DELSU Journal of Management Sciences (DELJOMS)
Abbr. Title: Deljoms, FMS
ISSN: *(Online)* **: 2756-3731**
OPEN
Research Article Volume 8, Number 1, June 2026

Enriching Mobile Payment Usage: The Impact of M-Airtime Voucher

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Publication Date: 2026/06/22

Abstract
The impact of m-airtime adoption on enhancing mobile commerce was the study focus. It clarified how to use m-airtime as a tool for e-payment in broader m-commerce. Hence, the conceptual framework characterises peers, Internet coverage, and self-efficacy as external variables, behaviour intention as a mediating variable, and actual behaviour as an endogenous variable. As a study tool, a hard copy questionnaire was created and disseminated to Nigerian telecom customers of the three major network service providers to ensure they meet the requirements needed to take part in the research. As a result, Smart PLS version 3 was applied for the 390 useable sampling data points analysis. The results showed that, on an individual level, Nigerian customers are more likely to purchase online rather than using a scratch card when they have higher degrees of self-efficacy, peer influence, and internet coverage. Regarding m-airtime adoption, path coefficient, t-state, p-value, and f-squared in this study have not been adequately discussed. Thus, the results have added to the knowledge already available in m-payment acceptance studies.
keywords: *m-payment, self-efficacy, social factor, m-airtime, behaviour intention*

Introduction

The technology of mobile devices, especially phones, has revolutionized many aspects of human existence, including government, business, and communication Akazue et al. (2024). However, human life in the twenty-first century has progressively evolved into "e-life," or electronic life. In addition to changing and improving human behaviour, these portable Internet-connected devices will only get better as demand for digital services rises Okofu et al. (2023). Once more, the ease and convenience of cashless marketing transactions have been facilitated by the use of mobile devices with Internet capabilities as payment instruments (Yokumah et al., 2017; Shy, 2020; Oyelami et al., 2020; Kaur et al., 2020). The studies above explain why governments, businesses, and economies at all levels are switching to electronic transactions because of its advantages (Yokumah et al., 2017; Elhajjar & Ouaida, 2019). It makes sense that Cascio & Montealegre (2016) noted how these technologies have changed human actions outside of time and place for outsmarting rivaling (Anning-Dorson & Nyamekye 2020). One such development in mobile devices is mobile payment, or m-payment,

which has shaped the payment systems (World Payment Report 2020). Conversely, resistance to innovation could be caused by a lack of skill, the sophistication of a few mobile applications, or, according to Blut & Wang (2020), people's scepticism of novel concepts. Anjum & Chai (2020) pointed to a lack of technical expertise as a barrier to new technology adoption.

Several academics have concentrated on the general adoption of m-payments (Gupta & Arora, 2019; Lin et al., 2019; Trachuk & Linder, 2017), with little emphasis on specific payment aspects, despite the advantages of m-payments, which include facilitating electronic payments for goods and services (Ting et al., 2016; Adebayo et al., 2017), trust (Okofu et al., (2024), convenience, time-saving, and lower transactional fees Chen et al. (2019). Furthermore, Yeh (2020) has demonstrated that adoption still requires thorough knowledge and is delayed. As a result, the factors impacting the acceptance of m-airtime as a substitute for scratched card vouchers have been discussed in this study. Digital transactions will be essential if developing nations like Nigeria are to reap the benefits of ICT for development (Ali & Odularu, 2020; Myovella et al., 2020).

Telecom customers in Nigeria can credit their phone accounts digitally, traditionally (with scratch cards), or by both methods, depending on the circumstances. But because it's a cash economy (Soyemi et al., 2015; Williams et al., 2018), the scratch card is the recommended approach Omolewa et al. (2018). The Nigerian government implemented a cashless policy to improve m-payment (Ezeamama et al., 2014; Okeke et al., 2017). The use of Point of Sale (POS) and Automated Teller Machine (ATM) technologies in payment transactions has increased as a result of this policy throughout time (Ehiedu et al. 2020, Ehiedu et al. 2021). In keeping with the UN's goal of economic development, the telecom sector has also launched m-airtime for tech natives (United Nations, 2015).

Conceptual Framework and Hypotheses Development

To understand the behaviour of Nigerian telecom consumers, this study has developed a conceptual model by including pertinent concepts from earlier research on technology adoption, m-commerce, and specifically m-payment. As a result, it is explained how peer pressure, Internet coverage, and phone self-efficacy relate to behaviour intention, which in turn affects actual usage.

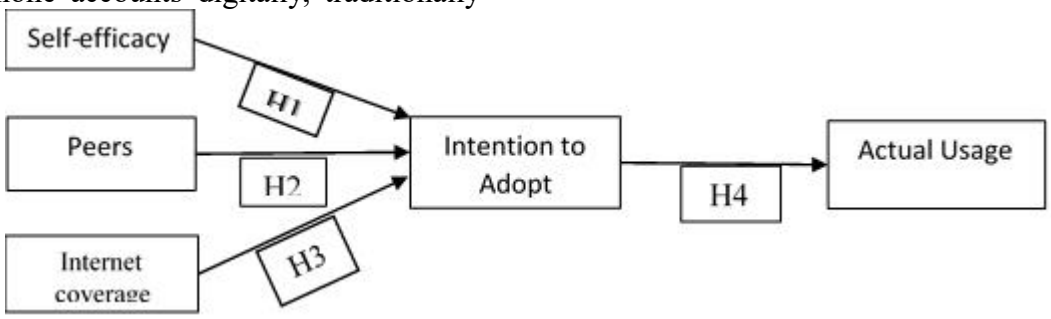

FIGURE 1 Conceptual framework of m-airtime adoption

Phone Self-Efficacy (PSE) and behaviour intention

Self-efficacy is a person's belief in their ability to do a task successfully (Bandura, 1986). Ross et al. (2016) observed that people who shun problems in executing tasks are less motivated to develop themselves. Blut & Wang (2020) noted that people who are skeptical about technology regard it as non-useful. Because it predicts technology adoption in telebanking among Jordanian consumers, online consumers with self-efficacy are more at ease and confident with mobile transactions (Marriott et al., 2017; Alalwan et al., 2016). Also, McIntyre et al. (2023) observed that self-efficacy determines mental activities. Therefore, when a technology user deliberately investigates to adapt novel concepts or services, they express self-efficacy. As in the research conducted by Foroughi et al. (2019) and Faqih & Jaradat (2015), the acceptance of mobile banking and mobile commerce were the impacts of self-efficacy. Therefore, the greater the adoption and perception of m-airtime's use among mobile phone users, the more they realize it will help them reach self-goals. On the other hand, resistance to utilizing m-airtime technology will arise from a lack of confidence in navigating the contents of mobile applications. Thus, the following hypothesis:

Consumers' level of phone self-efficacy significantly influences mobile airtime adoption.

Peer group and behaviour intention

Peer impact is the idea that when a group of consumers adopt a specific technology, the effect on individuals increases. Others will either directly or indirectly conform as a result of this new action due to the majority influence. According to Gulati (2017), peer influence is strong when individuals believe in their peer group and adjust to fit in as a socially acceptable member. Conversely, a technology's effect on the individual will be minimal if few people use it. Previous research has verified the impact of social factors on social interaction for blood donation (Duh & Dabula, 2021), the adoption of mobile wallets (Prabhakaran & Vasantha, 2020), mobile banking (Mokhtar et al. (2017), and mobile commerce (Sathye et al., 2018). These studies concentrated on various settings and applications of technological services. Thus, according to Venkatesh et al. (2012) that social variables impact the adoption of technology, it is hypothesized that:

Peer group influences behaviour intention to adopt m-airtime

Internet coverage and behaviour intention

The degree to which telecom providers span a large geographic area to allow customers to conduct transactions was referred to in this study as Internet coverage. It suggests that Internet services should be readily available, reasonably priced, and dependable (Mudzanani & Molaoa, 2018). It also refers to the possibility that customers would use telecom services around the clock, in any place. Technology adoption, on the other hand, is hampered by the absence of favourable conditions Venkatesh et al. (2012). Research like Asongu (2018) and Palau-Saumell et al. (2019) have shown that the availability of facilities influences technology adoption. Thus, based on earlier literary works, the study hypothesis that:

Internet coverage influences behaviour intention to embrace m-airtime.

Behaviour intention and actual usage

The propensity or choice of a consumer to use a good or service is behaviour intention Okofu et al. (2023). Here, it refers to the consumer choice to apply a novel concept

due to influences. Ho et al. (2015) state that behaviour intention reflects the precursor to actual purchase prediction with specific product or services (Dilotsotlhe & Duh, 2021). When a consumer experience benefits from online engagement, it enhances behaviour intention to purchase Okofu et al. (2024). Therefore, the connection between BI and AU has been studied in the context of online purchasing, m-payments and m-banking (Teng et al., 2018; Yeh, 2020; Zhang et al., 2018; and Rehman et al., 2019). Mombeuil (2020) noted that consumer convenience predicts m-wallet usage for online payments. Once more, Islam (2017) observed that among Bangladeshi customers, behaviour intention dictates mobile internet usage. Therefore, the hypothesis that:

Behaviour intention influence on actual use of m-airtime

RESEARCH METHODOLOGY

The study used a quantitative methodology, distributing and gathering primary data from consenting participants via a standardized questionnaire in hard copy. Also, the convenience sampling of non-probability technique for selecting willing and beneficial responses was adopted Akazue et al. (2023). Additionally, 390 of 400 data samples collected were usable due to the encouragement of participants to answer every question, which resulted in a high response rate. A 5-point Likert scale with 15 items—1 = highly agree, 2 = agree, 3 = neutral, 4 = strongly disagree, and 5 = disagree—was used as the measurement tool. The Smart PLS (3) was used for the data analysis in this work. However, Cronbach's alpha (CA) and composite reliability measures to assess the construct's internal consistency and reliability were adapted as described by Hair et al. (2019), whose indicators are higher than 0.7. Heseler et al. (2017) found that the heterotrait-monotrait (HTMT) scale for discriminant validity and the ratio are acceptable when the values are lower than 0.85, while the Average Variance Extract (AVE) evaluated convergent validity of the scale loading was acceptable above 0.5. Once more, the degree of multicollinearity among the variables was assessed using the Variance Inflation Factor (VIF), and a value of less than three was acceptable. Lastly, if the t-statistics is higher than 1.96 and the p-value is less than 0.05, the inner model of the path coefficient is significant. Thus, a t-test of a 5% significance level will indicate the proposed hypotheses are supported (Fornell & Cha, 1994). Furthermore, the f^2 criteria reach the hypotheses for impact values ranging from 0.15 to 0.35.

Result and Discussion

TABLE 1 Demographic descriptive statistics

Variable	Category	Frequency	Percentage
Gender	Male	205	53%
	Female	185	47%
Age	20-30	51	13%
	31-40	114	29%
	41-50	159	41%
	50-60	66	17%
Educational level	OND	78	20%
	HND	90	23%
	BSc	129	33%
	Masters	93	24%
Network	MTN	187	48%
	AIRTEL	122	31%
	GLO	81	21%

Table 1 showed that 205 (53%) participants were male and 185 (47%) were female. In age, 159 (41%) people between 41 and 50 were the highest, and MTN was the network of choice for 187 (48%) people. Lastly, the BSc respondent's certificates accounted for 129 (33%) of the total and had the largest sample size. Table 1 shows that the average Nigerian citizen has a high level of education, even with age disparities.

TABLE 2 Measurement model

Constructs/Items	Mean	Standard deviation	Loadings	VIF
***Phone self-efficacy CA=0.752; CR=0.842; AVE=0.640**				
PSE 1	1.89	1.173	0.817	1.089
PSE 2	2.43	1.174	0.788	1.428
PSE 3	2.24	1.104	0.794	1.518
Peers CA=0.883; CR=0.919; AVE=0.739				
PE 1	3.11	1.294	0.831	2.158
PE 2	3.30	1.265	0.850	2.468
PE 3	3.32	1.232	0.885	2.669
Internet coverage CA=0.858; CR=0.903; AVE=0.701				
IC1	2.15	1.126	0.825	2.259
IC2	2.27	1.093	0.852	2.362
IC3	2.28	1.157	0.876	2.580
Behaviour Intention CA=0.751; CR=0.855; AVE=0.664				
BI1	2.19	1.091	0.870	1.412

BI2	2.64	1.229	0.819	1.400
BI3	2.97	1.225	0.752	1.128
Actual usage CA=0.882; CR=0.948; AVE=0.859				
AUS1	1.98	1.275	0.917	2.998
AUS2	2.00	1.265	0.953	2.934
AUS3	1.80	1.146	0.910	2.783

According to Table 2's descriptive statistics, the mean scores on a 1 to 5 Likert scale for PSE, PE, IC, AU, and BI fall into the following ranges: 2.43 and 1.89, 3.33 and 3.30, 2.28 and 2.15, 2.97 and 2.19, and 2.00 and 1.80, respectively. The values of the standard deviations show that they are 1.174 and 1.104, 1.294 and 1.232, 1.157 and 1.093, 1.229 and 1.091, and 1.275 and 1.146. Table 2 shows that all mean scores and standard deviation scores, taken together, showed high means and low standard deviation. It indicates that the constructs are well-represented and that both the items and the constructions are near the average of the responses because they are near the mean scores. All of the loading of CA values for PSE, PE, IC, AU, and BI (0.752; 0.883; 0.858; 0.882; 0.751) above the minimum criterion of 0.70, according to the PLS-SEM data analysis. As a result, the dependability scale for Cronbach's alpha was good. The readings for PSE, PE, IC, AU, and BI (0.842; 0.919; 0.903; 0.948; 0.855) exceeded the threshold of 0.70, indicating the reliability of the scale, according to the CR for all constructs. PSE, PE, IC, AU, and BI values concerning the AVE (0.640, 0.739, 0.701, 0.859, and 0.664) were acceptable as values were higher than the necessary 0.5 cutoff. The model has indicated strong convergent validity. PES loading ranges from 0.788 to 0.817, PE from 0.831 to 0.885, IC from 0.825 to 0.876, AUS from 0.910 to 0.953, and BI from 0.752 to 0.870. Finally, there is no collinearity issue since the VIF variables are less than 3 (Hair et al., 2017). In conclusion, table 2 shows that all conditions met the minimal measurement of the latent variables defined. As a result, the model verified that the indications fit well.

TABLE 3 Heterotrait-Monotrait Ratio (HTMT) (Discriminant Validity)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Actual Usage														
2. Behaviour Intension	0.46													
3. Network problem	0.40	0.35	0.30	0.36	0.23	0.26	0.36							
4. Peers	0.14	0.38	0.28	0.28	0.27	0.73	0.40	0.19						
5. Phone Attitude	0.40	0.45	0.46	0.43	0.20	0.42	0.40	0.44	0.21	0.58				
6. Self-	0.36	0.44	0.40	0.43	0.26	0.42	0.42	0.38	0.33	0.49	0.48	0.21	0.47	

efficacy

Because all latent variables are smaller than 0.85, which indicates that the factors are statistically different, Table 3 statistically demonstrates that discriminant validity is validated

TABLE 4 Structure model

	Path Co-efficient	t-Statistics	p-Values	Hypotheses
Direct Effect				
Self-efficacy -> Behavioural Intension	0.159	2.713	**0.007**	Supported
Peers -> Behavioural Intension	0.098	2.009	**0.041**	Supported
Network problem -> Behavioural Intension	0.184	2.788	**0.000**	Supported
Behavioural Intension -> Actual Usage	0.596	14.649	**0.000**	Supported

Intention for Behaviour = R^2 = 0.229; Modified R^2 = 0.227. All the paths' f-squared values were slightly above the 0.15 cut-off, indicating a medium influence but still significant.

To ascertain the significant effects of the exogenous variable on the endogenous variable, the path coefficient, t-statistics, and p-value were utilized to calculate the structure model for this study. Thus, cut-off values for the path coefficient have been determined in this study when t-stat ($t>1.96$) and p-values ($p<0.05$).

First, the PSE, PE, IC, and BI all have path coefficients of 0.159, 0.098, 0.184, and 0.596. Once more, the PSE, PE, IC, and BI t-statistics were (2.713, 2.009, 2.788, and 14.649). Finally, all the p-values (0.007, 0.041, 0.000, 0.000) for PSE, PE, IC, and BI were less than 0.05. H1, H2, H3, and H4 support the statement by the p-values in Table 3.

Table 4's structure model demonstrates how exogenous factors directly affect endogenous components by the significant levels that signify the acceptance or rejection of the hypotheses. As a result, PSE H1 received support. The results are consistent with research by Alalwan et al. (2016), Faqih & Jaradat (2015), and Foroughi et al. (2019), which found that the adoption of m-banking, m-commerce, and telebanking technologies was influenced by self-efficacy. Contrary to Weng et al. (2015), self-efficacy and behavioural intention to embrace the technology do not significantly correlate. Empirically, there is a direct and beneficial influence of PSE on the behaviour intention to adopt mobile airtime. As a result, this study observed that when consumers face difficulties with a modern lifestyle, they use their expertise, confidence, intelligence, and self-belief to succeed.

To encourage adoption, parties like the government and network providers should raise knowledge of the advantages of m-airtime. ICT training programs should be promoted at all educational levels to improve adaptive attitudes, good habits, and self-competence. Furthermore, a literate and knowledgeable population will be more likely to adopt technology than one that is not. For example, all of the study participants had formal education. Nonetheless, the results can be different in settings where people lack literacy.

H2 is supported by the substantial direct influence of peers on BI, which is in line with research findings (Prabhakaran & Vasantha, 2020; Mokhtar et al., 2017). The results, however, counter Aydin and Burnaz's (2016) assertion that self-efficacy has little bearing on mobile payment systems. Therefore, peers

are crucial in increasing m-payment engagement and m-airtime uptake.

This result demonstrates that behaviour intention to embrace m-airtime is significantly influenced by Internet coverage Okofu et al (2023). The study's conclusions are consistent with those of Palau-Saumell et al. (2019) and Sharma (2014) but differ from Oliveira et al.'s (2016) finding that the state of a facility has no bearing on the adoption of technology. This research indicates that although Nigerians will not readily adopt m-payment due to unstable networks and being a cash economy, they are willing to participate in m-payment activities when Internet access is available and reliable.

Additionally, the study's findings showed that behaviour intention significantly affects how widely m-airtime is adopted. This study supports earlier research by Anning-Dorson (2018), Yeh (2020), and Islam (2017) that BI improves technology use. Positive anticipation promotes technology Soong et al. (2020). As a result, Nigerian customers tend to utilize m-airtime even after they first intended to use it.

Implication, Recommendation and Conclusion.

Technology usage in any arear enhance better services Nor et al. (2021), which includes enhance digital banking inclusiveness Alonsoc, et al. (2020). Verifying the variables impacting the m-airtime adoption of the greater m-payment in the Nigerian setting was the main implication of this study. Theoretically, the empirical finding offers proof in the form of improving literature on the behaviour of telecom customers. Peers, Internet coverage, behaviour intention, and phone self-efficacy are the specific elements that affected m-airtime usage. The adoption of m-airtime was significantly predicted by the measured variables. Because m-airtime consumer usage has not gotten enough attention in the Nigerian context, the study has contributed theoretically. Furthermore, the majority of research has concentrated on m-payments generally, giving little thought to the fact that different m-payment systems have diverse application usage patterns. The paper represents an early discovery about the connections between PSE and BI, Peers and BI, IC and BI, and BI and AU based on the introduction of m-airtime in Nigeria.

Once more, the conceptual underpinning for the research suggested that the models measured were well-fitting. Table 4 above indicated a variance of 22%, indicating that the factors may impact telecom consumers' desire to behave ($R2 = 0.229$). The network providers may have started an inventive process that has substantial relevance. Adoption is driven by new technical ideas, it seems. Furthermore, all of the paths' f-squared values were greater than the 0.15 cutoff, suggesting that the model is fit.

At the managerial level, the study has improved understanding of the effects of network coverage, social pressure, and self-efficacy on mobile voucher usage for mobile payment practitioners, mobile services, and especially the telecom sector. As a result, m-airtime service providers can leverage this information to encourage customer uptake and alter public impressions of mobile commerce. Once more, telecom marketers will be able to anticipate future demand trends and anticipate policymaking for a successful marketing campaign thanks to their awareness of m-airtime consumption. Furthermore, the study has shown that m-payments, especially m-airtime, are growing in Nigeria. The study has improved the adult segment's positive outlook and inventive thoughts, as well as the lite cash economy. But despite the variety of mobile payment options, social pressure, self-efficacy, and network coverage continue to be a concern. Therefore, there is proof that, regardless of age, environmental pressure drives digital users to uphold social status,

adhere to rules, and improve their self-worth and self-satisfaction.

This awareness will reduce carrying a large amount of money, reduce queues associated with failed scratched cards at the physical customer care services canters and save the time of entering the lengthened 14-16-digit scratched card voucher pin. Hence, government and online service providers should increase awareness via various advertisement tools to promote the benefits and convenience of m-airtime.

In addition to advertising tactics, adult education centers should support ICT training programs to promote technology use at all educational levels and promote online activities. To acquire users' trust, confidence, and happiness with new ideas, network providers need to offer dependable and stable Internet connections. Other online service providers, consumer preferences, desire, and willingness to embrace online services due to service qualities were revealed.

Peer influence is crucial to the success of m-airtime given the ageing population, increasing phone adoption, and increasing Internet penetration. The study will enhance the online experience, lower the logistical costs of producing scratch-off cards, and explain how peers' adoption of comparable technologies affects the group.

Limitations and Further Studies.

Notwithstanding the conclusions about the elements that encourage the adoption of m-airtime, the study only looked at one facet of m-payment and restricted data gathering to telecom users. Furthermore, only educated, employed adults in urban areas were sampled. Therefore, the results may vary from the youth segment, illiterate, rural and unemployed telecom consumers. Thus, a longitudinal study comprising youths, adults, illiterates, and literates, including rural and urban telecom users, should be incorporated into future research. Furthermore, a replication study with distinct sample procedures and research analysis should be recommended.

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