INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN 2278 – 0211 (Online)

Organisational Adaptability to Disruptive Technologies among Kenyan Commercial Banks

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Abstract:
While organisations endeavour to meet the needs of ever-discerning customers, advances in technology elicit responses by organisations in order to remain relevant to the unfolding technological environment. Such responses constitute organisational adaptability. Drawing from the dynamic capabilities view of the firm, we examine the response to disruptive technologies, specifically, mobile phone banking technology by commercial banks in Kenya through a cross-sectional survey of 71participants from 42 banks in Kenya and find that commercial banks adapt to mobile banking through resource reconfiguration, knowledge management and organisational learning. Based on our findings we conclude that when faced with disruptive technologies, organisations should consider adapting by reconfiguring resources, learning and building knowledge management capability. These findings have implication for theory since they contribute to the understanding of how organisations are likely to respond to disruptive technologies.

Keywords: *Disruptive technologies, organisational adaptability, commercial banks, Kenya*

1. Introduction

The financial sector development in Kenya can be reviewed in three phases (Misati, Njoroge, Kamau and Ouma, 2010). The third phase which is the main focus of this study is the late 1990s to date and can be classified as the era of financial innovation and emerging financial instruments. The period witnessed emergence of new products such as Islamic banking, automatic teller machines (ATMs), plastic money and electronic-money (e-money) amongst others within the banking sector (Misati et al., 2010). Likewise in this phase, commercials banks have enhanced their use of mobile phone networks, internet, payment cards, operational resilience and security systems in order to increase trust, integrity and confidence in their systems (GoK, 2012).

However, due to fact that mobile banking emerged into the market initially as a disruptive technology and, through successive improvements, made its way to become a mainstream platform for banking (Tellis, 2010), very little focus has been given to the processes through which commercial banks undergo to adapt to the technology and what the strategic value of the technology is. And while established firms are generally capable to adapt their organizations to continuously changing environments, they often encounter difficulties dealing with disruptive changes. Incumbents' success or failure to adapt their organizations to disruptive innovations was attributed to timing of entry (Mitchell, 1991), firm size and scale (Suarez & Utterback, 1995), engineering and technical capabilities misfit (Hill & Rotharmel, 2003), embedded managerial strategic orientation (Prahalad & Bettis, 1995) and structural inertia (Leonard-Barton, 1992).

1.1. Disruptive Technology

Disruptive technology is a technology that changes the bases of competition by changing the performance metrics along which organizations compete(Danneels, 2004).Such technology can lead to change in business models and even the basis of competition hence the imperative for organisations to adapt in a manner that enables them to continue meeting their business objectives. In this regard, organisational adaptability is the manner in which organisations dynamically adjust in order to address the business imperative in a changing business environment. In this study, the changing environment is the emergence of the mobile phone technology (referred to as disruptive technology) which continues to redefine how business is conducted and how customers are served by banks in Kenya

Though there exists empirical literature on disruptive technology, what it is and how it affects existing business models; and even rendering most of the conventional models obsolete, the characterisation of the mobile phone as a disruptive technology and the responses it elicits from organisations, particularly in the Kenyan context has received little attention. In order to understand how

commercial banks have responded to mobile phone technology, our two primary research questions (RQs) of this study were as follows:

- RQ1: What is the disposition of commercial banks in Kenya regarding adoption of mobile phone banking?
- RQ2: How do commercial banks in Kenya adapt to mobile phone banking technology?

2. Literature Review

We now review literature on disruptive technology and organisational adaptability

2.1. Disruptive Technology

According to Christensen (1997), organizations can manage radical technological innovations successfully but stumble with disruptive innovations and technologies. The disruptive impact of radical innovations on existing capabilities tends to be obvious when it emerges and trigger the need for adaptation (Henderson & Clarck, 1990), and most importantly, because it appeals to the organization's existing customers (Govindarajan et. al., 2011). Taking this view, scholars have further advanced disruptive innovations theory by showing that disruptive innovations and technologies are not only a technology problem (Chesbrough, 2010; Christensen, 2006; Markides, 2006) but also a source of value to organizations. This being the case, organisations should develop dynamic capabilities necessary to capture value from disruptive technologies. We therefore hypothesize that

- H1: Commercial banks in Kenya have adopted mobile phone technology in their business models

2.2. Organisational Adaptability

Sussman (2004) avers that adaptability is the ability to advance an organization's mission by strategically changing in anticipation of and in response to circumstances and in pursuit of enhanced results. Further, Motamedi (1977) defined adaptability as "the social system's ability to sense and understand its internal and external environments and to take action to achieve a fit or balance between the two." This being an imperative response to the emergence of disruptive technology and innovations, it is necessary that organisations effectively adapt to the disruptive technology which in our case in the mobile phone technology in the banking sector. Organisational adaptability comprises resource reconfiguration, organizational learning and knowledge management. This leads to our second hypothesis that:

- H2: Commercial banks in Kenya respond to mobile phone technology through resource reconfiguration, organizational learning and knowledge management.

3. Methodology

In determining the research methods and analysis for the study, the researcher takes an objective philosophical position (paradigm). Although there are numerous philosophical loci and variants in literature, Easter by and Smith (1991) identify two extremes of philosophical position that can usefully be employed to reflect on the research approach, with at one extreme, positivism and at the other phenomenology. Positivism sees the social world as existing externally and measurable by objective methods. Augustus Comte was influential in this view and believed that real knowledge was based upon observed fact (Comte, 1853). Although there is no single universally accepted set of characteristics, in taking this view the researcher sees "truth" as logical, linked and predictable and believes it is possible to derive and understand it through objective mathematical logic and scientific methods. Quantitative methods are seen as the most reliable tools to derive knowledge in an objective world (Neuman, 2000). Phenomenology on the other hand views the world as socially constructed and given meaning by people rather than being objective and external (Husserl, 1946).

The constructs in this study is the mobile phone based technologies and services, which are scientific in nature and consistent with this philosophical angling. As a critical systems thinker, the strength of viewing the research through alternative philosophical lenses is recognised. The wide variety of systems approaches that were of relevance with the research had clear associations with both perspectives and the research orientation. For example, internet banking is more closely associated with positivism while adaptation can be more in common with phenomenology. Consequently, the research committed to a pragmatic paradigm. However, some authors have argued that paradigms and methods are not inherently linked. Mir and Watson (2000) pointed out that a researcher who is anchored in constructivist methodology may employ a variety of methods including statistical analysis, just as a researcher employing a realist methodology may use qualitative research. Thus, research methods are more independent of epistemological and ontological assumptions than is sometimes supposed (Bryman & Bell, 2007).

3.1. Research Design

Given that there is hardly any empirical study on the strategic value of disruptive technologies on commercial banks in Kenya, this study sought to explore how organizations adapt to disruptive technologies using Kenya's commercial banks as the context and the mobile phone banking as a disruptive technology. A descriptive and explanatory survey of respondents selected from commercial banks registered by the Central Bank of Kenya as at 31st December 2015 was conducted using a quantitative approach to analyze relevant data. The quantitative research approach involved numerical representation and manipulation of the data for the purpose of describing and explaining the phenomenon of organisational adaptability to disruptive technologies by commercial banks in Kenya.

Commercial banks were chosen for the study because they are perceived to be avid users of information and communication technology in Kenya.

3.2. Study Population

The target population of the study comprised participants from all the 43 commercial banks licensed by the Central Bank of Kenya as at the end of December 2015. The bank was the unit of analysis with the units of observation being the top management team, namely the Chief Executive Officer; ICT/Technology manager; Finance/Accounts manager; and the Human Resource & Administration manager. To avoid instances of single respondent biases, the study used two respondents from each bank, giving the study population of 86. Therefore, the target population for the study comprised 86 participants made up of two managers from each commercial bank. Such members of the banks' management teams were considered to be well versed with the banks' operations and are key decision makers in those banks hence their suitability for this study.

3.3. Sampling and Sample Size Determination

The sample size was determined using the Yamane (1967) formula and a purposive sample of 71 selected from among top bank managers from the 43 commercial banks in Kenya.The target population for this study was all the 43 registered commercial banks in Kenya as at 31st December 2015. According to Saunders (2009), sample size is a subset of the target population. Webster (1985) defines a sample as a finite part of a statistical population whose properties are studied to gain information about the whole.

- Sample size determination. The sample size was determined using Yamane (1967) sample size formula. The formula was found to be very useful since it took care of the occurrence and non-occurrence of the phenomenon under investigation and also the design effect. Since this study was limited to one design effect and the population under study were homogeneous in the sense that all were senior members of staff in all the 43 registered commercial banks in Kenya giving a target population of 86 comprising two respondents from each bank. The following formula (equation 1)was used to arrive at a sample of 71 participants.

$n = N/[1 + N\varepsilon^2]$ ……. $(Equation\ 1)$

N = is the target population

ε = the selected margin of error of the study corresponding with 95% confidence level in this case 0.05.

Substituting for the values, N=86, $and\ \varepsilon$ = 0.05, we have

n = 86/(1+86*0.05^2)

n = 70.781893

n = 71

From this computed minimum design sample, 75 questionnaires were distributed to cater for non-response and/or non-usable completed questionnaires.

- Sampling design. The study used purposive sampling design to sample the unit of observation. In purposive sampling, the researcher selects experts who are well acquainted with the study interests (Black, 1999), in this case mobile phone banking operations of the banks they manage. According to the American statistical Association (1999), purposive sampling is used to select only those respondents considered to be key and resourceful in providing the required data. In this regard, data relating to mobile phone banking technology usage, resource allocation and usage, strategic leadership, communication, continuous learning, top management commitment, and training of employees within the banks was collected.

3.4. Measures of Variables

The research variables for this study were identified as both independent and dependent. Independent variables are those items that were manipulated and measured, while dependent variables are those that were observed and measured to determine a fact on the independent variables (Bless & Achola, 1987). The independent variables in the research included: mobile phone usage, characterization of mobile phone technology and their usage. The dependent variable is the organization's overall strategic value which was measured using efficiency and profitability. This was further investigated by using organizational learning, knowledge management capability, and resource reconfiguration.

	Variable Type	Factor Name	Variable Name	Variable Code	Measure	Items	Scale
Disruptive Technologies	Independent	Mobile Banking	MOBBK	MOBBK	YES / NO	7	Mixed
Organizational Adaptability	Mediating	Adaptation	Organizational Adaptation	ADAPT	Degree of adaptation	5	5 Point Likert
		Resource Reconfiguration	Resource Allocation	RRCRAL	Degree of resources allocated	8	5 Point Likert
			Resource Use	RRCRUS	Amount spent	7	Value
		Organizational Learning	Strategic leadership	OLSTL	Degree of leadership	5	5 Point Likert
			Communication	OLCOM	Use of ICT for Communication	5	5 Point Likert
			Continuous Learning	OLCSL	Degree of organizational learning	5	5 Point Likert
		Knowledge Management Capability	Top management commitment	KMTMC	Degree of Commitment	5	5 Point Likert
			Training of employees	KMTRE	Degree of trainined staff	5	5 Point Likert

Table 1: Measures of Variables

3.5. Research Instruments

The study used questionnaires to obtain quantitative data for analysis which was further validated from analysis results from secondary data quantitative analysis. Schwab (2005) defines questionnaires as measuring instruments that ask individuals to answer a set of questions or respond to a set of statement. Mugenda and Mugenda (2003) and Kothari (2004) define a questionnaire as a document that consists of a number of questions printed or typed in a definite order on a form or set of forms. In view of the advantages and the need to gather more information, questionnaires were administered to senior bank managers to solicit their views concerning the effect of bank innovations on performance of commercial banks.

The choice of the questionnaire was based on the fact that: it is a quick method to collect data; it is less time consuming, it is able to cover the entire sample within the proposed time frame; it offers greater assurance of anonymity; and the level of sensitivity of the study. This study required a high level of confidentiality and hence the appropriateness of the tool. The questionnaire consisted of four parts. Part I was used to collect demographic information such as gender, title of respondent, length of employment and responsibility, while Part II sought information and perceptions of respondents towards the banks' adoption of mobile phone banking technology. Similarly, Part III obtained information related to organizational adaptation along the three main study indices of resource reconfiguration, organizational learning and knowledge management. All responses in the questionnaire were in three formats: open ended responses; dichotomous responses; and Likert scale responses ranging from 1=strongly agree to 5=strongly disagree.

3.6. Piloting of the Instruments

A pilot test to test the validity and reliability of the questionnaires in gathering the data required for purposes of the study. Kombo and Tromp (2009) and Kothari (2004) describe a pilot test as a replica and rehearsal of the main survey. Dawson (2002) states that pilot testing assists researchers to see if the questionnaire will obtain the required results. According to Polit and Beck (2003), a pilot study or test is a small-scale version, or trial run, done in preparation for a major study. King (2001) states that the term pilot study has been misused by some researchers who appear to use it as an excuse for not using a bigger sample. Polit and Beck (2003) states that the purpose of a pilot test is not so much to test research hypotheses, but rather to test protocols, data collection instruments, sample recruitment strategies and other aspects of a study in preparation for a larger study.

Further, reliability was tested by use of 10 questionnaires which were piloted with randomly selected senior bank managers who were not included in the final study sample. This was meant to avoid response bias in case they were to complete the same questionnaire twice. The rule of the thumb suggests that 5% to 10% of the target sample should constitute the pilot test (Cooper & Schilder, 2011; Creswell, 2003; Gall & Borg, 2007).

- Validity. Validity and reliability are critical features of effective research. Validity refers to the extent to which questions in an instrument accurately measure the variables therein (Hair, 2003; Moule & Hek, 2011),

Validity was tested by use of ten questionnaires which were piloted with randomly selected senior bank managers who were not included in the final study sample. This was meant to avoid response bias in case they were to complete the same questionnaire twice. The rule of the thumb suggests that 5% to 10% of the target sample should constitute the pilot test (Cooper & Schilder, 2011;

Creswell, 2003; Gall &Borg, 2007). The pilot test sample was within the recommendation (7.5%). The questionnaire was validated by discussing it with two randomly selected senior managers from two banks. Their views were evaluated and incorporated to enhance the content and construct validity of the questionnaire.

- Reliability. Reliability refers to the degree to which a set of variables are consistent with what they are intended to measure (Amin, 2005). To test for reliability of the instruments, 10 questionnaires were coded and input into Statistical Package for Social Sciences [SPSS] version 20 for running the Cronbach reliability test. The reliability of the questionnaire was tested using the Cronbach's alpha correlation coefficient with the aid of Statistical Package for Social Sciences (SPSS) version 20. The Cronbach's Alpha was computed using the following formula:

$$\alpha=\frac{k}{k-1}\left[1-\frac{\sum\sigma_k^2}{\sigma^2}\right] \quad (Equation\ 2)$$

Where $\sum\sigma_k^2$ is the sum of the variance of k parts (usually items) of the test and σ is the standard deviation of the test. The value of Cronbach's alpha is between 0 and 1.00 with larger values indicating high reliability. Nunnally (1978) noted that Cronbach's alpha is a good measure of reliability while Sekaran (2003) specifies the ranges of alpha and their interpretation. In this regard, values of alpha ranging between 0.8 and 1.00 indicate a considerable reliability, and values between 0.70 and 0.80 indicate an acceptable reliability while values below 0.70 are considered less reliable and unacceptable. A minimum Cronbach's alpha value of above 0.7 was used to indicate reliability of the constructs. The instruments (questionnaires) were tested for reliability and the results are presented in Table 2.

Construct	**Cronbach's Alpha**	**N of Items**
Mobile/Internet service adoption	0.856	6
Resource reconfiguration	0.762	8
Organisational learning	0.715	15
Knowledge management capability	0.707	15

Table 2: Reliability Statistics

The instruments were adjusted by deleting some of the items that impaired the reliability top achieve a Cronbach alpha of at least 0.7 (see Table 2). The closer Cronbach's alpha coefficient is to 1, the higher the internal consistency reliability (Sekaran, 2003). A coefficient of 0.7 is recommended for a newly developed questionnaire and therefore 0.887 was adequate for this study.

3.7. Data Collection Procedure

Primary data was collected using a self-administered questionnaire which comprised of close-ended, open-ended and a combination of both questions. Research assistants were engaged to mainly make follow-up of the administered questionnaires. Kothari (2004) describe primary data as those which are collected afresh and for the first time, and thus happen to be original in character. Louis, Lawrence and Morrison (2007) describes primary data as those items that are original to the problem under study while Ember and Ember (2009) describe primary data as data collected by the investigator in various field sites explicitly for a comparative study.

To ensure that the respondents were not prejudiced in their responses due to time constraints, the study collected both qualitative and quantitative data simultaneously. This was informed by the fact that by concurrently collecting both forms of data, the study was able to continuously compare them with an eye for congruence. Further, the process was in line with the assertion that factors that inform researchers to design and conduct a mixed methods study are implementation of data collection, priority and congruence (Morse, 1991; Morgan, 1998; Tashakkori & Teddlie, 1998; Creswell, 2003). Prior to data collection, permission was obtained from the relevant licensed commercial bank authorities to conduct the study in their organizations. In addition, two research assistants were employed and trained in data collection techniques to enable them effectively seek audience from respondents.

Secondary data from the commercial banks was collected on total profit before tax, total assets and the number of mobile banking users. In addition, analysis and review of the following documents was made: Management reports and audited accounts for the period 2011 – 2014; strategic plans for the said period; employee manuals, policy documents, publications on mobile phone technology education usage and technology change publications. This secondary data was collected from the Central Bank of Kenya, Kenya National Bureau of Statistics, Banking survey manuals and annual reports of the banks.

Kothari (2004), defines secondary data as data that is already available, referring to the data which have already been collected and analysed by someone else. Polit and Beck (2003) explain that secondary research involves the use of data gathered in a previous study to test new hypotheses or explore new relationships. They also indicate that secondary analysis of existing data is efficient and economical because data collection is typically the most time-consuming and expensive part of a research project. Dawson (2009) states that secondary data involves the data collected using information from studies that other researchers have made of a subject. This data was used to validate the findings from analysis of primary data which was collected using questionnaires. The strategy of using both primary and secondary data to address the same study objectives was meant to improve the interpretive coherence and improve both communicative and pragmatic validity of the study results.

3.8. Data Analysis Technique

Besides using frequencies and descriptive analysis, correlation analysis, analysis of variance (ANOVA), andordinary least squares (OLS) regression analysis were used to test the hypotheses and the statistical significance of the various independent variables (mobile phone banking, organizational learning, resource reallocation and knowledge management) on the dependent variables (profitability and efficiency). The questionnaire responses were coded and analyzed.

3.9. Ethical Considerations

A number of ethical procedures and principles were ensured during the study. First, informed consent was sought and appropriate documentation was kept. Secondly, questionnaires were coded to guarantee anonymity as none of the respondents was named at any time during the research; and, thirdly, respondents were selected for their willingness to participate without compulsion, and no risks to the respondents could be identified at any stage during the research.

4. Results and Discussion

In this study, we examined the relations between and influence of mobile banking services (mobile money transfer, internet banking) organisational adaptability comprising three sub-variables, namely, organizational learning, resource reconfiguration and knowledge management capability among commercial banks in Kenya. The results of the study and their discussion is presented starting with the response rate, sample characteristics, correlation and finally regression analysis. The results are organized based on the two hypotheses that were tested.

4.1. Response Rate and Sample Characteristics

This section presents the basic characteristics of the sample of the study. Primary data was collected between March and May 2016 using a questionnaire while a self-constructed data collection sheet was used to collect secondary data.

- Response rate.Out of the 75 questionnaires that were distributed, 72 were returned representing a 96% response rate. This is consistent with Fowler's (2009) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent.
- Sample characteristics. This section outlines the baseline characteristics of the respondents in terms of their gender, position held, number of years of working experience, knowledge of ICT and degree of engagement in decision making in the bank.
- Gender. The distribution of respondents by gender is presented in Table 3.

Gender	Percentage
Male	50
Female	50
Total %	100

Table 3: Gender of respondents

The study found that both genders were equally represented thereby avoiding gender biases. This is contrary to some common notion that the management of commercial banks in Kenya is dominated by members of the male gender. This study reveals that there was gender parity among the bank managers.

- Management position. The management positions occupied by the respondents are shown in Table 4.

Position	Percentage
General Manager	2
Manager	18
Assistant Manager	12
Section Head	68
Total %	100

Table 4: Position held by the respondent

Data on Table 4 shows that majority of the respondents (68%) worked as section heads within the banks, 18% were managers, while 2% of the respondents worked as general managers. This kind of distribution is in tandem with the standard practice in organizations whereby lower level officers are the majority while the senior managers are fewer in number. However, the nature of the study generated more interest from the finance, ICT and human resource departments as they are the departments which champion technology innovations and resourcing. Additionally, this finding suggests that the data originated from a well representative sample.

- Work Experience. Results of the analysis on the duration (in years) that the respondents had worked in the banks are presented in Table 5.

Duration of work	Percentage
1-2 years	26
3-4 years	20
5-6 years	20
7-8 years	24
Over 8 years	10
Total %	100

Table 5: Work Experience

Regarding work experience, the study found that over 50% of the respondents had worked for their institutions for at least 5 years or more. This finding suggests that majority of the respondents joined the sector after year 2003 which is in line with the growth experienced in the past decade in the sector. Aggregate bank employees in Kenya in 2002 were 10,884 and grew to 30,056 by end of 2011 indicating staff growth of 2.76 times (CBK, 2012). This also shows that banks have recruited more people to oversee the growth that has been witnessed in the last decade and transformed themselves as sources of employment and have also attracted various skills in the past decade. The results also indicate a stable work environment which shows that most banks have turned themselves into employers of choice in the country by initiating several employee retention strategies and hence the many respondents who had worked for the banking sector for more than five years.

- ICT Knowledge. Mobile phones belong to the ICT equipment family. As such, it was imperative for the study to investigate the level of understanding the respondents had of ICTs. Data on ICT skills among the respondents was also analyzed and the results are presented in Table 6

ICT knowledge	Percentage
Very good	40.8
Good	28.6
Average	30.6
Total %	100

Table 6: Knowledge on ICT

The study has found that 42% of the respondents had very good ICT knowledge, 28% had good ICT knowledge while 30% had average ICT knowledge. This finding suggests that the respondents were very well versed with ICT issues which was a key requirement for the respondents. It also confirms that the purposive aspects of the respondents were responsive to the study.

- Direct involvement in decision making. Some of the variables in the study required responses from people who were in decision making positions, e.g. information on resourcing and management support. As such, the study sought to find out whether the respondents were directly involved in decision making. The results are presented in Table 7.

Direct involvement in Decision Making	Percentage
Yes	52
No	48
Total %	100

Table 7: Decision making

It was found that more than half (52%) of respondents were directly involved in decision making. This finding reveals that majority of the respondents are key decision makers in their organizations which was a vital aspect of the study. This finding is presented in Table 5.

4.2. Descriptive Statistics

This section presents the findings and discussion of the specific objectives of the study. Frequencies and descriptive statistics are presented first followed by inferential statistics. Adoption of mobile banking by commercial banks. From the supply perspective, banks adopt technology (in this case mobile phone banking) in order to offer services to their customers. The adoption of mobile banking by banks was assessed on two aspects, namely, access to the internet, and use of mobile phone banking services. Further, the adaptation (organisational adaptation) of the commercial banks to this disruptive technology was also assessed. The results are presented in Table 7 and Table 8.

	N	Range	Min	Max	Mean	Std. Deviation	Skewness		Kurtosis	
Variable/Construct	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Mobile banking services (MB1)	42	3.0	1.0	4.0	2.357	0.759	-.014	.365	-.297	.717
Mobile money transfers(MB2)	42	4.0	1.0	5.0	2.548	0.993	.255	.365	-.348	.717
Internet banking services (MB3)	42	4.0	1.0	5.0	3.190	1.330	-.760	.365	-.926	.717
Banking hall services(MB4)	42	4.0	1.0	5.0	1.619	1.229	1.947	.365	2.566	.717
Mobile banking service adoption/Use (Mbu)	45	3.6	1.0	4.6	3.278	0.849	-.821	.354	-.167	.695
Resource reconfiguration (RR)	42	3.3	1.4	4.6	2.412	0.686	.953	.365	1.514	.717
Organisational learning	42	1.9	1.1	2.9	1.885	0.378	.539	.365	.326	.717
Knowledge managementcapability	41	1.5	1.0	2.5	1.732	0.354	.422	.369	.177	.724
Valid N (listwise)										

Table 8: Adoption of mobile banking by commercial banks in Kenya

These results indicate that commercial banks have adopted mobile banking as shown by the means of below 3 on a scale of 1 t0 5 where 1=strongly agree and 5=strongly disagree on statements that were posed to seek information on the extent to which mobile banking had been adopted.

In line with Gardachew (2010), assertions, banks are able to achieve efficiency and profitability as a result of adoption of mobile banking and adaptation to technological innovations, which in turn increases access to banking services (Porteus, 2006).

- Access to the Internet. The internet has become the leading platform on which electronic transactions are undertaken. Some mobile phone technologies ride on the internet. As such, it was imperative that the study determines the extent to which respondents had access to it.

Adoption of mobile banking	Yes	No	
Internet Access	94.2	5.8	
Use of mobile phone banking	75	25	

Table 9: Internet Access

As see from Table 9, it was found that a majority (94.2%) of the respondents had access to the internet while the remaining 5.8 percent had no access to the internet. This finding suggests that the respondents were well conversant with the internet, its functionalities and capabilities.

4.3. Use of Mobile Phone Banking by Commercial banks in Kenya

Data was collected on the various types of mobile phone banking services that were offered by commercial as in Table 10.

Mobile phone banking services offered by banks	Yes	No
Mobile money transfer	97.6	2.4
Account balance and history	95.2	4.8
Viewing Account details	98.0	2.0
Transfer of funds	95.2	4.8
Registration and receipt of statements	95.2	4.8
Setup and manage transaction alerts.	87.8	12.2
setup and communication via secure email messages	87	13

Table 10: Mobile phone banking services

This study found that majority (97.60%) of the commercial banks offer mobile money transfers, while only 2.40% do not offer. This finding suggests that most commercial banks have highly integrated mobile banking as one of their services. The finding corroborates the evidence regarding mobile banking by Misati, Njoroge, Kamau and Ouma (2010), which revealed that mobile banking had expanded the range of services that a bank could offer.

- Viewing account balances and transaction history. In regard to the ability for customers to view their account balances and transaction history, the study found that a majority (95%) of the commercial banks enabled them to use their mobile phones while 5% do not offer this service. The findings corroborate Ndung'u (2011) findings that mobile phone banking has revolutionized the money transfer business in Kenya, which has in turn translated to more incomes and profits to the banks.
- Account balance inquiry. Customers having access to their account details is one of the key services that has been made possible through the use of mobile phones (Gardachew, 2010). This study found that majority (98%) of the commercial banks enable their clients to view their account details via their mobile phones while 2% do not enable this service.
- Transfer of funds. The ability of customers to transfer funds using their mobile phones, the study found that (95%) of the commercial banks have enabled the service while only 5% do not offer this service.
- Registration and receipt of statements. Regarding registration and receipt of statements via their mobile phones, the study found that a majority (92.5%) of the commercial banks have enabled their clients to register for and receive online statement through the mobile phone while 7.5% do not offer this service.
- Setup and manage transaction alerts. The study found that the majority (87.8%) of the commercial banks have enabled their clients to setup and manage alerts for transaction accounts via mobile phones while 12.2% do not offer this service.
- Setup and communication via secure email messages. In relation to the setup and communication via secure email messages, the study found that (83%) of the commercial banks have enabled their clients to setup and communicate through secure email messages while 17% do not offer this service.
- Banking hall-based services. Besides the mobile banking, the customers also use banking hall services (Table 11).

Banking hall based services	Percent
Yes	97.6
No	2.4

Table 11: Banking Hall Based Services

This study found that majority (97.60%) of the commercial banks offer banking hall based services while a few 2.40% do not offer.

4.4. Comparison of Use of Mobile Phone Banking by Customers

From the demand side perspective, the banks may make the services available, however customers may take time to adopt and use the services. The distribution of customers depending on the extent of use of mobile banking services is presented in Table 12

Service	Most used	More than averagely used	Averagely used	Less than averagely used	Least Used
Mobile banking services	11.9%	45.2%	38.1%	4.8%	0%
Mobile money transfers	14.3%	35.7%	33.3%	14.3%	2.4%
Internet banking services	21.4%	7.1%	9.5%	54.8%	7.1%
Banking hall based services	73.8%	9.5%	4.8%	4.8%	7.1%

Table 12: Customer Usage of mobile and internet banking Services

From the findings in Table 12, with regard to the usage of mobile phone as a banking platform the study found that 95.2% of the customers more than average to mostly used mobile banking services while 83.3% of the customers used mobile money transfers averagely to "mostly used". Majority (54.8%) of the customers used internet banking services less than average. Majority (73.8%) of the customers mostly used banking hall based services reflecting that the conventional way of banking still has a sway over the customers even though they have adopted mobile banking.

4.5. Services used by Customers on the Mobile Phone Banking Platform

Further, data was collected on specific mobile phone platform services that were being used by customers as shown in Table 13.

Service	Most used	More than averagely used	Averagely used	Less than averagely used	Least Used
View account balances and transaction history	52.4%	26.2%	9.5%	4.8%	7.1%
View account details	21.4%	31.0%	31.0%	7.1%	9.5%
Transfer funds	14.3%	38.1%	38.1%	7.1%	2.4%
Make payment of bills	19.0%	35.7%	31.0%	7.1%	7.1%
Update personal details	7.1%	21.4%	16.7%	31.0%	23.8%
Register for and receive online statements	11.9%	7.1%	19.0%	26.2%	35.7%
Setup and manage email alerts for transaction accounts	9.5%	7.1%	16.7%	19.0%	47.6%
Communicate through secure email messages	9.5%	11.9%	9.5%	14.3%	54.8%

Table 13: Customer Usage of Services offered over Mobile Phone Banking platform

Regarding customer usage of mobile phone banking services, the study found that viewing of account balances and transaction history was mostly used accounting for 88.1%; viewing account details, transferring funds and making payment of bills were averagely to mostly used with over 80%; updating personal details, registering for and receiving online statements and setting up and managing email alerts for transaction accounts were less than averagely to least used, at an average of 60%. Majority (69.1%) of the customers either less than average or least communicated through secure email messages. These findings are consistent with several mobile banking adoption studies that suggested that people refuse or are unwilling to use mobile banking mainly because of perceived risk (Riquelme & Rios, 2010; Natarjan, 2010; and Dasgupta. 2011) or perceived credibility (Dasgupta, 2011). The findings of this study suggest that commercial bank customers do not communicate with their banks through email as they perceive them as risky and as such may expose them to fraudsters and other online hackers.

4.6. Security and Safety of Mobile Banking

The results of analysis of data on whether the mobile banking is secure and safe are presented in Table 14.

Mobile phone banking is a secure & safe mode of doing financial transactions	Percent
Yes	92.9
No	7.1

Table 14: Mobile Banking secure and safety

The study further found that a majority (92.9%) of the respondents believe that mobile phone banking is a secure and safe mode of doing financial transactions while 7.1% do not believe so.It can be deduced from the results in Table 14 that customers perceive mobile phone banking as being secure and safe.

4.7. Testing Hypothesis One (H1)

The results in obtained from the frequency distributions and descriptive statistics e.g., Table 10 show that over 87% of customers have adopted mobile platform to transact all their banking requirements. The leads to the acceptance of the first hypothesis (*H_1) that: Commercial banks in Kenya have adopted mobile phone technology in their business models – a disruptive technology*.

4.8. Degree Association between Pairs of Variables

Correlation analysis was used to ascertain the degree of association between pairs of variables. Specifically, the purpose of Pearson correlation analysis is to examine the bivariate relationships among variables. Using this technique, the study sought to find the strength of the relationship among the variables used in the study; the correlation results are presented in Table 15.

			MB1	**MB2**	**MB3**	**MB4**	**Mbu**	**RR**	**OL**	**KC**
1	Mobile banking services(MB1)	Pearson Correlation	1							
		Sig. (2-tailed)								
2	Mobile money transfers(MB2)	Pearson Correlation	.122	1						
		Sig. (2-tailed)	.440							
3	Internet banking services (MB3)	Pearson Correlation	.173	**-.321***	1					
		Sig. (2-tailed)	.275	**.038**						
4	Banking hall services(MB4)	Pearson Correlation	.254	**.335***	**-.328***	1				
		Sig. (2-tailed)	.105	**.030**	**.034**					
5	Mobile banking service adoption/Use (Mbu)	Pearson Correlation	-.087	.237	-.110	-.279	1			
		Sig. (2-tailed)	.585	.131	.489	.074				
6	Resource reconfiguration (RR)	Pearson Correlation	-.280	**-.457****	.127	-.030	-.211	1		
		Sig. (2-tailed)	.076	**.003**	.430	.851	.181			
7	Organisational learning (OL)	Pearson Correlation	-.152	-.080	-.149	.190	-.257	**.410****	1	
		Sig. (2-tailed)	.342	.621	.353	.235	.100	**.007**		
8	Knowledge management capability (KC)	Pearson Correlation	-.026	**.314***	-.055	.216	**-.314***	-.088	**.468****	1
		Sig. (2-tailed)	.873	**.049**	.735	.180	**.046**	.584	**.002**	
	*. Correlation is significant at the 0.05 level (2-tailed).									
	**. Correlation is significant at the 0.01 level (2-tailed). N = 42									

Table 15: Correlations

The results in Table 15 indicate that resource reconfiguration (RR) and mobile money transfers (MB2) were strongly, negatively and significantly correlated (r= -.457, p=0.003<0.05). Further, knowledge management capability is positively and significantly associated with mobile money transfers (r=0.314, p= 0.049 <0.05). Lastly, mobile banking service adoption/Use (Mbu) is negatively correlated with organisational learning (r=0.314, p= 0.049 <0.05). It was also found that organizational learning and knowledge management capability were positively, significantly and strongly correlated (r=0.468, p=0.002 <0.05). This finding concurs with Liao and Wu (2010) study that found organizational learning as a mechanism along knowledge management, hence concluding that organizational learning acts as an intermediary in a positive relationship between knowledge management and organizational performance. In addition, organisational learning was also positively and significantly correlated with resource reconfiguration (r=0.410, p=0.007<0.05). This may imply that due to continuous learning, an organisation will be able to determine the need to adjust their resource well in advance and proactively in order to adjust such resources to the demands of a changing environment (such as emergence of disruptive technology) which would demand effective change from the organisation.
The negative but significant correlation (r=-.321, p=0.038<0.05) between internet banking (MB3) and mobile money transfers (MB2) may suggest that since once a customer decided to use internet banking services, they would not be at the same time be inclined to use mobile money transfer services and therefore the more a customer use internet banking the less they would use mobile money transfer. Further, there is a positive and significant association (r=0.335, p=0.030 <0.05) between banking hall services (MB4) and mobile money transfers (MB2). It is suggested banks have opened mobile money transfer services at their counters hence the convenience which customers find in transferring money from their mobiles; this is also secure. Conversely, banking hall service and internet banks are negatively and significantly associated (r=-0.328, p=0.034<0.05), with internet banking. This finding is would be expected because, once a customer is in the bank hall, they would be more inclined to use counter / teller services rather than using their internet terminals; it should be noted, however, that some commercial banks in Kenya have provided internet services within the banking halls that customers can use.

4.9. Analysis of Variance for Organisational Adaptability Dimensions across Commercial Bank Tiers

The analysis of variance on the three organisational adaptability variables, namely resource reconfiguration (RR), organisational learning (OL) and knowledge management capability (KC) implementation across the three bank tiers was conducted and the results were that the implementation of organisational adaptability(OA) across the three tiers were homogeneous on all the three dimensions OA that were studied. This was indicated by an insignificant (p>0.05) Levene statistic, specifically (Levene statistic, p-value): RR (1.466, 0.246), OL (1.747, 0.190) and KC (2.617, 0.087); the associated F-statiscs were also insignificant.

Regression Analysis

The study examined the effect of mobile phone banking on OA by running three regression models. The first model regressed mobile phone banking on RR (Tables 16, 17 and 18); while the second model regressed mobile phone banking on KC (Tables 19, 20 and 21). The third model regressed mobile banking on OA (Table 22 and Table 23).The results for these models are discussed as follows:

4.10. Influence of Adoption of Mobile Banking Services on Organisational Adaptability

The linear regression result for the test of the influence of mobile baking services on resource reconfiguration are presented in Tables 16, 17 and 18.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.579[a]	.335	.261	.5963
a. Predictors: (Constant), MB4, MB1, MB2, MB3				

Table 16: Model Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.441	4	1.610	4.528	.005[b]
	Residual	12.803	36	.356		
	Total	19.243	40			
a. Dependent Variable: RR						
b. Predictors: (Constant), MB4, MB1, MB2, MB3						

Table 17: ANOVA[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.435	.458		7.502	.000
	Mobile banking (MB1)	-.324	.137	-.356	-2.358	.024
	Mobile money transfer (MB2)	-.344	.105	-.485	-3.267	.002
	Internet Banking (MB3)	.096	.084	.180	1.140	.262
	Banking hall services (MB4)	.172	.091	.307	1.883	.068
a. Dependent Variable: RR						

Table 18: Coefficients[a]

The results imply that mobile banking and internet baking services significantly influence RR which is a dimension of OA.
Influence of use of mobile phone banking services use on knowledge management capability development
Further, the influence of mobile banking services on knowledge management capability was examined and the results are presented in Tables 19, 20 and 21.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.314[a]	.099	.075	.3399		
a. Predictors: (Constant), Mbu						

Table 19: Model Summary

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.492	1	.492	4.262	.046[b]
	Residual	4.505	39	.116		
	Total	4.998	40			
a. Dependent Variable: KC						
b. Predictors: (Constant), Mbu						

Table 20: ANOVA[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.164	.216		10.029	.000
	Mbu	-.131	.063	-.314	-2.065	.046
a. Dependent Variable: KC						

Table 21: Coefficients[a]

This result implies that the use of mobile banking services by customers significantly influence organisational adaptation through development of knowledge management capability.

Influence of mobile phone banking on Organizational Adaptability
The study sought to estimate the overall effect of mobile phone banking on organizational adaptability using Ordinary Least Square (OLS) approach(See Table 22 and Table 23).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.932	.868	.864	11.20498	1.069

Table 22: Model Summary

The study found R square of 0.868 implying that 86.8% of variations in organizational adaptability are explained by mobile phone banking. The Durbin-Watson (DW) had a value of 1.069 indicating that the model did not suffer from autocorrelation

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	28956.694	1	28956.694	230.636	.000
	Residual	4394.306	35	125.552		
	Total	33351.000	36			

Table 23: ANOVA

The results for ANOVA showed an F of 230.636 that had a p value of <.001 that was less than 0.05 implying that the mobile phone banking significantly affect organizational adaptability.

4.11. Testing Hypothesis Two (H2)
Based on the correlation results (Table 15), the hypothesis that: *H2: Commercial banks in Kenya respond to mobile phone technology through resource reconfiguration, organizational learning and knowledge management* is partially accepted based on the finding that RR and KC are positively and significantly associated (correlated with) mobile money transfers - a mobile phone banking service.
However, since mobile bank services have been shown to significantly and positively influence resource reconfiguration (RR) and knowledge management capability (KC) implementation– two sub-constructs of OA - and to also have an overall significant influence (R^2 = 0.868) on the main construct OA and ANOVA F-statistic of 230.636 ($p<0.001$) we fully accept the hypothesis (H_2) and conclude that*: Commercial banks in Kenya respond to mobile phone technology through resource reconfiguration, organizational learning and knowledge management*

5. Conclusion and Recommendations

The findings of the study revealed that the mobile phone banking technologies influenced strategic value positively. These findings were both supported by the frequencies of the responses from the respondents which were presented in the form of percentages and mean scores. Mobile phone banking technology had the highest positive influence on organizational efficiency. The results of the analysis of the mediating variables revealed that organizational learning had a higher mediating influence on strategic value than resource reconfiguration.

This study sought to establish the effect of mobile phone banking technology on organizational adaptability. Based on the results of the regression analysis using Ordinary Least Square (OLS) it was found that mobile phone technology very significantly explained variation in the organizational adaptability among commercial banks in Kenya. All the three dimensions of organizational adaptability: organizational learning, resource reconfiguration and knowledge management capability were impacted by mobile phone banking.

The other objective the study sought to establish was the extent to which organizational adaptability mediated the relationship between mobile phone banking technology and strategic value of commercial banks in Kenya. It is concluded that organizational adaptability comprising organizational learning, resource reconfiguration and knowledge management capability mediate the influence of mobile phone technology on strategic value of commercial banks. This implies that disruptive technology (such as the mobile phone technology) should elicit adaptation if it is to contribute positively and significantly to strategic value of an organization.

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