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# User behaviour on continuance intention to use M-commerce in African context: mediating effect of perceived value

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## Abstract

**Purpose** – There has been a huge fluctuation in online marketplace that suggests inconsistencies of m-commerce usage. The study investigates user behaviour to continued patronage of m-commerce and the mediating role of perceived value.

**Design/methodology/approach** – The study aimed to use adapted questionnaire and online version to pool data from respondents that has internet profile and conducts m-commerce. The hypotheses were proven through the use of structural equation model.

**Findings** – In this paper performance expectancy and user satisfaction are major determinants of continuance intention to use m-commerce in African context while perceived value partially mediate the relationship between the variables.

**Research limitations/implications** – Cross-sectional survey and the small sample size that was used calls for caution in generalisation.

**Practical implications** – With the mediating influence of perceived value, attention is directed to the role of value perception of m-commerce users. Keeping and increasing continuance usage requires pleasurable offerings and value indices that influence their subjective perceptions.

**Social implications** – The significance of the mediating variable highlights the social value dimension of users' value perception given that it can help to deepen the continuous usage of m-commerce.

**Originality/value** – The predictive power of 78.5% continuance intention demonstrates inclusion of factors with better predictive accuracy. Importantly, the significance of perceived value as a mediator demonstrates the importance of valuing not only the direct impacts of the variables but also the indirect roles that impacts continuance intention of m-commerce in African context.

**Keywords** Continuance intention, User behaviour, M-commerce, Cashless market

**Paper type** Research paper

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## Introduction

Recently, Nigeria's digital landscape is showing vast transformations. The nation's internet economy occupies lofty position in Africa on vast digital audience, network coverage and infrastructure for network connectivity (Varrella, 2020). A key contributor to the transformation is the rate of advancement of digital technology, about 50% increase in use of smartphone to access internet and 60% rate of internet penetration (Varrella, 2020). This development is great for fostering m-commerce in Africa's largest economy.

M-commerce or mobile commerce is any commercial activity conducted by an individual or a firm through a mobile device that can assess the internet (Sarkar, Chauhan, & Khare, 2020). It is beneficial to users in convenience and (Kalinic, Marinkovic, Kalinic, & Liébana-Cabanillas, 2021). Its potential in Nigeria is buttressed with its 65% contribution to 7% e-commerce sales in 2020 (Statista Research Department, 2022).

In Nigeria, accessing the internet using mobile devices is over 70% (Varrella, 2020). The increasing consumer power, penetration of internet-enabled devices and youthful population of Nigeria are fostering m-commerce. Recently, there are significant fluctuations in online marketplace's visitors for physical goods in Nigeria between 2017 and 2020 (Sasu, 2022). Despite the fluctuations, adoption of m-commerce is rapidly increasing because of the impact from retailers in using online retailing to attract customers, rapid rise in computer literacy, adoption of information and communication technology (ICT) and rising popularity of e-commerce (Omotayo & Omotope, 2018). Literature suggests that ICT impacts peoples' lives in a sustainable way while sustainability demands continuity and consistency (Alshammari, Messom, & Cheung, 2022). The number of order completion has risen sharply in Nigeria such that the future focus is on continuous incentivisation to deepen its usage (Intelligent CIO, 2017). This is significant because majority of the studies still focus on acceptance of m-commerce which does not imply its continuous adoption (Omotayo and Adeyemi, 2018). This could account for earlier studies' concentration on adoption models rather than post-adoption models in post-adoption studies such as unified theory of acceptance and use of technology 2 (UTAUT2) that was adopted with perceived risk and trust extensions in post-adoption study (Verkijika, 2018), and an integrative model that involves technology acceptance model (TAM), theory of planned behaviour (TPB), personal innovativeness and trust (Ghazali, Mutum, Chong, & Nguyen, 2018). Attracting and maintaining m-commerce users' continuous usage is a critical requirement for m-commerce to thrive (Chong, 2013). Few studies have focused on continuance intention thus emphasising the need for more information on post-adoption behaviour. Also, literature suggests existence of differences in adoption of m-commerce between countries (Dai & Palvia, 2009) such as in China where value for money motivates m-commerce continuance intention (Shang & Wu, 2017) while satisfaction is a key predictor in Malaysia (Luqman, Razak, Ismail, & Alwi, 2016) and Indonesia during COVID-19 (Nani & Lina, 2021). Moreover, significant interest in continuance intention is rapidly growing in developed nations while extant studies suggest poor attention to emerging African markets (Humbani & Wiese, 2019). With several studies identifying the importance of value and dearth of literature on the mediating impact of perceived value on continuance intention, this study aims to not only evaluate predictors of m-commerce continuance intention in African context but also to assess the mediating effect of perceived value, and determine the predictive power of the model.

The study has academic and theoretical significance. From academic perspective, the study provides evidence on the role of perceived value as a predictor and a mediator on m-commerce continuance intention in African context. Theoretically, a predictive model is proposed to assess the predictors in African context, determine its accuracy and the direct and indirect influence of m-commerce continuance intention given that existing models in African context used acceptance models which in most cases had low predictive accuracy.

## Review of related literature

### *M-commerce continuance in Nigeria*

Continuance intention is about repeat purchase and strength of individual's intention to repeat behaviour. In m-commerce it is a post-adoption behaviour that represents user's intention to continue using m-commerce. As a construct, satisfaction is fundamental in measuring it (Bhattacherjee, 2001). Its usefulness is buttressed from the large mobile payment ecosystem and factors that affect individuals' continuous usage. In Africa, there is increasing dominance of m-commerce among the youthful population, increase in ownership of internet-enabled mobile phones, rising internet penetration (Saleh, 2022) and rising consumer class that is becoming an attraction to many e-commerce giants (Ezennia & Marimuthu, 2022). Comparatively, Nigeria is predicted as the only African nation with 4% contribution to the projected 700 million new mobile subscribers globally by 2025 (Jumia, 2019).

### *Theoretical underpinning*

In studying consumer behaviour, several approaches have being adopted to solve the peculiarity of continuance intention (Bölen & Özen, 2020). Literature suggests appropriateness of using expectation confirmation model (ECM) and its prominence in addressing continuance use of information system/technology. Perceived usefulness, confirmation and satisfaction are its key factors (Bhattacherjee, 2001). The essence of the three factors is that user-satisfaction is influenced by perceived usefulness and confirmation such that satisfaction drives continuance intention. Perceived usefulness is post-usage belief that involves extrinsic values like time saving benefit while confirmation deals with trade-off between initial expectation of the user and post-usage belief (Bölen & Özen, 2020). In information system/technology studies concerning continuance intention, ECM is widely used such as in online shopping in private shopping clubs (Al-Hattami, 2021), m-shopping (Bölen & Özen, 2020) and food delivery apps (Zhao & Bacao, 2020). However, with several adaptations, there are various extensions of ECM (Al-Hattami, 2021). In essence there is no commonly acceptable model.

Moreover, UTAUT2 was developed by Venkatesh, Thong, and Xu (2012) to capture the dimension of consumer usage. It has been used to study behavioural intentions but scarcely applied in continuance intention studies (Singh, 2020). Its increasing usage is due to proliferation of mobile internet (Venkatesh *et al.*, 2012). The model has been widely modified in different contexts using a combination of other variables in mobile technology (Zhao & Bacao, 2020). Moreover, adoption intention is demonstrated with UTAUT2 while ECM demonstrates the theory of on-going consumer usage of information technology (Singh, 2020). Literature suggests that studies in Africa are more on adoption which accounts for adoption of models such as UTAUT in m-commerce adoption in Cameroun (Verkijika, 2018). Given the context of the study, an integrative model that is anchored on ECM with extension from UTAUT2 variables is adopted given that ECM is a post-adoption behavioural model with capacity to explain post-adoption behaviour in any geographical context. Moreover, UTAUT2 through performance expectancy provides deeper explanation than perceived usefulness given its elements of relative advantage and extrinsic motivation (Verkijika, 2018) while the social context helps in referrals and recommendation.

### *Hypotheses development and research model*

*Performance expectancy (PE).* "It is the degree to which using technology will provide benefits to consumers in performing certain activities" (Venkatesh *et al.*, 2012, p. 159). It is used as a predictor of intention to use a technology (Zhao & Bacao, 2020) following the individual's belief on the innovation being able to enhance performance. The belief increases where customers realise the value and utility of using an innovation (Singh, 2020). PE has been

validated in several innovation studies such as food delivery apps (Zhao & Bacao, 2020), and m-payment systems (Singh, 2020). From the context of ECM, it predicts satisfaction and continuance intention (Al-Hattami, 2021) though UTAUT2 considers it as a predictor of behavioural intention (Venkatesh *et al.*, 2012). As perceived usefulness it is claimed not to significantly influence continuance intention (Zhang, Zhu, & Liu, 2012). Thus, it is hypothesised:

*H1*. Performance expectancy positively influences continuance intention to use m-commerce.

*H2*. Performance expectancy positively influences user satisfaction of m-commerce.

*Social influence (SI)*. SI is the extent of an individual's belief in adopting behaviour because of other people's expectation and their compliance to the expectations (Kalinic *et al.*, 2021) which is also used as subjective norm (Oloveze, Ogbonna, Ahaiwe, & Ugwu, 2022). It is a multi-dimensional construct (Bourdon & Sandrine, 2009) considered with social image in TAM as external factors of social interactions (Oloveze, Oteh, Nwosu, & Obasi, 2021). As a multi-dimensional construct it comprises of belief and motivation. Previous studies show that it is a significant predictor in related studies such as food delivery apps (Zhao & Bacao, 2020). Such influence can be direct or indirect and are predicated on customer reviews and shared experiences. Kalinic *et al.* (2021) show that it is not a significant predictor of user satisfaction of m-commerce while few studies have considered it from post-purchase evaluations (Jones & Taylor, 2018); therefore it is hypothesised:

*H3*. Social influence positively influences user satisfaction of m-commerce.

*Confirmation (Con)*. This is the "user's perception of the congruence between the expectation of information system (IS) use and its actual performance" (Bhattacherjee, 2001, p. 359). Its importance is highlighted with the level of psychological condition it creates within an individual such that the individual has a feeling of satisfaction, or dissatisfaction. The comparison between previous expectation and outcome experience leads to confirmation or disconfirmation of the innovation in the mind of the individual (Bölen & Özen, 2020). Confirmation occurs with meeting and exceeding expectation while experiences that fall below expectations lead to disconfirmation. It has been validated in various studies involving mobile technologies such as online shopping (Al-Hattami, 2021). Therefore it is hypothesised:

*H4*. Confirmation positively influences user satisfaction of m-commerce.

*User satisfaction (US)*. Satisfaction is an individual's perception of difference between an expected outcome and the actual outcome. It is a reflection of an individual's feelings of emotional satisfaction as a result of needs and expectations met from an innovation (Bölen & Özen, 2020). Specifically, it occurs when the user experiences outcome that is beyond expectation given that individuals have pre-adoption expectations prior to the use of the innovation (Gupta, Yousaf, & Mishra, 2020). Evidence shows that it has a link with continuance intention (Zhao & Bacao, 2020). It is a key determinant of continuance intention toward m-commerce in Indonesia (Nani & Lina, 2021) and Malaysia (Luqman *et al.*, 2016) but not in African context (Franque, Oliveira, & Tam, 2021). Thus, it is hypothesised:

*H5*. User satisfaction positively influences continuation intention to use m-commerce.

*Mediating effect of perceived value (PV):*
PV is a multidimensional construct that involves functional value, emotional value, economic value and environmental value (Shao, Guo, & Ge, 2019). As a construct it is approached from economic dimension, social and interpersonal benefits dimension (Al-Adamat, Al-Gasawneh,

& Sourak, 2020). It is about aggregate intrinsic and extrinsic individual value aspects of a product/service that border on quality attribute, purchase and efficiency value. It results from purchase and use experience of the customer and influences consumer's consumption decision given the trade-off between derivable benefit and sacrifice in the exchange. PV is an attraction to customers due to its benefits. It is a significant predictor in intention studies (Shao *et al.*, 2019), and a mediator in continuance intention studies (Al-Adamat *et al.*, 2020). As a mediator it helps to understand the relationship between quality and customer satisfaction (Hapsari, Clemes, & Dean, 2016), and predictors of continuance intention but has rarely been assessed as a mediator between satisfaction and continuance intention of m-commerce. In some studies, PV is a significant mediating variable (Mathur & Gangwani, 2021) but not in others (Patma, Kusumawati, Mauludin, & Zaini, 2020). Thus, it is hypothesised (see Figure 1):

*H6.* Perceived value is significantly related to user satisfaction of m-commerce.

*H7.* Perceived value is significantly related to continuance intention to use m-commerce.

*H8.* Perceived value mediates the influence of user satisfaction on continuance intention to use m-commerce.

## Research methodology

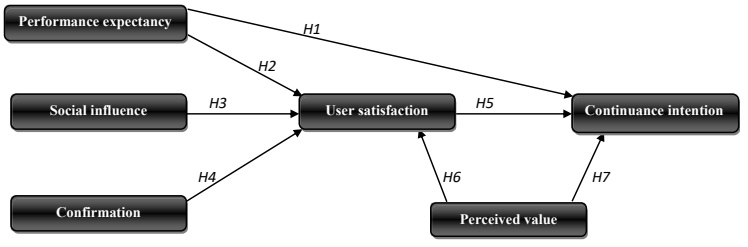
The study involved online survey of internet users with experience of m-commerce. Hypotheses were formulated to test the relationships.

### *Measurement development*

Measurement scales were adapted and scaled on a questionnaire using 7-point Likert scale that ranged from 1 = strongly disagree to 7 = strongly agree. They were subjected to content validity by 5 experts for completeness and appropriateness. Secondly, it was pretested on 25 m-commerce users using mall intercept at the offline office of Jumia and Konga which are Nigeria's e-commerce giants. After verification, online version of the questionnaire was designed using Google form and distributed through snowball sampling. The sampling technique is useful in accessing other reliable sources through referrals, and in times of lack of sampling frame yet it affects representativeness and randomness. The link was shared through email lists, WhatsApp and Facebook.

### *Data collection*

279 forms were collected. The drawn sample size was because of resource constraints. It is often the primary justification for small samples (Lakens, 2022). During data screening, 21 forms comprising 7.5% of the total forms were removed because of lack of m-commerce experience. 258 valid forms that comprised 92.5% of the total forms were used.




**Source(s):** Author's compilation

**Figure 1.**
Proposed structural model

The respondents' profile shows 59.3% male and 40.7% female. 54.7% were below 35 years and 45.3% were above 35 years. 53.9% use m-commerce frequently, 46.1% not frequently.

*Results of data analysis*

Data was analysed using structural equation model (SEM). Kaiser-Meyer-Olkin value is 0.933 which confirms sampling adequacy. Bartlett's test of Sphericity is significant with Chi-square value of 2946.978, df = 190 and $p = 0.000$. Common method bias (CMB) was conducted using Herman's single factor. At 46.382%, CMB does not have influence on the data given the threshold of 50%.

*Reliability and validity*

The suitability of the measurement scales was done using Cronbach's alpha (CA), composite reliability (CR), and average variance extracted (AVE) by employing Statistical Package for Social Sciences (SPSS 23) and Analysis of a Moment Structures (AMOS 23). The results confirm reliability and validity of the constructs given that the values of Cronbach, CR, and AVE are above recommended threshold of 0.7 for Cronbach alpha (Nunally, 1978), 0.7 for CR and 0.5 for AVE (Hair, Black, Babin, & Anderson, 2014). Specifically, for confirmation (factorial loadings (FL) were Con1:0.718, Con2:0.713, Con3:0.828, Con4:0.676; CA:0.824; CR:0.825; AVE:0.54), Social influence (FL were SI1:0.862, SI2:0.724, SI3:0.672; CA:0.841; CR:0.799; AVE:0.57), Perceived value (FL were PV1:0.718, PV2:0.822, PV3:0.717, PV4:0.808; CA:0.804; CR:0.0851; AVE:0.59), Performance expectancy (FL were PE1:0.748, PE2:0.739, PE3:0.803; CA:0.798; CR:0.808; AVE:0.58), User satisfaction (FL were US1:0.706, US2:0.659, US3:0.814; CA:0.851; CR:0.772; AVE:0.53), Continuance intention (FL were CI1:0.814, CI2:0.611; CI3:0.863; CI4:0.723; CA:0.782; CR:0.780; AVE:0.55). See Table 1 for furter illustrations.

| Variable | Item | Factorial loads ($\lambda$) | Cronbach alpha | Composite reliability (CR) | Average variance extracted (AVE) |
|---|---|---|---|---|---|
| Confirmation | Con1 | 0.718 | 0.824 | 0.825 | 0.54 |
| | Con2 | 0.713 | | | |
| | Con3 | 0.828 | | | |
| | Con4 | 0.676 | | | |
| Social influence | SI1 | 0.862 | 0.841 | 0.799 | 0.57 |
| | SI2 | 0.724 | | | |
| | SI3 | 0.672 | | | |
| Perceived value | PV1 | 0.718 | 0.804 | 0.851 | 0.59 |
| | PV2 | 0.822 | | | |
| | PV3 | 0.717 | | | |
| | PV4 | 0.808 | | | |
| Performance expectancy | PE1 | 0.748 | 0.798 | 0.808 | 0.58 |
| | PE2 | 0.739 | | | |
| | PE3 | 0.803 | | | |
| User satisfaction | US1 | 0.706 | 0.851 | 0.772 | 0.53 |
| | US2 | 0.659 | | | |
| | US3 | 0.814 | | | |
| Continuance intention | CI1 | 0.611 | 0.782 | 0.780 | 0.55 |
| | CI2 | 0.863 | | | |
| | CI3 | 0.723 | | | |

**Table 1.** Factorial loads, Cronbach's alpha, composite reliability, average variance extracted

*Structural model*

The model fit was confirmed using goodness-of-fit indices. The proposed model is good because each of the values exceeded the recommended threshold in literature. (minimum discrepancy

function by degrees of freedom divided (CMIN/DF) = 1.594 ≤ 5.00; root mean squared residual (RMR) = 0.047 ≤ 0.08; root mean squared error of approximation (RMSEA) = 0.048 ≤ 0.08 (Hu & Bentler, 1999); *p*-value for rejection of null hypothesis of a data fit (PCLOSE) = 0.600 > 0.05; PNFI = 0.758, 0 ≤ PNFI ≤ 1; parsimony goodness-of-fit index (PGFI) = 0.683, 0 ≤ PGFI ≤ 1 (Danarto, Putu and Riri, 2022); adjusted goodness-of-fit index (AGFI) = 0.884 ≥ 0.80; goodness-of-fit index (GFI) = 0.914 ≥ 0.90 (Hair *et al.*, 2014); normed fit index (NFI) = 0.918 ≥ 0.90 (Bryne, 1994); relative fix index (RFI) = 0.900 ≥ 0.90; incremental fit index (IFI) = 0.968 ≥ 0.90 (Bollen, 1989); Tucker-Lewis index (TLI) = 0.960 ≥ 0.90; comparative fit index (CFI) = 0.961 ≥ 0.90). See Table 2 for futher illustrations. The $R^2$ establishes the predictive accuracy of the model (Hair *et al.*, 2014). The $R^2$ value for satisfaction (0.683) and continuance intention (0.758) are strong indications of the variables providing strong explanations to the variance in satisfaction and continuance intention, respectively. The integrated model provides a better predictive accuracy on m-commerce compared with other studies in developing countries such as Malaysia (Luqman *et al.*, 2016) and Indonesia (Nani & Lina, 2021) and in African context (Omotayo & Omotope, 2018).

To ascertain the mediating effect of perceived value, Sobel test with 5000 bootstrapping samples for bias corrected and 95% confidence level was used through Hayes Macro Process v2.16. The coefficients, standard errors of the paths and normal theory test for indirect effect was used to confirm mediation.

| Fit indices | Recommended value | Value in structural model | Reference |
|---|---|---|---|
| CMIN/DF | ≤5.00 | 1.594 | Bentler and Paul (1996) |
| RMR | ≤0.08 | 0.047 | Pituch and Stevens (2016) |
| GFI | ≥0.90 | 0.914 | Hair *et al.* (2014) |
| AGFI | ≥0.80 | 0.884 | Hu and Bentler (1999) |
| PGFI | 0 ≤ PGFI ≤ 1 | 0.683 | Danarto *et al.* (2022) |
| NFI | ≥0.90 | 0.918 | Bryne (1994) |
| RFI | ≥0.90 | 0.900 | |
| IFI | ≥0.90 | 0.968 | Bollen (1989) |
| TLI | ≥0.90 | 0.960 | Bentler and Paul (1996) |
| CFI | ≥0.90 | 0.967 | Schumaker and Lomax (2016) |
| PNFI | 0 ≤ PNFI ≤ 1 | 0.758 | Danarto *et al.* (2022) |
| RMSEA | ≤0.08 | 0.048 | Hu and Bentler (1999) |
| PCLOSE | >0.05 | 0.600 | |

**Note(s):** RMR/SRMR = Standardised root mean squared residual. GFI = goodness-of-fit index. AGFI = adjusted goodness-of-fit index. NFI = Normed fit index. RFI = relative fix index. IFI = incremental fit index. TLI = Tucker-Lewis index. CFI = Comparative fit index. RMSEA = Root mean squared error of approximation

**Table 2.** Structural model fit indices in the proposed model

*Hypotheses testing*

In using SEM, maximum likelihood estimation was used. Seven hypotheses were empirically tested as the results Illustrated on Figure 2 and Table 3.

Specifically, performance expectancy positively influence continuance intention to use m-commerce (H1: β = 0.173; $p < 0.004$) as validated in related researches (AI-Hattami, 2021). H2 shows a direct and positive relationship between performance expectancy and user satisfaction of m-commerce ($\beta = 0.520$; $p < 0.000$) as confirmed in similar studies (Tam, Santos, & Oliveira, 2020). H3 indicates that social influence is not significantly related to user satisfaction of m-commerce ($\beta = -.019$; $p < 0.872$) as confirmed in Kalinic *et al.* (2021). H4 indicates direct and positive influence of confirmation on user satisfaction of m-commerce

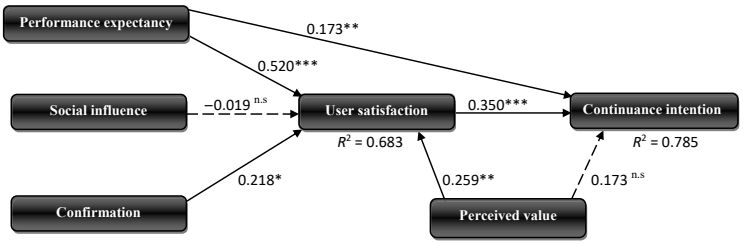



**Figure 2.**
Results of structural model

**Note(s):** *** = $p < 0.001$; ** = $p < 0.05$; * = $p < 0.1$; n.s = not significant

**Source(s):** Author's compilation

| Hypotheses | Std estimates | S.E | Sig. | Support |
|---|---|---|---|---|
| H1: Performance expectancy → Continuance intention | 0.173 | 0.060 | 0.004 | Yes |
| H2: Performance expectancy → User satisfaction | 0.520 | 0.094 | 0.000 | Yes |
| H3: Social influence → User satisfaction | −0.019 | 0.047 | 0.872 | No |
| H4: Confirmation → User satisfaction | 0.218 | 0.033 | 0.080 | Yes |
| H5: User satisfaction → Continuance intention | 0.350 | 0.072 | 0.000 | Yes |
| H6: Perceived value → User satisfaction | 0.259 | 0.062 | 0.034 | Yes |
| H7: Perceived value → Continuance intention | 0.173 | 0.050 | 0.150 | No |
| H8: User satisfaction/Perceived value → Continuance intention | | | | |

| Mediating path coefficient and std. error | | | | Sobel test from Hayes macro process | | | |
|---|---|---|---|---|---|---|---|
| Mediator path | Coefficient | Std. error | Effect | Test statistic ($Z$) | Std. error | $p$-value | Support |
| US → PV | 0.49 | 0.04 | 0.13 | 4.50 | 0.03 | 0.000 | Partial mediation support |
| US → CI | 0.59 | 0.04 | | | | | |
| US/PV → CI | 0.46 | 0.04 | | | | | |

**Note(s):** SE = Standard error; *** = $p < 0.0000$; ** = $p < 0.05$; * = $p < 0.1$; n.s = not significant

**Table 3.**
Results of hypothesised relationships

($\beta = 0.218$; $p < 0.080$) as in related studies (AI-Hattami, 2021). H5 shows a significant influence of satisfaction on continuance intention to use m-commerce ($\beta = 0.350$; $p < 0.000$) as confirmed in other studies (Nani & Lina, 2021). H6, H7 and H8 formulated from perceived value has contrasting results. H6 shows that perceived value significantly influence user satisfaction ($\beta = 0.259$; $p < 0.030$) as confirmed in (Shao *et al.*, 2019) while H7 shows that perceived value is not significantly related to continuance intention to use m-commerce ($\beta = 0.173$; $p < 0.1500$). This is contrary to earlier results on m-commerce adoption (Dai & Palvia, 2009) but confirmed in a related study (Mahendra, Dhyah, & Budi, 2019). H8 indicates that perceived value significantly mediate the relationship between user satisfaction and continuance intention to use m-commerce as confirmed in (AI-Adamat *et al.*, 2020).

## Discussion and conclusions

The main objective in this study is to analyse continuance intention of m-commerce users with key focus on identifying factors that influence behaviour in African setting and the mediating influence of perceived value using a proposed model. To achieve this objective, a proposed model was tested which was reasonably good.

**Theoretical contribution**

Firstly, six hypotheses out of the eight proposed hypotheses were significant. User satisfaction had the greatest effect on continuance intention to use m-commerce as confirmed in related studies (Singh, 2020). This reveals that individual's continuous use of m-commerce is driven by satisfaction level. When they are satisfied with utilising the option in commerce activities it will drive them to repeat the usage. Given that users have pre-adoption expectations, the result suggests the need to monitor service quality, improve them and endeavour to meet the user expectation about using the innovation. This helps provide the key reason for the drop in m-commerce between 2017 and 2020 in Nigeria. Furthermore, the $R^2$ value of the model indicates a better predictive accuracy in m-commerce in African context and also when compared with related studies in other developing nations such as Malaysia and Indonesia.

Secondly, performance expectancy is the second important variable that influences continuance intention to use m-commerce while positively and significantly predicting user satisfaction. This is confirmed in related studies (Al-Hattami, 2021) though as post perceived usefulness. In some other studies it was established not to significantly predict continuance intention (Zhang *et al.*, 2012). The result confirms the importance of the expected benefits of users from the innovation particularly in carrying out commerce activities online through their internet-enable mobile phones. If they cannot ascertain any difference in benefit between m-commerce and offline commercial activity, the adoption continuity will be affected. The result deepens the necessity of its inclusion in continuance intention studies given its better useful capacity than perceived usefulness particularly from relative advantage and extrinsic motivation (Verkijika, 2018).

Thirdly, the result did not confirm the effect of perceived value on continuance intention. This is contrary to earlier studies (Mathur & Gangwani, 2021). This presents a new highlight on perceived value in m-commerce and informs the direction for further studies. Particularly, it informs the direction to future studies on the dimensions of value perception to understand the critical dimension that influence m-commerce and ones that do not influence m-commerce continuation.

Fourthly, only three variables are related to continuance intention through user satisfaction of m-commerce. Performance expectancy is the most significant predictor of user satisfaction (Zhao & Bacao, 2020). The result confirms the link between the benefit the user expects from using the innovation and the actual utility that qualifies satisfaction or dissatisfaction. When users experience value and utility in using m-commerce, it reinforces belief in continuous usage. The utility is justified in terms of convenience, time savings value and speed (Singh, 2020).

Fifthly, perceived value establishes a positive effect on satisfaction. This is verified in several fields (Shao *et al.*, 2019). Though there is no direct effect of perceived value on continuance intention to use m-commerce in this study, this empirical result implies existence of an influence on continuance intention through indirect means (satisfaction). In other words, m-commerce users consider experiencing a satisfactory value from the innovation as a condition for continued usage. Also this can account for the fluctuations in online marketplace between 2017 and 2020 in Nigeria. Value is established when users of m-commerce establishes a positive difference between adopting the innovation and utility they received from the adoption.

Sixthly, confirmation establishes a positive relationship with user satisfaction. The finding is verified and confirmed in related fields (Al-Hattami, 2021) and indicates the importance of meeting or exceeding user expectation from using the innovation.

Finally, the study makes significant academic contribution because several literatures have wholly focused on intentions with the perception that m-commerce is yet to diffuse. Several literature are from nations other than Africa, implying that scanty works are focused

on Africa's emerging economy such as Nigeria which is rated as having a vast digital coverage, rapid penetration and comparative infrastructure in African continent. This is important given the dynamics of culture, education and value perception between locations. Few studies that focused on the Nation's budding economy used acceptance model constructs. The study considered a hybrid of UTAUT2 and ECM with key attention on user satisfaction construct to continuance intention. Integrating the constructs of UTAUT2 – social influence, and performance expectancy into the model provided better insight to indirect effects on continuance intention through user satisfaction and better predictive accuracy. Moreover, extant studies have ignored the impact of perceived value in mediating the relationship between satisfaction and continuance intention. The result validates the importance of the mediating influence of perceived value in m-commerce in African context.

## Practical implication

The result of user satisfaction practically calls for attention of managers, m-web designers and engineers on the importance of meeting and exceeding m-commerce users' expectation. Building and sustaining confidence in the system requires a constant delivery of worthwhile experience, creating a consistent positive navigation experience and effortlessness in using the innovation.

The significance of performance expectancy calls for focus on the value proposition. In developing, managing and sustaining the utility rendered to m-commerce users, a greater reason to continue its usage should go beyond time savings and convenience to involve inclusion and sustenance of attractive motivations. Moreover, communicating the existence of these benefits is essential which m-commerce giants like Jumia can execute by practical inclusion of m-commerce benefits in marketing campaigns.

With the mediating influence of perceived value, attention is directed to the role of value perception of m-commerce users. M-commerce users are moved by the value they place on m-commerce. Keeping and increasing their patronage requires provision of pleasurable offerings and value indices that influence their subjective perceptions. The user value preferences are vital while the review ratings are pointers to the nature of value needed by them. Additionally, it is an opportunity for policy formulation and implementation as well as re-strategizing to reap the benefits of m-commerce particularly for emerging economies like Nigeria that strive for cashless policy.

### *Limitation and further direction of study*

The use of cross-sectional survey which lasted between December and January calls for caution and a resort to longitudinal survey because of the concurrent examination of the relationships. The study was conducted within a given part of the nation that is predominantly "Igbo speaking tribe". This calls for a cross cultural study that incorporates other tribes. Attention can be directed towards the dimensions of value to understand its key mediating impact. Lastly, the adopted sampling technique calls for caution in generalisation of the findings given that non-probability sampling techniques disregard equality in representation.

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