not explicitly exhibit the antecedents driving trust and value perception, creating an interesting gap to be addressed in this study because practitioners not only need to know the value customers seek, but also to understand how to form trust and perceived value.

Furthermore, although the basic functions of an ODRS application appear easy to use, not everyone, including young adults, is technology-savvy and appreciates the innovative features. For example, Goldsmith and Freiden (2004) delineated that not all consumers are ready for and appreciate personalization. In a similar vein, Min et al. (2018) showed that complexity in the Uber mobile application negatively influences perceived ease of use and usefulness, which eventually leads to an unfavorable attitude and lower future usage intention.
The authors further acknowledged the importance of individual characteristics in using ridesharing applications and urged future studies to investigate the role of technology readiness in the ridesharing services context. This gap motivated the present study to explore how technology readiness can influence the relationship between service attributes (i.e. personalization) and perceived value. The proposition is based on the premise that innovative service characteristics (i.e. personalization) can only turn into value if consumers can comprehend them well.

Thus, the questions addressed in this research are:

**RQ1.** What are the antecedents of trust and perceived value toward ODRS?

**RQ2.** What is the role of trust in forming perceived value?

**RQ3.** Do individual differences (technology readiness) play a role in forming value perception?

Answers to these questions may provide valuable insights for marketers on consumer behavior, service system design and customer relationship management, which are crucial for service firms’ profitability and sustainability. Also, despite significant market opportunities in developing countries, past literature in this area primarily focuses on developed countries, which may result in an inappropriate generalization. This study was conducted in Malaysia, a fast-developing nation among the ASEAN countries.

The contributions of this research are twofold. First, this study proposes and empirically validates a framework that explains the antecedents of trust and perceived value toward ODRS among Malaysian consumers. The framework goes beyond price to understand the factors that drive value perception. Second, this study investigates the mediating role of trust and the moderating role of technology readiness to provide a more in-depth view to the antecedent-outcome mechanism. As a technology-based service, the level of consumers’ technology readiness is vital for the success of ODRS and thus considered in this study. Due to ODRS’ nature of service and experiential attributes, this study uses a post-consumption lens to better understand consumer perception and continuance intention.

This paper is presented in four sections. The first section conducts a thorough review of the literature on ODRS, which provided the basis for the study’s proposed hypotheses. The next section discusses methodology, followed by a discussion and the study’s implications in the third section. The paper’s concluding section discusses the study’s limitation with future directions for research.

**Theoretical foundations**

Relying on the foundation of the means-end chain theory (Gutman, 1982; Woodruff, 1997) and ODRS’ characteristics, this study addresses how perceived service attributes and service personal values influence customers’ continuance intention toward ODRS. Zeithaml (1988) and Woodruff and Gardial (1996) manifested the application of means-end model in capturing the essence of customer value. The means-end approach to customer value stresses the role of offering’s attributes and consequences derived from engagement with the offering (Woodruff and Gardial, 1996). The means-end chain theory postulates that decision making in consumption is influenced by connections among product attributes, perceived consequences of consumption and consumers’ personal values.

In general, products and services possess a bundle of implicit and explicit attributes such as packaging, brand name, and quality (Muellera and Szolnokib, 2010; Keller, 1999). Consumers have preferences for certain attributes as they deliver different personal desired consequences (Bagozzi and Dholakia, 1999). Consequences can be manifested by perceived value that results from the consumption of a product or service (Sheth et al., 1991). It has been asserted that attributes serve as cues for the consequences they deliver, and product attributes are direct determinants of consequences (Wang and Yu, 2016; Min et al., 2012).
For instance, Zeithaml (1988) has evidenced perceived value (Consequence) as a direct outcome of perceived service quality (Attribute). In the context of this study, besides offering lower prices than taxi services, ODRS flaunt their innovative technology, personalized trips, decent after-trip services and quality control through their rating/feedback system (Grab, 2017b; Quinn, 2016). Therefore, this study considers perceived innovativeness, perceived personalization and perceived usefulness of ODRS’ rating system as contributing attributes (means) for creating perceived value and trust.

The means-end chain theory can be understood from two perspectives, the bottom-up and the top-down approaches (Brunsø et al., 2004). As shown in the attributes–consequences link, the bottom-up route is directed by external input (product perception). In contrast, the top-down approach is driven by stable individual differences in personal values (Brunsø et al., 2004). An individual values system has long been determined as an influencer of consumer behaviour (Rokeach, 1973). Personal values communicate the importance of products and services for consumers and are therefore considered an important variable in understanding consumer purchasing behaviors (Lages and Fernandes, 2005). Recent studies have advocated that personal values serve as a foundation of perceived service value and perceived quality (Thuy et al., 2016; Hau and Thuy, 2012; Ladhari et al., 2011). Based on this premise, this study integrates personal values as determinants of perceived value and trust in the research model (Figure 1).

**Hypotheses development**

*Perceived innovativeness*

Perceived innovativeness refers to consumers’ overall innovativeness assessment toward services (Lowe and Alpert, 2015). Although innovation empowers firms to improvise and advance their offerings, innovation needs to be perceived as innovative to benefit the firms’ customers (Cass and Carlson, 2012; Kunz et al., 2011). According to Murat et al. (2013), innovation in the service industry results in customer value because it is the company’s
effort spent on thinking from a customer's perspective. Lowe and Alpert (2015) demonstrated the direct impacts of consumers' perceived innovativeness on utilitarian and hedonic evaluation. To clarify, higher perceived innovativeness signifies that a service carries attributes of uniqueness, which simulates affective responses like emotional value, and relative advantage, which evokes utilitarian responses such as functional value and monetary value (Lowe and Alpert, 2015). Similarly, building upon this idea, Leckie et al. (2018) illustrated the importance of service innovativeness in forming overall value evaluation of the services, customer engagement and loyalty.

Besides, it is well documented that a firm's innovative image may influence its credibility and trustworthiness (Aaker, 2007; Keller and Aaker, 1998). For instance, Cass and Carlson (2012) found that perceived website innovativeness is an important predictor of consumers' trust. The authors further clarified that perceived website innovativeness is relevant to the concepts of uniqueness and usefulness, and these embedded attributes engender trust toward a website. At the individual level, Zolfagharian and Paswan (2009) found that service innovativeness correlates with controllability and predictability, implying that service innovativeness allows consumers to have more perceived control of the service outcomes and less sense of uncertainty. Thus, customers who perceived ODRS as innovative are more likely to establish greater perceived value and trust. Based on the above reasoning, the following hypotheses are proposed:

**H1.** Perceived innovativeness has a positive relationship with perceived value.

**H2.** Perceived innovativeness has a positive relationship with trust.

**Perceived personalization**

Perceived personalization is defined as the process of individualizing service by using an individual's information to provide refined benefits (Shen and Ball, 2009) and facilitate interaction with customers, which ultimately aims to achieve customer satisfaction (Komiak and Benbasat, 2006). Coupled with both advancement in mobile technologies and GPS-enabled mobile devices, ODRS have been empowered to offer personalized services based on users' identities, preferences and geographic locations. Empirical evidence indicates that perceived service quality and satisfaction increase when personalized services are offered (Mittal and Lassar, 1996), with the belief that services that fit customers' unique needs are better than standardized services (Ball et al., 2006). Lee (2015) found that personalized service helps to reduce customers' cognitive effort and generate socialness. Through personalization, ODRS firms can better predict customers' behavior and meet their needs (Doney and Cannon, 1997), which, in turn, enable customers to have a more effortless and enjoyable riding experience. In addition, offering personalized service signifies that firms are making idiosyncratic investments, thereby creating an image of a believable, caring relationship and a willingness to sacrifice (Ganesan, 1994). This study posits that service personalization offered by ODRS firms influence customers' value evaluation and trust. Therefore, this study hypothesizes that:

**H3.** Perceived personalization has a positive relationship with perceived value.

**H4.** Perceived personalization has a positive relationship with trust.

**Perceived usefulness of rating system**

This study applied the perceived usefulness construct from technology literature in examining the effect of the ODRS rating system on perceived value. Perceived usefulness has been proven to be a robust construct in addressing information system acceptance and ODRS participation (Min et al., 2018; Wang et al., 2018; Venkatesh and Davis, 2000),
rendering it suitable to be used in examining the perceived helpfulness of the ODRS rating system. Perceived usefulness is defined as a user’s ex-post expectations and beliefs in system effectiveness (Bhattacherjee, 2001). Ratings and reviews are important for service judgment in light of the service characteristics of heterogeneity and intangibility (Racherla and Friske, 2012). Based on a value-based adoption model, perceived usefulness has been identified as a benefit component that positively influences perceived value (Kim et al., 2007). A useful rating system is expected to deliver decent perceived value gained, such as reducing the need for cognitive effort, increasing ride efficiency, and creating a worry-free and socially recognized riding environment. Also, a useful rating system used in shared services can build customer trust by minimizing the risk involved and facilitating decision making (Ert et al., 2016). The typical understanding is that the provision of crowd-sourced information (reviews and ratings) will result in people’s safety when interacting with strangers by providing sufficient information prior to the rides. Particularly, it can be argued that the mere presence of a rating system is insufficient to create value and trust, and instead, the perception of usefulness is the key because rating systems are neither perfectly objective, accurate, nor transparent (CHAFA, 2017; Fullerton et al., 2017). It is therefore proposed that customers may perceive higher value gained and trust only if the rating system is perceived to be useful. Thus, it is hypothesized that:

H5. Perceived usefulness of rating system has a positive relationship with perceived value.

H6. Perceived usefulness of rating system has a positive relationship with trust.

Service personal values
Personal values can be exhibited and fulfilled through the use of services (Homer and Kahle, 1988). Service personal values are defined as customers’ total evaluation of the service depending on the perceived achievement in terms of personal values (Lages and Fernandes, 2005). Service personal values are built on three dimensions: value to a peaceful life (VPL), value to social recognition (VSR) and value to social integration (VSI) (Lages and Fernandes, 2005). VPL is under the self-oriented level while VSR and VSI are under the social-oriented level. VPL refers to an evaluation of whether a service promotes a pleasurable life, brings or improves tranquillity, safety and/or harmony. VSR refers to an individual’s assessment of whether the service helps in gaining respect from others, solidifying social recognition and status, and achieving a more fulfilled and stimulating life. VSI refers to a judgment of whether the service improves relationships at a social, professional or family level.

According to the means-end chain theory (Gutman, 1982), personal values refer to the end states of an individual’s existence, which provides an understanding of how consumers perceive the self-relevant outcomes of product use and consumption. Taking the perspective of top-down information processing, superordinate goals (personal values) guide behavioral routines (Brunso et al., 2004). As personal values sit atop the hierarchy in the means-end chain, they are posited to be the drivers of concomitant judgment and behavioral outcomes such as perceived value, satisfaction, loyalty (Hau and Thuy, 2012; Durvasula et al., 2011; Ledden et al., 2007; Lages and Fernandes, 2005) and, possibly, trust. As trust is a behavioral outcome engendered after experiencing ODRS, it logically links service personal values as its determinant. As Homer and Kahle (1988) argued, behaviors serve to show an individual’s values. ODRS customers are more likely to trust the service if it promotes desirable personal values such as safety and social integration.

In short, service personal values serve as the “guiding principles in people’s lives” (Schwartz, 1994) and the standard from which belief, attitude and behavior are established (Lages and Fernandes, 2005; Carlson and Kacmar, 2000; Madrigal and Kahle, 1994). Therefore, it is proposed that service personal values drive consumers to trust and to
evaluate ODRS based on how well it fits their personal values. Based on the reasoning above, the following hypotheses are formed:

H7. Service personal values have a positive relationship with perceived value.

H8. Service personal values have a positive relationship with trust.

Perceived value
Perceived value provides competitive advantage, which eventually leads to companies’ long-term success (Day, 2000; Woodruff, 1997; Ravald and Grönroos, 1996). In this study, perceived value refers to consumers’ perception toward subjective worthiness of service consumption (Babin et al., 1994). According to Sweeney and Soutar (2001), four components reflect perceived value: functional, monetary, emotional and social. Functional value refers to the practical utilities provided by ODRS through their expected performance and perceived quality. Monetary value refers to the utility ODRS provides in proportion to the overall costs. Emotional value is the psychological need and utility generated by ODRS through enhancing individual’s social self-concept. Lastly, social value is the social utility delivered by ODRS through enhancing personal property and interactions with strangers, resulting in pervading implications of trust (Mittendorf, 2018). Relative high risk, uncertainty and interdependence that prevail in the sharing economy have rendered trust more important than ever before.

H9. Perceived value has a positive relationship with continuance intention.

Trust
In the sharing economy context, trust refers to trust in the provider of a shared service and to the other users one is sharing with (Möhlmann, 2015). To sustain and promote the use of shared services, facilitating trust among strangers is an indispensable yet challenging link for all types of sharing platforms because both customers and service providers are exposed to potential user opportunism (Horton and Zeckhauser, 2016). A considerable part of ODRS operates in an online mediated environment which carries attributes such as non-recurring relationships, temporary sharing of personal property and interactions with strangers, resulting in pervading implications of trust (Mittendorf, 2018). Relative high risk, uncertainty and interdependence that prevail in the sharing economy have rendered trust more important than ever before.

Möhlmann (2015) indicated that trust is a significant predictor of satisfaction in the use of shared services. Trust in platforms and peers has also been found to influence intention to consume or supply a resource (Hawlitschek et al., 2016). However, existing studies regarding trust in the sharing economy were tested in the AirBnb service context. The concept of trust should be further tested in the ODRS context due to the different nature of the services, such as consumer involvement. Importantly, studies on antecedents of trust in the sharing economy are scarce (Huurne et al., 2017; Cheng, 2016; Möhlmann, 2015), motivating the need for this study to quantify the factors influencing trust in the ODRS context.

Generally, trust is deemed to grant a good feeling, increases users’ confidence in service providers and enhances the impression of security in service use (Wirtz and Lwin, 2009). Extant studies in the online commerce and service context have provided empirical supports for the role of trust as a precursor to perceived value (Ponte et al., 2015; Kim et al., 2012; Zhu and Chen, 2012). According to Sirdeshmukh et al. (2002), trust forms value by: providing
relational benefits derived from interacting with service providers who are competent, benevolent toward the consumer and devoted to dealing with exchange problems; and alleviating exchange uncertainty in an ongoing exchange relationship. In addition, perceived trust has been found to reduce the risk, time and effort required in a transaction, thus raising satisfaction and perceived value (Saleem et al., 2017; Kim et al., 2012). It is expected that trust would lead to greater perceived value gained by providing a reliable, enjoyable, confident and effortless ride experience.

Integrating the reasoning presented above, one can reasonably put forward that perceived attributes, such as innovativeness, personalization, usefulness of rating system and service personal values, are the means to enhance customers’ trust and perceived value toward ODRS. Notably, while perceived service attributes and personal values are important in forming perceived value, arguably, trust is responsible as a mediator in explaining the value formation process. Therefore, this study posits that service attributes and personal values will help to establish trust, and, in turn, deliver a greater perception of value gained from service consumption.

Thus, it is hypothesized that:

H10. Trust has a positive relationship with perceived value.

H11. Trust mediates the relationship between perceived innovativeness and perceived value.

H12. Trust mediates the relationship between perceived personalization and perceived value.

H13. Trust mediates the relationship between perceived usefulness of rating system and perceived value.

H14. Trust mediates the relationship between service personal values and perceived value.

Moderating role of technology readiness
Technology readiness is an overall state of mind resulting from a configuration of mental contributors (innovativeness and optimism) and inhibitors (discomfort and insecurity), which collectively determine predisposition to use new technologies (Parasuraman and Colby, 2015). First, innovativeness refers to people’s tendency to be a technology pioneer and thought leader. Second, optimism is people’s positive view of technology, believing that it offers people enhanced control, flexibility and efficiency in their lives. Third, discomfort measures people’s perceived lack of control over technology and feelings of being overwhelmed by it. Fourth, insecurity captures people’s distrust of technology and skepticism about its ability to work properly. An individual who possesses higher traits of optimism and innovativeness and lower traits of discomfort and insecurity is more likely to adopt a new technology.

High technology readiness is expected to affect the strength of the relationship between ODRS’ attributes and perceived value. Wang et al. (2017) proposed that individual differences can result in different service technology evaluation. Innovativeness in technology can positively influence both utilitarian attitude and hedonic attitude (Lowe and Alpert, 2015). However, innovative technology can also evoke a negative feeling like anxiety (Meuter et al., 2003). A recent review of the literature on this subject has indicated technology readiness as a determinant of consumers’ cognitive and affective evaluations toward technology services (Ferreira et al., 2014). Consumers with high technology readiness tend to use innovative functions more variably and frequently, eventually leading to greater satisfaction and continuance intention (Son and Han, 2011). For instance, innovativeness exhibited in technology readiness increases the perceived ease of use of technology innovation (Chen, 2019). In contrast, consumers with low technology readiness distrust innovative technology and underestimate its functionality and usefulness (Lu et al., 2012). For this reason, it is
posited that a high level of technology readiness is needed for ODRS innovativeness to be transferred into a favorable value perception because innovative features in ODRS will only be used thoroughly and perceived as enjoyable for customers with high technology readiness.

The effect of personalization on perceived value may be contingent on differences in customers’ psychological, behavioral characteristics and experiences (Rose et al., 2011). Correspondingly, mixed results have been found between the relationship of perceived personalization and users’ response (Lee et al., 2015), suggesting that higher personalization may not necessarily result in higher value. Sometimes, some consumers are restricted by their competence from effectively interacting with technology-based services, which results in different evaluations of service experiences (Lin and Hsieh, 2007). For instance, Wang et al. (2017) found that the relationship between performance expectancy and future behavior toward a service provider is weaker for Eastern culture, attributing to their conservative nature and cautiousness toward new technologies. In ODRS, personalization may be perceived as a potential threat rather than value for customers with low technology readiness as it requires customers to provide personal information. Therefore, the positive effect of perceived personalization on perceived value is not constantly true; rather, it is likely to be augmented or weakened based on one’s technology readiness.

While insecurity captures people’s distrust of technology per se, Dong et al. (2007) suggested that distrust can be transferred, i.e. customers’ distrust in ODRS technology is expected to transfer to the service providers (drivers). This is aggravated by the lack of government regulation for ODRS. It has been demonstrated that customers with high technology readiness are optimistic and open to new technology, thus exhibiting greater trust in consumer-to-consumer business platforms (Lu et al., 2012). However, customers with low technology readiness not only tend to be skeptical about the ODRS platform, but also their service core, the service providers. In response to such circumstances, the online rating system allows customers to rate their drivers after rides and also access drivers’ ratings before taking rides. Drivers who obtain lower than the threshold rating are banned from offering the service. Here, the online rating system presents as an important means to mitigate perceived risk and increase confidence. Hence, it is expected that the effect of a perceived usefulness rating system on perceived value will be amplified for customers with low technology readiness.

Based on the arguments above, this study hypothesizes that:

**H15a.** Technology readiness moderates the relationship between perceived innovativeness and perceived value: when technology readiness is high, the relationship between perceived innovativeness and perceived value is stronger.

**H15b.** Technology readiness moderates the relationship between perceived personalization and perceived value: when technology readiness is high, the relationship between perceived personalization and perceived value is stronger.

**H15c.** Technology readiness moderates the relationship between perceived usefulness of rating system and perceived value: when technology readiness is low, the relationship between perceived usefulness of rating system and perceived value is stronger.

### Methodology

**Sample and data collection**

Difficulty in compiling a complete sampling frame for ODRS users prompts the selection of non-probability sampling (Sarstedt et al., 2018). Particularly, judgment sampling design was selected as it is suitable under the condition where a limited number or category of people possesses the required information (Sekaran and Bougie, 2016). In this study, the primary focus
is to examine continuance intention rather than adoption intention; thus, only Malaysians above 18 years old with experience in using ODRS were included. The minimum sample size was 126, based on a calculation using G*Power software, with \( f^2 = 0.15 \), \( \alpha = 0.05 \) and \( \text{Power} = 0.85 \) (Faul et al., 2007). In a one month time frame, questionnaires were distributed through face-to-face administration in Kuala Lumpur, the capital of Malaysia. Eventually, 293 responses were collected. However, 13 responses were discarded due to incomplete answers, resulting in 280 usable responses. In terms of sample characteristics, 54 percent of the respondents were female. Approximately, 71 percent of respondents were less than 30 years old and 55 percent of respondents had incomes of less than RM 2,000 (US$1 = RM 4).

Measures
Measurements used in this study were adapted from previous studies with minor changes in the wording to suit the target context: perceived innovativeness was adopted from Lowe and Alpert (2015); measurement of perceived personalization was adopted from Ball et al. (2006); measurement of perceived usefulness of rating system was adopted from Saeed and Abdinnour-Helm (2008); measurement of service personal values was adopted from Lages and Fernandes (2005); and Walsh et al.’s (2014) PERVAL-short scale was adopted to measure perceived value. In addition, Bhattacharjee’s (2001) measurement of continuance intention was adopted and Parasuraman and Colby’s (2015) technology readiness index was used to measure technology readiness level.

Different scales were used to assess the predictor and criterion variables for the purpose of minimizing the common method bias (Podsakoff et al., 2003). In this study, exogenous constructs were measured using five-point Likert scales while endogenous constructs were measured using seven-point Likert scales. In addition, this study tried to reduce the risk of common method bias by assuring anonymity and stressing the importance of honest answers (MacKenzie and Podsakoff, 2012).

Data analysis
This study used partial least square structural equation modeling (PLS-SEM) to analyze the research model because it is better suited for prediction-oriented, complex, and incremental models (Sarstedt et al., 2014), which characterized the research model in the present study. Also, this study involved formatively measured constructs that can be better handled by PLS-SEM (Hair et al., 2017). The two-stage analytical procedure proposed by Anderson and Gerbing (1988) was followed. Statistical remedies were conducted to examine the threat of substantial common method bias. First, the Harman single factor test (Podsakoff et al., 2003) revealed that the largest variance explained by the first factor was 25.55 percent of the total variance (must be less than 50 percent). Second, the correlation matrix procedure (Bagozzi et al., 1991) showed that the highest inter-construct correlation was 0.660, which was below 0.90, the threshold value. Hence, common method bias was not significant in this data set.

Measurement model analysis: first-order constructs level
Convergent validity, discriminant validity and construct reliability were assessed in the measurement model analysis. As shown in Table I, all composite reliability (CR) values exceeded the threshold value of 0.70 (Hair et al., 2017). All item loadings of the first-order constructs were above the cut-off value of 0.708. All average variance extracted (AVE) values were greater than 0.50 (Hair et al., 2017). Therefore, the constructs in this study met the requirement for internal reliability and convergent validity. The discriminant validity was assessed using the HTMT criteria (Henseler et al., 2015). As shown in Table II, all values passed the criterion of HTMT scores (HTMT < 0.90) (Gold et al., 2001), indicating the establishment of discriminant validity.
<table>
<thead>
<tr>
<th>First-order constructs</th>
<th>Indicators</th>
<th>Scale</th>
<th>Loading</th>
<th>CR</th>
<th>AVE</th>
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Table I. Reliability and convergent validity for first-order constructs
Measurement model: second-order constructs level

This study modeled service personal values and technology readiness as formative second-order constructs that consist of three and four first-order reflective constructs, respectively. A two-stage approach suggested by Ringle et al. (2012) was followed. As illustrated in Table III, all formative measures yield path coefficients above the threshold of 0.70, implying that all formatively measured constructs had sufficient degrees of convergent validity (Hair et al., 2017). VIF values of all dimensions were below the threshold value of 3.30 (Diamantopoulos and Siguaw, 2006); hence, collinearity was not a critical issue in the formative measurement model. Subsequently, the significance and relevance of the outer weights were assessed. All formative indicators were significant except for the values for social integration, discomfort and insecurity. However, Hair et al. (2017) suggested that a formative indicator should be retained even if its weight is not significant if the item loading was more than 0.50. Therefore, none of the formative indicators were deleted.

For perceived value, which was modeled as a reflective–reflective second-order construct, convergent validity and reliability were assessed (Hair et al., 2017). The recommended value for loadings was set at 0.708, the AVE at 0.50 and the CR at 0.70. As shown in Table III, all criteria were fulfilled.

Structural model

Before assessing the structural model, a collinearity test was conducted to assess the presence of highly correlated constructs. The highest VIF value of all constructs was 1.571 (below the suggested threshold of 3.30) (Diamantopoulos and Siguaw, 2006), indicating the absence of multicollinearity effects.

Model fit was measured using the standardized root mean square residual (SRMR) value (Henseler et al., 2016). The model’s SRMR value of 0.065 was below the threshold of 0.08, indicating sufficient model fit. Subsequently, this study examined Stone–Geisser’s $Q^2$ by applying blindfolding procedure with a pre-specified distance of six (Geisser, 1974; Stone, 1974). All endogenous construct exhibited $Q^2$ values above zero (ranging from 0.12 to 0.40), indicating sufficient predictive relevance of the model. This study took a further step to evaluate predictive validity (out-of-sample prediction) using cross-validation with holdout samples. According to Hair et al. (2019), only the model’s key endogenous construct’s indicators should be focused when interpreting PLS-predict results. The $Q^2_{\text{Predict}}$ values were positive; thus, the model offered appropriate predictive performance. Next, the result exhibited that RMSE and MAE values for the PLS analysis were all lower than the LM, thus indicating high predictive power (Hair et al., 2019) (see Table AI).

As shown in Table IV, perceived personalization, perceived usefulness of the rating system, service personal values and trust significantly influenced perceived value ($R^2 = 33.60$ percent).
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<th>FUNC</th>
<th>INNO</th>
<th>INS</th>
<th>VPL</th>
<th>MON</th>
<th>OPT</th>
<th>SOC</th>
<th>VSR</th>
<th>VSI</th>
<th>PI</th>
<th>PP</th>
<th>PU</th>
<th>TRU</th>
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Notes: HTMT < 0.90 (Gold et al., 2001); PI, perceived innovativeness; PP, perceived personalization; PU, perceived usefulness of rating system; EMO, emotional value; FUNC, functional value; SOC, social value; MON, monetary value; TRU, trust; INT, continuance intention; DIS, discomfort; INS, insecurity; INNO, innovativeness; OPT, optimism; VPL, value to peaceful life; VSR, value to social recognition; VSI, value to social integration.

Table II. Discriminant validity

Role of trust and perceived value in ODRS
Besides, perceived personalization, perceived usefulness of the rating system and service personal values significantly influenced trust ($R^2 = 25.50$ percent). Perceived value had a significant positive relationship with continuance intention ($R^2 = 40.8$ percent). This study further assessed the effect size. Following Cohen’s (1988) guideline, $f^2$ values of 0.02, 0.15, and 0.35 represent small, medium and large effects, respectively. Most of the exogenous variables revealed effect sizes ranging from small to medium.

This study tested the hypothesized mediation effects using a bias-corrected bootstrapping of indirect effects (Preacher and Hayes, 2008). As exhibited in Table IV, all 95% bootstrapping confidence intervals do not straddle a 0 in between, indicating that trust mediates the relationships between antecedents (perceived personalization, perceived usefulness of rating system, service personal values) and perceived value. Therefore, all direct and mediation hypotheses were supported except $H1$, $H2$ and $H11$.

### Table III.

Measurement model for second-order constructs

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<th>Constructs</th>
<th>Items</th>
<th>Scale</th>
<th>Convergent Validity</th>
<th>Weights</th>
<th>VIF</th>
<th>$t$-value weights</th>
<th>$f^2$</th>
<th>sig</th>
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<td>0.847</td>
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<td>6.835*</td>
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### Table IV.

Hypotheses testing for direct and indirect effects

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<th>Hypothesis</th>
<th>Relationship</th>
<th>Std. $\beta$</th>
<th>$t$-value</th>
<th>$f^2$</th>
<th>Confidence interval</th>
<th>Decision</th>
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<td>PI $\rightarrow$ PV</td>
<td>-0.047</td>
<td>0.795 ms</td>
<td>0.001</td>
<td>[-0.147, 0.048]</td>
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<td>$H2$</td>
<td>PI $\rightarrow$ TRU</td>
<td>0.071</td>
<td>1.323 ms</td>
<td>0.001</td>
<td>[-0.049, 0.188]</td>
<td>Unsupported</td>
</tr>
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<td>PP $\rightarrow$ PV</td>
<td>0.150</td>
<td>2.090*</td>
<td>0.004</td>
<td>[0.031, 0.203]</td>
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<tr>
<td>$H4$</td>
<td>PP $\rightarrow$ TRU</td>
<td>0.192</td>
<td>2.627**</td>
<td>0.063</td>
<td>[0.015, 0.254]</td>
<td>Supported</td>
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<tr>
<td>$H5$</td>
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<td>0.350</td>
<td>6.124**</td>
<td>0.149</td>
<td>[0.254, 0.441]</td>
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<tr>
<td>$H6$</td>
<td>PU $\rightarrow$ TRU</td>
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<td>2.456**</td>
<td>0.090</td>
<td>[0.042, 0.255]</td>
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<td>SPV $\rightarrow$ PV</td>
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<td>3.562**</td>
<td>0.048</td>
<td>[0.066, 0.273]</td>
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<td>[0.131, 0.346]</td>
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<td>13.235**</td>
<td>0.688</td>
<td>[0.548, 0.709]</td>
<td>Supported</td>
</tr>
<tr>
<td>$H10$</td>
<td>TRU $\rightarrow$ PV</td>
<td>0.240</td>
<td>3.822**</td>
<td>0.094</td>
<td>[0.137, 0.344]</td>
<td>Supported</td>
</tr>
<tr>
<td>$H11$</td>
<td>PI $\rightarrow$ TRU $\rightarrow$ PV</td>
<td>0.017</td>
<td>0.949 ms</td>
<td>–</td>
<td>[-0.035, 0.015]</td>
<td>Unsupported</td>
</tr>
<tr>
<td>$H12$</td>
<td>PP $\rightarrow$ TRU $\rightarrow$ PV</td>
<td>0.035</td>
<td>1.854*</td>
<td>–</td>
<td>[0.008, 0.070]</td>
<td>Supported</td>
</tr>
<tr>
<td>$H13$</td>
<td>PU $\rightarrow$ TRU $\rightarrow$ PV</td>
<td>0.038</td>
<td>2.205*</td>
<td>–</td>
<td>[0.014, 0.071]</td>
<td>Supported</td>
</tr>
<tr>
<td>$H14$</td>
<td>SPV $\rightarrow$ TRU $\rightarrow$ PV</td>
<td>0.059</td>
<td>2.486**</td>
<td>–</td>
<td>[0.028, 0.107]</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Notes: *$p < 0.05$; **$p < 0.01$. 

Notes: $r < 0.05$; **$r < 0.01$. 

Notes: *$p < 0.05$; **$p < 0.01$. 

Notes: $r < 0.05$; **$r < 0.01$. 

Notes: $r < 0.05$; **$r < 0.01$.
Moderation effects
This study tested the moderation hypotheses using two-stage approach as it yields highest power and is suitable for handling formative moderator (Henseler and Chin, 2010). As shown in Table V, technology readiness only moderates the relationship between perceived personalization and perceived value ($\beta = 0.167$, $t = 2.593$, $p < 0.05$). As Dawson (2014) suggested, the interaction effect were plotted to further elaborate the moderating phenomenon. As shown in Figure 2, the positive relationship between perceived personalization and perceived value is stronger under conditions of high technology readiness. This result was as hypothesized, supporting $H15b$.

Discussion and implications
The main question addressed in this research is: What are the critical antecedents that build perceived value and trust toward ODRS? In the process of addressing this question, this research has identified some interesting results. First, contrary to past research (Lin et al., 2013; Chang and Tu, 2005; Yi and La, 2004), this study has found that the relationship between perceived innovativeness and perceived value is not significant. One plausible reason is that customers may perceive ODRS as innovative, but its core remains a taxi-like service, thus hardly innovative enough for customers to perceive great value gained from this new way of taking a taxi. According to Meyers-Levy and Tybout (1989), an innovation perceived as highly congruent or one that assimilates with existing alternatives is unlikely to result in a particularly positive response. In addition, the effect of perceived innovativeness on trust is not significant, implying a paradox in which newness is not necessary to build trust but possibly does the opposite due to the extra uncertainty involved.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relationship</th>
<th>Std. $\beta$</th>
<th>$t$-value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H15a$</td>
<td>PI×TR→PV</td>
<td>$-0.065^{\text{ins}}$</td>
<td>1.242</td>
<td>Unsupported</td>
</tr>
<tr>
<td>$H15b$</td>
<td>PP×TR→PV</td>
<td>0.167**</td>
<td>2.593</td>
<td>Supported</td>
</tr>
<tr>
<td>$H15c$</td>
<td>PU×TR→PV</td>
<td>$0.022^{\text{ins}}$</td>
<td>0.543</td>
<td>Unsupported</td>
</tr>
</tbody>
</table>

Notes: ins, insignificant. **$p < 0.01$

Table V. Hypotheses testing for moderation effects

![Figure 2. Moderating role of technology readiness between perceived personalization and perceived value](image)
Second, perceived personalization is significant in influencing perceived value, which supports the findings of earlier studies (Lee, 2015; Liang et al., 2012). In addition, the direct effect of perceived personalization on trust and the indirect effect of perceived personalization on perceived value through trust are significant, suggesting the effect of perceived personalization on perceived value is partly transmitted through trust. Personalization attaches a greater psychological comfort to relationships (Ball et al., 2006), making customers to think that ODRS firms pay attention to and care for them, thereby forming trust toward the service firm and eventually enhancing value assessment.

Third, this study has demonstrated the perceived usefulness of the ODRS’ rating system as a determinant of perceived value and trust. Providing the rating system is perceived as useful, it serves the purpose as a trust building tool, which makes sharing with strangers less risky and more appealing (Frentken and Schor, 2017), and thus helps to provide greater values like quality and a worry-free ride experience. The significant mediating effect suggests trust as a factor that accounted for the effect of perceived usefulness of the rating system on perceived value.

Fourth, service personal values positively influence perceived value. This finding confirms the conclusion of earlier studies (Hau and Thuy, 2012; Ledden et al., 2007). Moreover, service personal values are found to be a predictor of trust and trust mediates the relationship between service personal values and perceived value. Personal values as the desired end states in the means-end hierarchy can be influential in an individual’s decision-making process. Unlike previous studies, this study found only a significantly important service personal values dimension in the ODRS context. ODRS customers subjectively evaluate the value gained from services used and build trust based on achievement in terms of personal values, specifically the value of a peaceful life. Hence, the result illustrates that delivering a safe and stable service is of utmost importance in forming value perception and trust.

Fifth, as Min et al. (2018) advanced, the evidence this study found points to the important role of technology readiness in the ODRS context. Of more importance, technology readiness not only affects intention in pre-adooption condition, but also plays a crucial part in forming value perception after the adoption of ODRS. The result lends support to Wang et al’s (2017) idea that technology readiness influences service evaluation. Under the condition of high technology readiness, the relationship between perceived personalization and perceived value has been found to be stronger. To clarify, personalization is more likely to transform into desired perceived value for customers who can fully understand and feel secure when using it. This situation is especially true given that many personalized features in ODRS’ mobile applications often raise security concerns due to the requirements of customers’ personal data. Customers with high technology readiness are more trusting toward technology, willing to explore new features, and able to enjoy personalization features instead of feeling insecure and uncomfortable (Parasuraman, 2000). Thus, personalization is more likely to be a value enhancer for customers with high technology readiness in the ODRS context.

**Theoretical implications**

First, this study has gone some way toward enhancing our understanding on determinants of the continuance intention on ODRS. Previous studies have mainly approached the consumers’ motivation to participate in the sharing economy through the TAM. However, the TAM was originally designed for information system acceptance in organizational settings, rendering it rather unsuitable for voluntary based setting (i.e. use of ODRS). This study attempts to enrich the understanding of the area beyond the TAM perspective by employing the means-end chain theory. In this way, this study takes a value-centric stance and addresses the largely untested inter-relationships among trust, perceived value and continuance intention in shared service context.
Second, the novel contribution of the present study stems from exploring the factors influencing trust and perceived value. Although previous research has highlighted the importance of trust and perceived value, the factors that constitute the formation of trust and perceived value are missing in the literature. Grounded in the means-end chain theory, this study not only exhibits the effects of service attributes, but also delineates the role of personal values in influencing trust and perceived value. Third, testing the mediating effect of trust in the relationship between service attributes, personal values, and perceived value adds to the growing body of knowledge on the role of trust, specifically in the shared service context. The significant mediating effects found suggest that trust should be considered when future research aims to explain factors influencing perceived value.

Fourth, previous research has called for the inclusion of individual differences, especially technology readiness in investigating shared service participation. Contemporary shared services are information technology-based and thus technology readiness should play a significant role in the perceived value formation process. Previous studies have mainly emphasized on the direct impact of technology readiness on product adoption. This study is one of the first attempts to thoroughly examine the moderating effect of technology readiness in the post-adoption context. Specifically, this study delineates the significant moderating effect of technology readiness in the relationship between perceived personalization and perceived value, widening the knowledge on technology readiness in a post-adoption context. Finally, previous research has mainly focused on adopting intention. This study extends the literature by investigating the continuance intention, which better reflect the post-consumption experience and sustainability of ODRS.

Managerial implications
First, in achieving greater perceived value gained and customers’ trust, the findings show that ODRS firms should prioritize perceived personalization and perceived usefulness of rating system. ODRS should move toward humanization in servicing customers, devoting more to the improvement of personalized communication with the appropriate use of customer information. Besides, it has been shown that the ratings are generally inflated and not very accurate (Filippas et al., 2017). Therefore, in order to strengthen the level of trust among users, ODRS firms may consider creating a system environment that encourages honest and in-depth ratings, wider rating participation and allows user reviews to be accessible by others. Also, constant monitoring and filtering users of either drivers or riders, based on their performance, should never be overlooked.

Second, ODRS firms, such as Uber and Grab, can develop and improvise their services to appeal to their target market’s personal values. The findings suggest that service providers should emphasize the specific value of a peaceful life in their service offerings to improve the value outcome and customer trust. The personal value of a peaceful life can be achieved by making the services more convenient, safe, and enjoyable. Besides, continuously improvement in applications’ ease of use, meticulous driver selection and pro-customer assistant features are critical to create a safe and worry-free ridesharing service.

Third, as the relationship between perceived personalization and perceived value is stronger when customers have high technology readiness, managers are advised to devise personalization strategies carefully and consider customer acceptability. ODRS firms should make personalization features optional as they are beneficial to customers with a higher degree of technology readiness. High personalization may not be desired by certain customers due to the sacrifice of their information privacy. However, personalization appears to be the right approach for younger generation as they are more likely to have high technology readiness, and thus this group of customers is the key target market for future sustainability of the ODRS industry.
Conclusions
This study has certain limitations. First, this research sourced respondents from a single country (Malaysia), thus hindering the ability to generalize the findings to populations of other countries. A comparative study between countries can offer better insights. Second, this research was based on a cross-section survey, in which exposure and outcome are simultaneously assessed. A longitudinal study is suggested as value perception and its antecedents may change over time. Third, the dimensions of personal values and perceived values can be further explored using the mixed-method or qualitative approach to capture the richness and validity of the construct conceptualization in this context. Fourth, future studies are suggested to examine the subject from the perspective of intrinsic motivation, such as anti-consumption attitude, and extrinsic motivation, like marketing tools to promote the use of ODRS. Lastly, future research is suggested to test the construct of perceived innovativeness with a different scale that can better reflect the multiple dimensions of service innovativeness. Ridesharing services has emerged as a viable alternative to transportation that fulfills the needs of the consumers of today. As the size of the industry has continued to grow, so has the magnitude of its economic and social impacts. Hence, much more needs to be done to understand the complex economic, regulatory and technological issues surrounding the industry. The current study indeed provides the first step in understanding the interplay of consumer mechanisms that drive the sustainability of this unique service.

References


Role of trust and perceived value in ODRS


Further reading


Appendix

| CI1 | 1.426 | 1.13 | 0.169 | 1.457 | 1.145 | 0.132 |
| CI2 | 1.373 | 1.097 | 0.150 | 1.409 | 1.134 | 0.106 |
| CI3 | 1.423 | 1.15 | 0.11 | 1.453 | 1.176 | 0.072 |

*Table AI.* Result of PLS-predict

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