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AN INVESTIGATION INTO THE CONTINUOUS USAGE OF MOBILE PAYMENT SERVICES AMONG CONSUMERS IN NIGERIA: COVID 19 AND BEYOND

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MSc FinTech

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AN INVESTIGATION INTO THE CONTINUOUS USAGE OF MOBILE PAYMENT SERVICES AMONG CONSUMERS IN NIGERIA: COVID 19 AND BEYOND

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Abstract

Mobile payments have received much interest as a potential substitute for conventional payment systems. Mobile payment systems such as mobile banking and mobile money have become popular in Nigeria, with the Central Bank of Nigeria (CBN) controlling, regulating, and monitoring mobile payment companies' activities. The Covid-19 pandemic has greatly impacted users' intentions and perceptions of mobile payment usage in Nigeria. This study intends to discover the underlying factors affecting continuous mobile payment usage among Nigerian mobile users during and after the pandemic by using key constructs from the UTAUT model (Facilitating Conditions) and the Expectation Confirmation model (Perceived usefulness, satisfaction). This study also investigates the potential impact of the Covid- 19 pandemic and perceived risk on mobile technology intention. Utilizing exploratory factor analysis, it was possible to identify probable factors that may affect the use of mobile payments.. In addition, the data were subjected to the Cronbach alpha test, descriptive statistics, and the Kruskal-Wallis test in order to answer the research objectives. The covid-19 impact was deemed to have the greatest influence on consumers' intentions to use mobile payment. Perceived usefulness, satisfaction, facilitating conditions, and perceived risk were all marginally significant predictors of continuing mobile payment usage. The findings also show that people are likely to continue utilizing mobile payment in the future with the continuous intention of having a high factor loading. The study's findings would be crucial for the government and mobile payment providers in terms of the elements that drive the intention to use mobile payment and implementing policies that assure the continuing use of mobile payment.

Keywords: Mobile payment, continuous intention, Covid-19 pandemic

1. Introduction

In recent years, the key to long-term growth in any economy, particularly developing markets, has been access to financial services and the expansion of the fintech sector to enable the availability and distribution of fintech products for practical economic functionality. Customers, service providers, network providers, and regulators are all linked to provide necessary payment systems and services to facilitate easy access to financial products and services. Financial services are useful because money is required to support

people's daily activities, and their benefits are essential to individual and corporate customers (Soetan *et al.*, 2021).

The recent Covid-19 pandemic significantly impacted the dominance and popularity of mobile payment in most countries due to mobility restrictions and the reduction of physical contact. Digital and mobile payment solutions were seen as the best and sometimes the only option for purchasing products and conducting transactions, leading to increased awareness and usage of mobile payment. In 2020, over 45% of the population in Nigeria used mobile banking applications to complete transactions compared to 36% the previous year (EFInA, 2020). This was heavily due to the lockdown mandates imposed on people to mitigate the impact of the virus.

Mobile payment systems are gaining prominence, especially in developing countries with limited access to financial products and services. With constant technological advancement and increased usage, ownership, and reliance on mobile phones for daily activities, fintech products that provide easy access, convenience, speed, and cost and charge reductions have been in high demand . Mobile payment is one such Fintech product (Leong *et al.*, 2022).
Mobile payments (including mobile wallets and money transfers) are regulated transactions conducted via a mobile device. Mobile payment technologies enable people to make payments online instead of with physical credit cards, cheques, or cash.

Mobile payments are gaining dominance in the payment sector as it affords users easy access to various services at their fingertips; this is most common in developing countries where there is a high percentage of the unbanked (people who have no access to banking facilities) (EFInA, 2020). In sub-Saharan African countries like Nigeria, mobile payment services are often categorized as mobile banking or mobile money (Idris, 2020). The former offers facilities and services to holders of bank accounts. In contrast, the latter provides fintech products and services to people without access to banking facilities or holding no bank account but possessing a mobile phone. In 2020, over 55% of the Nigerian population had no bank account with non-access to banking facilities, and attitudes towards banking procedures are a significant factor for the high rate of the unbanked in Nigeria (EFInA, 2020).

Despite over 89% of Nigerians owning mobile phones, only 22% are aware or use mobile money for financial transactions; reasons stem from a fear of unauthorized access to essential records or lack of internet access (Central Bank of Nigeria (CBN), 2018). To increase the use of fintech products and services, CBN has issued licenses to both financial and non-financial institutions to ensure that both the banked and unbanked populations enjoy the benefits of using mobile payment systems (CBN, 2018).

CBN is responsible for regulating, monitoring, and issuing licenses to facilitate the provision of mobile payment solutions among stakeholders in Nigeria. The issuance of permits to payment service providers was created to promote financial inclusion and improve access to financial services for low-income earners by leveraging technology (CBN, 2020). Payments and settlements are regulated by the Regulation of Bill payment Act 2018 (CBN, 2009).

Fundamentally, no entity or institution can offer public payment services without the CBN's authorization, ensuring that all partakers in the bill payment process attend to their responsibilities and provide adequate services (CBN, 2018).

The Act instructs all financial and non-financial institutions offering financial services and solutions to be of the highest standards and that mobile applications provide maximum security for users' confidential records and details. The CBN ensures that payment instructions must be followed consistently. In the event of a failure, an immediate reversal is required, and the user must easily navigate the user interface. A PIN or password must be inserted to grant access (CBN, 2018). In 2019, the CBN licensed 15 mobile money operators to provide mobile money services to Nigerians (CBN, 2020). Mobile money operators were required to dispatch mobile money services agents to various parts of the country, promoting the financial inclusion of the unbanked.

1.1 Rationale of the Study

The most recent statistics demonstrate how rapidly mobile payments are expanding in Nigeria. Since May 2019, mobile payments have increased by 391 percent (Idris, 2020). These transactions are carried out through apps and mobile wallets operated by businesses like OPay, Paga, and FirstMonie. Transaction volume and value have risen sharply, particularly in 2020 (Idris, 2020).

Compared to 724,803 in January 2019, there were over 7.4 million mobile payments in January 2020 (Idris, 2020). Since July 2019, payment traction trends have been consistent with this outstanding growth ((Global System for Mobile Communications (GSMA), 2022). Lockdown restrictions also contributed to the increase in usage of mobile payments in 2020. Transaction volume rose with over 9.5 million transactions worth a total of 230 billion dollars completed (Global System for Mobile Communications (GSMA), 2022).

Numerous academics have studied how users of mobile banking and payment services utilize these services because of the enormous potential for mobile payments in the financial sector and the critical role that customers play in their success. Few research studies, however, have uncovered critical traits or standards that may influence both the viability of mobile payment systems and how users select them. This study adds to the body of research on mobile payment by incorporating key constructs (Perceived Usefulness, Facilitating Conditions, and Satisfaction) from the UTAUT and ECM models as well as two significant determinants (Perceived Risk and Covid-Impact) to evaluate the impact of the drivers on continuous usage of mobile payment among Nigerian consumers.

1.2 Research Question

To what extent have mobile payment services been adopted as the preferred method of payment by mobile users in Nigeria?

1.3 Research Objectives

- Identify the factors or drivers responsible for the continuous usage of mobile payment among consumers in Nigeria
- Assessing the relationship between users' demographic variables on intention towards mobile payment.
- Ascertain the variety of transactions made through mobile payment by consumers in Nigeria.

2. Related Work

The COVID-19 pandemic increased consumer reliance on digital media for business relationships while also increasing consumer acceptance of it. Online and mobile payment solutions became more crucial, particularly for customers who were confined to a single location. Numerous studies have stressed crucial factors that make it easier for people to accept mobile payments and use mobile technology in general. This section outlines the findings on the impact of the Covid-19 pandemic and critically analyzes the various studies that have adopted the UTAUT AND ECM to determine key attributes that facilitate continuous intention towards mobile usage among consumers. The various constructs adopted will be reviewed based on the results of other studies and how these variables predict the intention to use mobile payment.

2.1 Covid-19 Pandemic and Consumers' Behavior

The emergence of the pandemic causes a massive shift in consumer lifestyle and behavior in many parts of the world. Mandatory quarantines, lockdowns, and other drastic measures were implemented to keep citizens indoors and prevent the virus from spreading. The imposed lockdown led to a change in consumers' purchasing behavior leading to more demand for necessary goods such as groceries, medical products, and other essential items. In comparison, there was less demand for luxury items (Satish *et al*., 2021).

Government policies and regulations around the pandemic encouraged healthy choices among consumers as orders for vegetables, hand sanitizers, paper towels, and other hygiene essentials skyrocketed (Leong *et al.*, 2022). Due to the possibility of complete lockdown and isolation, consumers' impulse purchasing behavior led to limited stocks available and more panic buying. To an extent, panic buying behavior exhibited by consumers was primarily impacted by unprecedented lockdown protocols mandated by governments in most countries (Gupta *et al*., 2021). Consumers who routinely go to the supermarkets and stores to purchase essential items showcased abnormal purchasing behavior due to anxiety and fear of limited stocks available.

The activities of many retail stores and supermarkets were affected drastically by the pandemic, which increased the use of online distribution channels to facilitate the exchange of goods and products (Satish *et al*., 2021). Due to the severity of contracting the virus and

the safety protocols, consumers could not purchase items at their local stores, bringing about a rapid change in the business landscape. Businesses began to adopt more online solution protocols and procedures such as online shopping, e-commerce accelerations, and other alternatives to ensure the accessibility of products and services by new and existing customers (Al-sharafi *et al*., 2022).

The rise of online stores, e-commerce websites, and platforms was evident in the pandemic as companies and businesses made quick adjustments to meet the continuous demands of their customers (Gupta *et al*., 2021) . Retail stores and outlets had to incorporate online and digital procedures because customers avoided crowded stores or outlets far away. Most businesses and retail stores had to adopt online channels to facilitate continuous patronage of their products and services by consumers due to the fear of contracting the virus resulting in a change in purchasing intentions of consumers and immediate adaption by businesses for survival.

The internet and communication technologies gained massive prominence in the covid-19 crisis as more people adopted online applications to facilitate daily activities, increasing knowledge and digital literacy. Due to mobility restrictions, consumers had familiarized themselves with operating digital technologies such as mobile payments, contact-tracing applications, and virtual learning (Leong *et al.*, 2022). In order to meet consumer demands and needs during the lockdown, a variety of industries and sectors, including healthcare and fashion, adopted mobile technologies. As a result, the increase in the number of mobile applications significantly impacted consumer growth in terms of digital literacy and usage (Leong *et al.*, 2022). Mobile application usage increased by 20% from 2019 to 2020 in most parts of the United States and by 40% in Russia, showcasing the pandemic impact on consumers' usage and interactions with mobile devices and applications (Marketing Charts, 2021).

The pandemic also accelerated using fintech payment solutions such as mobile payments portals (NFCs, and QR codes), mobile banking, and budgeting apps to enable fast transactions and effective monitoring of bank account details and balances (Daragmeh *et al*., 2021). In June 2020, 44% of youths aged 18 to 34 stated that they used mobile and online banking for the first time during the pandemic, and just 5% had negative reviews about mobile banking apps (Sénant *et al.*, 2020). A survey conducted by MasterCard in 2020 showed that nearly 79% of people during the covid-19 crisis preferred contactless payments due to fear of contracting the virus and being time-efficient and convenient (Mastercard, 2020).

Mobile applications offer customers the opportunity to track and monitor essential records, perform transactions with ease and convenience and make purchases with a push of a button, and Covid-19 has been instrumental in driving its growth and relevance in the past few years. Moreover, the Covid-19 pandemic has indirectly impacted consumers' continuous usage of mobile payment solutions as the lockdowns have been eased in the past year, and previous routine lifestyle is returning gradually (Leong *et al.*, 2022). Due to the benefits, reduction, and convenience of using mobile payment systems, consumers are likely to sustain their

mobile payment usage and continue using them long after the pandemic (Alhassan *et al.*, 2020).

The lockdown forced most people to use mobile payments more often than usual, thereby increasing digital literacy and perceived usefulness which are huge factors for continuous usage of any technology (Alhassan *et al.*, 2020). The dominance and increase in the use of mobile payments were very evident during the pandemic. They will likely continue as mobile payment applications offer more benefits and companies adopt and continually improve their digital offerings to the masses.

2.2 Studies on Consumers' Intention Towards Mobile Payment

Understanding consumers' intention toward mobile payment and usage has been a hot topic in the research world. Theories and models have been created and constantly improved by adding other variables to the existing factors to ascertain the drivers and determinants of intention to use mobile payment and continuous utilization of mobile payment services (de Luna *et al.*, 2019). Theories such as the UTAUT1, UTAUT2, and TAM have been used to ascertain consumers' behavioral intention toward mobile payment. At the same time, the Expectation-confirmation model (ECM) has been adopted to determine factors that facilitate consumers' sustainable usage of mobile payment. Other studies have integrated multiple theories to understand mobile payment usage among mobile users better and predict the relationship between the pre-adoption phase and post-adoption phase of mobile payment usage intention (Saima, Rahman and Ghosh, 2022).

Jaiswal *et al.* (2022) integrated the UTAUT and the ECM theories to determine the drivers influencing the intention to use mobile payment during the pre-adoption and post-adoption stages. Facilitating conditions, performance expectancy, and effort expectancy were key predictors of continuous intention toward mobile payment usage. Findings from the study illustrate that the availability of necessary resources and knowledge of digital and mobile services, together with benefits derived from mobile payment technology, were huge predictors of satisfaction, directly leading to continuous mobile payment usage (Jaiswal *et al* 2022).

According to a study by Al-Sharafi *et al.* (2022), the responses of 257 mobile wallet users were analyzed to investigate essential predictors of behavioral intention to use mobile wallets in India. The data was evaluated using SPSS software, and three theories (TAM, TPB, and ECM) were used to find the best predictive factors of mobile usage intention (Al-Sharafi *et al.* 2022). Results showed that perceived usefulness was a crucial driver in the usage intention of mobile payment services among mobile users. Incentives such as discounts, rewards, and other value-added benefits encouraged customers to invest more time and resources using mobile payment technology (Al-Sharafi *et al.* 2022). The research highlighted not assessing satisfaction as a possible factor as one of its limitations and emphasized its role as a mediating variable between other factors and continuous intention towards mobile payment.

De Luna *et al.* (2019) researched consumers' adoption and acceptance of various mobile payment systems. Participants were allowed to attempt the questionnaire after watching an explanatory video on each mobile payment system. In six months, the study's results identified perceived usefulness, subjective norms, and perceived ease of use as influential in predicting intention to use any of the three systems (De Luna *et al.* 2019). Since the target location for disseminating the questionaries was Mexico, a developing country, determinants like ease, speed, convenience, and available resources will be crucial in ensuring mass adoption of various mobile systems.

(Sénant *et al.*, 2020) designed an integrated model comprising the protection motivation theory (PMT) and ECM to evaluate the sustainability of mobile payment usage among mobile users in Malaysia. Satisfaction was a massive predictor of continuous use of contactless technologies, as over 69% of the participants were already familiar with mobile payment, and their experiences were very positive and gratifying (Sénant *et al.*, 2020). The epidemic, when the study was conducted, was a time when mobile payment was highly favored. Another significant element was perceived utility, which both directly affected satisfaction and indirectly affected sustained intention through satisfaction (Sénant *et al.*, 2020). The more users view technology as applicable, the more satisfaction they will feel, leading to constant usage of that technology.

Jegerson and Hussain (2022) used the ECM model to evaluate the factors responsible for adopting and accepting digital payment in the UAE. Using a nine-point Likert scale, analysis was conducted using SPSS, and over 250 respondents were recorded. Findings identified that with continuous mobile payment usage, major stakeholders must ensure that the mobile application or technology must be designed to meet the user's demands and needs (Jegerson et al., 2022). Therefore, satisfaction is paramount. According to the study, perceived risk also significantly influenced the likelihood of continuous usage of digital payment. System infrastructure, functionality, and standard multi-factor authentication should be critical when designing or upgrading digital or mobile technology to reduce fraud or security breaches for the adequate protection of records and vital information. The Covid-19 effect was also evaluated but had minor significance as the research was carried out after the pandemic (Jegerson et al., 2022).

The study by Daragmeh, Lentner and Sági (2021) centered on determining the factors for mobile payment adoption among Generation X in Hungary and evaluated the responses of over 1126 Gen X participants. Confirmatory analysis was employed to ascertain the relationship between the latent and observed variables. Perceived usefulness had an enormous significance because Gen X mobile users were restricted due to the lockdown, and mobile payment was a reliable and more efficient alternative (Daragmeh et al., 2021).

Upadhyay *et al.* (2022) used the UTAUT2 with extended factors like self-efficacy and perceived severity. Due to the pandemic, the questionnaire was disseminated online with a snowball sampling technique to ascertain the number of participants needed for the survey. The impact of facilitating conditions on the intention to use mobile payment services was

quite significant. The study stated enabling conditions as a crucial component to consider as it significantly impacts behavioral intention and user behavior (Upadhyay et al., 2022). The availability of the required infrastructure, resources, and support is said to be the responsibility of policymakers, regulators, and solution providers (Upadhyay et al., 2022). The importance of such a relationship indicates that customers have access to the infrastructure, resources, and assistance they need to build intents for using mobile payment services.

Khayer and Bao (2019) conducted a study on determining reasons for continuous of Alipay among mobile users in China, perceived usefulness, satisfaction, and attitude were the factors with the most significance, respectively with 282 Alipay users participating in the study. Confirmatory factor analysis was used to validate the hypothesis, while SPSS was utilized to execute all statistical techniques (Khayer et al., 2019). It was also discovered that the assumption that perceived ease of use significantly impacted attitude was not supported in the results because Alipay users were more concerned with the benefits of using the application rather than the interaction or user interface.

Franque, Oliveira and Tam (2021) analyzed the responses from 338 M-Pesa users in Kenya to ascertain the factors that necessitate the continuous usage of mobile payment. Using SPSS and confirmatory factor analysis, observations indicated that satisfaction, system quality, and confirmation directly impacted the constant intention (Franque et al., 2021). Perceived usefulness seemed to have no direct effect on ongoing intention but directly on satisfaction, ensuring continued usage (Franque et al., 2021). Because most African countries lack adequate technology, the study encouraged further research on factors such as "trust" and "perceived risk".

Zhao and Bacao (2020) aimed to understand factors influencing the continuous usage of food delivery apps (FDA) among mobile users in China during the Covid-19 crisis. An integrated model of UTAUT and ECM was employed to ascertain possible determinants of the proposed model (Zhao et al., (2020)). Satisfaction had the highest significance on continuous intention, indicating that satisfactory levels of mobile payment users must be a top priority among FDAs providers.

3. Research Methodology

In order to investigate the research hypotheses and validate the , data were acquired utilizing a questionnaire survey. The survey instrument was generated on the google forms and the necessary variables and items were entered. The questionnaire was divided into three parts. The first segment was a brief summary of the purpose of the study and respondent consent to participate, the second segment employed closed-ended questions to focus on the respondents' demographic information, such as gender, age, education, Martial Status, occupation, experience using mobile payment, frequency of mobile payment usage and

choice of variety of transactions. In the third section, constructs and items from pre-validated literature were referred to, with 19 assessment items serving as indicators of variables including Perceived usefulness (PRSU), Facilitating conditions (FAC), Perceived Risk (PR), Covid-19 Impact (COV) Satisfaction (SAT) and Continuous Intention (COI). All variables, apart from Covid-19 Impact which had four items, had three items each. All the variables and scale items with appropriate references will be available in the appendix below this report.

Based on the large number of measurement items, a five-point scale appears to be less confusing and time consuming for participants to increase the response rate. The questionnaire was disseminated via a link that was posted on multiple social media platforms like Facebook, Instagram, Twitter and LinkedIn. Before distributing the questionnaire, a validation test was done on the survey instrument. After being reviewed by industry experts in the Fintech domain, the questionnaire was considered fit for distribution. The objective of the questionnaire was to ascertain the drivers for continuous usage of mobile payment services among mobile users in Nigeria.

3.1 Target Population

Respondents who live in Nigeria and use mobile payment services between the ages of 18 and 65 make up the target population for the questionnaire. They were picked to find out whether they planned to use mobile payment technologies.

3.2 Scale and Measurement in the study

The questionnaire for this study used a five-point Likert scale, from "Strongly Agree" to "Strongly Disagree," to elicit precise responses from participants. The survey was broken into sections that asked respondents' opinions on a variety of variables influencing consumer preferences as well as demographic information. In order to verify that only accurate data was used in the study, a few questions that were similar but different were asked of respondents in the questionnaires. This made it possible to confirm that all survey questions had been answered by respondents.

3.3 Sample Size

There were 205 responses collected for the study of consumer intentions toward these services, with 200 valid responses examined. Prior to collecting the entire data from the respondents, the methods were tested on a sample of the first 50 respondents. The Snowball sampling approach was used to compile data on customer intentions.

3.4 Statistical Techniques

The following Statistical techniques were implemented to analysis the data.

Cronbach Alpha: Cronbach's alpha is a measurement of the internal consistency or reliability of a group of survey items. The Cronbach's alpha statistic assesses the degree of

agreement on a standardized 0–1 scale. Higher numbers suggest greater agreement between the items.

Descriptive Statistics: is used to examine data frequencies and percentages, as well as to calculate mean and standard deviation.

Kruskal Wallis Test: This test is a non-parametric substitute for the one-way ANOVA. It is employed when two or more groups are being compared when the data is qualitative, non-normal, and on an ordinal scale or continuous scale. The Kruskal Wallis test is employed in this study to determine the relationship between consumer demographic variables such as gender, age, education level, and occupation and factors that influence consumers' intentions to utilize mobile payments.

Exploratory Factor Analysis: is one of the methods for factor analysis used to determine the relationships between manifest variables when building a construct.

4. Results

After analyzing and evaluating a wide range of works of literature on the subject, it was discovered that several variables affect consumers' intentions to use mobile payment services. There were six aims created for this study. This section will look at how the data were analyzed and evaluated to identify factors responsible for continuous intention towards mobile payment usage among Nigerians.

4.1 Descriptive Statistics

The questionnaire responses are shown in the table below. There were 200 total participants. More than half of the participants were men, as evidenced by the fact that 34% of respondents were women and 65% of respondents were men. A substantial number of the respondents were young adults between the ages of 18 and 30, whereas only 26 people between the ages of 51 and 60 and 2 people between the ages of 61 and 65 participated in the survey. Graduates made up exactly half of the respondents, with post-graduate and doctorate accounting for 29.5% and 3.5%, respectively.

Over a quarter of the respondents worked in the private sector, 15.0% in the public sector, and 21.0% owned their own businesses. According to Table 1, more than half of the respondents have at least some experience using mobile payment; of these, 55.5% have five or more years of experience, 29% have used MPS for over three years, 8.5% have used MPS for more than a year, and just 6.5% have used MFS in the last year. 27.0% regularly use MPS,91% use MPS several times per week, and 25% use MPS rarely. In terms of transaction variety, most of respondents use MPS for more than one type of transaction.

Table 2 uses frequency analysis to determine customer intentions and opinions regarding mobile payment in Nigeria. The majority of participants agree that there are more benefits to using mobile payments than using cash or a debit card, and the utility is generally seen favorably. In general, there is a noticeable high level of satisfaction with utilizing mobile payment, and a high number of respondents reject the notion that doing so could be risky. The majority of respondents think that the Covid-19 epidemic had a significant impact on their use of mobile payment both during and after the outbreak. Many respondents want to adopt and use mobile payment technology more frequently in the future, therefore the intention to continue using mobile payment is relatively high.

Table 1: Demographic description of Respondents

Variables	Frequency	Percentage (%)
Gender		
a) Male	130	65.0
b) Female	69	34.5
c) Prefer not to say	1	0.5
Age		
1) 18 – 30	96	48.0
2) 31 – 40	33	16.5
3) 41 -50	43	21.5
4) 51 – 60	26	13.0
5) 61 – 65	2	1.0
Qualification		
1) Secondary	22	11.0
2) Graduate	100	50.0
3) Post Graduate	59	29.5
4) Doctorate	7	3.5
5) Professional Certificate	12	6.0
Employment Status		
1) Student	13	6.5
2) Private Sector	66	33.0
3) Public Sector	30	15.0
4) Unemployed	11	5.5
5) Self-employed	42	21.0
Years of Experience		
1) Less than a year	13	6.5
2) 1 – 2 years	17	8.5
3) 3 – 4 years	58	29.0
4) 5 years or more	111	55.5

Usage Frequency		
1) Daily	54	27.0
2) Several times in a week	91	45.5
3) Couple times in a month	50	25.0
4) Once a month	5	2.5
Transaction Variety		
1) Pay and receive money from other people	29	14.5
2) Bill payments and recharges (Electricity bills, mobile recharges, rental payments, credit cards)	15	7.5
3) Bookings(Flight, Hotels, Movies)	7	3.5
4) E-commerces stores (Jumia, Konga,Jiji)	9	4.5
5) Bill payments and recharges,Bookings and E-commerces	5	2.5
6) Pay and receive money from other people,Booking and E-commerces	8	4.0
7) Pay and receive money from other people, Bill payments and recharges and E-commerces	23	11.5
8) Pay and receive money from other people ,Bill payments and recharges and Booking	30	15.0
9) Pay and receive money from other people,Bill payments and recharges, Booking and E-commerces stores	74	37.0

Table 2: Frequency Analysis

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Using mobile payment offers more significant benefits in comparison to the traditional or physical method of payment.	**11**	**1**	**16**	**88**	**84**
I find that using mobile payment enhances my effectiveness during the payment process.	**2**	**3**	**26**	**101**	**68**
I do not take any cash risk when I use mobile payment	**1**	**8**	**22**	**106**	**63**
I have the necessary resources (Internet access, digital knowledge) to use mobile payment	**5**	**4**	**15**	**95**	**81**
There are adequate support systems and responses when I have difficulties using mobile payment	**3**	**35**	**53**	**93**	**16**
Data charges are suitable enough for easy internet access	**3**	**35**	**53**	**83**	**26**
I am hesitant to use mobile payment due to fear of unauthorized access to my financial information (e.g. transaction details and private information)	**22**	**80**	**40**	**40**	**12**
It is very likely that I might not be refunded in the evidence of transaction errors or incomplete transaction	**21**	**66**	**49**	**50**	**14**
Using mobile payment may increase my bank serve charges monthly	**21**	**61**	**54**	**54**	**10**
I had to make purchases and payment transactions online due to the covid-19 pandemic	**4**	**24**	**22**	**113**	**37**
The Covid-19 pandemic had an impact on my overall knowledge and usage of mobile payment apps	**17**	**33**	**30**	**77**	**43**
The Covid-19 pandemic has had a direct impact on how frequently I use mobile payment in the last year	**10**	**40**	**26**	**90**	**34**
The fear of physical contact during and after covid-19 made me to prefer mobile payment	**10**	**40**	**26**	**80**	**44**
My experience with using mobile payment has been very satisfying	**2**	**5**	**27**	**114**	**52**
Mobile payment has fulfilled all my expectations on making payments	**2**	**20**	**53**	**90**	**35**
Mobile payment has increased my knowledge of mobile apps	**2**	**25**	**43**	**95**	**35**
I intend to use mobile payment apps as my preferred means of payment rather than any other alternative means	**15**	**8**	**44**	**74**	**59**
I intend to increase the use of mobile payment in my daily life	**8**	**6**	**50**	**70**	**66**
I intend to know more about mobile apps	**8**	**6**	**52**	**64**	**70**

4.2 Cronbach Alpha

Cronbach's Alpha reliability testing was used to statistically evaluate the survey data's reliability. Acceptance results should be at least 0.7, according to this test. Any value less than 0.7 is regarded as untrustworthy. All six factors in this study have Cronbach's Alpha values greater than 0.7. As a result, the data collected is trustworthy for further analysis.

Table 4: Cronbach Alpha Reliability

Factors	Cronbach's Alpha	N of Items
Perceived Usefulness	0.806	3
Facilitating Conditions	0.747	3
Perceived Risk	0.808	3
Covid-19 Impact	0.859	4
Satisfaction	0.831	3
Continuous Intention	0.765	3

Cronbach alpha values, which ranged from 0.747 to 0.808, are displayed in Table 4. The measurements were very reliable, with Cronbach values above the minimum threshold of 0.70 (Kamalasanan et al., 2020).

4.3 Kruskal Wallis Test

The Kruskal Wallis test was employed in this study to determine if there are any differences in the factors that influence continuous intention towards mobile payment across certain users demographic. A p-value of < 0.05 indicates that there are significant differences between the groups(Guo *et al*., 2013)

Table 5: Results of Kruskal-Wallis test on Qualification

Items	Kruskal-Wallis Chi-squared	p-value
Using mobile payment offers more significant benefits in comparison to the traditional or physical method of payment.	11.972	0.018
I find that using mobile payment enhances my effectiveness during the payment process.	9.241	0.055
I do not take any cash risk when i use mobile payment	12.886	0.012
I have the necessary resources (Internet access, digital knowledge) to use mobile payment	8.347	0.080
There are adequate support systems and responses when I have difficulties using mobile payment	2.758	0.599

Data charges are suitable enough for easy internet access	1.502	0.826
I am hesitant to use mobile payment due to fear of unauthorized access to my financial information(e.g. transaction details and private information)	5.613	0.230
It is very likely that I might not be refunded in the evidence of transaction errors or incomplete transaction	7.192	0.126
Using mobile payment may increase my bank serve charges monthly.	5.705	0.222
I had to make purchases and payment transactions online due to the covid-19 pandemic	5.020	0.285
The Covid-19 pandemic had an impact on my overall knowledge and usage of mobile payment apps	3.262	0.515
The Covid-19 pandemic has had a direct impact on how frequently I use mobile payment in the last year	6.342	0.175
The fear of physical contact during and after covid-19 made me to prefer mobile payment	4.372	0.358
My experience with using mobile payment has been very satisfying	1.124	0.890
Mobile payment has fulfilled all my expectations on making payments	3.501	0.478
Mobile payment has increased my knowledge of mobile apps	2.848	0.584
I intend to use mobile payment apps as my preferred means of payment rather than any other alternative means	9.444	0.051
I intend to increase the use of mobile payment in my daily life	4.331	0.363
I intend to know more about mobile apps	2.910	0.573

From Table 5, The Kruskal-Wallis test was used to ascertain the differences in factors that affect mobile payment usage across various Qualifications. There were noticeable differences in the perceived usefulness of mobile payment across respondents with different qualifications with p-values of 0.012, 0.055, and 0.018 which are below 0.05, while there were no other significance observed in other factors.

Table 6: Results of Kruskal-Wallis test on Employment Status

Items	**Kruskal-Wallis Chi-squared**	**p-value**
Using mobile payment offers more significant benefits in comparison to the traditional or physical method of payment.	7.264	0.123
I find that using mobile payment enhances my effectiveness during the payment process.	7.736	0.102
I do not take any cash risk when i use mobile payment	11.854	0.018
I have the necessary resources (Internet access, digital knowledge) to use mobile payment	6.347	0.175
There are adequate support systems and responses when I have difficulties using mobile payment	5.000	0.287
Data charges are suitable enough for easy internet access	4.154	0.386
I am hesitant to use mobile payment due to fear of unauthorized access to my financial information(e.g. transaction details and private information)	1.601	0.804

It is very likely that I might not be refunded in the evidence of transaction errors or incomplete transaction	1.798	0.773
Using mobile payment may increase my bank serve charges monthly.	1.341	0.854
I had to make purchases and payment transactions online due to the covid-19 pandemic	1.259	0.868
The Covid-19 pandemic had an impact on my overall knowledge and usage of mobile payment apps	0.777	0.942
The Covid-19 pandemic has had a direct impact on how frequently I use mobile payment in the last year	4.464	0.347
The fear of physical contact during and after covid-19 made me to prefer mobile payment	3.488	0.480
My experience with using mobile payment has been very satisfying	2.920	0.571
Mobile payment has fulfilled all my expectations on making payments	3.929	0.416
Mobile payment has increased my knowledge of mobile apps	4.510	0.341
I intend to use mobile payment apps as my preferred means of payment rather than any other alternative means	7.899	0.095
I intend to increase the use of mobile payment in my daily life	5.142	0.273
I intend to know more about mobile apps	8.131	0.087

The Kruskal-Wallis measurement in Table 6 indicates that there is a difference in the perception that mobile payment offers the benefit of no risk of losing cash, with a p-value of 0.018, among different employment levels. No significant differences were observed among other factors.

Table 7: Results of Kruskal-Wallis test on Years of Experience

Items	**Kruskal-Wallis Chi-squared**	**p-value**
Using mobile payment offers more significant benefits in comparison to the traditional or physical method of payment.	8.822	0.032
I find that using mobile payment enhances my effectiveness during the payment process.	6.908	0.075
I do not take any cash risk when i use mobile payment	8.191	0.042
I have the necessary resources (Internet access, digital knowledge) to use mobile payment	3.451	0.327
There are adequate support systems and responses when I have difficulties using mobile payment	4.613	0.202
Data charges are suitable enough for easy internet access	4.462	0.216
I am hesitant to use mobile payment due to fear of unauthorized access to my financial information(e.g. transaction details and private information)	9.708	0.021
It is very likely that I might not be refunded in the evidence of transaction errors or incomplete transaction	10.436	0.015
Using mobile payment may increase my bank serve charges monthly.	11.537	0.009

I had to make purchases and payment transactions online due to the covid-19 pandemic	5.278	0.153
The Covid-19 pandemic had an impact on my overall knowledge and usage of mobile payment apps	0.337	0.953
The Covid-19 pandemic has had a direct impact on how frequently I use mobile payment in the last year	7.815	0.050
The fear of physical contact during and after covid-19 made me to prefer mobile payment	7.126	0.068
My experience with using mobile payment has been very satisfying	10.034	0.018
Mobile payment has fulfilled all my expectations on making payments	7.358	0.061
Mobile payment has increased my knowledge of mobile apps	8.292	0.040
I intend to use mobile payment apps as my preferred means of payment rather than any other alternative means	18.485	0.000
I intend to increase the use of mobile payment in my daily life	9.709	0.021
I intend to know more about mobile apps	9.952	0.019

The Kruskal-Wallis p-values (0.000, 0.021, and 0.019) in Table 7 show that there are significant differences in continuous intention toward mobile payment usage among experience levels. Users with varying levels of mobile payment experience have varying intents to utilize mobile payment in the future. Factors such as perceived danger, fraud, and a lack of online assistance show significant disparities across users with varied degrees of mobile payment expertise. In general, experience has a significant influence on perception and intention to utilize mobile payment.

Table 8: Results of Kruskal-Wallis test on Usage Frequency

Items	**Kruskal-Wallis Chi-squared**	**p-value**
Using mobile payment offers more significant benefits in comparison to the traditional or physical method of payment.	14.214	0.003
I find that using mobile payment enhances my effectiveness during the payment process.	27.835	0.000
I do not take any cash risk when i use mobile payment	31.315	0.000
I have the necessary resources (Internet access, digital knowledge) to use mobile payment	8.062	0.045
There are adequate support systems and responses when I have difficulties using mobile payment	5.310	0.150
Data charges are suitable enough for easy internet access	5.857	0.119
I am hesitant to use mobile payment due to fear of unauthorized access to my financial information(e.g. transaction details and private information)	9.073	0.028
It is very likely that I might not be refunded in the evidence of transaction errors or incomplete transaction	6.458	0.091

Using mobile payment may increase my bank serve charges monthly.	7.543	0.056
I had to make purchases and payment transactions online due to the covid-19 pandemic	12.089	0.007
The Covid-19 pandemic had an impact on my overall knowledge and usage of mobile payment apps	7.706	0.052
The Covid-19 pandemic has had a direct impact on how frequently I use mobile payment in the last year	4.905	0.179
The fear of physical contact during and after covid-19 made me to prefer mobile payment	4.367	0.224
My experience with using mobile payment has been very satisfying	5.849	0.119
Mobile payment has fulfilled all my expectations on making payments	1.272	0.736
Mobile payment has increased my knowledge of mobile apps	0.846	0.838
I intend to use mobile payment apps as my preferred means of payment rather than any other alternative means	4.058	0.255
I intend to increase the use of mobile payment in my daily life	11.532	0.009
I intend to know more about mobile apps	7.471	0.058

According to the Kruskal-Wallis test in Table 8, there are significant changes in parameters such as perceived utility, enabling conditions, Covid-19 influence, and future intention toward mobile payment depending on how frequently respondents use mobile payment. The frequency with which a user uses mobile payment may influence their impression of potential benefits, understanding of how to use mobile payment, and view of the feasibility of mobile payment services.

4.4 Exploratory Factor Analysis

Exploratory factor analysis (EFA) was used to analyze the construct validity of the questionnaire in order to identify the latent variables influencing continuous usage of mobile payment among consumers in Nigeria. The Bartlett's Test of Sphericity, which estimates the statistical likelihood that the correlation matrix contains significant correlations between some of its components, was applied to assess the correlation matrix's overall significance. The significance of the results was 0.000 ($p < 0.001$) as seen in table 9, showing that factor analysis was adequate. The Kaiser-Meyer-Olkin test was also administered, the p-value of 0.632 (> 0.5) obtained showed that the data was suitable for extracting key factors that influenced intention to use mobile payment.

Table 9	**KMO and Bartlett's Test**	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.632
Bartlett's Test of Sphericity	Approx. Chi-Square	4099.562
	Df	171

	Sig.	.000

After executing the KMO test and Bartlett test with figures showing that the data is suitable for factor analysis, the eigenvalues were calculated to identify the factors that explained the variance or most of the 19 variables. Seven factors were extracted with each having an eigenvalue greater than 1. So each of the variables has a factor loading under one of the six factors. It was also discovered that the 7 factors explained over 80% of the variance which can be seen under the cumulative column.

Table 10: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings	
	Total	% of Variance	Cumulative %	Total	% of Variance
1	4.654	24.496	24.496	4.654	24.496
2	3.038	15.990	40.486	3.038	15.990
3	1.878	9.883	50.369	1.878	9.883
4	1.784	9.390	59.759	1.784	9.390
5	1.579	8.312	68.071	1.579	8.312
6	1.362	7.169	75.239	1.362	7.169
7	1.018	5.356	80.596	1.018	5.356
8	.798	4.199	84.795		
9	.671	3.533	88.328		
10	.621	3.270	91.598		
11	.590	3.104	94.702		
12	.463	2.439	97.141		
13	.391	2.056	99.198		
14	.043	.224	99.422		
15	.037	.194	99.616		
16	.027	.143	99.758		
17	.020	.105	99.863		
18	.014	.075	99.938		
19	.012	.062	100.000		

Table 11: Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
COV3	.939						
COV4	.938						
COV2	.742						
COV1	.698						

PRUS2		.847					
PRUS3		.838					
PRUS1		.759					
SAT3			.954				
SAT2			.948				
CTI3				.959			
CTI2				.955			
CTI1				.469			
PR3					.955		
PR2					.945		
FAC3						.963	
FAC2						.953	
FAC1							.599
PR1					.462		
SAT1							.509
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.							
a. Rotation converged in 6 iterations.							

Figures in Table 11 indicate that there are 7 factors affecting the intention and perception of consumers towards mobile payment. For all 19 variables to be loaded in each factor, each variable had to meet a factor loading of 0.4 which all achieved. This means all the variables are accepted as the 19 variables all load properly under each of the factors. Factor 1 includes all items relating to Covid-19 impact (COV) while all variables relating to Perceived Usefulness (PRUS) loaded in factor 2 with quite high loading values (> 0.5). items relating to satisfaction such as “Mobile payment has increased my knowledge of mobile apps” (SAT3) and mobile payment has fulfilled all my expectations on making payment (SAT2) are loaded directing into factor 3.

A significant correlation was evident between all items under continuous intention (CTI) with all three variables loading properly in factor 4. Variables relating to perceived risk (PR2 and PR3) were observed to have a factor loading correlating with factor 5. Items relating to Facilitating conditions (FAC2 and FAC3) were seen to load under factor 6 while ain item under facilitating condition (FAC1) and another under satisfaction (SAT1) both had high correlation (> 0.5) with both having factor loadings under factor 7

5. Discussion

In order to identify the underlying factors influencing customers' intentions to use mobile payment in Nigeria, the data was studied using exploratory factor analysis. To ascertain which factors explained which variables, the components were extracted using principal component analysis, and the items were rotated into their respective factors using the

Varimax rotation method. Seven factors, as shown in table 10, accounted for more than 80% of the variation, suggesting that they contained elements that affected consumers' intentions and perceptions of mobile payment.
All four items in factor 1, which contains variables related to the influence of Covid-19, had values of 0.939, 0.938, 0.742, and 0.698. this factor received the greatest factor loading scores. This shows that the epidemic had a significant impact on consumers' decision to use mobile payment for purchases and transactions. Consumers have grown more accustomed to utilizing mobile payment over the past year, in part owing to the experience and familiarity they got during the pandemic. Likewise, all items relating to Perceived Usefulness all load into factor 2 indicating high factor loadings above 0.5. this explains the persecptive that consumers see mobile payment as having more benefits and less cost and time consuming in comparism with cash or debit payments.

Indicating that customers' general satisfaction levels in Nigeria have been largely favorable and that there is a high possibility that more people will use mobile payment in the future, two satisfaction-related factors (SAT2 and SAT3) loaded into factor 3 of the model. A higher correlation between the variables is demonstrated by the fact that every item linked to continuous intention loaded into factor 4 correctly. This suggests that Nigerian mobile payment customers intend to keep using mobile payment in the future. It is noteworthy that CTI1 had a factor loading of 0.46, which roughly equates to 0.5, which is adequate. Perceived risk (PR2) and perceived risk (PR3) variables have factor loadings into factor 5 of 0.945 and 0.955, respectively. This indicates that customers' intentions to use mobile payments are significantly influenced by perceived risk. Items linked to factors FAC2 and FAC3 demonstrated a strong association and loaded into factor 6, highlighting the significance of the infrastructure, resources, and help required to facilitate the use of mobile payment.

FAC1 and SAT1 coorelated with a factor loading of 0.599 and 0.509 respectively. Both loaded into the factor 7 showing that both variables make up the last factor that influence mobile payment usage. Finally, Exploratory factor analysis indicates that all item correlate among each other to produce seven significant factors that predict continuous intention towards mobile payment.

6. Conclusion and Future Work

This study set out to identify the variables that affect people's decisions to utilize mobile payments during the pandemic and in the future. Different user demographic characteristics such as (Qualification, Employment, Experience with mobile payment and usage frequency) and intentions towards mobile payment were found to exist. Results indicated that prior mobile payment usage had an impact on future intention. A user is more likely to utilize mobile payment in the future the more experience they have with it. Users with different

levels of experience differed in how useful they perceived mobile payments to be, which helps them realize their value in facilitating quicker transactions.

There were observable disparities between user frequency and the impact of COVID-19, indicating that users' views of the impact of COVID-19 on the use of mobile payments varied. The impact of the Covid – 19 pandemic was significant as many respondents attempted they had to use mobile payment during the pandemic.
This study found that consumers in Nigeria use mobile payments for a wide range of transactions, with the majority of them using them for mobile banking, e-commerce purchases, bookings, and rental payments. Most participants were experienced with mobile payment with majority of participants having experience with mobile payment for over five years. The findings suggest that mobile users will continue to use mobile payment in the future.

Network providers, government parastels and payment companies should continue to improve mobile payment services and instill proper infrastructures that enable efficient mobile payment transactions In contrast to the proposed six variables identified, seven factors were found to be suitable for the analysis with a prediction of 80% of the variation and intention of mobile payment usage in this study's exploratory factor analysis. All variables loaded properly into all seven components with high loading indicating high correlation, demonstrating its high predictability on mobile payment intention and future continuous usage.

Future Works

More research on the intention to use mobile payments can be done in order to better understand and advance upcoming discoveries and breakthroughs. In addition to the independent variables included in the current study, more significant components can be added to improve the analytic sample. Snowball sampling was used for gathering data and sample size, other developments on this study might employ the convenient sampling method to target respondents from certain brands or users of certain mobile companies to get deeper insight on the intention to use mobile payment. The study was conducted in Nigeria, further studies can be carried out in other countries to get a better understanding as different policies, climate conditions and traditions mighr create varying degrees of perception towards mobile payment technology.

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