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Article

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Determining the drivers of continued mobile food delivery app (MFDA) usage during a pandemic period

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ABSTRACT

The study aimed to determine the main factors that predicted users' intention to continue using mobile food delivery apps during the COVID-19 pandemic. The moderating role of user experience was also explored. Data were obtained from 411 users of mobile food delivery apps in South Africa, using the purposive sampling technique. The lens of the integrated modified unified theory of acceptance and use of technology (UTAUT2) and the task technology fit (TTF) were used for this research. The results indicate that users' continuance intentions are influenced by performance expectancy and habit, and that hedonic motivation and TTF are insignificant predictors. Performance expectancy mediates between TTF and continuance intention, and user experience moderates the relationship between predictors (TTF, hedonic motivation, habit) and continuance intention. Restaurant owners can use the findings of this study to design winning strategies that mix both technology features and mental perceptions to build a stronger client base during crises and future business possibilities.

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1. Introduction

Consumer behaviour has shifted significantly to digital channels as a result of the COVID-19 pandemic, causing businesses to revise their models to facilitate the increased adoption of technologies (Ramos, 2022). As people were encouraged to work and shop from home to limit virus transmission (Sheth, 2020), there has been a dramatic increase in mobile app usage as evidenced by a 7% increase in mobile app downloads year over year in 2020 across iOS and Google Play (App Annie, 2021). Although restaurants have now reopened to indoor diners due to worldwide vaccinations and a reduction in infections, experts still anticipate continued use of these apps beyond 2023, when the number of mobile app users is projected to reach 53.9 million (Kats, 2020). As a result, long after the pandemic has passed, mobile food delivery apps are expected to become a critical mode of financial transaction.

Although no business seems to be immune to the effects of the pandemic, one of the most severely affected industries was the food service outlets, as customer behaviours abruptly changed in response to the imposed physical distancing and mandated operational restrictions (Timur et al., 2023). As a result, eating habits have changed, causing restaurant operators to rethink their business tactics to keep up with shifting client preferences (Brewer & Sebby, 2021). Consequently, restaurants are turning to mobile food delivery apps (MFDAs) to boost their revenue and stay afloat (Timur et al., 2023). With these advancements in mobile technologies, it is envisaged that MFDAs will continue to grow and percolate to different areas in the retail industry, yet studies investigating intention to continue to use MFDAs in

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a pandemic situation are largely missing in emerging markets such as South Africa, which experienced the highest COVID-19 infections on the continent (NICD, 2023).

Researchers have long argued that continued use is the most reliable source of revenue for service providers (Nguyen et al., 2023). The global rate of abandonment of retail apps is 69.8%, which is a cause for concern amongst practitioners and academics (Coppola, 2022). As a result, it is unclear whether or not customers who began using MFDA during the pandemic will continue to do so post pandemic and why. Thus, the following main research question guided the study: What are the salient factors that promote continued usage of MFDA during a crisis period such as that posed by the COVID-19 pandemic? The answer to this question is critical because the business value of a product or service is determined by how long it is used, rather than how quickly it is adopted (Yap & Lee, 2023). Given that there may be a three-fold increase in the annual likelihood of severe epidemics developing in the coming years (Marani et al., 2021), management needs to be aware of the elements that contribute to the continuous usage of a technology like MFDA to improve readiness for a similar crisis. Despite this, not much research has been done on this topic in developing nations, especially not in South Africa, where about 40% of customers scanned or used a QR code to make a purchase in 2020 (GWI, 2020). Thus, the current study may provide insight into the continued use of MFDA during future crises resembling the COVID-19 pandemic.

MFDA are mobile apps that are downloaded by smartphone users as an alternative medium to gain access to restaurants, view menus, order food and make payments, without the need to physically visit the restaurant (Alalwan, 2020). Consumer intentions toward adopting online food delivery ordering systems have been extensively studied in the past (Belanche et al., 2020; Gunden et al., 2020). Despite the growing abundance of published research on the subject matter, consumer behaviour literature related to the continued usage of mobile food delivery technologies is still in its infancy (Gunden et al., 2020). This is surprisingly also true in South Africa, where about 12% of adult consumers prefer to eat at a restaurant every week compared to the global average of 28% (GWI, 2020). The top reliable MFDA commonplace in South Africa are Mr. D Food, Uber Eats, Oishi Sushi, Checkers Sixty60, Yumbi, Appetite and Nandos Ormonde (Karimi, 2020).

The primary objective of this study was to investigate the extent to which habit, hedonic motivation, performance expectancy, and task technology fit (TTF) predict the intention to continue using MFDA amongst existing users of MFDA during the pandemic. The study took the view that focussing on existing users could provide invaluable insights, since the motivations for a prospective user of new technology not only differ from those of the current user, but attitudes and beliefs before adoption also differ from those in the post-purchase adoption (Hernández-Ortega et al., 2008). A significant body of prior research indicates that the aforementioned factors (habit, hedonic motivation, performance expectancy, task technology fit) are significant predictors of the intention to continue to use new technologies (Cheng et al., 2020; Foroughi et al., 2023; Sreelakshmi & Prathap, 2020; Tam et al., 2020), and are therefore worthy of further investigation in the context of MFDA in an emerging economy, such as South Africa, where the food delivery business is expected to reach R17 billion by 2023 (Statista, 2022). Furthermore, the study also determined the mediating effect of performance expectancy between TTF and continuance intention, as reported by Zhao and Bacao (2020). In addition, the study also aimed to determine the moderating role of user experience in influencing continuance intention to use MFDA during the pandemic. Because user experience shapes attitudes, it has been found to play a profound role in shaping subsequent consumption behaviours (Sun et al., 2022). Understanding user behaviour based on user experience is crucial for service providers, as they are increasingly investing in learning about user experiences, not only to better understand consumer habits and preferences (Sun et al., 2022), but also to provide long-lasting experiences that retain users.

Currently, there are limited studies in emerging markets that shed light on the impact of the COVID-19 pandemic on users' intention to continue using MFDA, and on how user experience with MFDA could enhance the continuance usage of the apps during the pandemic period. To address these knowledge gaps, the study aimed to join the ongoing conversation amongst scholars concerning the intention to continue using MFDA and the moderating effect of user experience in a way that advances the theoretical literature. This information is expected to be valuable to academicians to build knowledge, as well as to service providers who need to revise their business models in tandem with

changing consumer needs, as the pandemic persists in some parts of the world, such as China and South Africa.

This study contributes to mobile payment literature in two ways. Firstly, the study developed an integrated model from carefully selected elements taken from the unified theory of acceptance and use of technology (UTAUT2; Venkatesh et al., 2012) with elements taken from the TTF model (Goodhue & Thompson, 1995) to investigate the factors predicting the continuance intention to use MFDA in a pandemic context. The UTAUT2 framework was updated by Venkatesh et al. (2012) in tandem with the inevitable technological changes for analysing consumer acceptance of new technologies. The TTF has largely been lauded as a theory to measure the extent to which a technology matches the task of the user (Foroughi, et al., 2023; Franque et al., 2023), which in this case is the performance of the MFDA in enabling transactions during a pandemic period. Previous studies also supported a direct link between the TTF and performance expectancy (Alalwan, 2020; Franque et al., 2023). It was envisaged that by integrating the TTF model with the UTAUT2, the explanatory power of the intention to continue using MFDA could be enhanced, compared to when the models are used separately (Timur et al., 2023).

Theoretically, examining users' post-adoption behaviour enriches the theoretical framework of information system user behaviour, as continuance usage is central to the survival of business-to-consumer relationships and to service providers of mobile food delivery technologies (Foroughi et al., 2023). Practically, the MFDA market is attracting investments from restaurant businesses, and as a result, research on the intention to continue using the apps is critical to keep up with changing customer needs and expectations. Because it is less expensive to retain existing users than to acquire new ones, the intention to continue using mobile technology is considered important to gauge technology success (Yap & Lee, 2023).

2. Theoretical framework and hypotheses development

2.1. Mobile delivery apps in context

Of the estimated 8 million infections on the continent, South Africa was the hardest hit with over 4 million infections and over 100 000 deaths, including 357 active cases as of January 2023 (NICD, 2023). During the pandemic period, mobile payment was regarded as an instrument for promoting the social distancing mandate, and an important medium to make payments. Businesses were forced to transition to online payments, thus forcing consumers to follow suit as a way to avoid physical contact with banknotes, or any other medium of exchange. As the restaurant industry continued to face operational challenges during the pandemic, many people turned to mobile food delivery apps (Foroughi et al. 2023). Given the devastating effects of the Covid-19 pandemic, it seemed prudent for South African users of MFDA to continue using them to prevent the virus's transmission. Indeed, the food delivery business is expected to reach R17 billion by the end of 2023 (Statista, 2022). The need to move from in-restaurant to over the mobile phone precipitated restaurants and shop owners to develop their food delivery apps as a way of survival, many of which operate across South African cities. The top reliable countrywide MFDA in South Africa include Mr D Food, Uber Eats, Oishi Sushi, Yumbi, Apetitie, Checkers Sixty60 and Nandos Ormonde food delivery app (Karimi, 2020). The Checkers Sixty60 app, amongst others, suggests the heightened adoption of MFDA in South Africa during the pandemic, with over 1.2 million app downloads since its launch in late 2019 (Shoprite Holdings Ltd, 2021). As reported by Al Amin et al. (2021), most markets that experienced a high coronavirus outbreak witnessed an upsurge in demand for online delivery. Therefore, this study considers South Africa as a desirable context to determine consumers' continuance intention to use MFDA during the pandemic.

2.2. Intention to continue using mobile food delivery apps

Continued use intention in the context of MFDA can be described as the extent to which a person using the mobile application plans on using it in the future (Yap & Lee, 2023). Mobile application markets are highly competitive, therefore, understanding how to increase consumers' continuance intention to use MFDA is crucial. Several studies that examined factors that influence continuance intention found that habit, hedonic motivation, performance expectancy and TTF have a direct effect on continuance intention to use MFDA (Kah Boon et al., 2023; Lam et al., 2023; Yap & Lee, 2023). As the success of an

information system depends on the user's continuance (Franque et al., 2023), the study posits that users' commitment to use MFDAs will ultimately determine their success.

Ukpabi et al. (2019) argues that continuance intention can be understood from two viewpoints: the initial stage of adoption and the post-adoption stage. In the initial stages of adoption, an individual's prior expectations help to formulate attitudes towards the new technology to decide whether or not to adopt it. In the post-adoption stage, an individual's experience using the technology drives the intention to continue or discontinue using the app. This study was based on the premise that the formed habit of using MFDAs would continue as the pandemic persists. The assumption was that the pandemic precipitated the gradual use of MFDAs, and those who were already accustomed to the behaviour started using the service even more (Kats, 2020). The current paradigm shift towards digital payments is expected to grow continually as restaurants open more delivery windows. Extant literature suggests that a lack of understanding of the factors that drive continued use can be costly to service providers, as the real business value is derived from consumers' continued use (Humbani & Wiese, 2019; Yap & Lee, 2023). Thus, the ability to retain existing customers is not only crucial for survival, but also creates a sustainable competitive edge.

There is a paucity of research on the continuation of mobile technology use in South Africa. More importantly, there is no evidence that the continued intention to use MFDAs has been previously investigated in the South African context, save for anecdotal reports. This highlights the need for a study of this nature in South Africa where most people (60%) are confident using new technologies, compared to the global average of 43% (GWI, 2020).

2.3. Development of a conceptual framework

Scholars have tried to develop models that better explain technology acceptance and use. Venkatesh et al. (2012) combined eight antecedent factors to develop the unified theory of technology acceptance and use (UTAUT). After realising the shortcomings of the earlier model, Venkatesh et al. (2012) expanded it to the UTAUT2 by incorporating consumer perceptible determinants relating to technology use, price value, habit and hedonic drive. Despite these efforts, consumer behaviour is complex, and no single framework can fully capture all of the dynamics of information system acceptance and use (Timur et al., 2023). Consequently, there is a growing call amongst scholars to merge various theoretical frameworks to better understand the acceptance and use phenomenon (Timur et al., 2023). In response to that call, the current study integrated UTAUT2 and the TTF to explain users' intention to continue using MFDAs during a pandemic. The UTAUT2 was developed to explain the intention to use new technology and the subsequent behaviour (Venkatesh et al., 2012). Based on the tenets of the TTF, technology acceptance and use are greater when users feel that the technology helps them to effectively accomplish tasks (Goodhue & Thompson, 1995).

The integration of theories to explain the continuance intention phenomenon is supported by a number of empirical researches. For instance, Sharma et al. (2022) used the Information System Success Model (DeLone & McLean, 2004) with UTAUT2 (Venkatesh et al., 2012) to better understand why Indian consumers want to keep using news applications. Similarly, Yap and Lee (2023) combined the UTAUT2 components with the Expectation Confirmation Model (Bhattacharjee, 2001) to explain Malaysian consumers' continued interest in online food delivery services. To investigate the continuing intention toward MFDAs, the UTAUT2 and TTF were thus integrated in this study.

The motivation to integrate the two models was two-fold. Firstly, the TTF on its own could not address the various determinants that are perceived as important by users of MFDAs. Conversely, the UTAUT2 alone would fall short in addressing the extent to which the characteristics of both the technology and the task itself help to explain TTF in using MFDAs. Therefore, an integration of two theories 'provides a complete account of the causal mechanism underlying the relationships and unique insight that cannot be obtained from a single theory driven model' (Rahi et al., 2021, pp. 987).

Recognising the limitation of each framework, efforts were made in the current study to integrate the UTAUT2 alongside the TTF, to explain the concept of continuance intention to use MFDAs during a pandemic to provide a better understanding of the phenomenon. Moreover, there is no evidence to suggest prior studies that holistically assessed MFDA continuance intention by examining the role of

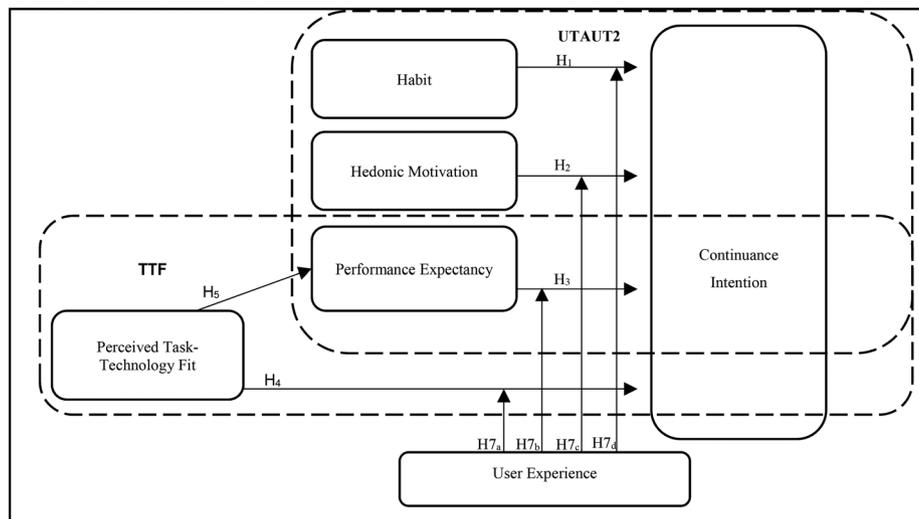


Figure 1. Conceptual framework for the predictors of continuance intention.

technology perceptive determinants of the UTAUT2 and TTF, a knowledge gap that this study also attempts to bridge.

In this study, the UTAUT2 was modified by not considering facilitating conditions, effort expectancy and situational influences, because they are not applicable factors in the context of MFDAs. In a related study, Chotigo and Kadono (2021) likewise disregarded the existence of facilitating conditions and effort expectancy in the context of food delivery applications, as factors non-existent in the context of food delivery apps. For instance, Chotigo and Kadono (2021) define social influence as the degree of approval of a particular behaviour, which applies to consumers not familiar with a particular technology. By focusing on experienced users of MFDAs, social influence is rendered inapplicable in the context of this study. The research model is illustrated in Figure 1.

2.4. Predictors of continuance intention to use MFDAs

2.4.1. Habit

Habit is defined as the level of automatic behaviour resulting from previous learning (Yap & Lee, 2023). In a recent study on consumer intention to reuse food ordering apps in Vietnam, Kah Boon et al. (2023) reported that habit influences the continuous desire to use technology-based goal-directed behaviour as the results of their study showed a significant relationship between habit and continuance intention to use e-Wallet in Malaysia. Ly et al. (2022), who also found habit to be a major predictor of mobile app usage intention, back up the predictive potential of habit in the continued use of mobile apps. Sheth (2020) posits that habitual behaviour is context-based, such as social (e.g. life events), technology (e.g. smartphones), rules and regulations (e.g. alcohol consumption), and natural disasters (e.g. COVID-19). This current study took the view that the COVID-19 pandemic influences the formation of habitual behaviours leading to consumers' intention to continue using MFDAs to avoid being infected and infecting others. Based on the foregoing, the following is hypothesised:

H1: Habit positively influences the intention to continue using MFDAs.

2.4.2. Hedonic motivation

Hedonic motivation is defined by Yap and Lee (2023) as the enjoyment, fun and pleasure derived from using a new technology. Thus, hedonic motivation refers to the internal motives that can be linked to the level of innovativeness and novelty when using new technology, such as playfulness, enjoyment, fun and pleasure (Lam et al., 2023). In their investigation of the e-wallet usage continuance intentions in Malaysia post-COVID-19, Kah Boon et al. (2023) found that the greater the entertainment value provided

by the mobile providers, the more likely users are to accept it. In a similar study, hedonic motivation was found to be a crucial predictor of mobile technology continued usage by Ly et al. (2022), implying that users will continue to use the MFDA's if the experience provides them with pleasure, delight and comfort. Thus, it is inferred that hedonic motivation plays an essential role in predicting intention to continue to use MFDA during the pandemic. MFDA's are perceived as being creative and modernised technology, and the role of hedonic motivation shapes consumer perceptions of the usefulness and convenience of these MFDA's (Lam et al., 2023).

Based on the above empirical findings, the following is hypothesised:

H2: Hedonic motivation positively influences the desire to continue using MFDA's.

2.4.3. Performance expectancy

Performance expectancy is the degree to which a person believes that adopting a new system or application will help them to attain what they want (Ramos, 2022). In the context of this study, the MFDA's ability to enable the user to pay for a delivered meal could significantly impact future app usage. Recent empirical studies conducted in Vietnam and Malaysia have proved the importance of performance expectancy towards continuous usage of mobile technologies (Kah Boon et al., 2023; Lam et al., 2023; Ly et al., 2022). Moreover, Yap and Lee (2023) posits that consumers will likely have a good reaction and intention to continue using a new system if they believe it will save them time or effort. Expectancy in terms of performance can be compared to perceived usefulness (Venkatesh et al., 2012), which is described as the extent of an individual's belief that using a system will improve their achievement of goal-oriented tasks. Therefore, it can be inferred that when users perceive MFDA's as a useful way to initiate and complete their transactions during the pandemic, they will choose that payment method instead of using cash. Moreover, Ly et al. (2022) investigated continuance intention to use e-wallets and found that performance expectancy was the most significant determinant of the intention to use mobile apps in the future. Thus, the following can be hypothesised:

H3: Expected performance positively influences the decision to continue using MFDA's.

2.4.4. Perceived task technology fit

Foroughi et al. (2023) describe TTF as efficiency in completing a task when the technology, requirements for the task itself, and individual abilities are compatible. Thus, users will adopt technology if it is practical and enhances their ability to execute their tasks. Similarly, the continued intention to use MFDA's during the COVID-19 crisis could be dictated by qualities such as contactless food supply service and convenience, which meet the required social distancing mandate to stop the virus from spreading. As a result, task and technological features define the TTF, making it easier to adopt and use an information system (Franque et al., 2023). Prior empirical studies concur that TTF substantially enhanced consumers' attitudes and continued intentions if MFDA's helped them to execute desired tasks including food ordering, online payment and order tracking (Foroughi et al., 2023; Franque et al., 2023; Shahzad et al., 2023). A study undertaken during the early stages of the COVID-19 pandemic concluded that there is a significant impact of TTF on food delivery app continuance intention, wherein contactless delivery plays an important role (Zhao & Bacao, 2020). Hence, the current study proposes the following:

H4: Perceived TTF positively influences the intention to continue using MFDA's.

There have been few studies on the relationship between TTF and performance expectancy. TTF appears to have a critical role in the formulation of users' performance expectancy in the adoption and continuation intention to use information systems (Franque et al., 2023). This suggests that users must recognise the value of using technology, such as the ease with which they can adapt to social distancing protocols, to complete individual tasks (Franque et al., 2023), such as purchasing meals for oneself or one's family while under COVID-19 travel restrictions. As a result, the following is hypothesised:

H5: Perceived TTF positively influences performance expectancy.

2.4.5. The mediating role of performance expectancy

The current study also attempted to determine how much the MFDA's performance expectancy influences the relationship between TTF and continuation intention. The mediating role of performance expectancy has been examined in prior empirical studies related to technology usage. With a sample from Portugal, Zhao and Bacao (2020) discovered that performance expectancy mediates the influence of job technology fit and continuance intention to use food delivery apps. Previously, Rahi et al. (2019) confirmed that performance expectancy mediates the relationship between effort expectancy and intention to use internet banking in Pakistan. This study assumed that the better the MFDA meets or exceeds customer expectations, the more task fit affects consumers' intention to use MFDA's in the future. It is understood that consumers wanted to avoid getting the virus and to follow the social distancing mandate to prevent the COVID-19 virus from spreading. As a result, the MFDA's ability to accomplish the users' job of decreasing virus transmission while enjoying the service most likely influenced whether or not they continued to use the app. TTF depicted the characteristics and benefits of the MFDA's in the COVID-19 pandemic setting, in which consumers could purchase food even while in self-quarantine and paid with the app (Zhao & Bacao, 2020). As a result, the TTF helped consumers to form high expectations for the continued use of MFDA's during the pandemic. Based on the foregoing, it is possible to hypothesise the following:

H6: Performance expectancy mediates the link between TTF and intention to continue using MFDA's.

2.4.6. The moderating effect of user experience

This study was based on users' direct experience with MFDA's during the pandemic. Prior empirical studies show that the determinant factors for IT usage have differing influencing effects on the use intention depending on user experience (Sinha & Singh, 2022; Sun et al., 2022). A recent earlier study investigated the role of the user experience as a moderator (Al-Shamaileh & Sutcliffe, 2023). Therefore, the current study took the view that the influence of user habit, hedonic motivation, TTF and perceived expectancy would lead to a different outcome on users' continuance intentions if moderated by user experience. For instance, Nel and Boshoff (2019) posit that user experience leads to habit, which is explained by repeated behaviour. Thus, once users gain experience using the MFDA, their continuance intentions are enhanced by the experience. Nel and Boshoff (2019) also note that experience enhances the accuracy of information search and the ability to revisit the information to reach higher levels of searching in a way that improves decision-making. In the current study, users required MFDA's to provide them with pertinent information, such as menus, prices and delivery times, to enhance their decision-making abilities. Thus, TTF and performance expectancy could be enhanced by user experience. Therefore, the following is hypothesised:

H7a: User experience moderates the relationship between TTF and continuance intention.

H7b: User experience moderates the relationship between performance expectancy and continuance intention.

H7c: User experience moderates the relationship between hedonic motivation and continuance intention.

H7d: User experience moderates the relationship between habit and continuance intention.

3. Methodology

3.1. Sample and data collection

The empirical study is based on information gathered in 2021 from individual South African smartphone users who used MFDA's to order food online during the COVID-19 pandemic. The study required participants to be at least 18 years old. In the absence of a sampling frame, a non-probability sampling method was deemed appropriate, and the purposive sampling technique was applied as the study targeted consumers who had previously used a MFDA during the pandemic. The data was gathered through a

structured self-administered online questionnaire distributed by an online market research firm to its online research community for a period of four weeks from 14 July to 14 August 2021. A total of 411 responses were used to test the hypotheses. Unfamiliar terminology was explained and explicit instructions were given to reduce errors commonplace with self-administered questionnaires. The foundation for the questionnaire was comparable studies (Alalwan, 2020; Zhao & Bacao, 2020).

The questionnaire was divided into 4 parts. The questionnaire's introduction section discussed the study's major goal and defined the key terms used in the questionnaire. Before completing the questionnaire, respondents had to have downloaded and used a MFDA. Section B gathered information on how MFDA's are used in general; Section C included 19 measurement items from previously validated research to assess the predictors of MFDA continuation intention; and Section D collected the demographic information of the respondents.

Four scale items that were adapted to measure the continuance intention of using MFDA's were taken from Cho, Bonn and Li (2019) and Shao, Zhang, Li and Guo (2019). The 4 scale items for habit and 3 scale items for hedonic motivation were measured using the scales suggested by Venkatesh et al. (2012). Performance expectancy was measured using 4 adapted scale items taken from Bhattacharjee and Premkumar (2004), Roh and Park (2019) and Venkatesh et al. (2012), and TTF was measured using 4 adapted scale items from relevant sources (Goodhue & Thompson, 1995; Yuan, Liu, Yao & Liu, 2016; Zhao & Bacao, 2020). The wording of the adapted scales was slightly adjusted to fit the study's setting. Factor loadings were more significant than 0.50 on all scales used in the study; average variance extracted (AVE) ranged from 0.600 to 0.830; and composite reliability (CR) values were equal to or greater than the recommended 0.7 (Hair, Black, Babin & Anderson, 2019). All of the predictors were assessed using a 7-point Likert response format with 1 indicating severe disagreement and 7 indicating strong agreement.

3.2. Common method bias

To avoid common method bias, several of the steps proposed by Rodríguez-Ardura and Meseguer-Artola (2020) were taken during the questionnaire design. Before pre-testing, the phrasing of the questions was slightly changed to be more succinct and straightforward, while also offering clear descriptions for any anticipated new terms. Respondents were assured of their anonymity and confidentiality, in addition to improved item phrasing, to encourage them to provide objective responses. Respondents were also informed that the study was conducted solely for academic purposes, to encourage honest responses. The items were arranged randomly, but the purpose and relationships between the constructs were also not apparent when the questionnaire was fielded, as suggested by Tripathi et al. (2021).

4. Data analysis and results

Data were captured from 411 respondents, and then cleaned and prepared using the Statistical Package for Social Sciences (SPSS) Version 27, and analysed using the AMOS Version 27 for structural equation modelling. The data analysis and findings are presented in this section.

4.1. Sample profile

Data were analysed from 411 completed questionnaires, and 160 of the respondents were men (38.8%) and 250 were women (60.7%). The largest group of respondents (45.1%) were between the ages of 41 and 56, and the 18–40 age group was the second largest group (35.4%). In terms of race, White respondents made up 47.3% of the entire sample population, followed by Black Africans (26.7%), and Coloureds, Indians and other minority ethnic groups (25.5%). At the time of the poll, 60.4% of participants were from Gauteng, and 20.1% were from the Western Cape. Gauteng is the country's most populous province, accounting for 23.9% of the country's population (Statistics SA, 2021). Regarding the respondents' marital status, slightly more than half (51%) were married at the time of the survey. Furthermore, the majority of the respondents (67.5%) had full-time employment, and 18% were self-employed. More than half of the participants had a decent income of between R10 001 and R40 000 per month.

According to the findings of the current study, 73.5% of respondents used MFDA as a direct result of the COVID-19 pandemic, implying that the pandemic had a direct impact on MFDA use. Around 80% of the entire group had downloaded up to three distinct MFDA onto their mobile devices at the time of the survey. Most respondents (66.2%) had been using MFDA for more than a year, 38.3% indicated that they use MFDA at least once a month and 28.6% use it once a week. Mr. Delivery Food (38.8%), Uber Eats (34.5%) and Checkers Sixty60 (13.8%) were the most popular MFDA amongst the respondents.

4.2. Measurement model

The correlations in this study were investigated using covariance-based structural equation modelling. In particular, confirmatory factor analysis, as recommended by Hair et al. (2019), was used to determine the model fit, reliability and validity of the constructs using AMOS Version 27. The measurement model's results: Chi-Square/Degrees of freedom (χ^2/df) = 3.501, root mean square error of approximation (RMSEA) = 0.078, normed fit index (NFI) = 0.930, Tucker-Lewis index (TLI) = 0.937, comparative fit index (CFI) = 0.949, incremental fit index (IFI) = 0.949, standardised root mean residual (SRMR) = 0.048 satisfied the model fit criteria (Hair et al., 2019). The constructs' internal consistency reliability (Cronbach's alpha coefficient) and convergent validity were both adequate, as shown in Table 1. Cronbach's alpha readings ranged from 0.853 to 0.908 (meeting the 0.7 thresholds for Cronbach's alpha). The composite reliability (CR) and the average variance extracted (AVE) values met the Fornell and Larcker (1981) threshold criteria of values equal to or greater than 0.7 for CR, which ranged between 0.803 and 0.910 for the current study, and AVE values that range from 0.578 to 0.732, both exceeding the 0.5 threshold value, indicating adequate convergent validity.

Due to some criticisms levelled against the criteria relating to its potential failure to detect discriminant validity, the heterotrait-monotrait ratio of correlations (HTMT) was used instead of the commonly used Fornell and Larcker (1981) criterion, and cross-loadings for the discriminant validity of the constructs (Henseler et al., 2015). The HTMT is defined as 'the mean value of item correlations across constructs as a percentage of the (geometric) mean of average correlations for items measuring the same construct' (Hair et al., 2019). Discriminant validity analysis using the HTMT criterion was performed on the constructs, and HTMT scores greater than 0.90 for conceptually identical constructs and greater than 0.85 for conceptually distinct ideas suggest insufficient discriminant validity (Hair et al., 2019). As a result, the results in Table 2 reveal that discriminant validity was not an issue for the independent variables because HTMT values ranged from 0.682 to 0.872.

4.3. Hypotheses testing

The structural model's parameters (χ^2/df = 3.655, RMSEA = 0.080, NFI = 0.926, TLI = 0.933, CFI = 0.945; SRMR = 0.055) satisfied the required limits for acceptable psychometric qualities (Hair et al., 2019). Table 3

Table 1. Convergent validity.

Latent	Indicator	Standardised loadings	Alpha	CR	AVE
Continuance	Cl_1	0,861	0.908	0.910	0.718
	Cl_2	0,846			
	Cl_3	0,782			
	Cl_4	0,894			
Habit	Hab_1	0,822	0.850	0.803	0.578
	Hab_2	0,743			
	Hab_3	0,758			
Hedonic	Hed_1	0,866	0.890	0.891	0.732
	Hed_2	0,843			
	Hed_3	0,859			
Performance	Perf_1	0,797	0.898	0.892	0.674
	Perf_2	0,834			
	Perf_3	0,854			
	Perf_4	0,85			
TTF	TTF_1	0,848	0.887	0.892	0.674
	TTF_2	0,864			
	TTF_3	0,858			
	TTF_4	0,704			

Table 2. HTMT analysis.

	Habit	Hedonic	Performance	TTF
Habit				
Hedonic	0.809			
Performance	0.719	0.711		
TTF	0.682	0.730	0.872	

Note: Thresholds are 0.850 for strict and 0.900 for liberal discriminant validity.

Table 3. Results of hypotheses testing.

Alternative hypotheses	SRW	P value	Result
H1: Habit → Continuance intention	0.480**	0.000	Supported
H2: Hedonic motivation → Continuance intention	-0.074	0.051	Not supported
H3: Performance expectancy → Continuance intention	0.849**	0.000	Supported
H4: TTF → Continuance intention	-0.210	0.793	Not supported
H5: TTF → Performance expectancy	0.884**	0.000	Supported

Notes: SRW- Standard regression weight; **Significant at $p < 0.05$.

Table 4. Results of the mediation effect.

Point estimate		Bootstrapping							
		Bias-Corrected 95% CI			Percentile 95% CI				
		Lower	Upper	p-value	Lower	Upper	p-value		
TTF PE CI	Indirect effect	0.751	0.564	0.023	0.077	0.569	1.027	0.010	CM
TTF CI	Direct effect	-0.210	-0.473	1.023	0.012	-0.480	0.007	0.058	

shows the findings of the hypothesised paths that were evaluated in the study. Habit and continuance intention ($\beta = 0.480$, $p < 0.05$), performance expectancy and continuance intention ($\beta = 0.849$, $p < 0.05$), and TTF and performance expectancy ($\beta = 0.884$, $p < 0.05$) exhibited positive and statistically significant associations, indicating support for H1, H3, and H4. Although statistically significant, H5 was not supported because the results showed a negative effect between TTF and continuation intention ($\beta = -0.210$, $p < 0.05$). Surprisingly, H2 ($\beta = -0.074$, $p < 0.05$), which tested the link between hedonic motivation and continuance intention, was also not supported because the relationship was negative and not statistically significant. In the context of the COVID-19 pandemic, hedonic motivation thus emerged as a statistically insignificant predictor of the desire to continue using MFDAs.

4.4. Mediation results

One of the study's goals was to ascertain whether performance expectancy mediates the relationship between TTF and continuance intention. The bootstrapping and product-of-coefficients approaches were used to investigate the mediation effects of performance expectancy, using AMOS Version 27 (MacKinnon et al., 2002). According to Hair et al. (2019), the 95% bias-corrected confidence interval of the indirect effect is used to determine whether the mediating variable mediates the influence of the predictor and outcome variable. If the indirect effect's confidence interval includes '0', the mediating variable does not mediate the predictor-outcome relationship. It can be claimed that there is a mediation effect if the confidence interval does not include '0'. The 95% bias-corrected confidence interval of the direct effect is used to determine whether the mediating variable partially or fully mediates the effects of the predictor and the outcome variable. If the direct effect's confidence interval includes '0', it is safe to assume that the mediating variable fully mediates the predictor outcome. It can be claimed that there is a partial mediation effect if the confidence interval does not include '0'. The effects of performance expectancy on TTF and continuation intention are shown in Table 4.

The total effect is decomposed into direct and indirect effects. The indirect effect depicts the causality related to the mediation of the intermediate variable, which in this example is performance expectancy. The direct effect shows a statistically insignificant relationship between TTF and continuance intention. Thus, the results show that performance expectancy has a full mediating effect on the relationship between TTF and continuation intention (standardised indirect effect = 0.751, $p < 0.05$; CI (0.589, 0.967)) to support H6.

Table 5. Moderation results.

	Low experience			
	Chi-square (constrained model)	Chi-square (unconstrained model)	DIFF	Moderation
Habit	427.6	391.6	36	YES
Hedonic	421.2	391.6	29.6	YES
Performance	391.9	391.6	0.3	NO
TTF	437.6	391.6	46	YES
High experience				
	Chi-square (constrained model)	Chi-square (unconstrained model)	DIFF	
Habit	438.7	410.8	27.9	YES
Hedonic	486.1	410.8	75.3	YES
Performance	412.5	410.8	1.7	NO
TTF	455.8	410.8	44.7	YES

4.5. Moderation results

The study also tested the moderation effect of user experience on the relationship between the predictors of continuance intention and continuance intention. Firstly, a mean-split was performed to create two groups (low user experience and high user experience) for the independent variables (habit, hedonic motivation, performance expectancy and TTF). Each group was plotted against continuance intention. Secondly, a multi-group analysis was performed to examine the moderating effects of user experience. The low user experience group comprised 138 respondents, and the high experience group comprised 273 respondents. Moderation occurs if the chi-square difference value between the constrained model and unconstrained model is above 3.84 for both low and high values (Hair et al., 2019). As shown in Table 5, user experience moderated three of the four independent variables to show support for H7a, H7c, and H7d but not for H7b.

The results indicate that when user experience was higher, continuance intention also increased from low to high levels, as the habit of using MFDA's increased. Therefore, it can be inferred that high user experience has a greater impact on continuance intention and increased as people got into the habit of using MFDA's to purchase restaurant meals during the pandemic.

The results also indicate that for high user experience, the impact on hedonic motivation was stronger compared to low experience levels. Thus, the intention to continue to use a MFDA is enhanced by increasing user enjoyment with the app amongst experienced users of the MFDA, compared to less experienced users. Furthermore, high user experience had a strong effect on the relationship between TTF and continuance intention compared to low levels of user experience. This implies that even with low levels of TTF, the more experienced users are, the more inclined they are to continue to use the app compared to users with less experience. As the perceived TTF increases with the use of MFDA's, users become more attached to using the apps.

5. Discussion and implications

The integrated UTAUT2 and TTF frameworks were used to reach the current study's primary objective, which was to look into consumers' ongoing willingness to use MFDA's to avoid communicable infections, with a particular focus on the COVID-19 pandemic, to identify ways in which to improve continued use. In an attempt to answer the research question, the study aimed to determine the salient factors propelling MFDA usage during the pandemic as the business value of any technology investment is determined by its continued use rather than its initial adoption (Lam et al., 2023). The COVID-19 pandemic lockdowns encouraged MFDA use in emerging economies such as South Africa, Thailand and India (Chaveesuk et al., 2022; Sreelakshmi & Prathap, 2020). Restaurant owners and app developers saw an opportunity to increase loyalty to the MFDA's and restaurants in particular, as a result of the shift in consumer behaviour. Apart from the situation influence of the pandemic, it is necessary to understand why consumers would want to continue using the apps during the pandemic, even if users of the payment mode are not entirely immune to the virus infection.

Performance expectancy, as predicted by H3, was the strongest predictor of customers' decision to continue using MFDA's during the COVID-19 pandemic. This finding corresponds to several previous empirical studies (Alalwan, 2020; Ramos 2022; Zhao & Bacao, 2020). Similar to Jordanian consumers

(Alalwan, 2020), the result highlights the significance of MFDAs' cognitive and functional advantages from the standpoint of South African consumers. Performance expectancy assesses how likely consumers are to assume that using MFDAs will improve their ability to accomplish tasks such as ordering and getting meals at their convenience (Ramos, 2022).

For example, Ramos (2022) found that consumers will accept MFDAs with features that give them the freedom to order meals that can be delivered right to their doors without having to go to restaurants. This implies that the utility and convenience of MFDAs influenced users' decisions to continue using them during the pandemic. As reported by Nguyen et al. (2023), service providers must ensure that these apps not only perform well, but are also simple to use in order to meet user expectations throughout a crisis such as the COVID-19 pandemic period. It appears as though the features of a specific MFDA, such as live meal tracking and simple payment alternatives, which may raise the perceived performance expectancy for food ordering needs, outweigh the risks of being infected by the virus from the delivery personnel. Because performance expectancy is linked to the use of technology to accomplish work faster, aspects like the personalisation of new applications connect to the ease with which people can accomplish tasks on time (Cheng et al., 2020).

The proposed framework was also tested to determine how habits could promote the desire to use MFDAs regularly during the pandemic. The current study demonstrates that consumers' continuance intentions to use MFDAs during the pandemic were influenced by habit. Although this finding contradicts a similar empirical study in the MFDA context in Thailand, (Chotigo & Kadono, 2021), the positive influence of habit on satisfaction indicates that South African consumers who developed the habit of using MFDAs during the pandemic, have increased chances of obtaining more satisfaction and using them in the future. According to Foroughi et al. (2023), customers who develop regular behaviours with new technologies are more likely to keep the drive to use the system in the future. Timur et al. (2023) expresses similar ideas, stating that if people are happy with the results of specific behaviour, they will naturally repeat it in comparable circumstances. Thus, the COVID-19 pandemic established new habits for the continuous use of MFDAs that provided a fast payment method without contracting or infecting others with the virus. According to Yap and Lee (2023), organisations should emphasise habitual cues, such as reminding users of recurring purchases made, which could stimulate habitual MFDA system use, to preserve these created habits. The findings of Wang et al. (2013) on self-service technologies confirm the notion that as learning and experience grow, use continues to be rationally motivated (self-efficacy), and then emotionally driven (satisfaction), leading to habitual behaviour.

The finding confirming a negative link between TTF and intention to continue to use MFDAs came as a surprise and contradicts previous empirical research (Shahzad et al., 2023; Zhao & Bacao, 2020). TTF was expected to show that the characteristics of the MFDAs which enabled users to order food even in self-quarantine situations, would promote continued use of MFDAs. Put differently, high expectations of TTF should make it easier for consumers to build mental expectancies about using MFDAs in the future, but the data demonstrate otherwise. One likely explanation is that the COVID-19 pandemic did not provide consumers with many options. Given the mandated travel restrictions to avoid getting and spreading the virus, MFDAs were possibly the only feasible way to eat out without fear of becoming sick. Whether the MFDA was up to the task of ordering food or not, consumers were required to do so per the COVID-19 travel requirements. Another possibility is that TTF varies depending on the circumstance (Shahzad et al., 2023). It appears that technology attributes become less essential in situations when consumers do not influence their immediate environment. Despite this unusual finding, the researchers take the view that restaurant owners should consider TTF when designing MFDAs, as previous empirical research showed that the better the technology fit with a user's task, the more likely that they would use it again (Shahzad et al., 2023; Zhao & Bacao, 2020).

Despite the insignificance of the relationship between TTF and continuance intention, the study revealed that consumers' perceptions of TTF have a positive influence on performance expectancy regarding the use of MFDAs during the pandemic. The empirical finding backs up that of Franque et al. (2023), who found that perceived TTF has a beneficial impact on performance expectancy. Accordingly, users will only believe that using MFDAs can make their task easier when they see a satisfying fit between the MFDA's function and efficient food ordering, payment and delivery tasks. Customers can therefore save money and effort thanks to the expected MFDAs properties such as real-time. Foroughi

et al. (2023) concur that the task-technology fit would be less favourable if the MFDA technology was poorly developed, or if it lacked the necessary functionality to finish the task. Given the fact that people have less time owing to rising job demands, key stakeholders could focus their marketing efforts on the MFDA's specific technological advantages to meet user criteria, such as timeliness, reliability and the convenience of home delivery. Furthermore, in light of the pandemic, the safety of non-contact payments can be stressed to encourage continued use.

The finding that hedonic motivation emerged as an insignificant predictor of continued intention to use MFDA's contradicts the empirical findings of previous studies (Alalwan, 2020; Yap & Lee, 2023). A plausible explanation could be that South African consumers were to a large extent not motivated by the enjoyment and pleasurable experiences of using MFDA's during the pandemic, as the fear of contracting COVID-19 was more real. However, the finding can also be explained in light of Babin and Harris's (2014) assertion that online customers for the most part assess both hedonic and utilitarian motivations. Hedonic motivation, which is defined as the pleasure, enjoyment, amusement or playfulness received from using technology (Babin & Harris, 2014), corresponds to using a MFDA. Utilitarian value, on the other hand, refers to the benefits that a user derives from using the instrument in light of the work at hand and rational consumption behaviour rather than pleasure (Yap & Lee, 2023). This implies that MFDA use became more of a utilitarian value rather than hedonistic during the pandemic, as people followed the social distancing rules to prevent becoming sick or infecting others. It appears that users would not be concerned with the entertainment value or intrinsic motivation of mobile apps during the pandemic, but would be more prone to pragmatic consumption practices (Alalwan, 2020).

In terms of the mediation test, the research showed that performance expectancy does mediate the association between TTF and intention to continue to use MFDA's. The result corroborates empirical findings reported by Zhao and Bacao (2020), in which they found performance expectancy to play a significant mediating role between task technology fit and intention to use food delivery apps during the COVID-19 pandemic. According to the current study's findings, if users believe that a MFDA fulfils or surpasses their performance expectations, their perception of TTF and willingness to continue using it improves as well. If a user successfully initiates, executes and completes a financial transaction using a MFDA, the MFDA's functioning becomes a crucial precursor of the desire to continue. As a result, during the COVID-19 pandemic, it was prudent for restaurant owners to focus on MFDA technology features that matched user expectations in completing mobile payments in a secure environment. The ability to make payments with minimal disruption could make the task more suitable for the pandemic's demands and users' needs.

Findings also indicate that user experience moderates the relationship between continuance intention and predictors of habit, hedonic motivation and TTF, except performance expectancy. Thus, the study demonstrates that user experience plays a crucial role in evaluating the performance of an information system such as the MFDA. The finding supports Sinha and Singh (2022)'s empirical findings, in which they reported that user experience directly influences consumer preferences and decisions to continue to use a technology. Thus, in this study, the pleasurable experiences (hedonic motivation), repeated behaviours (habit) and technology befitting the task (TTF) were strengthened by user experience. Therefore, app developers should prioritise these factors to encourage continued use.

6. Implications

6.1. Theoretical implications

This study's empirical findings contribute to the relevant literature in several ways. Firstly, the researchers modified the UTAUT2 model by eliminating non-applicable factors and adding TTF to better understand MFDA continuance intention, thus contributing to the advancement of knowledge on continuance intention to use MFDA's. Secondly, the study validates the critical role of user experience in influencing continuance intention to use MFDA's. Essentially, the study identified the critical criteria to determine whether or not consumers will continue to use MFDA's during the COVID-19 pandemic. In this study, habit and performance expectancy were identified as important aspects for restaurant owners to consider when creating efficient MFDA's, confirming the findings of Yap and Lee (2023, Tam et al. (2020) and Sheth

(2020). Thirdly, rather than the normal pre-adoption behaviour, the study looked at consumers' post-purchase behaviour during the pandemic. Examining users' behaviour from a post-adoption perspective could bring new insights and help strengthen the theoretical framework of information system user behaviour.

Merging the fundamental tenets of the UTAUT2 and TTF frameworks into an integrative framework to analyse the driving factors determining MFDA users' continuing intents further contributes to the literature. According to Rahi et al. (2021), when several theories are examined together, they can provide a deeper and more comprehensive explanation of consumer behaviour in the context of information technology (IT) usage, than when each theory is considered separately. Thus, the proposed framework was envisaged to significantly contribute to the current conversations on IT continuance usage and can be used as a basis for future related studies.

6.2. Practical implications

Restaurant owners and app developers are investing in the MFDA market to tap into the growth potential (Tamilmani et al., 2019). As a result, the research on MFDA's continuous use could have a lot of practical implications, due to the broad potential it has in many industries. For instance, the findings of this study could be useful to small and medium businesses looking to use apps during a similar crisis in the future.

The study provides knowledge about the salient factors that can help MFDA providers to attract more customers. As stated above, habit and performance expectancy are key factors that MFDA providers should prioritise in the design of the apps. Encouraging habitual use through providing incentives and personalised service, and upgrading MFDA functionality would enhance continued use intentions. Thus, businesses can use the findings of this study to design winning strategies that mix technology features and mental perceptions to build a stronger client base, not only during a crisis but also for future business possibilities, as highlighted in prior research (Yap & Lee, 2023).

Typical loyalty programmes are one technique to encourage continuance usage, but not the only one. According to Kelso (2021), over 60% of consumers who have already signed up for at least one loyalty programme are willing to spend more on food orders from restaurants if they have a loyalty programme. Offering a loyalty programme in the digital space could effectively incentivise customers to return. Furthermore, service providers can use MFDA's to deliver more benefits to users by sending personalised messages to inform them about promotions and offers relevant to their needs, which can improve word-of-mouth interactions and encourage users to use the service again. Implementing such strategies could help to explain why users would intentionally continue to use MFDA's during the pandemic and even beyond.

7. Conclusion

The main purpose of the study was to determine the salient factors driving intention to continue using MFDA's during the COVID-19 pandemic, in order to provide insights to management on how to prepare for similar crises in future. The proposed framework was developed by revising the conceptual paradigms of the UTAUT2 model and eliminating the factors that did not fit the study context, while incorporating TTF to obtain a new perspective. Consistent with recent empirical findings (Alalwan, 2020; Sheth, 2020; Tam et al., 2020), habit and performance expectancy were identified as two critical predictors of continuance intention to use MFDA's during the pandemic period. Thus, the study results affirm the two primary associations of the UTAUT2 model in the context of a pandemic period in a developing country.

It is undeniable that there was a surge in the use of mobile food delivery apps (MFDA's) during the Covid-19 pandemic, but given the critical research gaps, it is unclear if this increase is 'sticky' in the sense that consumers who started using MFDA's during the pandemic will continue to do so and why. There are conflicting reports in existing literature. Scholars such as Nguyen et al. (2023) and Yap and Lee (2023) argue that the popularity of mobile food ordering applications is only

projected to increase in the upcoming years as they have become a permanent fixture in the food service sector. Factors in favour of this growth include inter-alia, the rise in popularity of MFDA, the increasing number of new adopters who demand more personalised services, and the working-from-home trend (Nguyen et al., 2023). In contrast, Foroughi et al. (2023) reported that only 22% of newly registered consumers will continue to use MFDA after the first week; by day 30, this number reduces to 4%. This indicates a low retention rate for MFDA. Therefore, to properly build and administer their apps, MFDA service providers and related stakeholders need to understand the determining factors influencing consumers' post-adoption behaviour (Anbumathi et al., 2023). This will allow them to retain clients and maintain their competitiveness. Against this backdrop, we contend that South Africa is a typical and innovative market that merits research into the noticeable shifts in consumer behaviour toward MFDA usage at the post-pandemic phase, from which MFDA providers can learn how to offer users significantly innovative functions, products, and services, especially by encouraging frequent use (i.e. stimulate continued use).

MFDA accessibility, consistent performance and effectiveness could drive habitual use and continued app use. Essentially, the MFDA should be capable in terms of enabling users to scan through all of the nearby restaurants in the area, examine their menus and choose the meals they want to eat with simply a tap or click. Essentially, restaurants should aim for optimal delivery speed, time and effort by enabling clients to make orders promptly and track their food deliveries.

In contrast to Yap and Lee (2023) and Lam et al. (2023)'s reports, hedonic motivation and TTF did not show a direct influence on continuance intention in this study. The result indicates that during the COVID-19 pandemic, consumers did not consider the pleasure of using a MFDA or whether the app was fit for the purpose as important attributes, but rather its performance was more crucial to them to realise the value of using them. In conclusion, the study also showed that continuance intention is a complex construct that requires rigorous inquiry to address consumers' underlying issues, as their perceptions can change over time, as reported by Kumari and Biswas (2023).

However, the research provides a comprehensive view of South African consumers' use of MFDA during a crisis and creates a basis upon which future business opportunities in a similar situation can be seized. The findings suggest the need for academics and practitioners to continuously refine the existing models of technology acceptance, in tandem with changing consumer behaviour and situational influences.

Reports indicate that about 92% of users will uninstall a mobile app if it crashes, freezes, or is too slow (89%) (Insider Intelligence, 2018). This suggests that app developers should focus on designing high-performance apps that are not only secure, but also efficient and fully functional to encourage users to keep using them despite a pandemic or a similar crisis. The behavioural model used in this study will help researchers, specialists and policy makers to create practical marketing plans for MFDA.

8. Limitations and directions for future research

The following limitations should be considered when interpreting the study's findings. To begin with, this study only included respondents from South Africa, and therefore, the findings may not apply to other cultures, countries or locations. As a result, future research should expand the sample profile to other regions, to add to the body of existing knowledge on the subject. Secondly, the sample was skewed towards female participants. Future studies could sample a relatively equal split sample of both men and women, to have a better understanding of the phenomena. Furthermore, this study primarily reflects the short-term perspectives of MFDA users, particularly during the COVID-19 pandemic, and future research can undertake longitudinal studies that look at the research findings across time.

Because the current study focused on MFDA in general, the research approach can be adjusted to specific MFDA platforms, MFDA stakeholders, or related businesses. The study can also be applied to several sorts of technologies to boost the degree to which the results can be generalised. Finally, future research might look at the impact of TTF in other contexts to see whether negative findings can be found, and if so, clear inferences can be drawn to add to the existing body of knowledge.

Disclosure statement

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

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References

- Al Amin, M., Arefin, M. S., Alam, M. R., Ahammad, T., & Hoque, M. R. (2021). Using mobile food delivery applications during COVID-19 pandemic: An extended model of planned behavior. *Journal of Food Products Marketing*, 27(2), 1–18. <https://doi.org/10.1080/10454446.2021.1906817>
- Alalwan, A. A. (2020). Mobile food ordering apps: An empirical study of the factors affecting customer e-satisfaction and continued intention to reuse. *International Journal of Information Management*, 50, 28–44. <https://doi.org/10.1016/j.ijinfomgt.2019.04.008>
- Al-Shamaileh, O., & Sutcliffe, A. (2023). Why people choose Apps: An evaluation of the ecology and user experience of mobile applications. *International Journal of Human-Computer Studies*, 170, 102965. <https://doi.org/10.1016/j.ijhcs.2022.102965>
- Anbumathi, R., Dorai, S., & Palaniappan, U. (2023). Evaluating the role of technology and non-technology factors influencing brand love in Online Food Delivery services. *Journal of Retailing and Consumer Services*, 71, 103181.
- App Annie. (2021). *The state of mobile 2021*. <https://www.appannie.com/en/go/state-of-mobile-2021/>
- Babin, B. J., & Harris, E. G. (2014). *Consumer behavior* (Student ed.). South-Western Cengage Learning.
- Belanche, D., Flavián, M., & Pérez-Rueda, A. (2020). Mobile apps use and WOM in the food delivery sector: The role of planned behavior, perceived security and customer lifestyle compatibility. *Sustainability*, 12(10), 4275. <https://doi.org/10.3390/su12104275>
- Bhattacharjee, A. & Premkumar, G. (2004). Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal test. *MIS Quarterly*, 28(2), 229–254. <https://doi.org/10.2307/25148634>
- Bhattacharjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly*, 25(3), 351–370. <https://doi.org/10.2307/3250921>
- Brewer, P., & Sebby, A. G. (2021). The effect of online restaurant menus on consumers' purchase intentions during the Covid-19 pandemic. *International Journal of Hospitality Management*, 94, 102777. <https://doi.org/10.1016/j.ijhm.2020.102777>
- Chaveesuk, S., Khalid, B., & Chaiyasoonthorn, W. (2022). Continuance intention to use digital payments in mitigating the spread of COVID-19 virus. *International Journal of Data and Network Science*, 6(2), 527–536. <https://doi.org/10.5267/j.ijdns.2021.12.001>
- Cheng, Y., Sharma, S., Sharma, P., & Kulathunga, K. (2020). Role of personalization in continuous use intention of mobile news apps in India: Extending the UTAUT2 model. *Information*, 11(1), 33. <https://doi.org/10.3390/info11010033>
- Cho, M., Bonn, M. A., & Li, J. J. (2019). Differences in perceptions about food delivery apps between single-person and multi-person households. *International Journal of Hospitality Management*, 77, 108–116. <https://doi.org/10.1016/j.ijhm.2018.06.019>
- Chotigo, J., & Kadono, Y. (2021). Comparative analysis of key factors encouraging food delivery app adoption before and during the COVID-19 pandemic in Thailand. *Sustainability*, 13(8), 4088. <https://doi.org/10.3390/su13084088>

- Coppola, D. (2022). *Global online shopping cart abandonment rate 2006–2020*. <https://www.statista.com/statistics/477804/online-shopping-cart-abandonment-rate-worldwide/#:~:text=According%20to%20data%20recorded%20in,face%20difficulty%20in%20converting%20customers>
- DeLone, W. H., & McLean, E. R. (2004). Measuring e-commerce success: Applying the DeLone & McLean information systems success model. *International Journal of Electronic Commerce*, 9(1), 31–47. <https://doi.org/10.1080/10864415.2004.11044317>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.1177/002224378101800104>
- Foroughi, B., Yadegaridehkordi, E., Iranmanesh, M., Sukcharoen, T., Ghobakhlo, M., & Nilashi, M. (2023). Determinants of continuance intention to use food delivery apps: Findings from PLS and fsQCA. *International Journal of Contemporary Hospitality Management*, 1–28. Ahead-of-print. <https://doi.org/10.1108/IJCHM-10-2022-1209>
- Franque, F. B., Oliveira, T., & Tam, C. (2023). Continuance intention of mobile payment: TTF model with Trust in an African context. *Information Systems Frontiers*, 25(2), 775–793.
- Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS Quarterly*, 19(2), 213–236. <https://doi.org/10.2307/249689>
- Gunden, N., Morosan, C., & DeFranco, A. (2020). Consumers' intentions to use online food delivery systems in the USA. *International Journal of Contemporary Hospitality Management*, 32(3), 1325–1345. <https://doi.org/10.1108/IJCHM-06-2019-0595>
- GWI. (2020). *Consumer snapshot: South Africa*. <https://www.gwi.com/reports/south-africa-consumers>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hernández-Ortega, B., Jiménez-Martínez, J., & José Martín-DeHoyos, M. (2008). Differences between potential, new and experienced e-customers: Analysis of e-purchasing behaviour. *Internet Research*, 18(3), 248–265. <https://doi.org/10.1108/10662240810883308>
- Humbani, M., & Wiese, M. (2019). An integrated framework for the adoption and continuance intention to use mobile payment apps. *International Journal of Bank Marketing*, 37(2), 646–664. <https://doi.org/10.1108/IJBM-03-2018-0072>
- Insider Intelligence. (2018). *Why mobile users download (and delete) retail apps*. <https://www.insiderintelligence.com/content/why-mobile-users-download-and-delete-retail-apps>
- Kah Boon, L., Sook Fern, Y., Xin Yee, T., & Cheng Ling, T. (2023). Investigating the e-wallet usage continuance intention in Malaysia post-Covid 19 pandemic. *International Journal of Business and Technology Management*, 5(1), 333–350.
- Karimi, C. (2020). *Reliable food delivery apps South Africa 2020*. <https://briefly.co.za/52587-reliable-food-delivery-apps-south-africa-2020.html>
- Kats, R. (2020). *More consumers are turning to food delivery apps amid indoor dining restrictions*. <https://www.emarketer.com/content/more-consumers-turning-food-delivery-apps-amid-indoor-dining-restrictions?ecid=NL1014>
- Kelso, A. (2021). *Nearly half of diners join at least one restaurant loyalty program*. *Payment Dive*. <https://www.paymentsdive.com/news/nearly-half-of-diners-join-at-least-one-restaurant-loyalty-program/602680/>
- Kumari, N., & Biswas, A. (2023). Does M-payment service quality and perceived value co-creation participation magnify M-payment continuance usage intention? Moderation of usefulness and severity. *International Journal of Bank Marketing*, 41(6), 1330–1359. <https://doi.org/10.1108/IJBM-11-2022-0500>
- Lam, T. N., Vuong, T. K., & Tran, S. T. (2023). Key factors influencing customer satisfaction and intention to reuse food ordering apps. *Management Dynamics in the Knowledge Economy*, 11(2), 152–169.
- Ly, H. T. N., Khuong, N. V., & Son, T. H. (2022). Determinants affect mobile wallet continuous usage in Covid 19 pandemic: Evidence from Vietnam. *Cogent Business & Management*, 9(1), 2041792. <https://doi.org/10.1080/23311975.2022.2041792>
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7(1), 83–104. <https://doi.org/10.1037/1082-989x.7.1.83>
- Marani, M., Katul, G. G., Pan, W. K., & Parolari, A. J. (2021). Intensity and frequency of extreme novel epidemics. *Proceedings of the National Academy of Sciences*, 118(35), e2105482118. <https://doi.org/10.1073/pnas.2105482118>
- Nel, J., & Boshoff, C. (2019). Online customers' habit-inertia nexus as a conditional effect of mobile-service experience: A moderated-mediation and moderated serial-mediation investigation of mobile-service use resistance. *Journal of Retailing and Consumer Services*, 47, 282–292. <https://doi.org/10.1016/j.jretconser.2018.12.003>
- Nguyen, T., Huang, E., & Nguyen, D. M. (2023). Food delivery app continuance: a dual model and segmentation approach. *International Journal of Retail & Distribution Management*, 51(5), 569–589.
- NICD. (2023). *Daily hospital surveillance report*. <https://www.nicd.ac.za/diseases-a-z-index/disease-index-covid-19/surveillance-reports/daily-hospital-surveillance-datcov-report/>
- Rahi, S., Khan, M. M., & Alghizzawi, M. (2021). Extension of technology continuance theory (TCT) with task technology fit (TTF) in the context of Internet banking user continuance intention. *International Journal of Quality & Reliability Management*, 38(4), 986–1004. <https://doi.org/10.1108/IJQRM-03-2020-0074>
- Rahi, S., Mansour, M. M. O., Alghizzawi, M., & Alnaser, F. M. (2019). Integration of UTAUT model in internet banking adoption context: The mediating role of performance expectancy and effort expectancy. *Journal of Research in Interactive Marketing*, 13(3), 411–435. <https://doi.org/10.1108/JRIM-02-2018-0032>

- Ramos, K. (2022). Factors influencing customers' continuance usage intention of food delivery apps during COVID-19 quarantine in Mexico. *British Food Journal*, 124(3), 833–852. <https://doi.org/10.1108/BFJ-01-2021-0020>
- Rodríguez-Ardura, I., & Meseguer-Artola, A. (2020). How to prevent, detect and control common method variance in electronic commerce research. *Journal of Theoretical and Applied Electronic Commerce Research*, 15(2), 0–0. <https://doi.org/10.4067/S0718-18762020000200101>
- Roh, M., & Park, K. (2019). Adoption of O2O food delivery services in South Korea: The moderating role of moral obligation in meal preparation. *International Journal of Information Management*, 47, 262–273. <https://doi.org/10.1016/j.ijinfomgt.2018.09.017>
- Shahzad, K., Zhang, Q., Zafar, A. U., Ashfaq, M., & Rehman, S. U. (2023). The role of blockchain-enabled traceability, task technology fit, and user self-efficacy in mobile food delivery applications. *Journal of Retailing and Consumer Services*, 73, 103331. <https://doi.org/10.1016/j.jretconser.2023.103331>
- Shao, Z., Zhang, L., Li, X., & Guo, Y. (2019). Antecedents of trust and continuance intention in mobile payment platforms: The moderating effect of gender. *Electronic Commerce Research and Applications*, 33, 100823. <https://doi.org/10.1016/j.elerap.2018.100823>
- Sharma, S., Cheng, Y., & Sharma, P. (2022). Determinants of continuous use intention of news apps in India: Towards an integrated model. *International Journal of Human-Computer Interaction*, 39(12), 2450–2467. <https://doi.org/10.1080/10447318.2022.2076774>
- Sheth, J. (2020). Impact of Covid-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research*, 117, 280–283. <https://doi.org/10.1016/j.jbusres.2020.05.059>
- Shoprite Holdings Ltd. (2021). *Checkers Sixty60 named one of Memeburn's best apps of 2020*. <https://www.shopriteholdings.co.za/articles/Newsroom/2021/checkers-sixty60-one-of-memeburn-best-apps-2020.html>
- Sinha, N., & Singh, N. (2022). Moderating and mediating effect of perceived experience on merchant's behavioral intention to use mobile payments services. *Journal of Financial Services Marketing*, 28(3), 448–465. <https://doi.org/10.1057/s41264-022-00163-y>
- Sreelakshmi, C. C., & Prathap, S. K. (2020). Continuance adoption of mobile-based payments in Covid-19 context: An integrated framework of health belief model and expectation confirmation model. *International Journal of Pervasive Computing and Communications*, 16(4), 351–369. <https://doi.org/10.1108/IJPC-06-2020-0069>
- Statista. (2022). *Online food delivery in South Africa*. <https://www.statista.com/outlook/dmo/eservices/online-food-delivery/south-africa>
- Statistics SA. (2021). *Statistical release P6420, food and beverages (preliminary)*. <http://www.statssa.gov.za/publications/P6420/P64>
- Sun, Y., Xue, W., Bandyopadhyay, S., & Cheng, D. (2022). WeChat mobile-payment-based smart retail customer experience: An integrated framework. *Information Technology and Management*, 23(2), 77–94. <https://doi.org/10.1007/s10799-021-00346-4>
- Tam, C., Santos, D., & Oliveira, T. (2020). Exploring the influential factors of continuance intention to use mobile apps: Extending the expectation confirmation model. *Information Systems Frontiers*, 22(1), 243–257. <https://doi.org/10.1007/s10796-018-9864-5>
- Tamilmani, K., Rana, N. P., Prakasam, N., & Dwivedi, Y. K. (2019). The battle of brain vs. heart: A literature review and meta-analysis of “hedonic motivation” use in UTAUT2. *International Journal of Information Management*, 46, 222–235. <https://doi.org/10.1016/j.ijinfomgt.2019.01.008>
- Timur, B., Oğuz, Y. E., & Yılmaz, V. (2023). Consumer behavior of mobile food ordering app users during COVID-19: Dining attitudes, e-satisfaction, perceived risk, and continuance intention. *Journal of Hospitality and Tourism Technology*, 14(3), 460–475. <https://doi.org/10.1108/JHTT-04-2021-0129>
- Tripathi, S. N., Srivastava, S., & Vishnani, S. (2021). Mobile wallets: Achieving intention to recommend by brick and mortar retailers. *Journal of Marketing Theory and Practice*, 30(2), 1–17.
- Ukpabi, D., Karjaluoto, H., Olaleye, S. A., & Abass, S. M. (2019). Factors influencing mobile banking continuous use in Sub-Saharan Africa: A study of mobile banking users in Nigeria. In A. A. Shaikh & H. Karjaluoto (Eds.), *Marketing and mobile financial services: A global perspective on digital banking consumer behaviour* (pp. 92–115). Routledge Studies in Marketing. <https://doi.org/10.4324/9781351174466-5>
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157–178. <https://doi.org/10.2307/41410412>
- Wang, C., Harris, J., & Patterson, P. (2013). The roles of habit, self-efficacy, and satisfaction in driving continued use of self-service technologies: A longitudinal study. *Journal of Service Research*, 16(3), 400–414. <https://doi.org/10.1177/1094670512473200>
- Yap, C. P., & Lee, W. O. (2023). Factors influencing continuance intention to adopt Online Food Delivery Services among Millennials during the Covid-19 pandemic. In *10th International Conference on Business, Accounting, Finance and Economics (BAFE 2022)* (pp. 47–65). Atlantist Press.
- Yuan, S., Liu, Y., Yao, R., & Liu, J. (2016). An investigation of users' continuance intention towards mobile banking in China. *Information Development*, 32(1), 20–34. <https://doi.org/10.1177/0266666914522140>
- Zhao, Y., & Bacao, F. (2020). What factors determining customer continuingly using food delivery apps during 2019 novel coronavirus pandemic period? *International Journal of Hospitality Management*, 91, 102683. <https://doi.org/10.1016/j.ijhm.2020.102683>