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Unravelling Biased Blocking in The Adoption of Payattitude NFC Electronic Payment in Nigeria: An Exploratory Analysis

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ABSTRACT

Although payment in exchange for goods or services remains an intricate part of human life, its evolution across different multicultural settings continues. However, there remain many challenges associated with major electronic payment tools around the globe. This paper discusses the electronic payment challenges in Nigeria and the factors affecting adoption by exploring the introduction of the Payattitude NFC contactless payment system. This study uses biased blocking theory to explain how experience with Payattitude NFC contactless payment is blocked by preconceived bias from experience with other electronic payment technology held by individuals in Nigeria. Findings show that though Payattitude is first of its kind, blocking causes subsequent information to be ignored in favor of the preconditioned bias, even if the new information is highly relevant to the subject's decision. Findings also bring understanding of the attributes of an innovation that affects adoption of the Payattitude NFC contactless payment solution.

Keywords

Near field communication (NFC), Electronic Payment (e-payment), Technology, Biased Blocking.

INTRODUCTION

Electronic payment systems, while existing for decades, are becoming increasingly popular as businesses and consumers embrace the convenience and efficiency they offer (Yu et al. 2002). There are various types of electronic payments ranging from credit cards, contactless, bank transfers, ACH payments, prepaid cards, cryptocurrency, wire transfers and checks. While electronic payments provide convenience and aid ecommerce, they come with several challenges. Of these issues, problems with network connectivity have been one constant issue, especially in burgeoning areas such as Nigeria (Okifo and Igbunu 2015).

This study examines the rollout of a novel NFC electronic payment system to address network issues identified with previous electronic payment systems. Introduced into the Nigerian electronic payment landscape during a period marked by frequent network connectivity challenges across various payment channels, Payattitude NFC aimed to address these issues and enhance the overall transactional experience for consumers. Near field communication (NFC) contactless electronic payment stands out as a notable technological advancement in electronic payments, offering users increased control, convenience, and faster transactions (Wang 2008). Results show that, despite its purposeful design to tackle network connectivity problems, the adoption of Payattitude encountered notable resistance. Results show that user attitudes align with biased blocking theory (Luse et al. 2018) whereby preexisting customer bias towards electronic payment system network issues block subsequent information pertaining to new products, even when this information addresses the issues that brought on the existing bias. Overall, this research provides a real-world example of issues that can occur with information system deployment in the face of preexisting bias.

BACKGROUND

Electronic Payment Systems

Electronic payment systems have been available for decades and have existed in many forms. The advent of e-payment systems has indeed revolutionized the financial landscape, introducing diverse electronic modes of payments. Financial institutions have strategically leveraged this technology to provide a spectrum of e-payment opportunities and services to their clientele. These encompass credit cards, debit cards, online banking, and mobile banking (Premchand and Choudhry 2015).

Visa and Mastercard stand as the world's foremost payment processing networks. Unlike Discover and American Express, these entities refrain from directly issuing cards to the public; instead, they distribute cards through affiliated financial institutions (Hayes 2021). These payment brands distribute their credit and debit cards through financial institutions in Nigeria to the public. Overall, these electronic payment systems can provide advantages to customers, retailers, and banking institutions over traditional payment systems.

Despite numerous benefits, electronic payments come with their own challenges even in the developed world (Okifo and Igbunu 2015), including security risks due to vulnerabilities to data breaches, card data security, cybersecurity, customer trust issues, infrastructure reliability, processors fees, and technical issues (Hassan et al. 2020). According to NTTData (2024), electronic payments come with challenges like cost of fraud, password threats, security concerns, disputed transactions and technical problems. One such technical problem is network failures and downtimes that can occur during cash withdrawals, cash deposits, and payments. We define an electronic payment network as a group of interconnected devices that exchange data and share resources using ISO 8583 communication protocols to transmit information over physical or wireless technologies (Mian et al. 2015). These network issues can result in several hours of downtime which can frustrate consumers.

The diagram below shows a basic transaction flow including the many network communications needed for an electronic payment to occur. Using the ATM (Automated Teller Machine) for illustration, when a debit/credit card is used on the ATM, the transaction travels through the connecting points all the way to the bank and payment scheme, the dotted lines are the most prominent transaction failure points. This helps to demonstrate the many possible points of failure that can occur due to network issues just with a simple ATM withdrawal. Overall, various issues can occur when network stability is a problem as transactions are not completed but customers are debited. For example, network issues sometimes result in double debit for a single transaction thereby making the customer part with more money than intended. This leads to frustration especially when automated reversals of those debits do not function and/or dispute is not resolved in a timely manner.

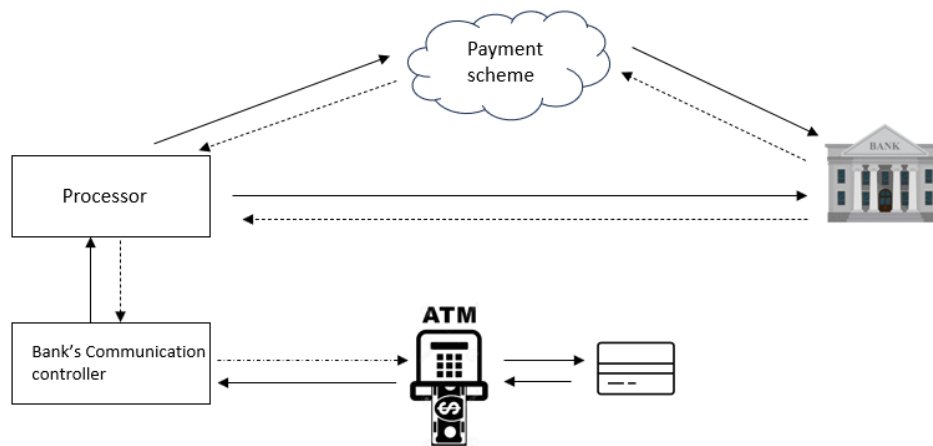


Figure 1. All needed network transactions associated with an ATM withdrawal

The Nigerian financial sector plays in the global electronic payment space through its partnerships with these global brands through provisioning payments via ATM, PoS (Point of Sale), mobile devices, and the web platforms. Nigerian implementations of e-payment systems are inundated with challenges and most dominantly faced with technical challenges such as network issues. As e-payment is increasingly getting more significant in Nigeria's financial transactional activities, investigating customers' satisfaction with electronic payment systems is of great importance (Adeoti and Osotimehin 2012).

Payattitude NFC

Electronic money has significant benefits for ecommerce, financial organizations, and banks (Fiallos and Wu 2005). As such, electronic payment continues to evolve to address the issues associated with it. Some of the challenges became the bedrock of creativity and innovation upon which Payattitude NFC technology was born. One of the latest trends in short-range wireless technology that is widely used in the payment industry is the NFC chip (Khando et al. 2023). Rahul et al. (2015) conducted a survey on NFC and described it as a technology that allows electronic gadgets to communicate safely. Whenever an NFC

device is brought within proximity (20cm) of another NFC-enabled device, communication is established. The first NFC payment solution in Nigeria, Payattitude can function by bringing the tag and NFC-enabled device close within proximity of 20cm for a successful communication to be established.

Payattitude NFC was designed to address some of the issues associated with electronic payment systems. Specifically, Payattitude sought to alleviate network challenges through its offline wallet system and provide unique paying experience for its users. Payattitude NFC is a payment tool that utilizes *offline* features of its e-purse to store value and approve transactions. The e-purse is linked to a bank account during activation and can be funded by transferring money from the bank account to the e-purse. Payattitude NFC agents are situated at different strategic locations to facilitate the ease of these transfers thereby creating convenience for the customers.

Biased-Blocking

Biased blocking has been introduced as a theory to help explain attitudes towards products or services by incorporating the two concepts of bias and blocking into one theoretical concept (Luse et al. 2018). Research on bias shows that if an individual receives information, whether first or second hand, pertaining to a product, subsequent introduction of additional information pertaining to the product is altered (Ahluwalia 2000). This preexisting bias can have such an effect that it can cause the individual to psychologically block subsequent information pertaining to the product (Van Osselaer and Alba 2000). Overall, this classical conditioning shows that initial information can have such a powerful influence that subsequent information can have little to no effect on the attitudes of the individual that were constructed from the first information received (Kamin 1969).

Biased blocking occurrences are more likely to arise in Nigeria due to the difficulties with electronic payment systems. People form previous prejudices against the electronic payment methods that are currently in use against the backdrop of enduring concerns including network connectivity issues, security threats, and technological difficulties. Consumers' unfavorable experiences get embedded in their perspectives as they struggle with frustrations arising from network instability and other limitations. The study's findings on biased blocking imply that these ingrained biases subsequently function as cognitive roadblocks, preventing people from processing new information about novel solutions like Payattitude NFC, even when this new information is positive. The interaction between biased blocking and the difficulties in the electronic payment landscape shapes people's adoption patterns and how they perceive and react to new payment technologies. To successfully integrate disruptive payment innovations in the Nigerian environment and overcome biased blocking, it is imperative to comprehend this complex interaction.

Given this, we propose that previous experiences with electronic payment systems will have a biasing effect on individuals towards subsequent information about e-payment systems including new e-payment system products.

P1: Because of their bias towards previous electronic payment technology, blocking will occur whereby individuals will be unaware of the advantages of Payattitude.

METHODS

Data Collection

Our study aimed to investigate biased blocking in the adoption behavior of consumers towards Payattitude NFC technology. A comprehensive survey involving 302 participants from 33 diverse professions, including IT (Information Technology), education, health, engineering, and entrepreneurship, was conducted. Utilizing questionnaires as a data collection method, we sought to measure preferences, attitudes, behaviors, intentions, and opinions regarding electronic payments.

The participants were selected from various professions, reflecting a broad spectrum of perspectives. The survey specifically focused on gathering information related to demographics, professions, knowledge, usage patterns, and challenges associated with electronic payments. Questionnaires can be an effective way of measuring preferences, attitudes, behaviors, intentions, and opinions of a large number of subjects quickly and with less cost (McLeod 2023).

To ensure a representative sample, online surveys were distributed through multiple channels, including social media, emails, and forums. The data collection occurred one year after the launch of Payattitude NFC technology in the Nigerian market. This timing allowed us to assess the participants' attitudes following a substantial period of exposure to the technology. The survey results, collected over a one-week period, provide valuable insights into the biased blocking tendencies among consumers in the adoption of Payattitude NFC technology.

Results

The theoretical background on biased blocking states that a bias must first be present. To establish the presence of a bias, participants were first asked about the challenges experienced with current e-payment systems. The top response selected by subjects was the lack of network connectivity, with a significant proportion of subjects selecting this answer ($\Phi = 0.62$, $\chi^2_{(1)} = 17.65$, $p < 0.001$). This provides credence to the assumption that a bias was already present in the individuals towards network connectivity problems with current systems.

With a preexisting bias supported, biased blocking theory would next suggest that the individual would next need to be informed about the new Payattitude technology. To establish this knowledge of the new product, a second question asked participants whether they had heard of the new technology. Responses showed that a significant proportion of subjects had heard of the new Payattitude system ($\Phi = 0.59$, $\chi^2_{(1)} = 10.22$, $p = 0.001$). This provides support that the subjects had knowledge of the new system, which is necessary to then establish blocking.

With both a preexisting bias and knowledge of the new Payattitude system confirmed, biased blocking theory would suggest that the previous bias would block the subjects from subsequent information about the new system. Five separate questions were used to assess subject knowledge of the new Payattitude system. Of these five questions, a significant proportion of subjects did *not* know four of the informational specifics about Payattitude. Furthermore, these questions all pertained to *positive* aspects of the Payattitude system, implying that a bias could have blocked the subject from processing this information. Table 1 provides the statistical tests for the survey questions.

Question	Responses	Proportion	$\chi^2_{(1)}$	p-value
What are the challenges experienced with the current e-payment types available? -Network connectivity	Yes = 188	0.62	17.65	< 0.001
Have you heard of Payattitude Contactless NFC Tags?	Yes =176 No =120	0.59	10.22	0.001
Do you know Payattitude guarantees 100% transaction approval as it can work without network connectivity?	No =161 Yes = 139	0.54	1.47	0.225
Do you know with Payattitude it takes 2 secs to complete a transaction, you just tap and go?	No =180 Yes = 118	0.60	12.49	< 0.001
Are you aware that Payattitude has the capability to work on Tolls, LagBus, Carparks, Train Stations and for airtime top ups and bills payments?	No = 182 Yes = 114	0.61	15.17	< 0.001
Do you know you can also use NFC to access doors and vaults, share contacts, music, share files, business cards between one NFC supported smartphone and another?	No= 197 Yes = 97	0.67	33.34	< 0.001
Do you know Payattitude tags are chip and PIN thereby providing the adequate comfort to consummate a transaction securely?	No =179 Yes = 112	0.62	14.97	< 0.001

Table 1. Proportional analysis of survey questions.

DISCUSSION

This study examined Nigeria's complex electronic payment environment and highlighted the obstacles that have sparked innovation—Payattitude NFC technology, in particular. By using biased blocking theory as a lens, we have been able to understand how people's adoption behaviors are influenced by preexisting biases towards traditional electronic payment systems, which keeps new solutions like Payattitude NFC from being universally adopted.

Some important conclusions have emerged from our investigation of biased blocking in the context of Payattitude NFC adoption. People's general prejudice toward network connectivity problems in the existing electronic payment systems was found to be pervasive in the study. The prevalence of biased blocking was shown by the participants' conspicuous ignorance of certain positive characteristics of Payattitude NFC, despite their knowledge of the platform. The paper contributes to the growing body of knowledge on electronic payment systems by providing a nuanced understanding of biased blocking dynamics in the Nigerian electronic payment context. Using Payattitude NFC as a case study, we provide recommendations

for researchers, practitioners, and policymakers who want to increase the uptake of cutting-edge payment methods in multicultural environments. In the future, successful integration of innovative technologies such as Payattitude NFC will depend on eliminating biased blocking behaviors. Initiatives to dispel preconceived notions and increase understanding can lead to a more knowledgeable and accommodating customer base. Furthermore, biased blocking's negative effects on adoption behaviors can be lessened by creating an atmosphere that rewards good experiences with cutting-edge payment methods.

All things considered, this study is a great resource for those involved in the electronic payment ecosystem since it offers insights into the psychological and social components of innovation acceptance in addition to its technical features. Understanding and reducing biased blocking will be essential to ensure the effective adoption and ongoing use of innovative technologies like Payattitude NFC as the electronic payment environment develops.

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