

Technology-Based Self Service and Performance of Banks Listed in the Nairobi Securities Exchange, Kenya

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Abstract: The objective of the study was to assess the effect of Technology-based self service (TBSS) on performance of banks quoted in the Nairobi Securities Exchange. The relevant primary data were gathered from Information Technology and finance managers of eleven banks quoted in the Nairobi Securities Exchange using a semi structured questionnaire. The results revealed that Technology-based self service dimensions of ATMs, smart cards, credit cards, internet banking and mobile banking were statistically significant. The composite index score of TBSS variable explained 64.7% of the variation of the bank performance score. The results revealed that the selected TBSS dimensions had a positive effect on performance of banks in a developing economy. The study recommends that future research should intensify use of other forms TBSS dimensions and embrace both subjective and objective indicators of firm performance.

Keywords: Technology based service, firm performance, banks, Nairobi Securities Exchange

INTRODUCTION

With increased advances in technology, deregulation of the financial system, increased competition, an enlightened customer base, firms have used technology based service delivery platforms changing the way they interact with their customers leading to enhanced firm performance. Technology-based self-service (TBSS) are referred to as self-service technology (SST) enables customers get services independent of employee [1]. In a market characterized by similar product and service offering, financial institutions rely greatly on information and communication technology to acquire, process and deliver needed information in a timely manner to all relevant users and customers and thus differentiate their products and services. Meuter *et al.* [2] posits that today's fast-paced world is becoming increasingly characterized by technology-facilitated transactions.

The Kenyan banking sector comprises 42 commercial banks, 1 mortgage finance company, 12 microfinance banks, 8 representative offices of foreign banks, 79 foreign exchange bureaus, 17 money remittance providers and 3 credit reference bureaus [3]. Out of the 42 banks, 11 are listed in the Nairobi Securities Exchange. Banks are adopting technology in an effort to responding to the needs for the Kenyan market for convenience and efficiency through alternative banking channels such as ATM, mobile, internet and agency banking as banks increase their branch network locally and in the East African community region. The use of modern information and communication technologies in daily business activities is generally accepted (Rust, 2001). However, the

adoption of TBSSs in Kenyan banking sector has been slow with some customers perceiving greater benefits from TBSSs, while others perceive greater benefits from banking through face-to-face [4]. Examples of SSTs in the banking industry are automated teller machines (ATM), Internet banking, mobile banking, telephone bill payment and the customer activated terminal (CAT).

Self-Service Technologies refer to access to banking transactions by use of technology as medium [5]. It enables customers to perform transactions without visiting a bank's branch. This makes Intelligent ATMs, credit cards, smart cards, Internet banking (IB), Mobile banking (MB) and most recently banking applications downloaded from the mobile play store. SSTs make businesses continuously available for the consumers' convenience and comfort [6]. Devlin [27] referred to the banking industry as amongst pioneers in adoption of automation services. The players have recognized that technology innovation offer opportunities to differentiate themselves from competitors. Banks have adopted self-service technology of various types which are availed to customers independently to meet their needs without them having to interact directly with any bank employees [2].

Introduction of SSTs in service delivery are aimed at benefiting the customer; this requires increased involvement by the customer. These factors may discourage the customer from trying out the technology [7]. Satisfaction with service delivery through SSTs is commonly viewed as a useful gauge

for effectiveness by the customer. This should result in customer satisfaction and retention which eventually should impact performance through growth of customer numbers and increase in value per customer [8]. The extant literature lacks an agreement on the unique definition of the term performance [10]. According to Langfield-Smith and Chenhall, [9] performance has been used defined to fit the individual research purpose. Performance may relate to actual results or outputs of certain activities, how the activity is carried out or the potential for the activities [11]. Performance can be measured using financial and non-financial terms. Venkatraman and Ramanujam, [12] argues that financial performance focuses on the use of simple outcome-based financial indicators, whereas business performances comprise the indicators of non-financial indicators in addition to indicators on financial performance. Performance has been measured through growth in customer numbers, customer value and employee satisfaction [13]. Firm performance is viewed as a multi-dimensional construct that includes financial, operational and customer-related performance measures [14]. Top management's subjective evaluation of performance has been found to be highly correlated with objective measure [15].

The faced-paced technological advancement has led many firms to adopt technology-facilitated transactions [2]. Firm that has adopted technology as a strategy achieve increased customer satisfaction, cost reduction, and deliver faster service delivery with increased reliability. Parasuraman and Grewal (2000) further noted that the use of technology appeals to service providers because it can standardize delivery of service, reduce the cost of labor and expand delivery options. Banks find TBSS important due to the promise of cost efficiencies, improved service quality, and attraction of new customers as compared to other modes of service. Banks are coming up with technological innovations with the aim of ensuring that customers undertake their banking operations without visiting the bank branches. Most banks in Kenya are moving towards use of technology-based services in providing their services. Empirical studies on the influence of technology-based self-service in the Kenyan banking industry are limited. The objective of this study was to establish the influence of technology-based self-service dimension on the performance of banks quoted in the Nairobi Securities Exchange.

LITERATURE REVIEW

There are various dimensions of forms of Self-Service Technology such as internet banking, automatic teller machines, smart cards, credit cards and mobile banking.

Internet banking refers to systems that enable customer's access their accounts and general information on bank products and services through a personal computer (PC) or a mobile handset. Introduction of Internet-based technology systems is seen as part of cost reduction strategy despite the need for investment in substantial technological and marketing that comes with it and requirement to recruit new technological experts. Online banking has emerged as noble way of offering banking service to the people [16]. The technology has emerged as the most potential medium for banking as it can overcome all barriers to entry in the traditional banking system.

Automatic teller machine (ATM) minimizes amount of time required to fill a single packet [17]. An identification code is then transmitted to the bank's central computer through a communication link. A well-conceived strategy on ATM service directs attention of the organization towards the real priorities of the customer. It is at this stage slogans are formed. The company slogan should be easily understood and represent the image of the company. ATMs have interbank network connections enabling users to the bank where their accounts are domiciled. This offers convenience especially for travelers as they are able to make withdrawals at locations where one's own bank has no branch. This includes withdrawal of a better exchange rate compared to foreign exchange bureaus. The banks have to provide customers 'convenience like 'new' Automated Teller Machines (ATM's) and provide customers with services such as online transactions and online shopping [18]. This term 'new' explains the emergence of intelligent ATMs that accept deposits, performs money transfer functions amongst other advanced functionalities.

Smart card is a plastic type of chip containing an embedded computer chip which stores and transacts data. The data on the card is transacted via a reader which is part of smart cards are in use today through several key applications and include healthcare, banking, entertainment, and transport. The cards use more secure encryption and authentication technology modes as compared to previous payment modes. At the heart of the smart card is a microprocessor chip that is embedded and that can be programmed for specific industries [16].

Smart cards used in banking industry enable users the freedom to carry large sums of cash around without fear or anxiety of possible theft of their money. Safety is also due to the fact that the cards can be easily replaced and one needs to know personalized PIN number to access stored value from the card.

Credit Cards allow users a continuing balance of debt which is charged a curtailed interest fee as pre agreed. Credit cards play an important role both to the consumers and the banking businesses. It is a very important tool for exchange and transmission of funds from the cardholders to the businesses and also serves to improve customer service through convenience as most are globally accepted. Further, Robert [19] noted that in modern business transactions, credit cards are increasingly becoming an essential tool and it offers a cardholder convenience, safety, higher purchasing power and a range of fringe benefits as most cards are issued with a number of privileges such as VIP lounge access and redeemable air travel miles. Credit cards are attractive to banks due to higher risk-adjusted returns they provide compared to other loan types.

Mobile banking is a financial service delivered via a mobile network using mobile phones. Such services are varied and include deposits, withdrawals, sending or saving of money and payments [16]. Technology in mobile phones has been improving at tremendous speed over the last decade. Many sophisticated financial services have been added to mobile phone functionality. Today's mobile phones can store money in form of information in the SIM card or memory card as well as transfer cash value from one individual to another real time virtually [20]. Mobile banking includes m-payments that involve access to banking services by use of mobile device. Such services include account-based savings or basic transactional products offered by banks at reduced costs. The channel allows formation of new relationships with the financial sector by new entrants and subsequent distribution of services thereby it uses existing mobile communications infrastructure with existing wide reach to unbanked persons. M-banking system allows users to store currency in an account accessible via the mobile phone provided there exists a bank account that can be linked [21]. M-Banking is also seen as efficient in terms of entry costs for instance the absence of charges are at the time of registration.

The importance of service delivery, need for improved satisfaction, retention of customers, improving sales and need to increase market share in order to improve corporate image cannot be overstated [8]. Self Service Technology as a development over traditional banking system reduces the cost of transaction processing, Service providers who adopt SSTs may experience increased customer satisfaction, productivity, improved cost efficiency and ultimately organization performance [23]. SSTs allow customers to perform transactions and complete services on their

own reducing the need for tellers and thereby saving the associated expenses and costs [18].

Tanya and Nicola [22] noted that SSTs provide opportunity to increase accessibility of services, improve competitiveness through increased market share, ensure higher consumer satisfaction and loyalty, and improve productivity. SSTs serve as differentiator that firms can leverage on to improve reputation through technological advancement. The relationship between SST technology strategy and performance is the key to measure user satisfaction [24]. The customer perception of overall service excellence is seen through quality. There exists a rapid advance in technology-based systems which lead to fundamental changes in banking interaction with customers, a trend that is well established in the service industry. Service providers are increasingly urged to invest in technology to better secure their future in the electronic world [23].

The importance of self-service technology strategy on banking is seen from improved satisfaction and retention of customers. Self-service technology provides an opportunity to utilize customers as free inputs in increasing productivity in banking industry [25]. SSTs can reduce costs and improve efficiency of resources used in the service process resulting in positive impact to customer value [23].

Anselmsson [26] examined customer-characteristic and technology-specific factors of service quality in a context of self-servicing at commercial banks. According to Meuter *et al.* [2], SSTs are to meet their service needs free of direct service employee involvement. The services that SSTs provide are varied including monetary transactions, self-help and customer services.

METHODOLOGY

This study adopted descriptive cross sectional design. The population of study comprised 11 listed commercial banks as at November 2016 making it a census. Data was collected using self-administered questionnaires. Secondary data was collected from published sources. Two questionnaires were distributed to each bank. The ICT manager and the Finance manager were required to fill the questionnaires. Out of 22 questionnaires were issued, 16 responses were received representing a 73% response rate. The respondents were requested to give their responses corresponding to items on a five-point likert type scale ranging from (1) to a small extent to (5) to a very great extent. Respondents demographic profile is presented in Table 1.

Table 1: Demographic profile

Item		Percentage
Gender	Male	43.8
	Female	56.3
Age	31-40 years	37.5
	41-50 years	43.8
	Over 50 years	18.7
Highest completed education	Certificate/Diploma	31.2
	Bachelors degree	50.0
	Masters degree	18.8
Length of continuous service	Less than 5 years	3
	5-10 years	25
	Over 10 years	56.3

Source: Primary data

DATA ANALYSIS AND RESULTS

The study sought to establish the different TBSS dimension adopted and performance of banks

listed in the Nairobi Securities Exchange. The results are presented in Table 2.

Table 2: Summary of Individual technology based service and firm performance

Technology Based Self service dimensions	Overall mean score	Standard Deviation
Internet Banking	3.84	0.869
Automatic Teller Machine	3.94	0.900
Smart Cards	3.91	0.730
Credit cards	3.85	0.688
Mobile Banking	3.71	0.831
Firm performance	3.88	0.763

Source: Primary data

The results in Table 2 reveal that ATMs had the highest mean score of 3.94 and a SD of 0.900, while mobile banking had the lowest mean score of 3.71 and a SD of 0.831. The results imply that ATMs are the most popular dimension of TBSS among the banks surveyed. The results also imply that mobile banking is yet to be adopted fully by customers.

The study also sought to establish the relationship between TBSS and performance of banks listed in the Nairobi Securities Exchange. The results obtained are summarized in Table 3.

Table 3: Regression Analysis of TBSS and Firm Performance

(a) The Goodness-of-Fit						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.805 ^a	.647	.519	.53522		
(b) The Overall Significance						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regressions	5.786	4	1.447	5.050	.015 ^a
	Residual	3.151	11	.286		
	Total	8.937	15			
(c) The Individual Significance						
Model		Un standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.170	1.323		1.640	.105
	Internet Banking	.463	.302	.393	1.533	.056
	ATM	.353	.177	.382	2.001	.073
	Smart card	.421	.276	.338	1.529	.007
	Credit card	.594	.278	.487	2.140	.018
	Mobile Banking	.038	.135	.054	.284	.003

Source: Primary Data

The results in Table 3(a) indicate an r of 0.805. This shows a strong relation between TBSS and

performance. The results also indicate that the TBSS had a statistically significant influence on firm

performance as they accounted for 64.7% of the variation in performance ($R^2=.647$). Table 3(b) shows that the overall significance of the model was statistically significant (p-value=0.15).

The overall model reveals a statistically significant relationship between TBSS and firm performance ($F= 5.050$, p-value=.15). This implies that TBSS influences firm performance.

The results in Table 3(c) indicate that holding internet banking, automatic teller machine, smart cards, credit cards and mobile banking constant, performance of listed banks would be at 2.170; unit increase in internet banking would result in increased performance by 0.463; unit increase in automatic teller machine would lead to performance increase by 0.353; unit increase in smart cards would lead to performance increase by 0.421; unit increase in credit cards would lead to performance increase by 0.594 and a unit increase in mobile banking would lead to performance increase by 0.038. .

CONCLUSION

The self service technologies used were indicated as automatic teller machines facilities, mobile banking, internet banking, credit cards and smart cards. Usage of these technologies enables customers to access banking services anytime and anywhere. Despite the benefits, adoption of TBSS dimensions varies among users. In the Kenyan banking sector, ATMs were the first to be introduced compared to other forms of TBSS dimensions. The usage of the ATMs and smart cards by customers can be attributed to the convenience of using the cards, security features and the ability to transact any time. The increased usage of the ATM cards has seen a reduction in the number of people visiting the bank to make withdrawals/deposit reducing the employee and customer interaction and lines in banking halls. This has seen increased customer satisfaction and hence enhanced firm performance.

Due to changes in the banking market space as a result of globalization, intensified competition, mergers and acquisitions coupled with strict regulation have made the banking sector highly competitive with banks offering similar products and services. Managers have had to be aggressive on differentiating their products and services through TBSS so as to remain competitive. An increasing technologically-savvy and more informed customer base have made banks introduce more innovative ways of doing business. Customers are also adopting use of internet and mobile banking as this enables them to carry out transactions anytime, anywhere. The banks have also benefitted from TBSS through reduction of the number of customers visiting the bank for service they can do for

themselves, reduced the number of customer facing employees, reduced operational costs, a more satisfied work force and increased customer satisfaction leading to improved performance. The findings of the study may assist other financial institutions, service oriented firms, government ministries, department and agencies and manufacturing firms amongst others adopt TBSS dimensions which may enhance customer satisfaction, loyalty and improved performance. Future research should consider adding other forms of TBSS and embrace both objective and subjective performance indicators.

REFERENCES

1. Moodi A, Nafafizadeh NS, Ghaseni P. Service quality dimensions in technology based banking: Impact on customer satisfaction and loyalty. *Advances in Environmental Biology*. 2013; 7(11): 3205-3215.
2. Matthew LM, Ostrom AL, Roundtree RI, Bitner MJ. Self-Service Technologies: Understanding Customer Satisfaction with Technology-Based Service Encounters. *Journal of Marketing*. 2000; 64: 50-64.
3. Central Bank of Kenya, July 2016.
4. Bateson J EG. Self-service consumer: An exploratory study. *Journal of Retailing*. 2010; 61(3):49-76.
5. Zeleny RN. Determinants of customer perceived service quality: A confirmatory factor analysis approach. *Journal of Services Marketing*. 2009;16(1): 9-34.
6. Meuter ML, Bitner MJ. Self-service technologies: extending service frameworks and identifying issues for research, *Marketing Theory and Applications journal*. 2008; 9:12-19.
7. Honebein S, Cammarano J. Satisfaction in Technology-Enabled Service Encounters, *Journal of Services Marketing*. 2005; 23(3): 134-44.
8. Lewis J, Mitchell A. Effects of personal control on adoption of self-service technology innovation, *The Journal of Service Marketing*. 2004;16 (6): 553-72.
9. Langfield-Smith K, Chenhall RH. Multiple perspectives of performance measures. *European Management Journal*. 2007; 25(4): 266-282.
10. Njeru W. Market orientation, external environment and performance of tour firms in Kenya, *Prime Journal of Business Administration and Management*. 2014; 4(7): 1515-1525.
11. Ukko J. Managing through measurement: A framework for successful operative level performance measurement, (Unpublished Ph.D Thesis). Laappenranta University of Technology, Finland, 2009.
12. Venkatraman N, Ramanujam V. Measurement of business performance in strategy research: A

- comparison of approaches, *Academy of Management Review*. 1986; 11(4): 801-814.
13. Gibson H, Singhal VR. Firm characteristics, total quality management, and financial performance, *Journal of Operations Management*. 2010; 19: 269-85
 14. Kaplan RS, Norton DP. Using the Balance Scorecard as a strategic management system. *Harvard Business Review*. 1996;74(1): 75-85.
 15. Baker WE, Sinkula JM. Environmental marketing strategy and firm performance: Effects on new product performance and market share. *Journal of Academy of Marketing Science*. 2005;33(4): 461-475.
 16. Cronin JJ, Taylor SA. Measuring service quality: A reexamination and extension. *Journal of Marketing*. 2008; 56: 55-68.
 17. Laforet S. Consumer's attitudes towards online and mobile banking in China. *International Journal of Bank Marketing*. 2005;23 (5): 362-380.
 18. Hammer M. Why Consumers Use and Do Not Use Technology-Enabled Services. *Journal of Services Marketing*. 2010; 20(2): 125-35.
 19. Robert I. Self-service technologies: Understanding customer satisfaction with technology based service encounters. *Journal of Marketing*. 2007;64 (3): 50-64.
 20. Hamdi A, Helmi T. Can E-Payment Systems Revolutionize Finance of the Less Developed Countries? The Case of Mobile Payment Technology. *International Journal of Economics and Financial Issues*. 2011; 1(2):23-40
 21. Sujan M. Consumer knowledge: Effects on evaluation strategies mediating consumer judgments. *Journal of Consumer Research*. 2008; 12: 31-46.
 22. Tanya J, Nicola H. The moderating effects of message framing and source credibility on the price-perceived risk relationship. *Journal of Consumer Research*. 2006; 21:145-153.
 23. Bitner V, Gillberg F, Gummerus J, Riel A. Technology Readiness and the Evaluation and Adoption of Self-Service Technologies, *Journal of Retailing and Consumer Services*. 2009;13: 177-91.
 24. Pitt L, Berthon PR. Market orientation and business performance: some European evidence. *International Marketing Review*. 2010; 13(1): 5-18.
 25. Ojasalo K. Customer influence on service productivity. *SAM Advanced Management, Journal of Retailing and Consumer Services*, 2009.
 26. Anselmsson J. Customer-perceived service quality and technology-based self-service. Unpublished doctoral dissertation, Lund University, Lund, 2001.
 27. Devlin MAT. E-Service Quality Strategy: Achieving Customer Satisfaction in Online Banking, *Journal of Theoretical and Applied Information Technology*. 2010; 38(1).