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## Governance Capabilities in Business Intelligence and Performance of Mobile Service Providers in Kenya

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### **Abstract:**

*According to the communication Authority of Kenya, performance of the mobile service providers in Kenya has not met the threshold of achieving 80 percent in the set Quality of service standards (QoS) since 2014, calling for heavy fines for non-compliance. Most of the reviewed previous studies focused on performance of mobile service providers but failed to analyze the effect of Business Intelligence governance capabilities on performance. Similarly, previous literature has employed market share and revenue growth as the measures of performance and never focused on QoS and ARPU which this study opted to adopt. The study was anchored on Technology-Organization-Environment framework. The target population was the three mobile service providers in Kenya, namely Safaricom limited, Telkom and Airtel. Secondary panel data for the period 2010-2019 was collected. Through an explanatory non-experimental design, descriptive statistics and panel regression were carried out to find out the nature and magnitude of the relationships between the variables and test the hypothesized relationships. The study findings established that governance capability had significant influence on performance of mobile service providers in Kenya. The study recommended that policy issues and availability of training programs should be carefully considered by the management of mobile service providers.*

**Keywords:** Business Intelligence, Quality of service (Qos) standards, Average Revenue per User (ARPU), Governance Capabilities, Mobile service providers

### **1. Introduction**

Research has established that the mobile service providers are the main growth pillar for other sectors of the economy as well as a major enabler to the enterprise growth of regions (Venkatram & Zhu, 2012). The economic growth of a country is enhanced through adoption of mobile service providers by connecting not only the international financial market but also the domestic financial market and commodity market. Badran *et al.*, (2012) postulated that for a majority of new frontiers, mobile service providers are key sources of revenue for national treasury. Considering the telephone density and its effect on the business environment, International Finance Corporation and World Bank, (2013) reported that as the world wide telephone density (density of telephone users) grows by 10 percent, the global gross domestic product (GDP) should go up by 6 percent.

Shollo and Constantiou (2013), asserted that for an organization to develop competitive advantage in business environment, the accessibility of reliable and adequate information in a timely manner is paramount. In the contemporary knowledge-based economy, innovation activities, which generate and diffuse new knowledge, have become major research topics (Karlsson, 2014). This cannot be achieved without use of current Business Intelligence systems especially the idea of Business Intelligence (BI), ICT and digital networks. Business Intelligence is a combination of methods and concept geared to enhancing decision making in the business to arrive at a fact based support system for the firm (Irtameh *et al.*, 2016).

BI applications (Olaru, 2014) play a significant role in the mobile service providers due to the availability of large volume of data and the rigorous competition in the industry. Globally, mobile network technology has progressively spread worldwide positively impacting lives. Despite the tremendous growth, the mobile service providers still face challenges. There is a shortage of growth in traditional mobile services in developed countries. As of 2017, 2.3 billion people in developing countries did not use mobile services and 3.9 billion did not have access to the mobile internet (Kenney & Pon, 2011). Emerging markets are also witnessing decreasing growth rates and lower voice ARPU (Average Revenue per User).

Meanwhile, India boasts of being the second-largest market for Telecommunications products globally, with around 1.19 billion members on the close of September 2018. African mobile telecoms have witnessed massive growth over the last decade; subscriptions in terms of Compound Annual Growth Rate (CAGR) reached 3.3 percent during 2012-14 and 4.2 percent 2015-17 (Deloitte & Touche, 2014). Large countries with high subscription growth or comparatively

higher Average Return per User (ARPU) levels continue to be viewed as high-growth markets. In much of Africa, there is evidence of limited network penetration and access coverage remains a major block for universal mobile internet acceptance. In Kenya, mobile broadband access has had a penetration rising to 12.7 million in 2016 from 7.2 million in 2015. The mobile firms offer vast possibilities for investments and possible partnerships (Maitai&Omwenga, 2016). The Kenyan administration has made it a universal right to access ICT which is a major objective of Kenya's Vision 2030 which is aimed at propelling Kenya from a least developed nation to a middle-income country.

The mobile mass telephony valued service providers in Kenya is comprised of three firms; Safaricom Limited, Airtel Networks Kenya and Telkom Kenya Ltd. These firms offer a wide range of services which include voice, data, cloud computing, mobile money transfer and mobile money banking. Safaricom Kenya Limited has the largest market share in an intensively competitive market of 71 percent as at December 2017. The second largest operator by market share is Airtel at 15 percent. This is closely followed by Telkom with a market share of 9 percent. (www.ca.go.ke). Most organizations do not have the skills and organizational commitment for managing, implementing and supporting significant cross-functional BI projects. The firm's knowledge of where key complementary skills is located, specially without the firm is an important requirement for this case: 'the kind of skill set of who understands what, who may assist with your issue, or who may be able to utilize new data'(Jayawardhana& Weerawardena,2014).

### *1.1. Statement of the Problem*

The Communications Authority of Kenya has penalized the mobile market players since 2014 for failing to achieve the 80 percent minimum threshold set for compliance thus failing to adhere to the standard procedures (CAK, 2017), (Www.coastweek.com). Further, the market performance in the internet and mobile service providers fail to indicate stable trends in their growth (Communications Authority of Kenya, 2018). This is a clear indication that the mobile service providers are not performing as expected by their regulator and in the set standards of the Vision 2030.

The Firm's focus should be directed to governance capability rooted in Business Intelligence (BI), which extends to explaining and implementing fabric that will support organization's goals. Its infrastructure constitutes of software, hardware, staffing and strategy requirement necessary for extracting business interagency from available data. Hwang and Hongjiang, (2017) considered five factors that are imperative to the view of how simple an information storage facility was to be utilized: obviously characterized business needs/benefits client contribution/interest, source information quality, reasonable usage plan, and sufficient subsidizing. In general, top administration support was the main factor though perceived as unimportant. Wieder and Ossimitz, (2015), revealed that basic leadership quality by means of information quality and data quality validates the calls for appropriate BI. Without freely accessible information on the utilization of BI programming in the objective gathering, the effect of leadership avoidance couldn't be resolved. The reviewed studies showed that previous studies have focused on different dimensions of governance capability and ignored firm culture and policy issues and availability of training programs which the current study considered. This study sought to investigate the effect of the level of managing the implementation of BI systems, firm culture, top management support, policy issues and availability of training programs on the performance of mobile service providers in Kenya. Quality of Service (QoS) Standards was adopted as the measures of the performance of mobile service providers in the current study.

## **2. Literature Review**

### *2.1. Theoretical Foundation*

The study is anchored on the Technology Acceptance Model (TAM) which aims at explaining the behavior of ICT usage as authored by Davis in 1989. The TAM prediction of BI governance in terms of user acceptance of any technology is based on perceived usefulness and perceived ease-of-use. Inside the TAM, the Perceived Usefulness (U) is characterized as the degree to which a given client accepts that utilizing a framework will upgrade his/her exhibition. On the other hand, Perceived Ease-of-Use (EOU), is defined as the extent to which a given user believes that by using a given system, his/her efforts will be reduced (Davis, 1989). Both the perceived usefulness and the perceived ease of use are based on the perceptions of the user's belief about the system which in turn affect the level of managing implementation of BI systems, ability to enforce top-down directive, top management support, firm culture, policy issues and availability of training. According to the TAM, Perceived Usefulness (U) and Perceived Ease of Use (EOU) impacts significantly on a user's attitude towards the use of a system. The perceived ease of use is highly related to the training and skills that the employees possess. The mobile service providers should train their staffs on the implementation of the systems to enable them apply the technology effectively and efficiently.

### *2.2. Empirical Literature Review*

The administration of Business Intelligence is characterized as 'the usage of a foundation that will bolster association's objective' (Matney and Larson, 2004). The frameworks are; the product, equipment, staffing and technique expected to gather insight from data. Powerful administration (Geiger, 2006) in any BI activities involves coordinating, controlling or unequivocally impacting activities and incorporates setting up and authorizing related approaches. Shockingly, individuals regularly consider administration a limitation. A strong administration structure is really advanced as creative suspecting inside a firm. The advantage out of the successful administration is the arrangement of the BI activities with the business needs, coordinated effort of business pioneers to land at the venture view and advancement of the BI achievements all through the firm.

Bijker and Bustech (2013) employed an exploratory approach to investigate factors that influence the use of data warehousing (DW) within five organizations that had maintained mature DW capabilities for nine to 15 years. The researchers employed the Technical- Organizational-Environment framework to highlight emerging themes. The emerging themes included a lack of senior executive buy-in and involvement; a lack of managerial involvement or ownership; the need for support and training on using the data derived from DW; the importance of a phased implementation approach to deliver incremental business value; and issues regarding the integration, timeliness, and accuracy of data. The two researchers concluded that among the Technical-Organizational-Environment factors, the organizational factor had the strongest influence on DW pervasiveness. Additionally, the authors found that, for some organizations, the role of regulatory compliance influenced DW use. The current study investigated the influence of top management support on performance of mobile service providers with regulatory framework considered as a moderating variable.

Wieder and Ossimitz, (2015) used a cross-sectional research configuration and utilized with an overview managed to the 500 biggest Australian Stock Exchange (ASX) recorded organizations regarding capitalization. Forty-four (44) senior IT administrators reacted to the review (10.21 percent of viable example size of 431), yet 11 were expelled from the example because of inability to meet the base size criteria (AU\$50 million income of 50 workers). A non-reaction predisposition was intrinsic to the examination to the extent that lone firms which conveyed BI programming (as characterized above) were urged to take an interest. Without freely accessible information on the utilization of BI programming in the objective gathering, the effect of this avoidance couldn't be resolved.

A critical way from BI, the board quality to basic leadership quality by means of information quality and data quality is uncovered, which validates the calls for appropriate BI the executives (counting information quality administration activities) communicated in the professional writing. The current study employed an explanatory non-experimental research design to find out the influence of top management support as an aspect of governance on mobile firm performance. It focused on more dimensions of governance like level of managing implementation of BI systems, ability to enforce top-down directive, policy issues and availability of training programs. Data and information quality were treated as one of the indicators of BI capability as an independent variable unlike treated as mediating variables as in this study.

Hwang and Hongjiang, (2017) carried out an exploratory study to individually examine success variables on data warehouse success implementation. The study uncovered that the components that are significant and the quality of their consequences for various achievement factors. The examiner model was created to gather eight information storage facility achievement factors and eleven usage factors. The data information was collected through email rundown of more than 15,000 information warehousing experts who were utilized as the wellspring of the examination. The outcomes considered five factors that are imperative to the view of how simple an information storage facility is to be utilized: obviously characterized business needs/benefits client contribution/interest, source information quality, reasonable usage plan, and sufficient subsidizing. In general, top administration support is the main factor though perceived as unimportant. The current study investigated the influence of top management support in addition to other dimensions as measures of BI Capability on the performance of mobile service providers in Kenya.

The reviewed studies confirmed the existence of an empirical gap in the field of BI governance's capability and firm performance. This study therefore sought to advance the existing literature by investigating the effect of BI governance capabilities on the performance of mobile service providers in Kenya. Based on the literature reviewed, the study proposed the following hypothesis:

- $H_0$ : Governance' capability has no significant effect on the performance of mobile service providers in Kenya.

### 3. Research Methodology

The study embraced Positivism research approach as the study is quantitative and is associated with testing of hypothesis. Positivists hold that facts do exist and can actually be measured. Explanatory non-experimental study design was used for this study where the mobile service providers were involved. An explanatory research seeks to establish causal relationship between variables and non-experimental research is systematic empirical inquiry in which the researcher does not have direct control of independent variables because their manifestations have already occurred (Sekaran and Bougie, 2011).

An empirical model was used to test the statistical significance of the relationship involving the independent and dependent variables. A rating Likert scale ranging from 1=strongly disagree to 5=strongly agree was used to measure the indicators of the independent variable (users' capability) and the dependent variable of performance of mobile service providers measured by Quality of Service (QoS) standards. This study focused on three mobile service providers in Kenya namely; Safaricom limited, Airtel and Telkom Kenya. This was based on the Communications Authority of Kenya (CA) list of mobile service providers within the Telecommunication industry that have been active and operational in the period under study (2010-2019) without changing ownership (CA, 2017).

The study adopted a census approach and therefore all three (3) mobile service providers were studied. Secondary data was utilized which was collected via document review from sector statistical reports from the Communication Authority of Kenya (CA); mobile service providers audited published financial statements and annual data from the Kenya National Bureau of Statistics (KNBS) for the period between 2010 and 2019. Data collected was analyzed using descriptive statistics and panel multiple regression analysis. The study ensured that ethical standards were upheld by seeking permission from the relevant authorities prior to the commencement of the study. The data collected was strictly kept private and confidential with use only for academic research, ensuring privacy of the firms from which data was collected.

#### 4. Results and Discussions

The study also aimed at finding out how the Kenyan mobile service providers performed in terms of governance capabilities. Table 1 presented the outlined indicators of governance capability.

	<b>Very Unsatisfactory (%)</b>	<b>Unsatisfactory (%)</b>	<b>Moderately Satisfactory (%)</b>	<b>Satisfactory (%)</b>	<b>Very Satisfactory (%)</b>	<b>Mean</b>	<b>Std Dev</b>
Level of managing implementation of BI systems	6.7	10.0	16.7	36.7	30.0	3.73	1.20
Firm culture	10.0	6.7	20.0	30.0	33.3	3.70	1.29
Top management support	3.3	10.0	26.7	23.3	36.7	3.80	1.16
Policy issues and availability of training programs	10.0	6.7	30.0	30.0	23.3	3.50	1.22
Overall Mean score						<b>3.68</b>	

Table 1: Governance Capability in Mobile Service Providers in Kenya  
Source: Research Data (2020)

The study questioned to establish whether level of managing implementation of BI systems among the Kenyan mobile service providers was satisfactory. The results presented in table 4.5 showed that management of BI systems was found to be 65.7 percent satisfactory. On whether the firm culture was adequate for BI capabilities use, the results showed that 30.0 percent and 33.3 percent indicated they were satisfactory and very satisfactory respectively.

Top management for BI capabilities among the mobile service provider was also rated as satisfactory as indicated by the mean of 3.80. Finally, the study endeavored to find out whether there were policy issues and availability of training programs on BI capabilities among the mobile service providers. The results showed that policies and trainings were rated as moderately satisfactory (30.0%), satisfactory (30.0%) and very satisfactory (23.3%).

The findings showed that majority of the Kenyan mobile services providers had satisfactory governance systems for BI capabilities (overall mean 3.68). The study findings concurred with Geiger (2006) who argued that a strong administration structure is important in creating success within the firm by supporting adoption of modern business strategies to enhance performance and market positioning.

This study finding supported the finding of Hwang and Hongjiang, (2017) who carried out an exploratory study to individually examine success variables on data warehouse success implementation. The study uncovered that the components that are significant and the quality of their consequences for various achievement factors. The outcomes considered five factors that are imperative to the view of how simple an information storage facility is to be utilized: obviously characterized business needs/benefits client contribution/interest, source information quality, reasonable usage plan, and sufficient subsidizing. In general, top administration support is the main factor though perceived as unimportant.

##### 4.1. Inferential Statistics

Panel data analysis was conducted to examine the influence of BI governance capabilities on the performance (QoS) of the Kenyan mobile service providers. The model adopted by the study was multiple regression analysis. Hypotheses were tested at a 5 per cent significance level. Tables 4.2, 4.3 and 4.4 below presented the results.

<b>Model</b>	<b>R</b>	<b>R-Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
QoS	0.535	0.286	0.266	2.338
a Predictors: (Constant), Governance Capability				
The model summary results indicated that BI governance capability accounted for 28.6% of the variation in performance (QoS) ( $R^2= 0.286$ ). The results established that BI governance capability was a good predictor of performance of mobile service providers in Kenya.				

Table 2: Model Summary for BI Governance Capability and Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
QoS	Regression	78.771	1	78.771	14.411	.001
	Residual	196.778	36	5.466		
	Total	275.549	37			
b Predictors: (Constant), Governance Capability						

Table 3: ANOVA for BI User's Capability and Performance  
Source: Research Data (2020)

The ANOVA results for regression models fitted for BI governance capability and performance (QoS) were all statistically significant as indicated in Table 3. The finding indicated that regression models were significant in predicting the influence of BI governance capability on performance of mobile service providers in Kenya ( $F=14.411$ ,  $p=0.001$  (QoS)).

		B	Std. Error	Beta	t	Sig.
QoS	(Constant)	0.972	0.913		1.064	0.294
	Governance Capability	1.103	0.291	0.535	3.796	0.001

Table 4: Regression Coefficients for BI Governance Capability and Performance  
Source: Research Data (2020)

The results further established that BI governance capability had a positive and significant influence on performance (QoS) ( $\beta=1.103$ ,  $p=0.001$ ). The findings implied that increasing governance capabilities would result to increase in QoS performance of mobile service providers in Kenya. The study therefore rejected the null hypothesis that governance capability had no significant effect on the QoS performance of mobile service providers in Kenya. Similarly, the study findings concurred with Geiger (2006) who argued that a strong administration structure is important in creating success within the firm by supporting adoption of modern business strategies to enhance performance and market positioning.

## 5. Conclusion and Recommendation

The study findings showed that governance capability significantly predicted performance (QoS) of mobile service providers in Kenya. The study therefore concluded that governance capabilities had significant impact on performance of mobile service providers in Kenya. The study recommended that top management and firm governance must act as stewards in adoption of BI capabilities and proper communication should be carried out to reduce sabotage from employees which may affect the influence of BI capabilities on firm performance.

## 6. Suggestions for Further Studies

The study findings were based only on secondary data collected from annual sector statistical reports by the firma, communication authority of Kenya, and KNBS. Future studies can be based on primary data from the customers, employees and managers in order to provide a broad generalization of the results. In addition, the study can be target broader population by covering the entire telecommunication sector.

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