Contribution of Mobile Banking on Customer Satisfaction in Commercial Banks in Rwanda, Case Study of Banque Popularie du Rwanda Plc, Part of Atlas Mara/ Headquarters (2016- 2020)

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ABSTRACT

The research analysed the "Contribution of Mobile Banking on the Customer Satisfaction in Commercial Banks in Rwanda. Case Study of Banque Popularie du Rwanda Plc. Part of Atlas Mara/ Headquarters (2016-2020)". Research hypothesis was H0: Mobile Banking does not contribute to the Customer Satisfaction in Banque Popularie du Rwanda Plc. Part of Atlas Mara/ Headquarters. Specific objectives were: to analyse mobile banking services provided by BPR Plc; to assess the extent to which customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application by BPR Plc; and to find out the challenges and solutions of mobile banking experienced by customers of BPR Plc. A sample of 100 respondents was selected from a total population of from 92,961 users of Mobile Banking at BPR Plc using Yamane's formula. Statistical data was collected using a questionnaire and qualitative data was collected through interview. The major findings are the following: (i) Three main categories of mobile banking services provided by BPR Plc are Accounting information ($\bar{x}$ =3.72); transactions services ($\bar{x}$ =3.21); and support services ($\bar{x}$= 2.47). In overall, mobile banking services are accessed at high level (overall $\bar{x}$ =3.13). (ii) Customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application at high extent respectively by overall mean values of $\bar{x}$ =3.50; $\bar{x}$ =3.13; and $\bar{x}$ =4.00. (iii) Main challenges of mobile banking with BPR Plc include: inability to apply for loan using mobile banking ($\bar{x}$ =4.00); weak protection of accounts ($\bar{x}$ =4.00); limited accepted amount for transfer per day ($\bar{x}$ =3.29); temporally server failure ($\bar{x}$ =3.12);

and limited number of ATM ($\bar{x}$ =3.02). In overall, 97% of respondents agreed that mobile banking at PBR Plc increase customer satisfaction. This leads to reject the Null Hypothesis and accept alternative hypothesis. (iv) The research recommends: to encourage all customers shifting to mobile banking; to provide additional options to limit access by simple user name and password; to strengthen security face possible cyber- crimes; to adjust the amount of money to transfer upon demand; to allow access to small loans though Mobile banking; to improve server maintenance to avoid service shortage; to spread agents in main centers to allow access to cash; and to increase ATMs to reduce the queue at bank.

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1. BACKGROUND OF THE STUDY

The rapid spread of mobile devices has engendered a proliferation of mobile banking services throughout the world, with particular significance in African and other developing-world countries where the poorest members of the population have traditionally been unbanked. Globally, the percentage of adults who owned a formal bank account rose from 62% to 69% between 2014 and 2017. In the developing economies, the rise was from 54% to 63% (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2018). Rural communities in Africa have experienced a considerable proliferation of mobile devices for the past two decades. In Sub-Saharan Africa, it is estimated that only 44% of the population had a mobile subscription at the end of 2017 (GSMA, 2018). For Rwanda, the data published by STATISTA showed that Rwanda mobile subscription was 76.49% in 2019 from 0.49% in 2000.

Researchers defined Mobile banking as the use of mobile devices to access bank accounts in order to conduct financial transactions such as verifying account status/balances, money transfer, bill payments (Alafeef, Singh, & Ahmad, 2012; Lee & Chung, 2009; Shih, Hung, & Lin, 2010). Allied Market Research (2020) reported that mobile banking market size to hit $1.82 Billion by 2026 as a result of governments' initiatives due to progress in technology, increase in consumer acceptance, and surge in smartphone usage drive the growth of the global mobile banking market. On the other hand, the rise in concerns related to safety and security along with inappropriate connectivity and network infrastructure impede the growth to some extent (Allied Market Research, 2020). Key mobile banking services outlined the researches are (i) accessing account information such as account balances; (ii) performing bank account transactions, such as funds transfers between accounts and third-party payments; (iii) accessing support services such as cheque or card requests; and (iv) accessing content services such as loyalty-related programmes (Mallat, Rossi, & Tuunainen, 2004; Porteous, 2006).

According to Fatihudin, Jusni and Mochklas (2018), Customer satisfaction that results in customer retention in one among 12 key financial performance indicators for any business including retail bank namely: Operating Cash Flow (bank ability to pay for deliveries and routine operating expenses); Working Capital (subtraction of bank's existing liabilities from its existing assets); Current Ratio (division of total assets by liabilities); Debt to Equity Ratio (business's total liabilities in contrast to shareholders' equity 'net worth'); LOB Revenue vs. Target (compares the revenue for a line of business to the projected revenue for it); LOB Expenses vs. Budget (comparing actual expenses to the budgeted amount to understand where and how some budgeted spending went off track); Accounts Payable Turnover (the rate at which the business pays off suppliers); Accounts Receivable Turnover (the rate at

which your business is successfully collecting payments due from customers); Inventory Turnover (inventory continuously flows in and out of production and warehousing facilities); Return on Equity (company's net income in contrast to each unit of shareholder equity 'net worth'); Quick Ratio (organization's ability to utilize its highly liquid assets to immediately meet business's short-term financial responsibilities) (Fatihudin, Jusni & Mochklas, 2018).

Customer Satisfaction is the largest competitive advantage for banks. The banking industry is a commoditized space. With everyone offering nearly the same products and services without much room to compete on price, the experience customers have with their banks is what gives one bank a competitive advantage over another. In this line, mobile banking could be important mode of customer satisfaction because the downsides of traditional banking are that it requires the customer's physical presence at the bank premises, and the presence of bank staff at the branch to engage with the customers and paperwork. It is therefore both time-consuming and manpower dependent (Beck & Cull, 2013; Chavan, 2013). Therefore, many benefits have been cited for the adoption of mobile banking. Mobile banking makes it easy for the bank account to be accessible at any time from any place in the world, without the account-holder physically visiting the bank branches. This is why mobile banking is also referred to as "branchless banking" (Ivatury & Mas, 2008). On the other side, mobile banking is challenged by a series of issues including poor mobile connectivity, Lack of awareness of mobile banking services, Illiteracy, Lack of trust due to perceived security risks, and Cultural factors (Baptista & Oliveira, 2015; Chukwumah, 2017).

Using the case of Banque Populaire du Rwanda Atlas Mara, formed in 1975 and as of March 2019, it maintained a network of 193 full-service branches, and over 105 ATMs in all regions of Rwanda. BPR offers products that include current and savings accounts, debit and credit cards, mortgages and loans; and it offers banking tools like mobile banking. As an ancient Bank in Rwanda, the research assessed how it satisfies its customers through modern technology of Mobile banking.

2. PROBLEM STATEMENT

According to the research of Sharma and Al-Muharrami (2020) mobile banking use is rapidly increasing worldwide. In the first half of 2020 alone, there were 26% more mobile banking app sessions globally than in 2019. While the acceleration of mobile banking has indeed brought opportunity for financial institutions, it has also resulted in challenges. There are significant security risks that arise from using mobile banking apps. 76% of mobile banking apps can be accessed by hackers, it is easy for security to fall short at any stage. A substantial 62% of mobile banking users claim they would switch providers after a negative experience (Sharma & Al-Muharrami, 2020). For Africa, a research of Pankomera and Van Greunen (2018) identified the following key challenges of mobile banking: poor mobile connectivity; lack of awareness of mobile banking services; illiteracy; poverty; lack of trust due to perceived security risks; legal and regulatory frameworks; and cultural factors (Pankomera & Van Greunen (2018).

The Government of Rwanda has over the years been promoting the use of cashless transactions as opposed to cash. With 76.49% of Rwandans connected to mobile phones as of 2019 and 60.4% able to access the internet as of 2019 (according to the December 2019 report by the Rwanda Utilities Regulatory Agency 'RURA'), coupled with the New Coronavirus outbreak, cashless transactions have even become more necessary than ever before, to minimize human contact.

A Research of Nyataya and Ukwimanishaka (2017) outlined a series of challenges of mobile banking in Rwanda including network problems; privacy and security problem; high charges and barrier in

withdrawing higher than a specific amount (Nyataya & Ukwimanishaka, 2017). BPR Plc Part of Atlas Mara has been promoting cashless transactions through BPR Mobile Banking offers, which allow customers to use cashless means on their mobile phones or laptops to access their accounts and do any transaction without having to line up in the bank. However, the Bank is closing 20 branches and trimming the workforce as part of a strategy to reduce its soaring cost to income ratio. The question is to know the contribution of Mobile Banking on Customer Satisfaction in Commercial Banks in Rwanda specifically in Banque Populaire du Rwanda Plc. Part of Atlas Mara/ Headquarters.

3. RESEARCH HYPOTHESIS

H_0: Mobile Banking does not contribute to the Customer Satisfaction in Banque Popularie du Rwanda Plc. Part of Atlas Mara/ Headquarters.

4. RESEARCH OBJECTIVES

General objective

The general objective of the research was to assess the contribution of Mobile Banking on Customer Satisfaction in Banque Populaire du Rwanda Plc. Part of Atlas Mara/ Headquarters.

Specific objectives

(i) To analyze mobile banking services provided by BPR Plc Part of Atlas Mara.

(ii) To assess the extent to which customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application by BPR Plc Part of Atlas Mara.

(iii) To find out the challenges and solutions of mobile banking experienced by customers of BPR Plc Part of Atlas Mara.
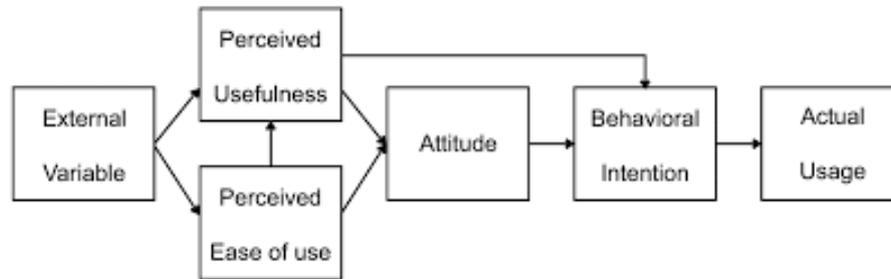
5. THEORETICAL REVIEW

Technology acceptance model (TAM)

According to Muhammad, Tariq, and Farwa (2015), the technology acceptance model (TAM) is an information systems theory developed by Fred Davis and Richard Bagozzi in 1989 that models how users come to accept and use a technology. The actual system use is the end-point where people use the technology. Behavioral intention is a factor that leads people to use the technology. The behavioral intention (BI) is influenced by the attitude (A) which is the general impression of the technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably: (i) Perceived Usefulness (PU) – This was defined by Fred Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance". It means whether or not someone perceives that technology to be useful for what they want to do. (ii) Perceived Ease-Of-Use (PEOU) – Davis defined this as "the degree to which a person believes that using a particular system would be free from effort". If the technology is easy to use, then the barriers conquered. If it's not easy to use and the interface is complicated, no one has a positive attitude towards it. (iii) External variables such as social influence is an important factor to determine the attitude. When these things (TAM) are in place, people will have the attitude and intention to use the technology. However, the perception may change depending on age and gender because everyone is different (Muhammad, Tariq, & Farwa, 2015; Davis, 1989; Davis, Bagozzi, & Warshaw, 1989).

Application of the theory in the context of Mobile Banking and Customer Satisfaction

Technology acceptance model (TAM) can be schematized as by the following figure below.

Figure 1: TAM applied to Mobile Banking and Customer satisfaction

Source: Davis, Bagozzi, & Warshaw (1989).

The new technology consist of shifting from Traditional banking to Mobile Banking. (i) External variables: for this context include social influence on adopting Mobile Banking such a spread of mobile phones even in rural areas of Rwanda where even farmers or cow keeper and shepherd have cell phones; the promotion of access to electricity; coupled with an averaged good network (approximately the whole Rwanda is covered by the network). At these factors are added the spread of bank agents and the promotion of mobile money. All these factors broken the fear to use Mobile Banking among Rwandese. (ii) Perceived usefulness: Mobile banking apps used by BPR Plc. as Part of Atlas Mara use mobile application that works on any type of mobile device with no further configurations required, no registration fees and monthly fees, it is very safe, and it allows access to bankable services without necessarily going to the bank. (iii) Perceived ease of use: BPR Plc. As Part of Atlas Mara uses mobile banking application which is easy to use by anyone because it comes in 3 languages (Kinyarwanda, English and French) to facilitate even people with little education. (iv) Attitude: At this point, there is positive attitude towards the use of Mobile banking technology as it saves time and it is effective. (v) by Behavioral intention, customers of BPR Plc. As Part of Atlas Mara adopt practically the use of Mobile banking by attending trainings of Bank's agents. (vi) Actual usage: this is the actual situation where customers of BPR Plc. As Part of Atlas Mara uses Mobile Banking in their daily lives.

6. EMPIRICAL REVIEW

Impact of mobile banking on customer satisfaction in commercial banks

Uwalaka and Eze (2020) assessed the effect of mobile banking on customers' satisfaction in commercial banks in Anambra State in Nigeria. Specifically, the study examined the effect of security of mobile banking service, mobile banking technology proficiency, ease of use, responsiveness of mobile banking application on customer satisfaction. The population of study consists of all the customers of the five selected commercial banks in Anambra State. The study used a sample of 384 respondents. The study found that (i) responsiveness of mobile making application has significant effect on customer's satisfaction; (ii) ease of product use has significant effect on customer's satisfaction; (iii) mobile banking technology proficiency has significant effect on customer's satisfaction; (iv) security of mobile banking has significant effect on customer's satisfaction. The study concludes that mobile banking has significant effect on customer satisfaction in selected commercial banks in South East Nigeria. The study recommends amongst others that banks should provide adequate security for mobile banking transactions (Uwalaka & Eze, 2020).

Gomachab (2018) assessed the impact of mobile banking on customer satisfaction in commercial banks

of Namibia (Keetmanshoop). The results revealed that the most frequently used service is airtime purchases and the least frequently used service is the allocation of funds; and that mobile banking services in the Keetmanshoop banking sector has an overall satisfaction rate of 75%. It is reliable, convenient, cost effective, available on different mobile networks, advertisements are encouraging, service is compatible with mobile devices, income (social aspect of transacting) of respondents influences the usability of mobile banking and mobile banking services are more secure than branch based services (Gomachab, 2018). Researches outlined the benefits to customers including: (i) Convenience and accessibility; (ii) Reduced handling of cash; (iii) Promotion of financial inclusion; (iv) Reduced urban-rural divide; and (v) Reduced inequality and poverty through creating new opportunities for the poor. These results are shared with the research of Baptista & Oliveira, 2015; Mago & Chitokwindo, 2014; Mlitwa & Tshetsha, 2012; Mtambalika et al., 2016; Shrivastava, 2010; Van der Wansem, 2013; Van Deventer et al., 2017; Ammar & Ahmed (2016).

Factors influencing customer satisfaction of mobile banking services

Jannat and Ahmed (2015) analyzed Factors influencing customer satisfaction of mobile banking services using a study on Second-Generation Banks. The main objective of this study was to identify the most influential factors of customer satisfaction of mobile banking of second-Generation banks. The study mainly followed a quantitative research methodology while structured questionnaire used as main data collection instrument. Data analysis performed using Statistical Package for Social Sciences (SPSS). The study found that, the most influential factors of customer satisfaction include Transaction speed; Security and trust; Ease of use; Ineffective advertisement; Accuracy of transactions; System availability; Responsiveness; Convenience; Cost effectiveness. The research found that, the security and trust factor is the most influential factor where ineffective advertisement has negative influence on the customer satisfaction of mobile banking.

Challenges of mobile banking

Researches assessed challenges to mobile banking including: (i) Poor mobile connectivity: six studies—examining conditions in Nigeria, Zimbabwe, Sudan, Rwanda, Ghana and South Africa—cite poor network infrastructure as the predominant barrier to people at embracing mobile banking (Ammar & Ahmed, 2016; Asongu, 2018; Hinson, 2011; Mago & Chitokwindo, 2014; Mlitwa & Tshetsha, 2012; Shrivastava, 2010). According to the researches, poor cellular network coverage in rural areas limits people's access to financial and banking services over the mobile devices. (ii) Lack of awareness of mobile banking services. (iii) Illiteracy. The research found that people who are literate more easily appreciate the notion of mobile banking and are more likely to be aware of at least basic mobile banking services (Baptista & Oliveira, 2015; Chukwumah, 2017; Hinson, 2011). (iv) Poverty where lack of regular income makes it a challenge for people to open an account (Chukwumah, 2017). (v) Lack of trust due to perceived security risks. A key reason for this lack of trust is the perception of risks associated with mobile banking, e.g., fear of security threats, such as fraud, that can occur during mobile banking (van Deventer, de Klerk, & Bevan-Dye, 2017). (vi) Legal and regulatory frameworks (Mtambalika et al., 2016). (vii) Cultural factors such as unwillingness to accept change, uncertainty avoidance, and perceived power imbalances between users and banking operators, all of which can be cultural moderators in relation to adoption of mobile banking (Baptista & Oliveira, 2015). The study based in Rwanda shows that some men do not permit their wives to own mobile phones, thus presenting a clear gender barrier to mobile banking uptake (Van der Wansem, 2013). Gurme (2019) assessed issues and challenges in mobile banking in Pune in India. The research found the following positive effects of mobile banking on customer satisfaction namely: a) Time saving: Instead of allocating time to

walk into a bank, you can check account balances, schedule and receive payments, transfer money and organize your accounts when you're on the go. b) Convenient : The ability to access bank accounts, make payments, and even track investments regardless of where you are can be a big advantage. c) Secure: Mobile banking applications have a security guarantee or send you a SMS verification code you need to input to authorize a payment for added security. d) Easy access to your finances: with the introduction of mobile banking, you are able to access your financial information even beyond the working hours. e) Increased efficiency: Functions of mobile banking are functional, efficient and competitive and it also reduces the amount of paperwork for both the banker and the customer f) Fraud reduction: Customers are being authorized in real time to watch their accounts (Gurme, 2019).

7. RESEARCH METHODOLOGY

Research design

This research used a mix of quantitative and qualitative design Nassaji (2015). Under quantitative design, the research used a questionnaire in form of four levels Likert scale where the scale of measurement was 1= Disagree (D); 2= Tend to Disagree (TD); 3= Tend to Agree (TA); and 4= Agree (A). The design is descriptive because it tend to answer the question "What" or "To what extent". The results are presented in form of percentages or descriptive tables indicating the mean and standard deviation. Under qualitative design, the research collected non- numerical data using an interview conducted with the Customer care officer and the Manager of Bank Populaire du Rwanda Plc. As Part of Atlas Mara, Headquarters.

Study population and sampling techniques

The total population is consists of 92,961 Users of mobile banking among 193,450 customers of BPR Plc. As Part of Atlas Mara. In fact, all customers of BPR Plc. As Part of Atlas Mara do not use mobile banking. The department of Information Technology which is in charge of assigning this function of using mobile banking to customers provided separate statistics of the customers by distinguishing those who use mobile banking and those who do not use it. And based on provided statistics it was possible to have both categories. The sample size given as by application of Yamane's formula: $n = \frac{N}{1+Ne^2}$ (Yamane, 1967, p.388). Where: n= Sample size; N = total population e = confidence level (10% for this study). By applying the formula to the study, the sample size is calculated as the following: $n = \frac{N}{1+Ne^2} = \frac{92,961}{1+92,961*(0.1)^2} = \frac{92,961}{930} = 99.9 \approx 100$

n = 100. The sample for the study is 100 customers using Mobile Banking at BPR Plc. As Part of Atlas Mara.

For selecting those 100 respondents from 92,961 users of Mobile Banking at BPR Plc. As Part of Atlas Mara, the research used the following techniques: Stratified sampling used by grouping those 92,961 users of Mobile Banking into two sub- groups based on gender with the aim of having both sexes represented in the research. The researcher deliberately chosen to use in the research women at 50% and men at 50% which indicate that over a sample of 100 respondents, women were 50 and men were 50. Simple random sampling was applied to determine the sample of 50 women and 50 men, the researcher proceeded by administrating randomly the questionnaire to the target 100 users of Mobile Banking. The work was facilitated by the customer officer of BPR Plc. As Part of Atlas Mara. The customers were asked at their arrival whether they use or not Mobile Banking. If Yes, they were administrated a questionnaire. Numerical data collected through the questionnaire was analyzed using IBM SPSS Statistics Version 20 and the results were presented in form of descriptive tables showing the mean and

standard deviation as well as percentages. Qualitative data collected through interview helped supporting numerical data.

8. RESULTS AND DISCUSSIONS

This chapter presents the results by specific objectives namely: to analyze mobile banking services provided by BPR Plc; to assess the extent to which customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application by BPR Plc; and to find out the challenges and solutions of mobile banking experienced by customers of BPR Plc.

8.1. Mobile banking services provided by BPR Plc Part of Atlas Mara

Objective one of this research was "To analyze mobile banking services provided by BPR Plc Part of Atlas Mara". The question was in form of four levels Likert scale and the Mean is interpreted as the following: $3 <= \bar{x} <= 4$ indicates high level of access and use; $2 <= \bar{x} < 3$ indicates moderately accessed and used; while $1 <= \bar{x} < 2$ indicates No access or use. A standard deviation $\sigma < 0.5$ indicates homogeneity of answers and $\sigma > 0.5$ indicates heterogeneity of answers.

Table 1: mobile banking services provided by BPR Plc

N°	Statement on mobile banking services provided by BPR	Usage level		
		N	$\bar{x}$	σ
	Account Information services			
1	Mini-statements	100	4.00	.000
2	Balance inquiry	100	4.00	.000
3	Monitoring of deposits	100	4.00	.000
4	Alerts on account activity or passing of set thresholds	100	4.00	.000
5	Access to card statements	100	2.59	.367
	Average	100	3.72	.073
	Transactions services			
1	Inter-Accounts transfer	100	3.58	.391
2	Transfer funds to BPR account	100	3.19	.299
3	Transfer to funds to Easy cash and withdraw on BPR ATMs	100	3.55	.287
4	Transfer to other bank's accounts instantly	100	3.42	.317
5	Transfer to Tigo cash	100	2.89	.325
6	Pay for EWSA prepaid electricity	100	4.00	.000
7	Pay for star times TV	100	4.00	.000
8	Pay for DSTV,MTN postpaid bill	100	2.29	.344
9	Pay for Rwanda revenue taxes	100	1.90	.259
10	Pay for WASAC water Bills	100	3.97	.269
11	Order for a Cheque book	100	2.55	.333
	Average	100	3.21	.257
	Support services			
1	Status of requests for credit	100	1.29	.369
2	Check (cheque) book and card requests	100	3.88	.255
3	Exchange of data messages and email	100	2.59	.342
4	ATM location	100	2.11	.333
	Average	100	2.47	.325
	Overall Average	**100**	**3.13**	**.218**

Source: Primary data (2021).

N indicates Number of respondents; $\bar{x}$ indicates Mean; **σ** indicates Standard Deviation.

The table 1 above shows three main mobile banking services provided by BPR Plc namely: Accounting information accessed at high level x̄= 3.72; transactions services accessed at high level x̄ =3.21; and support services accessed at moderate level x̄= 2.47. In overall, mobile banking services are accessed at high level (overall x̄ =3.13).

8.2. The extent to which customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application of BPR Plc Part of Atlas Mara

The second objective of the research was to assess the extent to which customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application by BPR Plc Part of Atlas Mara. The results are presented in the following table 8, 9 and 10 below.

Table 2: Customer Satisfaction by Security of BPR Mobile Banking Application

Nº	Statement on mobile banking security	Satisfaction level		
		N	x̄	σ
1	BPR Plc. has qualified IT technicians to deal with cyber-criminals.	100	1.97	.636
2	BPR Plc. provides the use of strong user name and password for account.	100	3.88	.366
3	In case of fraud, Rwanda Investigation Board (RIB) is professional in fighting against hackers.	100	4.00	.000
4	BPR Plc. recommends to clients clearing their cache to make sure no one else can view the confidential information their have viewed.	100	3.76	.349
5	BPR Plc. recommends to clients avoiding the risk of using a public terminal for accessing online bank accounts.	100	3.59	.388
6	BPR Plc. recommends to clients always lock their phone when not using it to prevent unauthorized user access.	100	3.77	.222
	Average	**100**	**3.50**	**0.327**

Source: Primary data (2021).

The table 2 above shows that level of satisfaction by security of mobile banking application of BPR Plc is high as indicated by the overall x̄ =3.50. The key mobile banking security indicators are those with the mean value > 3.00 namely: confidence in national security through RIB (x̄ =4.00); use of strong user name and password for account (x̄ =3.88); clearing their cache (x̄ =3.76); avoiding the risk of using a public terminal for accessing online bank accounts (x̄ =3.59); locking own phone (x̄ =3.77). The standard deviation <0.500 indicates homogeneity of answers.

Table 3: Customer Satisfaction by Responsiveness of BPR Mobile Banking Application

No	Statement on mobile banking Responsiveness	Satisfaction level		
		N	x̄	σ
1	Mobile banking apps of BPR Plc Part of Atlas Mara provides correct response to the query.	100	3.52	.366
2	Mobile banking apps of BPR Plc Part of Atlas Mara takes reasonable time to respond over a stable network.	100	2.66	.642
3	At each operation executed, the Apps provides an output result.	100	3.21	.258
	Average	**100**	**3.13**	**.422**

Source: Primary data (2021).

The table 3 above shows that level of satisfaction by Responsiveness of mobile banking application of BPR Plc is high as indicated by the overall x̄ =3.13.

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Vol. 5 No. 7 | Jul 2023   **100**

Table 4: Customer Satisfaction by Ease of use of BPR Mobile Banking Application

No	Statement on mobile banking apps ease of use	Satisfaction level		
		N	x̄	σ
1	Mobile banking Apps of BPR Plc. is set in three languages (English, French and Kinyarwanda).	100	4.00	.000
2	Mobile banking Apps of BPR Plc. is straightforward.	100	4.00	.000
3	The list of available banking services is clearly integrated into Mobile banking Apps of BPR Plc.	100	4.00	.000
4	No special trainings are required to use Mobile banking Apps of BPR Plc. as Part of Atlas Mara.	100	4.00	.000
5	It works on any type of mobile device with no further configurations required	100	4.00	.000
	Average	**100**	**4.00**	**.000**

Source: Primary data (2021).

The table 4 above shows that level of satisfaction by ease of use of mobile banking application of BPR Plc is high as indicated by the overall x̄ =4.00.

8.3. Challenges and solutions of mobile banking at BPR Plc Part of Atlas Mara

The third objective of the research was to find out the challenges and solutions of mobile banking experienced by customers of BPR Plc Part of Atlas Mara. The results are presented in the following tables 5 and 6 below.

Table 5: Challenges of mobile banking at BPR Plc.

No	Statement on challenges of mobile banking	Satisfaction level		
		N	x̄	σ
1	It requires having bundles for network in the phone.	100	1.00	.000
2	No possibility to apply for small loans.	100	4.00	.000
3	The amount of money to transfer is too limited.	100	3.29	.236
4	Internet connection failure affect the transaction.	100	4.00	.000
5	Fewer ATMs leading to go to the bank as in traditional mode.	100	3.02	.222
6	Issue of cyber- criminals	100	2.00	.000
7	Technical issues associated to network shortage on the server.	100	3.12	.197
8	Easy to steal once having only account user name & password.	100	4.00	.000
	Average	**100**	**3.05**	**.082**

Source: Primary data (2021).

The table 5 above shows that the main challenges of Mobile banking at BPR Plc include: inability to apply for loan using mobile banking (x̄ =4.00); issue of poor network connection (x̄ =4.00); weak protection of accounts (based on only user name and password easy to steal) (x̄ =4.00); limited accepted amount for transfer per day ((x̄ =3.29); temporally server failure (x̄ =3.12); and limited number of ATM (x̄ =3.02).

Table 6: Proposed solutions to challenges of Mobile banking at BPR Plc.

Nº	Proposed solution	Frequency	Percentage
1	To allow access to small loans though Mobile banking.	87	87%
2	To adjust the amount of money to transfer upon demand.	92	92%
4	To increase ATMs to reduce the queue at bank.	51	51%

5	To spread agents in main centers to allow access to cash	57	57%
5	To continue strengthening security face possible cyber- crimes	99	99%
6	To improve server maintenance to avoid shortage	58	58%
7	Providing checkup options in additional to user name & password before proceeding transactions.	100	100%

Source: Primary data (2021).

The table 6 above provide solutions to cited changes namely: providing additional options to limit access by simple user name and password (100%); strengthening security face possible cyber- crimes (99%); to adjust the amount of money to transfer upon demand (92%); allow access to small loans though Mobile banking (87%); improving server maintenance to avoid service shortage (58%); to spread agents in main centers to allow access to cash (57%); and To increase ATMs to reduce the queue at bank (51%).

9.   HYPOTHESIS TESTING

Respondents were asked to appraise whether does Mobile Banking contribute to the Customer Satisfaction in Banque Popularie du Rwanda Plc. Part of Atlas Mara/ Headquarters? The following were the answers.

Table 7: Overall appraisal of Customer satisfaction by mobile banking by BPR Plc

Agree	Uncertain	Disagree
97	3%	0%

Source: Primary data (2021).

The table 7 shows that 97% of respondents agreed that mobile banking at PBR Plc increase customer satisfaction.

10. DISCUSSIONS OF RESULTS

This section discusses the main findings aligned with specific objectives. The quantitative findings are supported by the results of interview with Customer care officer and the Manager of Bank Populaire du Rwanda Plc. As Part of Atlas Mara, Headquarters.

Objective 1: To analyze mobile banking services provided by BPR Plc Part of Atlas Mara.

The research found three main categories of mobile banking services provided by BPR Plc namely: Accounting information accessed at high level $\bar{x}$ =3.72; transactions services accessed at high level $\bar{x}$ =3.21; and support services accessed at moderate level $\bar{x}$= 2.47. In overall, mobile banking services are accessed at high level (overall $\bar{x}$ =3.13). These findings are supported by the results of interview where the Customer care officer affirmed that mobile banking facilitates customers accessing from their home services such as Account information services (Mini-statements, Balance inquiry, Monitoring of deposits, Alerts on account activity, Access to card statements); transaction services (such as different transfers, payments operations, and ordering a cheque); and support services (exchange of information, ATM location). And most of these services are free of charge to retain current customers and attract more new customers.

These mobile banking services provided by BPR plc are aligned with those provided by Keetmanshoop in Namibia as described by the research of Gomachab (2018) while assessing the impact of mobile banking on customer satisfaction in commercial banks of Namibia (Keetmanshoop). The results revealed that the most frequently used service is airtime purchases and the least frequently used service

is the allocation of funds; and that mobile banking services in the Keetmanshoop banking sector has an overall satisfaction rate of 75%. The difference between the two banks is that for Keetmanshoop customers do not use frequently the allocation of fund service compared to customers of BPR Plc.

Objective 2: To assess the extent to which customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application by BPR Plc Part of Atlas Mara.

The research found that customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application at high extent respectively by overall mean values: $\bar{x}$ =3.50; $\bar{x}$ =3.13; and $\bar{x}$ =4.00. These findings are supported by the results of interview with the Manager of BPR Plc who affirmed that mobile banking saves money and time to go to the bank; it allow quick access to 24/7 bank services; there is free of charge for all transfers to own accounts, pushing to mobile wallets (MTN Momo and Tigo/Airtel Money), buying airtime, Pay for TV subscription (DSTv, Startimes, Canal+), buying cash power, among so many other services, is currently free. No registration fees and monthly fees. All these advantages among others lead customers to satisfaction of banking services. The high level of satisfaction of Security, Responsiveness, and Ease of use of mobile banking application found for the case of BPR Plc are supported by the research of Uwalaka and Eze (2020) while assessing the effect of mobile banking on customers' satisfaction in commercial banks in Anambra State in Nigeria and found significant effect of those variables on customer's satisfaction.

Objective 3: To find out the challenges and solutions of mobile banking experienced by customers of BPR Plc Part of Atlas Mara.

The main challenges of mobile banking with BPR Plc include: inability to apply for loan using mobile banking ($\bar{x}$ =4.00); issue of poor network connection ($\bar{x}$ =4.00); weak protection of accounts ($\bar{x}$ =4.00); limited accepted amount for transfer per day (($\bar{x}$ =3.29); temporally server failure ($\bar{x}$ =3.12); and limited number of ATM ($\bar{x}$ =3.02). Proposed solutions proposed by respondents include: providing additional options to limit access by simple user name and password (100%); strengthening security face possible cyber- crimes (99%); to adjust the amount of money to transfer upon demand (92%); allow access to small loans though Mobile banking (87%); improving server maintenance to avoid service shortage (58%); to spread agents in main centers to allow access to cash (57%); and To increase ATMs to reduce the queue at bank (51%). Through interview, the Manager recognized that clients face issue of network shortage due to poor network infrastructure in Rwanda in general, and this also affect the server of the bank sometimes. This challenge is over bank control. Another challenge is about securities of accounts where the manager recognized this weakness for the software used but he acknowledged that based on several claims the software can be reviewed. The limited ceiling of money transfer per day was set as a security measure and its extension can be not well accepted by most of customers. These cited challenges are shared with those outlined by the research of Ammar and Ahmed (2016); Asongu (2018); and Mago and Chitokwindo (2014) namely poor network connection and lack of trust by Van Deventer, de Klerk, and Bevan-Dye (2017).

11. CONCLUSION

The research intended to analyze the "Contribution of Mobile Banking on the Customer Satisfaction in Commercial Banks in Rwanda. Case Study of Banque Popularie du Rwanda Plc. Part of Atlas Mara/ Headquarters (2016- 2020)". Research hypothesis was H0: Mobile Banking does not contribute to the Customer Satisfaction in Banque Popularie du Rwanda Plc. Part of Atlas Mara/ Headquarters. Specific objectives were: to analyze mobile banking services provided by BPR Plc Part of Atlas Mara; to assess the extent to which customers are satisfied of Security, Responsiveness, and Ease of use of mobile

banking application by BPR Plc Part of Atlas Mara; and to find out the challenges and solutions of mobile banking experienced by customers of BPR Plc Part of Atlas Mara. A sample of 100 respondents was selected from a total population of from 92,961 users of Mobile Banking at BPR Plc using Yamane's formula. Statistical data was collected using a questionnaire and qualitative data was collected through interview with the Manager and Customer care officer. The major findings are the following: (i) On objective one analyzing mobile banking services provided by BPR Plc Part of Atlas Mara, the research found three main categories of mobile banking services provided by BPR Plc namely: Accounting information accessed at high level $\bar{x}$ =3.72; transactions services accessed at high level $\bar{x}$ =3.21; and support services accessed at moderate level $\bar{x}$= 2.47. In overall, mobile banking services are accessed at high level (overall $\bar{x}$ =3.13). (ii) On objective 2 assessing the extent to which customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application by BPR Plc Part of Atlas Mara, the research found that customers are satisfied of Security, Responsiveness, and Ease of use of mobile banking application at high extent as indicated by respectively the following overall mean values: $\bar{x}$ =3.50 (for Security); $\bar{x}$ =3.13 (for Responsiveness); and $\bar{x}$ =4.00 (for Ease of use). (iii) On objective 3 about finding out the challenges and solutions of mobile banking experienced by customers of BPR Plc Part of Atlas Mara, the research found that the dominant challenges of mobile banking with BPR Plc include: inability to apply for loan using mobile banking ($\bar{x}$ =4.00); issue of poor network connection ($\bar{x}$ =4.00); weak protection of accounts (based on only user name and password easy to steal) ($\bar{x}$ =4.00); limited accepted amount for transfer per day (($\bar{x}$ =3.29); temporally server failure ($\bar{x}$ =3.12); and limited number of ATM ($\bar{x}$ =3.02). The research was based on null hypothesis, H0: Mobile Banking does not contribute to the Customer Satisfaction in Banque Popularie du Rwanda Plc. Part of Atlas Mara/ Headquarters. Considering the above results and the final appraisal, the research found that 97% of respondents agreed that mobile banking at PBR Plc increase customer satisfaction. This leads to reject the Null Hypothesis and to accept alternative hypothesis H_1: Mobile Banking contribute to the Customer Satisfaction in Banque Popularie du Rwanda Plc. Part of Atlas Mara/ Headquarters. The secondary data obtained from archive of BPR Plc shows that active customers of BPR Plc are 193450 however, mobile banking users are 92961 indicating 48.1%. The findings from this research showed significant contribution of mobile banking on customer satisfaction in BPR Plc implies that remaining 51.9% customers should shift to mobile banking users. This because mobile banking have several advantages such as saving money and time to go to the bank; allowing quick access to 24/7 bank services; there is free of charge for all transfers to own accounts (other accounts customers have with BPR), pushing to mobile wallets (MTN Momo and Tigo/Airtel Money), buying airtime, Pay for TV subscription (DSTv, Startimes, Canal+), buying cash power, among so many other services, is currently free. No registration fees and monthly fees.

12. RECOMMENDATIONS

Based on findings and conclusion, the research recommend: (i) to encourage all customers shifting to mobile banking; (ii) providing additional options to limit access by simple user name and password; (iii) strengthening security face possible cyber- crimes; (iv) to adjust the amount of money to transfer upon demand; (v) allow access to small loans though Mobile banking; (vi) improving server maintenance to avoid service shortage; (vii) to spread agents in main centers to allow access to cash; and (viii) to increase ATMs to reduce the queue at bank.

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