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The Use of Contactless Payment Method to Promote Cashless in Birnin Kebbi Central Market, Kebbi State-Nigeria.

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ABSTRACT

Contactless payment systems are the type of cashless payment that don't need direct physical touch between the consumer's device and the merchant's point-of-sale terminals. RFID (radio frequency identification) devices can be incorporated into a wide range of objects, including cards, key chains, watches, and cell phones. The three major payment cards accepted by this method of payment are American Express (ExpressPay), MasterCard (MasterCard PayPass), and Visa (Visa Contactless). Every single one of these items complies with the international ISO 14443 standard, offering a single, worldwide payment system. Contactless payment systems can be implemented using the same infrastructure as magnetic strip payment cards, meaning that businesses and financial institutions won't need to make any further expenditures except from updating the POS terminals that are currently in use. RFID tokens, Sony FeliCa technology, NFC (Near Field Communication) devices, and the ISO 14443 standard are among the technological options that were used for the deployment. This paper describes the Use of Contactless Payment Method to promote Cashless in Birnin Kebbi Central Market, Kebbi State-Nigeria

Keywords: Contactless, Payment, Cashless

EXECUTIVE SUMMARY

The payment card industry has been working hard to offer users contactless "tap-and-pay" credit and debit card products since 2017. Payment networks, card issuers, and banks have made efforts to guarantee that contactless cards—which use Near Field Communication technology to wirelessly transmit payment information to point-of-sale terminals—are at the top of customers' minds at the time of purchase (Akana, 2020).

These days, contactless payments are more widespread since Near Field Communication (NFC) technology is supported by newer smartphones, tablets, POS terminals, and payment cards (also known as "tap-and-pay" cards). Concerns have been raised over how successfully NFC-enabled contactless payment systems shield people and businesses from new security and privacy risks, meanwhile, as NFC technology becomes more widely used (Akinyokun& Teague, 2017).

Contactless transactions have quickly increased in recent years. NFC, MST, contactless cards, among many more payment options, are all part of it (Gupta & Narayan, 2020).

 These days, contactless payments are more widespread since Near Field Communication (NFC) technology is supported by newer smartphones, tablets, POS terminals, and payment cards (also known as "tap-and-pay" cards). Concerns have been raised over how successfully NFC-enabled contactless payment systems shield people and businesses from new security and privacy risks, meanwhile, as NFC technology becomes more widely used. the awareness, trust, privacy, and confident, people gave on the use of Contactless payment technology.

INTRODUCTION

If we examine the evolution of payments, we can see that trading began with the barter system, or commodity money, in which individuals transacted directly by exchanging products or services. Numerous problems with the barter system led to the development of paper money. Credit and debit cards were created as a solution since people cannot carry all of their cash in their pockets. People began to switch to new electronic techniques that are quicker, easier, less expensive, and comparatively more secure as a result of technological advancements rather than dealing with antiquated and slow ways of using cash and cards. This led to the development of a cashless and paperless method that makes use of the sensor or camera found in practically every smartphone. Through the usage of this technology, a customer can enter any store that has a scanning device, tap their contactless

payment device on the scanner to authenticate, and then pay. Contactless payments are a newer form of payment, and there are several instances of them on the international market right now, including Apple Pay, Samsung Pay, and Android Pay (Aljawder&Abdulrazzaq, 2019).

Globally, EMV (Europay, MasterCard, Visa), sometimes known as "Chip & PIN," is quickly taking the lead in card-based payment systems. The initial purpose of the EMV Chip & PIN transaction protocol was to function in a setting where the card was physically put into the ATM or POS terminal and a wired connection was utilized for communication. "Has usability been improved at the cost of security?" is an intriguing question that has been raised by the adoption of EMV contactless payment technology. In particular, EMV cards now have a wireless interface, and contactless payments no longer require a PIN, making them more practical and easy to use. Are contactless cards less secure as a result of these new usability features? (Emms, 2016).

The technique of securely making payments with a contactless card or other payment-enabled device over a short-range wireless connection between that device and a contactless checkout terminal is known as contactless payment. When a contactless card or an enabled contactless device is tapped or brought close to a contactless point of sale (POS) terminal, payment information is communicated or transmitted for authorization. Payments made with contactless technology happen almost twice as quickly as those made with cash, debit, or credit cards. With the use of this technology, shops can possibly speed up transactions and lower operating expenses while also encouraging customers who prefer this payment option to visit them more frequently. (O. Okunbor, A. Adekunle, O. Adebayo, O.D., & M.O., 2020).

Thus, the application of technical procedures in data communication is related to information technology. Without a doubt, information technology can assist banks in lowering transaction costs, which will result in cheaper service costs for consumers. Banks use information technology in a variety of ways, such as computerizing client accounts and storing and retrieving data, accepting deposits and withdrawals via automated teller machines (ATMs), and utilizing networking to enable account access from any bank location. (Omokugbo& Festus, 2020).

In the last ten years, contactless card technology has been introduced for usage in retail, transportation, and ticketing. By just placing their contactless cards up against a scanner in close proximity, users can save time by avoiding the need to put and take out paper cards, such as when using train admission gates. Mobile phones can be equipped with NFC technology to function as contactless cards, which can be used as a convenient way to make payments. Recently, successful NFC technology development has begun in several nations where businesses provide a range of services based on mobile phones and contactless card technology. (Pourghomi, Qasim, &Ghinea, 2013).

PROBLEM STATEMENT/JUSTIFICATION

When a physical transaction is made, contactless payment refers to the method wherein the buyer uses a physical or digital card to make the purchase while the card is in close proximity to the payment terminal. Usually, if the value is less than a specific threshold, no pin code needs to be entered, and the transaction is accepted provided the cardholder has sufficient funds in their bank account or, in the case of a credit card, available credit. The customer must input the pin number if the amount exceeds the limit, and the transaction will only be accepted if the cardholder has enough money on hand (CPSS Glossary, 2003). Contactless payments have been the subject of debate and safety concerns. The goal of the contactless payment system is to Holding intended to be a speedier and more straightforward method of transaction completion than standard card payments. The halo effect, which indicates a decline in cash payment activities and a rise in contactless ones, is frequently seen when using this payment method (Brzoska&Hjelm, 2020). Consequently, this motivates an increase in customer satisfaction, which is very important in highly competitive retail markets. Along with this advantage, it has other results such as eliminatingcash shrinkage, reducing error when it comes to manually processing cash, and reducing the risk of theft. Consequently, consumer behavior was also influenced by these actions. The customer gained more trust in cashless payment methods, which resulted in the satisfaction of the shopping experience (Brzoska&Hjelm, 2020). With the assistance of HSBC Bank plc, Master Card's PayPass was one of the first debit cards to introduce the contactless payment mechanism. (HSBC, 2005). Through implementing the chips into the debit or credit cards, customers were able to execute the transaction only by tapping the terminal.

RESEARCH QUESTION

RQ1. What are the contactless device require to have its own unique secret key that uses standard encryption technology to generate a unique card verification value, cryptogram or authentication code that exclusively identifies each transaction.

RQ2. How does the Cardholders control both the transaction and the contactless device throughout the transaction. Cardholders do not have to hand over either a device or their account information to a clerk during a contactless transaction.

RQ3. How to investigating/creating the awareness, trust, privacy and security factors related to contactless payment technologies and their impact on the willingness of people to adopt these technologies.

OBJECTIVES

1. To investigate and obtained how the contactless device will have its own unique secret key that uses standard encryption technology to generate a unique card verification value, cryptogram or authentication code that exclusively identifies each transaction.

2. To investigate how the Cardholders control both the transaction and the contactless device throughout the transaction. Cardholders do not have to hand over either a device or their account information to a clerk during a contactless transaction.

3. To investigating/creating awareness, trust, privacy and security factors related to contactless payment technologies and their impact on the willingness of people to adopt it.

LITERATURE REVIEW

The goal of this study was to find out how University of Bahrain students were utilizing contactless payment methods. The primary goal of the study was to determine how students' readiness to accept contactless payment technology was influenced by their level of understanding, trust, privacy, and security concerns. A modified version of the technology acceptance model (TAM) was devised and tested through a survey in order to operationalize this study. that the majority of participants said they planned to utilize contactless payment in the future. Users' intention to utilize contactless payment systems is influenced by trust, PAS, and awareness, but convenience of use was not thought to be a significant consideration. Additionally, the income of the students was a predictor of their intention to use contactless payments; those with greater incomes were more likely to do so. By extending the study to a broader sample, this research aims to extend the study to a wider segment of Bahrain's population. Additionally, in order to allay users' worries about security, privacy, and trust, it is critical to investigate contactless payment systems' security in greater detail and to suggest better solutions. In terms of research methodology, using various data gathering techniques will improve the accuracy of the findings and enable respondents to be more descriptive and provide a clearer picture of their opinions. (Aljawder&Abdulrazzaq, 2019).

To create and deploy a rogue program that requires the user to install it on her phone and impersonates an NFC card.

When she tries to make a contactless purchase with her card near her phone, this software talks to the terminal before the card does. The app functions like a card, therefore the EMV process is completed even if the terminal detects a card collision. We show the app's ability to retrieve transaction data from the terminal, which includes payment-related information like the amount and date. The experiment's findings show that our app can track contactless payments successfully, with a success rate of roughly 66% when tested with different cards. It also successfully wins the race condition caused by card collisions. We advocate for the consideration of privacy and security issues in the specifications, implementations, and standards of contactless cards and readers. (Spicer & Sanborn, 2019).

The study examined a survey titled "Contactless Smart Cards and Payment Systems: Technologies, Policies, Attacks and Countermeasures," which covered contactless smart cards and payment systems in great detail. It also covered user data security strategies and various potential attacks on the communication technology. Additionally, it discusses possible countermeasures to stop the attack as well as problems with them. Data security is lacking in the countermeasures on a number of levels, which calls for improvement. Additionally, recommendations to strengthen the security of the contactless payment system are provided in the report (Gupta & Narayan, 2020).

showed that a live attacker was using a wormhole attack to stop an ongoing transaction by sniffing the token that was generated for payment. • POSAUTH, a system that augments the payment token with the terminal's unique identification, was proposed. • The transaction is tied to a specific terminal using POSAUTH. Additionally, one-way hashing prevents sniffing and substitution, and static keys are utilized for encoding and hashing to prevent wormhole attacks. (Chen, Zhong, Feng, Korea, & Liu, n.d.).

The designed a protocol compatible with EMV static data authentication for payment, along with light use of secure element. The security of the tool was proved by Tamarin. And Prevents wormhole attack. And Secure from stolen key attack. Which Interaction with rogue terminal is possible. Token can be used until new token with greater value is not generated (Cortier, Filipiak, Florent, Gharout, &Traoré, 2017).

present a brand-new NFC payment app that builds upon our award-winning "NFC Cloud Wallet" concept to show off the dependable architecture of the NFC ecosystem. In order to thoroughly analyze the payment application, we also detail the step-by-step implementation of the suggested protocol. The Mobile Network Operator (MNO) is the primary participant in this ecosystem, thus we will be concentrating on them. also took into account the protocol's precise implementation, demonstrating how our protocol functions dependably in cloud-based NFC transaction architecture. Furthermore, this article presents additional pertinent concerns that need to be investigated to determine the various responsibilities, accesses, and ownerships of parties involved in the NFC ecosystem (Pourghomi et al., 2013).

A presentation was made regarding the security analysis of contactless EMV payments. This takes into account both the broader effects of contactless technology on the security of the EMV card payment system overall and the security of the EMV contactless transaction protocols as stand-alone procedures. Additionally, a structured analysis technique that finds EMV protocol weaknesses and illustrates how they affect the EMV payment system (Emms, 2016).

The examination of contactless payment systems' security involved taking into account the various adversarial assaults and privacy threats that these systems need to fend off. And concentrate on the examination of the underlying technologies, security protocols, and trust assumptions that underpin the interchange of sensitive transaction data between contactless point of sale terminals and contactless payment cards and Near Field Communication (NFC) enabled mobile wallets. Additionally, examine the EMV and ISO contactless payment standards and point out any flaws in how they enforce security and privacy in these types of transactions. explain the differences between the ISO and EMV standards and how card issuers and mobile wallet providers set up their NFC-enabled mobile wallets and contactless payment cards using these standardsWe were able to demonstrate how NFC-compliant contactless payment systems are vulnerable to various adversarial attacks due to specific implementation defects in the security and privacy-preserving procedures outlined in the EMV specifications. revealed that even seemingly insignificant decisions made by mobile wallet providers when creating their NFC-enabled wallets—such as the trade-off between using a host card emulation system or a security element—could result in major security flaws that a knowledgeable adversary could take advantage (Akinyokun& Teague, 2017).

The impact of merchant acceptance of contactless card technology on card sales was examined, along with the response of card sales to merchant contactless payment acceptance. On a special sample of approximately 275,580 French merchants, score matching and difference-in-difference techniques are used to determine that, in 2018, accepting contactless payments increases card-sales amount by an average of 15.3 percent (and increases the number of card-sales by 17.1 percent) compared to merchants who do not accept contactless payments. Discover proof that accepting contactless payments boosts contact card sales by around 1.3 percent, which considerably raises the average annual card sales amount and count for small businesses and new entrepreneurs.   (Bounie&Camara, 2020).

The review of the Contributions of Contactless Payment Technologies in the COVID-19 Pandemic Process was observed. And the use of contactless payments, artificial intelligence-supported digital innovations and Covid-19 measures were examined in the retail sector (Sahinaslan, Sahinaslan, &Gunes, 2021).

METHODOLOGY

A contactless payment is one in which the consumer does not need to swipe their credit or debit card. This technique works with chip cards that you place into a payment terminal or cards that have magnetic stripes. Customers only need to hold a card or other device up to the payment terminal in order to make a contactless purchase. The phrase "tap to pay" originated from the fact that in certain situations a quick tap simplifies the transaction.

These Methodologies will be:

A. Sampling Process

According to a study, people who spend time in formal education and who are exposed to new technology are more likely to be early adopters. Thus, an ideal target population for this research will be determined

B. Instruments and Data Collection

A closed-ended questionnaire will be created for the purpose of gathering data. It will be an online survey with a set format. These techniques will include demographic data collection, which included multiple-choice questions to obtain broad information about the respondents in support of the study's aims, as well as level of awareness and expertise about contactless transactions. Through the use of surveys, interviews, and observations, data will be gathered. In order to administer the questionnaire, we plan to employ and train research assistants. Furthermore, the online version of the survey will be made to collect information from individuals who may not be reachable in person as well as those who would rather.

C Testing of Hypotheses: The research's findings will be demonstrated through the use of hypothesis testing. Where There will be three regression analyses carried out. The first will examine the connections among Perceived Ease of Use (PEOU), Awareness (A), and Trust (T). Additionally, a second analysis will be conducted to evaluate the connections among Perceived Utility (PU), Privacy and Security (PAS), Awareness (A), and Trust (T). The associations between Behavioral Intention to Use (BITU), Perceived Utility (PU), and Perceived Ease of Use (PEOU) will be tested in the third analysis.

CARD PAYMENTS

The majority of debit or credit card transactions made with tap-to-pay use tangible cards. These cards have an embedded radio frequency identification (RFID) chip that allows the payment terminal to receive all of the card information. This type of chip is almost certainly included in any new credit card that your credit card provider has given you in the last year. When a customer pays with a wireless chip card, the interaction is as follows:

- **The customer presents the card.** The customer hovers the card over a point-of-sale terminal that accepts contactless payments. Only newer terminals offer this function.

- **The wireless chip transmits card information.** When the customers hovers their card close to the terminal or, more commonly, taps the card onto the terminal, the radio frequency identification (RFID) chip transmits all of the card information, just like a magnetic stripe would.

- **The payment terminal contacts a bank.** Now the payment terminal sends a payment request to the financial institution backing the card. This is typically a bank or a credit union. Just as with a normal credit card, the merchant will request the transfer of funds from the card issuer.

- **The card issuer transmits an approval or a denial.** If the purchase amount aligns with the purchaser's bank balance or credit limit, the financial institution will allow the sale to go through. The payment terminal beeps to signal a successful transaction. Or, if the purchaser lacks the funds or credit to make the purchase, the bank will deny the transaction.

RESULT

The result of the analysis of Questionnaire designated for this research was discussed as follows:

    i.   Distribution of Contactless transaction by age group
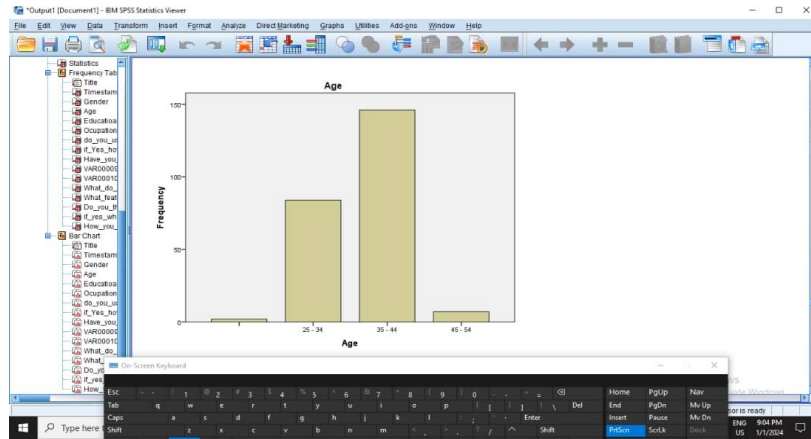
Figure 1: Contactless transaction response by age

In Figure 1 above, the distribution of contactless transactions across different age groups is depicted. And this show that people at the age of 35 to 44 have the highest knowledge of contactless transaction.

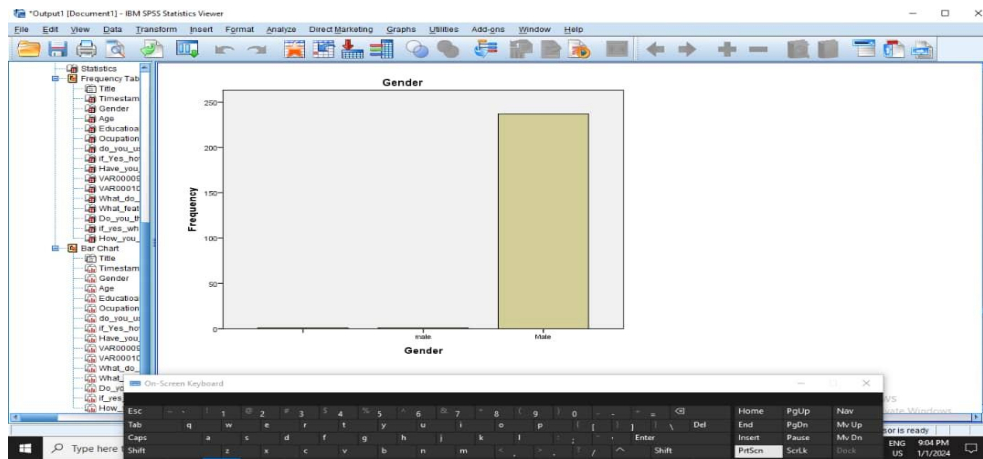ii.   Comparison of Contactless Transaction Usage by Gender

Figure 2: Comparison of contactless transaction by Age

Figure 2 above, Describe the comparison between genders in their use of contactless transactions, this shows that male have higher level of awareness to contactless transactions than their female counterpart.

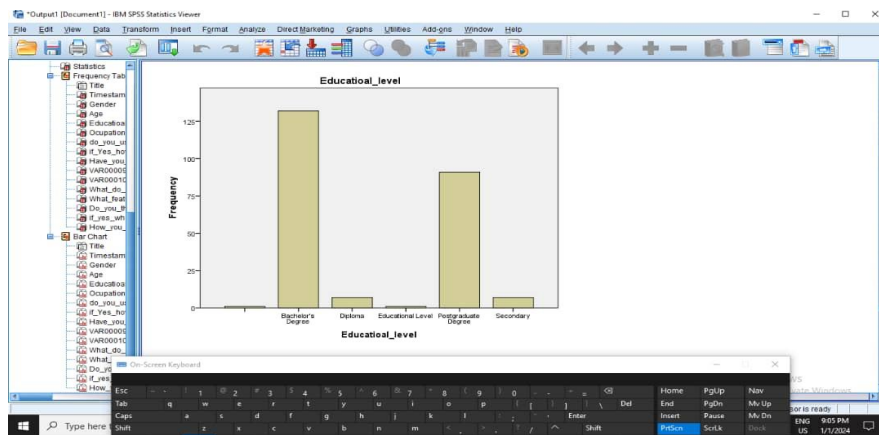iii.   Contactless transaction by education level

Figure 3: Comparison of transaction by the level of education

Figure 3 above, Describe the comparison of people with different level of education on the knowledge of Contactless transaction and the graph shows that people with Bachelors Degree have the highest level of contactless transaction.

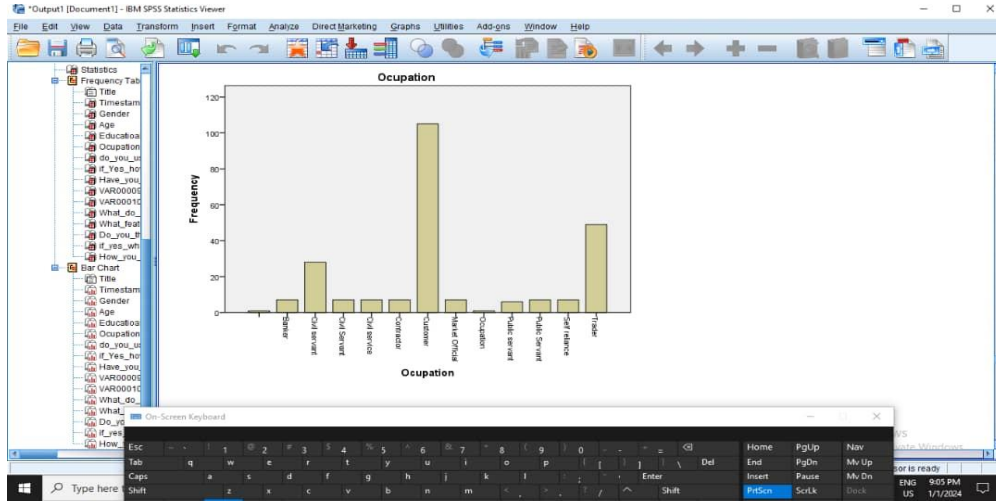iv.   Distribution of Contactless transaction by Occupation

Figure 4: Contactless transaction by occupation

Figure 4, shows the distraction of transaction by the Describe the comparison of people with different occupations and this graph indicate that among those people interaction with market, customers are the people that use contactless transactions the most.

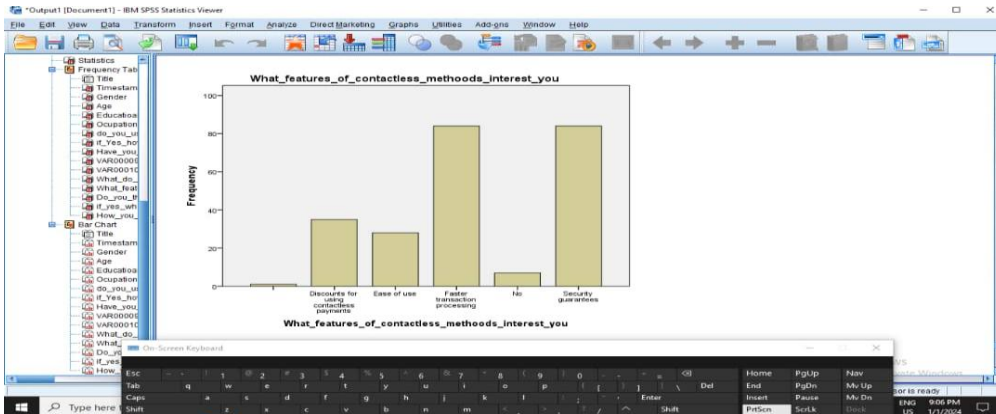v.   Distribution of contactless transaction that interest you the most

Figure 5: Distribution of Contactless transaction that interest the customers

Figure 5 above, shows the distribution of contactless transaction that interest the customer and the figure show that faster transaction processing is of the highest to people interacting with the transactions.

The frequency distribution of those transactions that interest customers the most is shown in the figure below.

What_features_of_contactless_methoods_interest_you

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.4	.4	.4
	Discounts for using contactless payments	35	14.6	14.6	15.1
	Ease of use	28	11.7	11.7	26.8
	Faster transaction processing	84	35.1	35.1	61.9
	No	7	2.9	2.9	64.9
	Security guarantees	84	35.1	35.1	100.0
	Total	239	100.0	100.0	

Figure 6: Frequency Distribution of the transaction

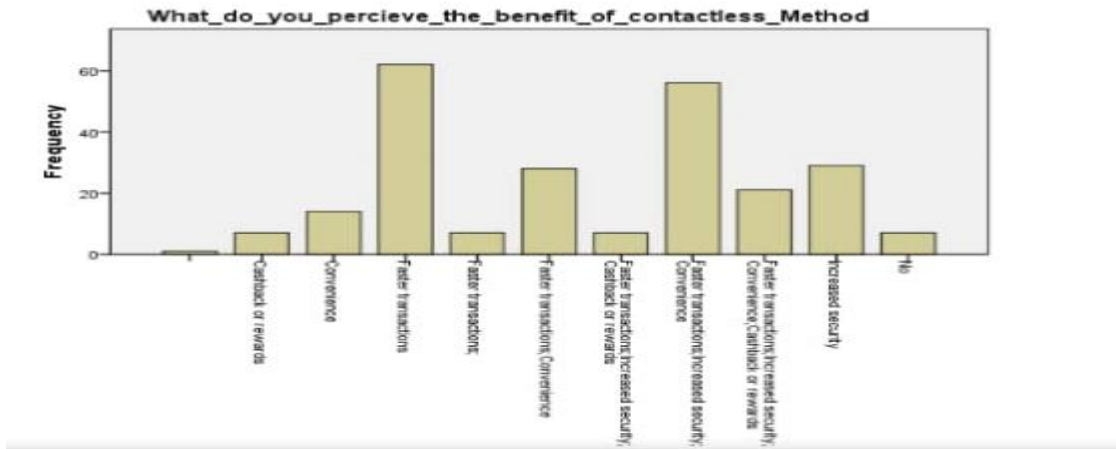vi.   The frequency Distribution of the benefit of using Contactless method

Figure 7: Benefit of using Contactless Method

 The figure above shows the benefit of using Contactless transaction and majority of the people using the method find the faster transaction of contactless method as major benefit being enjoyed by the people using it.

Vii. Frequency, percentage and cumulative percentage distribution of contactless transaction

Do_you_think_there_is_need_for_awareness_of_these_methods

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.4	.4	.4
	No	14	5.9	5.9	6.3
	Yes	224	93.7	93.7	100.0
	Total	239	100.0	100.0	

Figure 8: Frequency, percentage and cumulative percentage distribution of contactless transaction

The figure 8 above, shows the frequency, percentage and cumulative percentage of the distribution.

SUMMARY:

The goal of the study was to examine the existing state of contactless transactions in Birnin Kebbi Central Market and determine the adoption rate as well as the ramifications for customers and merchants. Results show that contactless payment methods are being adopted by customers and sellers in a slow but encouraging manner. Technological infrastructure, customer knowledge, and the COVID-19 pandemic's impact on prioritizing convenience and safety were all factors in this acceptance.

Even while contactless transactions are quicker and may have safety advantages, there are still issues that need to be resolved, such as expanding the availability of suitable technology and building more confidence among traditional cash-reliant users. However, the move to contactless payments is set to maximize market efficiency and hygiene, even though it will necessitate coordinated efforts to resolve technological issues and inform stakeholders.

Proactive actions are advised going forward, including targeted education campaigns, infrastructural improvements, and cooperative projects involving financial institutions, retailers, and regulatory agencies. The objective of these measures is to enable a smooth shift towards a broader adoption and application of contactless transactions, guaranteeing sustained advancement and compliance with changing consumer needs.

CONCLUSION

The study concludes by highlighting the positive trend of contactless payment methods in Birnin Kebbi Central Market and recommending targeted interventions to remove obstacles in order to create a marketplace that is more effective, safe, and user-friendly in the long run. Additionally, it is concluded that:

1. Technological Infrastructure: Support from financial institutions and the availability of contactless payment terminals are essential. Higher adoption rates may result if local banks or financial institutions support contactless payment methods and if retailers in the market have embraced these terminals.

2. Consumer Trust and Awareness: People must understand the advantages of contactless transactions as well as the security precautions involved. Adoption rates are greatly influenced by users' level of trust in the technology and their confidence in its security features.Consumer Trust and Awareness: People must understand the advantages of contactless transactions as well as the security precautions involved. Adoption rates are greatly influenced by users' level of trust in the technology and their confidence in its security features.

3. Government Policies and efforts: The adoption of contactless payments and cashless economies can be greatly influenced by government policies and efforts. Contactless payment systems may be adopted by customers and merchants due to incentives or rules that favor them.

4. Cultural and Behavioral Factors: The adoption of contactless transactions can be influenced by regional customs, preferences, and payment practices. Some consumers may still favor cash over other payment methods out of habit or mistrust..

5. Influence of the epidemic: Fears that contact with cash or payment terminals could spread the virus may have contributed to the rapid uptake of contactless transactions during the COVID-19 epidemic..

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