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Article

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Cogent Business & Management

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Suggested Citation: Handayani, Putu Wuri; Azzizah, Safa Fathya; Annisa, Audrey (2022) : The impact of user emotions on intentions to continue using online food delivery applications: the influence of application quality attributes, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 9, Iss. 1, pp. 1-20,
<https://doi.org/10.1080/23311975.2022.2133797>

This Version is available at:

<https://hdl.handle.net/10419/289286>

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To cite this article: Putu Wuri Handayani, Safa Fathya Azzizah & Audrey Annisa (2022) The impact of user emotions on intentions to continue using online food delivery applications: the influence of application quality attributes, Cogent Business & Management, 9:1, 2133797, DOI: [10.1080/23311975.2022.2133797](https://doi.org/10.1080/23311975.2022.2133797)

To link to this article: <https://doi.org/10.1080/23311975.2022.2133797>



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Received: 23 February 2022
Accepted: 14 May 2022

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Reviewing editor:
Albert W. K. Tan, Asia Pacific Graduate Institute, Shanghai Jiao Tong University, Singapore

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OPERATIONS, INFORMATION & TECHNOLOGY | RESEARCH ARTICLE

The impact of user emotions on intentions to continue using online food delivery applications: the influence of application quality attributes

Putu Wuri Handayani^{1*}, Safa Fathya Azzizah¹ and Audrey Annisa¹

Abstract: This study analyzes the quality attributes to online food delivery applications (OFD) that affect users' emotions and their continuous use intentions according to the pleasure–arousal–dominance and stimulus–organism–response theories. The study employs a mixed methods approach. The data processing and analysis of quantitative data were carried out using the covariance-based structural equation modeling method. We use content analysis to proceed the qualitative data. The results of this study indicated that the convenience quality attribute affected users' pleasure, arousal, and dominance, but the price information quality attribute only affected dominance, and the trustworthiness quality attribute do not affect any of the three user emotions. Furthermore, pleasure, arousal, and dominance affected intentions to continue using OFD. The limitation of this research is that respondents are dominated by respondents who live in urban areas. The results of this study are expected to provide theoretical contributions regarding the analysis of the quality attributes of OFD that affect the user's emotions on the user's continuous use intention of OFD. Finally, this study can assist OFD service providers in developing their applications.

Subjects: Social Impact of Computing & IT on Society; Management of IT; Mobile Systems

Keywords: online food delivery applications; user emotions; continuous usage intention; food delivery applications' quality attributes; Indonesia

1. Introduction

Global mobile commerce sales reached USD 2.35 trillion in 2019 and are expected to reach USD 2.95 trillion by 2020 (Statista, 2020c). Mobile applications (hereafter “apps”) are software applications that run on mobile devices and provide various services such as online food ordering and delivery, online shopping, instant messaging, navigation, and games (Hsieh et al., 2021). The number of mobile app downloads reached 140 billion in 2016 and increased to 204 billion in 2019 (Statista, 2020a). Additionally, Statista (2020a) stated that in the second quarter of 2020, consumers spent USD 37.8 billion on mobile apps.

The increase in the use of mobile devices has led to the emergence of various online food delivery apps (hereafter “OFD”; V. C. Yeo et al., 2017; Kapoor & Vij, 2018; Ray et al., 2019; Roh & Park, 2019), which now constitute one of the fastest growing mobile commerce sectors, reaching USD 107.4 billion worldwide in 2019 and estimated to reach USD 182.3 billion by 2024 (Forbes, 2021; Statista, 2020b). An OFD is a service for the ordering and delivery of food from various restaurants through the app (Pigatto et al., 2017). Pigatto et al. (2017) explained that, when using an OFD, users can search for their desired restaurants, select the menus available at those

restaurants, and provide their delivery addresses. Another app resembling OFD is electronic grocery (e-grocery) shopping, which is a form of electronic commerce that allows consumers to buy various foodstuffs online (Driediger & Bhatiasavi, 2019). The difference between OFD and e-grocery apps lies in the items being sold, with the OFD focusing on selling various prepared foods and e-grocery apps focusing on selling food ingredients.

Users have different priorities and preferences for food and have different expectations regarding OFD quality and service (Cho et al., 2019). Cho et al. (2019) explains that the quality attribute of OFD apps has a significant and positive effect on the user's perceived value, then the user's perceived value also has a significant and positive effect on the user's continued use intention. The food selection process on OFD apps to the payment process can affect the user's emotional response (Kumar et al., 2021). Jain et al. (2021) also stated that these emotional responses influence user behavior, such as buying behavior, continuing, or leaving OFD apps. In other words, emotional responses can guide future user behavior (Jain et al., 2021).

In the other hand, most researches regarding OFD are related with intention and continuance intention of using OFD. Research on users' continuance intention to use OFD apps for specific country has been investigated by Amin et al. (2021a), Amin et al. (2021b), Kumar and Shah (2021), Jain et al. (2021), and Zanetta et al. (2021), Cho et al. (2019), and Jun et al. (2021) analyze the users' intention on using OFD apps. Jun et al. (2021) also stated that research results for certain country may vary across countries due to cultural difference and other factors. Amin et al. (2021a), Amin et al. (2021b), and Kumar and Shah (2021) focus on analyzing user satisfaction in reusing OFD apps. Then, research on the emotions generated by users in the use of OFD has been investigated by Gavilan et al. (2021), Kumar and Shah (2021), and Jain et al. (2021). Research on the quality attributes of OFD has been investigated by Kumar and Shah (2021), Jain et al. (2021), Cho et al. (2019), and Azizul et al. (2019), where the research of Kumar and Shah (2021) and Jain et al. (2021) specifically examines the quality attributes of OFD apps on the emotions that users generate when using OFD in the form of pleasure, arousal, and dominance (PAD). However, the research of Kumar and Shah (2021) and Jain et al. (2021) only examined the quality attributes of OFD, which were limited to design attributes. Cho et al. (2019) and Azizul et al. (2019) in their research state that there are other quality attributes of OFD apps besides design attributes, namely trustworthiness, convenience, and competitive price which are required also by OFD. The trustworthiness of OFD has been identified as the main driver of users' intentions to continue using OFD (Kang & Namkung, 2019). Price information on OFD can motivate users to use OFD repeatedly (Sharma et al., 2021). Buvaneswari et al. (2021) also found that the convenience aspect of OFD can increase users' intentions to continue using them.

Indonesia, as the country with the fourth largest population in the world, has high numbers of OFD apps (Nielsen, 2019). Nielsen's (2019) showed that, in 2019, around 58 % of Indonesians bought food through OFD on mobile devices. On average, Indonesians' bought food through OFD on mobile devices 2.6 times per week (Nielsen, 2019). Then, OFD market in Indonesia reached USD 1.09 billion in 2020 with an estimated annual growth rate of 11.5% in the period 2020–2025 (Reogma, 2020; Statista, 2020d). Currently, OFD service providers in Indonesia are dominated by GoFood and GrabFood (Taufik et al., 2020). Additionally, e-commerce companies are starting to provide OFD services, including Shopee, which launched ShopeeFood in early 2021 (Shopee Indonesia, 2021). Thus, the main question underpinning this study was: What quality attributes of OFD elicit the emotions that affect users' intentions to continue using OFD? The results of this study are expected to provide a reference for OFD service providers in developing their services and thus assist them in increasing users' intentions to continue using OFD.

2. Literature review and hypothesis

2.1. Food delivery apps

An OFD is an internet-based food ordering and delivery system that connects customers with restaurants through a mobile app (Ray et al., 2019). Pigatto et al. (2017) defined OFD as food ordering

and delivery services from various restaurants through apps. According to Pigatto et al. (2017), OFD provide ordering, monitoring, payment, and tracking facilities for food delivery. OFD can be divided into two categories (Zhao & Bacao, 2020). The first category, according to Zhao and Bacao (2020), refers to restaurants that have their own apps for taking orders online, such as Pizza Hut or Domino's. The second category refers to third-party services that act as intermediaries between users and restaurants, such as Uber Eats or Swiggy (Roh & Park, 2019; Zhao & Bacao, 2020).

2.2. Stimulus–organism–response

The Stimulus–organism–response (SOR) theory developed by Mehrabian and Russell (1976) holds that various environmental stimuli (S) influence the internal cognition or state of an individual organism (O) and drive its behavioral responses (R; Kamboj et al., 2018; Mehrabian & Russell, 1976). Stimuli are environmental factors that influence consumers' behavior and psychology (Kumar et al., 2021a, 2021b; Zhai et al., 2019). Kumar et al. (2021a); (2021b) and Zhai et al. (2019) claimed that organisms (i.e., consumers) experience feelings or internal changes in response to stimulus; thus, responses reflect the results of stimulus and organism (Zhai et al., 2019). The SOR model uses a visual framework to study the impact of a stimulus on a user's internal psychology, which then determines the user's behavioral response (Jain et al., 2021). Consumers respond according to previously received stimuli (Peng & Kim, 2014) and, during the process, their internal cognitions are reflected by their emotions (Zhai et al., 2019).

2.3. Pleasure, arousal, and dominance

Mehrabian and Russell (1976) proposed a PAD theory based on an environmental psychology perspective to understand the emotions that influence users' judgments and responses. The study identified three basic emotions: pleasure, arousal, and dominance (Mehrabian & Russell, 1976). Pleasure is the extent to which users feel happy or satisfied with an environment (Hsieh et al., 2021). Arousal is the extent to which users feel excited or active in a situation (Hsieh et al., 2021). Dominance is the extent to which users feel free to act or in control in a situation (Hsieh et al., 2021). PAD refers to the main emotional responses that reveal an individual's perception of the physical environment (Chang et al., 2014). The PAD model describes the emotional dimensions that are shaped by the environment and affect individual behavior (Hsieh et al., 2021). When PAD is formed, users tend to adopt behaviors in the surrounding environment (Hsieh et al., 2021).

2.4. Research hypotheses

The research model for this study modifies the research models of Azizul et al. (2019) and Cho et al. (2019) by including the PAD and SOR theories. This study adopts the SOR theory that can describe a cause-and-effect relationship so that it can explain user orientation towards OFD (Jain et al., 2021). This study uses the quality attribute of the OFD as an environmental stimulus (S). According to Mehrabian and Russell (1976), and Jain et al. (2021), the response to environmental stimuli is internal cognition or the state of the organism (O) in the form of emotions generated by the user, namely pleasure, arousal, and dominance (PAD). This study adopts PAD theory in the context of OFD because PAD theory can accurately express consumer preferences in the context of using OFD (Roh & Park, 2019), and is suitable for evaluating the results of emotional responses regarding the use of OFD (Kumar & Shah, 2021). Furthermore, the internal cognition or state of an individual's organism drives a behavioral response (R) in the form of the user's continued use intention in OFD (Jain et al., 2021; Kamboj et al., 2018; Mehrabian & Russell, 1976).

Thus, in this research model, there are three exogenous variables: trustworthiness, convenience, and price information as environmental stimulus (S). The research model also includes four endogenous variables: pleasure, arousal, and dominance as internal cognition or the state of the organism (O), and continuous usage intention as a behavioral response (R). The study was based on 12 hypotheses, as shown in Figure 1. Table 1 describes the variables' description used in this study.

Nilashi et al. (2015) defined trustworthiness as a user's trust in mobile apps, which plays an important role in their decisions regarding online purchases. In the context of this study,

Figure 1. Proposed conceptual model.

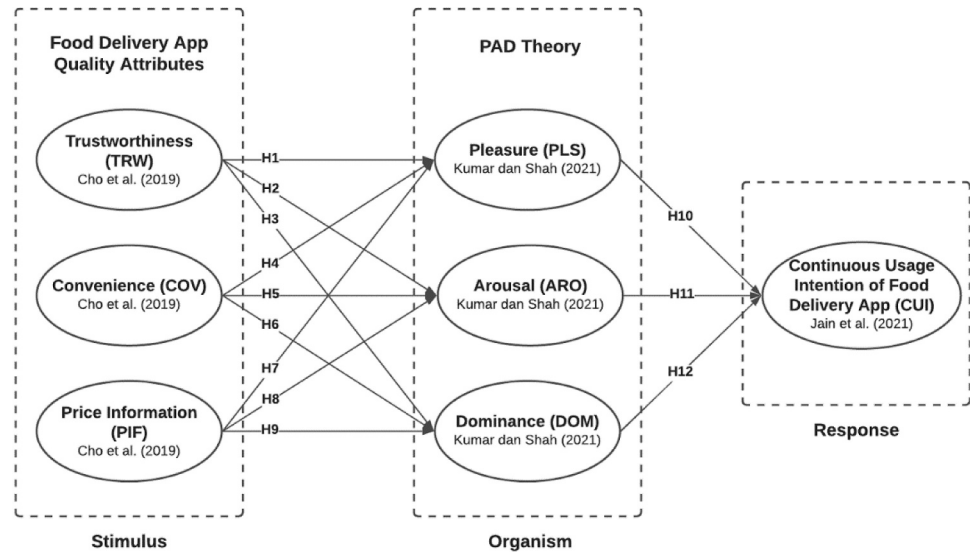


Table 1. Variable's description

Variable	Description	References
Trustworthiness	the extent to which users trust an OFD to be reliable and secure	Nilashi et al. (2015), Li and Yeh (2010), Cho et al. (2019), Hsieh et al. (2021), S. F. Yeo et al. (2021)
Convenience	the extent to which users can access and use OFD at convenient times and places	F. Liu et al. (2017a), (2017b)), Ray et al. (2019), Cho et al. (2019) and Huang et al. (2017)
Price information	the extent to which OFD can display information related to the prices of products or services offered	Cho and Park (2001), Alalwan (2020)
Pleasure	the extent to which users feel happy or satisfied when using an OFD	Hsieh et al. (2021), Zarantonello and Schmitt (2010)
Arousal	the extent to which users feel excited, interested, or active when using an OFD	Hsieh et al. (2021), Jain et al. (2021)
Dominance	the extent to which users feel free to act or in control when using OFD	Hall et al. (2017), Hsieh et al. (2021), Kumar and Shah (2021)
Continuance usage intention of food delivery app	users' intentions to continue using OFD	Kumar and Shah (2021), Jain et al. (2021), Cho et al. (2019)

trustworthiness is the extent to which users trust an OFD to be reliable and secure. Li and Yeh (2010) stated that trustworthiness plays an important role in producing a satisfying online transaction experience. Moreover, Jain et al. (2021) and Kumar and Shah (2021) claimed that a relationship exists between the design quality attributes of OFD and PAD. Azizul et al. (2019) and Cho et al. (2019) asserted that, besides the design quality attribute, trustworthiness is a vital OFD quality attribute. OFD with high trustworthiness, such as through their provision of reliable information, create a sense of confidence in users (Cho et al., 2019; Hsieh et al., 2021). Then, the high level of security in the OFD can also make users feel confident when using the application because there is a guarantee that there is no risk when ordering food through the OFD (Cho et al., 2019; S. F. Yeo et al., 2021; Hsieh et al., 2021). OFD with a high level of trustworthiness allow users to get results that match what they do on the application so that users can feel satisfied when using OFD (S. F. Yeo et al., 2021; Jain et al., 2021; Uzir et al., 2021; Zhao & Bacao, 2020).

Furthermore, the trustworthiness of OFD can make users feel pleasure emotions, such as feeling happy, satisfied, or confident when using OFD. We proposed the following hypothesis:

H1: Trustworthiness (TRW) influences pleasure (PLS) in using OFD.

High-level OFD trustworthiness allows users to believe and feel safe when placing orders through the apps (Cho et al., 2019). Users who trust OFD can actively explore those apps without worrying about the security of user data (Chang et al., 2014; Cho et al., 2019). OFD with high levels of trustworthiness can also help users to obtain results according to what they do on the apps so that they will feel interested when using the apps (S. F. Yeo et al., 2021; Jain et al., 2021). Trust in OFD can therefore make users experience arousal, such as being interested or active when using OFD. We proposed the following hypothesis:

H2: TRW influences arousal (ARO) in the use of OFD.

OFD with high levels of trustworthiness can make users feel in control when using the apps because their actions on the apps give appropriate results (S. F. Yeo et al., 2021; Hsieh et al., 2021; Kumar & Shah, 2021). When users feel safe ordering through an OFD, they also feel free to act on the app (Cho et al., 2019; Hsieh et al., 2021). The trustworthiness of OFD can also determine the type of experience that users have based on the actions they take when using the apps (Hsieh et al., 2021); therefore, trust in OFD can make users experience dominance, such as the freedom to act or be in control when using the apps. We proposed the following hypothesis:

H3: TRW influences dominance (DOM) in the use of OFD.

F. Liu et al. (2017a), (2017b)) defined convenience as the guarantee of accessing and using mobile apps at convenient times and places. Ray et al. (2019) explained that convenience refers to the ability to use something without difficulty. In the context of this study, convenience is the extent to which users can access and use OFD at convenient times and places. Also, Azizul et al. (2019) asserted that convenience acts as an attraction and motivator for users to choose an OFD. Cho et al. (2019) and Huang et al. (2017) explained that convenience affects the emotions that app users feel. Jain et al. (2021) and Kumar and Shah (2021) claimed a relationship between the design quality attributes of OFD and PAD. Furthermore, Azizul et al. (2019) and Cho et al. (2019) stated that besides the design quality attribute, the convenience quality attribute is important. High levels of convenience in using OFD can generate a sense of joy or satisfaction for users when using those apps (Cho et al., 2019; Jain et al., 2021; Nuryakin, 2016). OFD that offer high levels of convenience in comparing prices from different places can also foster users' sense of confidence when using the apps (Hsieh et al., 2021; Ray et al., 2019) because, based on the results of price comparisons on OFD, users can confidently determine the choice of food products according to their desired prices. Furthermore, OFD that allow users to order food anytime and anywhere can also make users feel happy when using OFD (Cho et al., 2019; Jain et al., 2021; Nielsen, 2019). We proposed the following hypothesis:

H4: Convenience (COV) influences PLS in using OFD.

OFD allow users to order anytime and anywhere (Cho et al., 2019). This can make users enthusiastic when using the app and feel that the OFD is attractive (Chang et al., 2014; Chen & Yao, 2018; Jain et al., 2021). Furthermore, a sense of comfort when using OFD can prompt users to actively explore those apps (Chang et al., 2014; Cho et al., 2019); for example, the convenience

provided by an OFD to compare food prices encourages users to be more active in exploring various food options on the app and find prices that suit their preferences (Chang et al., 2014; Ray et al., 2019). The convenience of OFD can make users experience arousal, such as enthusiasm or activeness, when using OFD. We proposed the following hypothesis:

H5: COV influences ARO in the use of OFD.

The convenience of comparing prices on OFD allows users to feel they have control over the OFD (Kumar & Shah, 2021; Ray et al., 2019). By providing features that allow users to comfortably compare prices, the OFD gives full rights to the user to control the price of the food product they want to buy. Users also feel in control when using OFD when they can place orders anytime and anywhere (Cho et al., 2019; Hsieh et al., 2021; Kumar & Shah, 2021); therefore, the convenience of OFD makes users experience dominance in terms of being in control or having the right to control when using the apps. We proposed the following hypothesis:

H6: COV influences DOM in the use of OFD.

Cho and Park (2001) identify price information as information on the price of a product or service that is in accordance with what is being offered. In the context of this study, price information is the extent to which OFD can display information related to the prices of products or services offered. Alalwan (2020) found that price information affects user satisfaction as a form of emotion felt by users when using food delivery apps. Jain et al. (2021) and Kumar and Shah (2021) claimed a relationship between the design quality attributes of OFD and PAD. Furthermore, Azizul et al. (2019) and Cho et al. (2019) stated that besides the design quality attribute, the price information quality attribute is important. OFD that have price information make it easier for users to find information about appropriate product prices (Cho et al., 2019), which can generate a sense of confidence (Hsieh et al., 2021). Furthermore, OFD with price information about available promos can create a sense of joy for users when using those apps (Jain et al., 2021; Ray & Bala, 2021). Another price information that OFD have is that they can display prices based on users' requests (Ray & Bala, 2021), which can enhance users' satisfaction with OFD (Alalwan, 2020; Jain et al., 2021) and engender pleasurable feelings, such as happiness, satisfaction, or confidence when using food delivery apps. We proposed the following hypothesis:

H7: Price information (PIF) influences PLS in using OFD.

Promo information displayed on OFD can arouse users' enthusiasm for using OFD (Chang et al., 2014; Chen & Yao, 2018; Ray & Bala, 2021). Also, the promo information displayed on OFD can trigger an active sense of exploration of promotions on the food delivery apps (Chang et al., 2014; Ray & Bala, 2021). Adjustment of the prices displayed on OFD according to user demand creates attractiveness for app users (Jain et al., 2021; Ray & Bala, 2021); therefore, the ability of OFD to display price information can make users experience arousal, including enthusiasm, interest, or activeness when using those apps. We proposed the following hypothesis:

H8: PIF influences ARO in the use of OFD.

Another price information on OFD is that they can display the total price that users will need to pay on OFD (Sharma et al., 2021). This can make users feel they have the right to control OFD (Kumar & Shah, 2021). The display of the total price on the app gives users the right to control their orders based on consideration of the total price, such as adding, subtracting, or confirming orders.

Furthermore, OFD that display prices based on users' requests make users feel in control when using them (Hsieh et al., 2021; Kumar & Shah, 2021; Ray & Bala, 2021), because the users can control which food products will be displayed according to their desired prices. The ability of OFD to display price information can allow users to experience dominance in terms of being in control or having the right to control when using OFD. We proposed the following hypothesis:

H9: PIF influences DOM in the use of OFD.

Hsieh et al. (2021) defined pleasure as the extent to which an individual feels happy or satisfied within an environment. In the context of this study, pleasure is the extent to which users feel happy or satisfied when using OFD. Yang et al. (2020) found a positive relationship between pleasure and continuous usage intentions. Zarantonello and Schmitt (2010) also claimed that the pleasure felt by users can trigger app reuse. In the context of OFD, Kumar and Shah (2021) showed that pleasure is positively related to intentions to continue using OFD. Also, Miniero et al. (2014) stated that pleasure determines intentions to use OFD, and Jain et al. (2021) confirmed a positive relationship between the emotional dimensions of pleasure and continuous usage intentions regarding OFD. A pleasant user experience can motivate users to reuse OFD and experience the same satisfaction again (Jain et al., 2021). Pleasurable emotions, such as liking, satisfaction, joy, or confidence when using food delivery apps, affect users' intentions to continue using OFD. We proposed the following hypothesis:

H10: PLS influences continuous usage intention (CUI) in OFD.

Arousal is the extent to which individuals feel excited or active in a situation (Hsieh et al., 2021). In the context of this study, arousal is defined as the extent to which users feel excited, interested, or active when using OFD. Bi et al. (2020), Yang et al. (2020), and Zhang et al. (2020) showed that arousal is related to user intentions. Furthermore, Miniero et al. (2014) explained that arousal plays an important role in determining users' future behavior. Yang et al. (2020) also stated that arousal affects users' intentions to reuse. The arousal felt by users can motivate them to intend to reuse OFD (Jain et al., 2021) because users want to experience arousal emotions again by continuing to use the OFD. The reuse of OFD by users can be related to activities of browsing on apps, trying various app features, and ordering or paying for orders (Jain et al., 2021); therefore, arousal, including feeling excited, enthusiastic, interested, or active when using OFD, affects users' intentions to continue using OFD. We proposed the following hypothesis:

H11: ARO influences CUI in OFD.

Hall et al. (2017) explained that dominance reflects the freedom, autonomy, or control of the user. Hsieh et al. (2021) defined dominance as the extent to which individuals feel free to act or in control in a situation. In the context of this study, dominance is the extent to which users feel free to act or in control when using OFD. Kumar and Shah (2021) found that dominance was positively related to continuous usage intentions regarding OFD, based on users' sense of control over the apps (Hsieh et al., 2021). Hsieh et al. (2021) explained that when users feel they have control, they will intend to reuse the apps. Users can experience dominance when using OFD when they have control and the right to control those apps (Kumar & Shah, 2021). Since, when using OFD, users can freely choose between the various products available on the app, they will have various types of experiences when using those apps according to the actions they take (Hsieh et al., 2021). Users' sense of control when using OFD can increase their likelihood of reusing the apps and reexperiencing the emotion (Kumar & Shah, 2021). In other words, when users experience dominance when using OFD, it fosters their intentions to continue using that app; therefore, dominance, including

a sense of freedom to act, being in control, or having the right to control when using OFD, affects users' intentions to continue those apps. We proposed the following hypothesis:

H12: DOM influences CUI in OFD.

3. Research methods

3.1. Data collection

This study used a mixed methods approach that combined a quantitative online questionnaire and qualitative interviews. Based on O'Cathain et al. (2007), mixed methods approach is used to increase the confidence of findings, comprehensiveness and ensuring that disempowered people are heard. To the best of our knowledge, there is limited sources analyzing the OFD then we used a qualitative approach to deepen the interpretation of the results of the hypothesis, especially for the rejected hypothesis due to limited OFD research in Indonesia. Due to the rapid growth of OFD users; thus, this study focused on OFD that acted as third-party intermediaries between users and restaurants in Indonesia, such as GoFood, GrabFood, ShopeeFood, and others. GoFood, GrabFood, and ShopeeFood, respectively, offer Gojek, Grab, and Shopee products in the food category (Gojek, 2021; Grab, 2021; Shopee Indonesia, 2021). The purpose of quantitative approaches is to develop theoretical models and/or hypotheses, identify causal relationships, and test hypotheses (Bhawna & Gobind, 2015; Taguchi, 2018).

To test the feasibility of the questionnaire, we conducted a readability test to observe the extent to which each question and statement on the research questionnaire could be clearly understood by the readability test participants. The readability test was carried out with seven participants who met the criteria for participation: Indonesian people who had conducted transactions on OFD. For the readability test, participants were asked to provide feedback on the research questionnaire. The feedback suggestions included improving the grammar of the writing, such as diction and sentence structure; adding explanations; and adjusting the context to the research. The questionnaire was improved based on this feedback and then distributed to collect research data. Thus, we do not used pilot study since Tsang et al. (2017) stated that it is advisable to test questionnaire items if there is confusion about any items and from the readability test, we have improved our questionnaire.

The distribution of research questionnaire links was carried out through several social media channels: LINE, WhatsApp, Instagram, and Twitter. The social media channels were chosen because they had many users from various circles. The criteria for the respondents were Indonesian people who had conducted transactions on OFD (purposive sampling). A purposive sample is the one whose characteristics are defined for a purpose that is relevant to the study; thus, the findings relevant for subpopulations can be identified (Andrade, 2021). The questionnaire data collection was carried out for three weeks, from 9 September 2021, to 10 October 2021. We gave a total prize of Rp. 500,000.00 for ten lucky respondents who provided valid answers to the questionnaire. We managed to get 618 respondents but only 591 respondents have ever used OFD to make transactions. Table 2 shows the demographics of the respondents.

Furthermore, this study also applied a qualitative approach by conducting in-depth interviews with five people to confirm the quantitative research results on the rejected hypothesis. Vasileiou et al. (2018) found that the sample size of qualitative research is determined by the saturation and to pragmatic considerations. Since we selected the five respondents that are advanced in using OFD and from the result of the five respondents, we understood the reason why the hypotheses are being rejected. Interviews were conducted with five people because the odd number of people can make it easier to find most answers where there are no different answers with a balanced number. The interviews were held over five days, from 26 October 2021, to 30 October 2021. We

Table 2. Respondents' demographics

Demographics		Number of Respondents	Percentage
Gender	Women	333	56.3 %
	Men	258	43.7 %
Age	17–25 years old	331	56.0 %
	26–35 years old	109	18.4 %
	36–45 years old	91	15.4 %
	>45 years old	60	10.2 %
Domicile	Greater Jakarta	329	55.7 %
	Outside Greater Jakarta (Java)	130	22.0 %
	Kalimantan	81	13.7 %
	Sumatera	28	4.7 %
	Sulawesi	10	1.7 %
	Bali	7	1.2 %
	Maluku/Papua	6	1.0 %
The most frequently used OFD	GoFood	285	48.2 %
	GrabFood	245	41.5 %
	ShopeeFood	57	9.6 %
	Others	4	0.7 %
Duration of using OFD	3–4 years	213	36.0 %
	1–2 years	175	29.6 %
	>4 years	135	22.8 %
	<1 year	68	11.5 %

used Zoom to interview each of the respondent, and all the respondents has given their consent to be involved in this study. We record and transcribe the qualitative data.

3.2. Analysis methods

We used the covariance-based structural equation modeling (CB-SEM) method to analyze the data because this quantitative study was a confirmatory study. The CB-SEM steps were carried out according to Hair et al. (2010) and Kline (2011), consisting of model specifications, model identification, model evaluation and data filtering, measurement model testing, and structural model testing. The software packages used to process and analyze the research data were AMOSTM 26, IBM® SPSS® Statistics 25, and Google Sheets. AMOSTM 26 was used to analyze the data with the CB-SEM method, IBM® SPSS® Statistics 25 was used to perform common method bias (CMB) and Cronbach's alpha (CA) tests, and Google Sheets was used to manage and process the data from the research questionnaire and the results of the data analysis.

Moreover, we used content analysis to proceed the qualitative data. We selected content analysis due its strengths to describe qualitative summary of key findings (Hsieh & Shannon, 2005). We follow the coding techniques based on Forman and Damschroder (2007) which included three phases namely immersion to the data, reduction of the data through systematic coding, and interpretation of the findings for the rejected hypothesis.

3.3. Research instruments

The research instrument was an online questionnaire consisting of three parts. The first part was a validation section to ensure that respondents met the criteria for research participation (i.e., Indonesian people who had conducted transactions on food delivery apps). The second part

contained questions relating to the respondents' demographics. The third part contained statements about variable indicators related to the research. This section included 28 statements about the 7 research variables. These statements were rated by respondents based on their experiences and feelings when using the food delivery apps. This study used a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5) to represent the respondents' views on the measurement items. Based on Sachdev and Verma (2004), a five-point Likert scale has been recommended by the researchers to reduce the frustration level of respondents and increase response rate and response quality. Appendix describes the measurement items used in this study.

4. Results

4.1. Measurement and structural models

This study has a value of % of variance is 49.689% and this value indicates that this study has met the requirements of the CMB test. Thus, this study could continue to the measurement model testing. Based on Hair et al. (2010), a convergent validity test was carried out by calculating the factor loading and average variance extracted (AVE) values. Furthermore, according to Hair et al. (2010), the value for all factor loadings was ≥ 0.7 and the AVE values of each variable was ≥ 0.5 (Table 2); thus, this study has met all the requirements. Based on Hair et al. (2010), a reliability test was done by calculating the composite reliability (CR) and CA values. Those values should have value ≥ 0.7 (Hair et al., 2010). Table 3 shows that the CR and CA values for all variables met the requirements.

A goodness of fit (GoF) test on the structural model was carried out by considering the criteria for the chi-squared fit statistics/degree of freedom (CMIN/df), goodness-of-fit index (GFI), root mean square residual (RMR), normed fit index (NFI), comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA) values. Table 4 shows the GoF values after adding covariance to the structural model. The table shows that all the GoF criteria met the cut-off value according to the requirements.

4.2. Hypothesis testing

Hypothesis testing, according to Hair et al. (2014), is a test carried out to determine the relationships between exogenous variables and endogenous variables based on a research model. This study conducted a two-tailed hypothesis test with a significance level of 5 %. The hypothesis was accepted if the p value was < 0.05 (Hair et al., 2014). Table 5 shows the results of the hypothesis testing of the 12 hypotheses tested, 7 were accepted and 5 were rejected.

5. Discussion

This study found that H1 was rejected because it proved that trustworthiness does not affect pleasure in using OFD. The H1 results contrasted with the results of Uzir et al. (2021) and Zhao and Bacao (2020), which indicated that users' trust in OFD affects their satisfaction when using those apps. Furthermore, the results of the qualitative interviews with interviewees who had conducted

Table 3. AVE, CA, and CR values

Variable	AVE	CA	CR
TRW	0.740	0.894	0.895
COV	0.625	0.822	0.833
PIF	0.688	0.866	0.868
PLS	0.794	0.932	0.939
ARO	0.707	0.904	0.906
DOM	0.730	0.885	0.890
CUI	0.701	0.867	0.875

Table 4. GoF values of final structural model

Criteria	Cut-Off Values	Result	Description
CMIN/df	<2	1.982	Good fit
GFI	≥0.9	0.945	Good fit
RMR	≤0.05	0.014	Good fit
NFI	≥0.9	0.965	Good fit
CFI	≥0.9	0.982	Good fit
TLI	≥0.9	0.977	Good fit
RMSEA	≥0.08	0.042	Good fit

Table 5. Hypothesis testing results

Hypothesis				Estimate	Lower	Upper	P
H1	PLS	←	TRW	0.047	−0.304	0.255	0.691
H2	ARO	←	TRW	0.093	−0.149	0.270	0.334
H3	DOM	←	TRW	0.156	−0.034	0.322	0.083
H4	PLS	←	COV	0.903	0.612	1.399	0.002
H5	ARO	←	COV	0.782	0.571	1.116	0.002
H6	DOM	←	COV	0.379	0.147	0.653	0.003
H7	PLS	←	CPR	−0.089	−0.374	0.089	0.433
H8	ARO	←	CPR	−0.07	−0.275	0.081	0.405
H9	DOM	←	CPR	0.353	0.169	0.519	0.001
H10	CUI	←	PLS	0.322	0.206	0.443	0.001
H11	CUI	←	ARO	0.212	0.113	0.321	0.002
H12	CUI	←	DOM	0.428	0.318	0.546	0.002

transactions on OFD showed that the features of OFD could make them believe that the app was reliable and secure: “Yes, I quite believe that OFD have good reliability and security” (Interviewee 1). However, the interviewees felt that their trust in the OFD did not correlate with feeling happy or satisfied when using it:

I don’t think my trust in the OFD makes me feel happy or satisfied when using the app . . . So, there is no correlation between the trustworthiness of the app and feeling happy or satisfied when using the app (Interviewee 4).

Feeling happy or satisfied when using OFD was not influenced by the user’s trust in the app. Responding to the previous explanation regarding the rejection of H1, the interviewee stated the need for development of a feature in the OFD that would allow users to contact the driver even when an order status had been completed: “A feature that needs to be developed, in my opinion, is to be able to chat with the driver even though my order status is complete, so I can confirm my order is correct” (Interviewee 2). Such a feature could make users feel more confident when using OFD. Other interviewee wanted OFD service providers to provide a feature displaying the driver’s location throughout the entire food delivery process: “In my opinion, a feature that should be developed for the app is to display a map of the driver’s location from the start—when you place an order, not just when the driver wants to deliver the order” (Interviewee 5). The development of this feature could make users feel more confident and satisfied when using OFD.

H2, which was rejected in this study, stated that users’ trust in OFD does not make them feel excited, interested, or active when using the apps. The H2 results aligned with Ramkumar and Jin

(2019) that users' trust in a platform does not affect their feelings of enthusiasm, interest, or activeness when using the platform. Furthermore, based on the results of qualitative interviews with interviewees who had used OFD to conduct transactions, it was clear that the interviewees felt that the features of OFD can make them believe the app is reliable and secure:

Yes, I believe in OFD ... Every time I order food, it is always on time according to the estimated information stating when my order will arrive, which is displayed on the app, so the app is reliable in my opinion (Interviewee 4).

However, the interviewees claimed that there was no relationship between user trust in the OFD and the excitement, interest, or activeness they felt when using it: "No, I don't think trust in the app has anything to do with the feeling of excitement when using the app" (Interviewee 3). Therefore, feeling excited, interested, or active when using OFD was not influenced by users' trust in OFD. Moreover, one interviewee wanted the OFD service providers to provide a promo list feature that displays all promos that might apply to the users' orders:

I think the features that should be developed relate to promo. Sometimes there are promo that are displayed on a promo list, but I can't use that for my order. That makes me lose interest in ordering food on the app. Maybe a promo list could be developed that only shows promos that can be used for that orders (Interviewee 4).

Such a feature would make the information displayed on OFD more reliable and encourage users to feel more interested and enthusiastic when using the OFD.

H3, which was rejected in this study, stated that user trust in OFD does not make users feel free to act or in control when using OFD. The H3 results contradicted those of Hsieh et al. (2021), which indicated that users' trust based on reliable information on the app affects their sense of freedom to act or being in control when using the app. Furthermore, based on the results of interviews, interviewees felt that the features of the OFD could make them believe that the app was reliable and secure: "In my experience, OFD make me believe to the app" (Interviewee 5). However, the interviewees felt that their trust in the app did not make them feel free to act or in control when using the food delivery app: "I feel free to act, but it is not because of my trust in the app" (Interviewee 1). Therefore, the feeling of being free to act or in control when using OFD was not influenced by the users' trust in the OFD. Also, other interviewees wanted OFD service providers to provide them with features that would allow them to rate restaurants and see the ratings for restaurants provided by other users:

Features that should be developed are features that can allow customers to rate restaurants on the products ordered and enable customers to see the evaluations of other customers of the restaurant. By looking at the rating of the restaurant, I would have control in deciding whether to order products from that restaurant or not (Interviewee 5).

The development of these features could make users feel more in control and give them the right to control when choosing restaurants for their orders when using OFD.

Based on the results of the accepted H4, convenience affects pleasure in using OFD. One form of convenience felt by users was that of comparing the prices of various restaurants on the app (Ray et al., 2019). The results of price comparisons on OFD can help users confidently determine their choices of food products according to their desired prices. The H4 results aligned with Nielsen (2019). It seems that a main reason for users liking to use OFD is because of the convenience permitted by the OFD.

Based on the results of the accepted H5, convenience affects arousal in the use of OFD. The convenience felt by users when using OFD may be because the apps allow users to order food anytime and anywhere (Cho et al., 2019), which makes users feel interested and enthusiastic when

using OFD. Another form of convenience that users feel when using OFD is that of comparing the prices of various restaurants on the apps (Ray et al., 2019). The convenience of comparing food prices encourages users to be more active in exploring various food options on the apps and finding prices that suit their budgets. The H5 results aligned with those of Chen and Yao (2018), who claimed that user convenience includes using apps anytime and anywhere, which generates feelings of excitement, interest, or enthusiasm when using the apps.

Based on the results of the accepted H6, convenience affects dominance in the use of OFD, showing that the convenience of accessing and using OFD makes users feel free to act or in control when using them. The convenience of comparing the prices of various restaurants on OFD is a form of comfort felt by users in using such apps (Ray et al., 2019). The ability to compare prices on OFD makes users feel they have full rights to control which food products they buy according to the prices they want. The H6 results aligned with Hsieh et al. (2021) that one of the reasons users feel free to act or in control when using OFD is because of the convenience of using OFD.

Next, H7, which was rejected in this study, claimed that OFD's ability to display information about the prices of products or services offered on the apps does not foster feelings of joy or satisfaction in users when they use OFD. The H7 results contrasted with those of Alalwan (2020), who explained that price information plays an important role in building user satisfaction with OFD, which is a form of emotional pleasure in using OFD. The results of the qualitative interviews also showed that the interviewees felt that OFD could display information about the prices of the products or services offered: "Yes, so far the OFD displays price information" (Interviewee 3). However, the interviewees felt that OFD's ability to display price information did not make them feel happy or satisfied with the app, because they saw no correlation between the ability of OFD to display price information and feelings of joy or satisfaction when using those apps. Furthermore, one interviewee added that the ability of OFD to display price information is a basic requirement of OFD and does not necessarily make users feel happy or satisfied with the app:

In my opinion, the ability of the app to display price information is a basic thing that the app must have, so the ability of the app to display price information, in my opinion, does not affect feelings of joy or satisfaction gained by using the app (Interviewee 4).

The interviewee stated that the feature that needs to be developed in the OFD is the promo filter feature to display promos that can be used for certain restaurants or orders:

In my opinion, the feature that can be developed is the promo filter feature to display promos that can be used at certain restaurants. If there is such a feature, when choosing a food or restaurant, the customer does not have to try one by one the existing promos to know that the promo can be used in the order or restaurant that the customer wants (Interviewee 5).

Also, other interviewee suggested developing a product filter feature to display products according to the promos that users want to use:

In addition, maybe a feature can also be made that displays food whose prices match the promos that I want to use (Interviewee 4).

The development of those features can make users feel more satisfied and confident when using OFD.

Moreover, H8, which was rejected in this study, stated that an OFD's display of information relating to the prices of products or services offered on the app does not build a sense of excitement, interest, or activeness in users when they use OFD. The H8 results contradicted those of Chen and Yao (2018), who stated that the ability of apps to display promo information

affects feelings of excitement, interest, or enthusiasm when using apps. Moreover, the results of the qualitative interviews showed that the interviewees felt that the OFD could display information about the prices of the products or services offered: “Yes, from my experience using OFD so far, I can see appropriate price information on the apps” (Interviewee 1). Furthermore, another respondent added that the ability of OFD to display price information is one of the general capabilities of OFD and is not intended to make users feel excited, interested, or active when using the app:

No, the ability of OFD to display price information does not affect feelings of excitement, interest, or activeness when using the app because, in my opinion, the ability of an app to display price information has nothing to do with feeling excited, interested, and active when using the app (Interviewee 3).

The ability of OFD to display price information does not make me feel excited, interested, or active when using the app. Regarding that, I feel normal because it is the most basic general ability that a food app must have (Interviewee 1).

A feature that could be developed for OFD is a product filter feature to display products according to the price range specified by the user: “[There is a] need to develop features related to product search according to the entered price range” (Interviewee 3). The development of such a feature could increase users’ activity in exploring various products on OFD.

Based on the results of the accepted H9, the ability of OFD to display information about the prices of products or services offered on the apps makes users feel free to act or in control when using those apps. In other words, the more OFDs can display price information, the more the users will feel free to act or in control when using them. The display of price information by OFD could be in the form of the total price that users can expect to pay (Sharma et al., 2021). The display of the total price on an app gives users the ability to control their orders based on consideration of the total price, such as adding, subtracting, or confirming orders. Another form of the ability of OFD to display price information is the ability to display prices based on user requests (Ray & Bala, 2021). This makes users feel in control when using OFD because they can control which food products to view according to the prices they want to pay. The H9 results aligned with those of Hsieh et al. (2021), who stated that an app’s ability to display price information based on user requests affects the sense of freedom to act or being in control when using the app. A reason for users to feel free to act or in control when using OFD is therefore because of the apps’ ability to display price information.

According to the results of the accepted H10, users feel joy or satisfaction when using OFD, which encourages them to reuse the app and act similarly in the future. In other words, the happier or more satisfied users feel when using OFD, the more they will reuse OFD in the future. The H10 results aligned with those of Kumar and Shah (2021) and Yang et al. (2020), who claimed that pleasure affects continuous usage intentions regarding OFD. Furthermore, these results aligned with Jain et al. (2021), confirming a relationship between the emotional dimensions of pleasure and continuous usage intentions regarding OFD. The feeling of pleasure that users feel when using OFD can motivate them to reuse the app and reexperience the same satisfaction (Jain et al., 2021), reflecting what, in this study, is a form of emotional pleasure in using OFD.

H11, which was accepted in this study, stated that users’ feelings of excitement, interest, or activeness when using OFD trigger their intentions to reuse the app in the future. The H11 results aligned with those of Miniero et al. (2014), who found that arousal played an important role in determining users’ future behavior. This study also aligned with Yang et al. (2020), who explained that arousal affects users’ re-use intentions. Arousal felt by users in terms of excitement, interest, or activeness can motivate them to reuse OFD (Jain et al., 2021) because users want to reexperience the arousal fostered by using OFD.

Finally, based on the results of the accepted H12, users' feelings of being free to act or in control when using OFD encourage them to reuse the OFD in the future. In other words, the freer to act or in control users feel when using OFD, the more they will reuse OFD. The H12 results aligned with those of Kumar and Shah (2021), who stated that dominance is related to continuous usage intentions regarding OFD. Hsieh et al. (2021) also supported H12 which explains that the emotion of dominance involving the user's sense of control over the app encourages the user's intention to reuse the application. Kumar and Shah (2021) explained that users' sense of control over OFD can increase their likelihood of reusing the apps to reexperience the same feelings. In other words, the dominance felt by a user when using an app encourages the user's intention to continue using OFD.

6. Implications

6.1. Theoretical implications

The results of this study contribute to enrich the research of Azizul et al. (2019) and Cho et al. (2019) by including the PAD theory in examining the effect of the quality attributes of OFD on users' intentions to continue using the apps. The study offers a more suitable approach in evaluating the results of users' emotional responses to the use of OFD. Furthermore, the results of this study enrich Jain et al. (2021) and Kumar and Shah (2021) regarding the relationship between the quality attributes of OFD and the PAD theory. This study found that there are other quality attributes of OFD that influence PAD theory, including the quality attributes of trustworthiness, convenience, and price information, which were not examined by Jain et al. (2021) and Kumar and Shah (2021). This study supports the findings that pleasure, and arousal are influenced by convenience quality attributes, and dominance emotions are influenced by convenience and price information quality attributes in the use of OFD. However, the results of this study also contradict those of Jain et al. (2021) and Kumar and Shah (2021) because this study shows that arousal affects continuous usage intentions regarding OFD. This contradiction may have been caused by differences in the -objects of the studies, since the object of this study is continuous usage intention of OFD in Indonesia, whereas the object of Jain et al. (2021) and Kumar and Shah (2021) is continuous usage intention of OFD in India. The difference in OFD used in this study and the other two studies can provide different research results.

6.2. Practical implications

This study is expected to assist OFD service providers in developing their apps. Convenience factors that affect pleasure, arousal, and dominance in the use of OFD indicate that OFD service providers need to focus on developing features that can increase user convenience in accessing and using their apps. OFD service providers can develop a cart feature that allows users to enter orders from different restaurants into the cart so that users can compare the prices of orders from various restaurants more conveniently. The price information factors that affect dominance in the use of OFD indicates that OFD service providers should focus on developing features that can improve the ability of their apps to display information about the prices of products or services offered on the apps. OFD service providers can develop a promo filter feature to display promos that are applicable for certain restaurants or orders. OFD service providers can also develop product filter feature to allow users to filter products according to user-defined price ranges and increase the ability of OFD to display prices based on user requests.

This study also found most of the obstacles faced when using OFD and expectations for the development of OFD in the future based on respondents' demographic data. Demographic data of respondents showed that most of the obstacles faced by 51.7 % of the total respondents when using OFD were incomplete food information. This is also aligned with the demographic data of respondents which shows that most expectations that 37.1 % of the total respondents want for the development of food delivery apps in the future are complete and appropriate food information. Therefore, OFD service providers need to ensure that OFD can display complete and appropriate food information which include product descriptions and display, product availability

information, add-ons as additional product details according to OFD user preferences, and other information.

7. Conclusion

This study found that pleasure and arousal were influenced by convenience quality attributes, but not by the trustworthiness and price information quality attributes of OFD. This shows that users feel happy or satisfied, as well as excited, interested, or active when using OFD due to the convenience of accessing and using them. Meanwhile, these two emotions are not elicited by users' trust in OFD or the app's ability to display information about the prices of the products or services offered on the app. Dominance is influenced by the quality attributes of convenience and price information, but not by the quality attribute of the trustworthiness of OFD. This shows that users feel free to act or in control when using OFD due to the convenience of accessing and using them, as well as the ability of OFD to display information about the prices of products or services offered on the apps. These emotions are not prompted by the users' trust in OFD. Furthermore, this study found that continuous usage intentions regarding OFD are influenced by pleasure, arousal, and dominance in the use of OFD. This indicates that users will intend to reuse OFD in the future if they feel happy, satisfied, excited, interested, or active and feel free to act or in control when using the apps. Future study could explore other emotional dimensions felt by users when they use OFD, as well as examine the influence of other factors besides the quality attributes of OFD on user emotions, such as promo, perceived ease of use, various food choices, or other factors. The future study could also examine OFD that refer to restaurants that have their own apps for taking orders online, such as Pizza Hut or Domino's.

Funding

This work was supported by the Ministry of Research, Technology and Higher Education Indonesia through the PDUPT Grant No. NKB-788/UN2.RST/HKP.05.00/2022.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Citation information

Cite this article as: The impact of user emotions on intentions to continue using online food delivery applications: the influence of application quality attributes, Putu Wuri Handayani, Safa Fathya Azzizah & Audrey Annisa, *Cogent Business & Management* (2022), 9: 2133797.

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Appendix

Code	Measurement Items	References
TRW1	I believe in the reliability of the OFD when ordering food.	Cho et al. (2019)
TRW2	I feel safe when ordering food through OFD.	
TRW3	The information provided by OFD is reliable.	
TRW4	I obtain results that match my actions when using OFD.	S. F. Yeo et al. (2021)
COV1	I feel comfortable when using OFD.	Cho et al. (2019)
COV2	OFD let me order food anytime.	
COV3	OFD let me order food anywhere.	
COV4	OFD provide the convenience of comparing food prices from various places.	Ray et al. (2019)
PIF1	OFD should display price information per product.	Cho et al. (2019)
PIF2	OFD should display the total price that must be paid by the user.	Sharma et al. (2021)
PIF3	OFD should display applicable promotions.	Ray and Bala (2021)
PIF4	OFD should display prices based on user requests.	
PLS1	I like using OFD.	Jain et al. (2021)
PLS2	I feel satisfied when using OFD.	
PLS3	I feel happy when using OFD.	
PLS4	I feel confident when using OFD.	Hsieh et al. (2021)
ARO1	I find OFD very interesting to use.	Jain et al. (2021)
ARO2	I feel excited when using OFD.	
ARO3	I actively explore when using OFD.	Chang et al. (2014)
ARO4	I feel enthusiastic when using OFD.	
DOM1	I feel in control when using OFD.	Kumar and Shah (2021)
DOM2	I have the right to control OFD.	
DOM3	I can choose products freely on OFD.	Hsieh et al. (2021)
DOM4	The actions I take when using OFD determine the type of experience I have.	
CUI1	I intend to reuse OFD.	Jain et al. (2021)
CUI2	I choose to stick with one OFD compared to other OFD.	Abbas and Hamdy (2015)
CUI3	I would invite others to use OFD.	
CUI4	I intend to always use OFD in my daily life.	Alalwan (2020)



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