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MSc. INFORMATION TECHNOLOGY MANAGEMENT

AN EVALUATION OF ORGANIZATION COMPETITIVE ADVANTAGE THROUGH USE OF BIG DATA – CASE OF MEDIA IN KENYA

BY

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DECLARATION

I declare that this research project is my original work and has not been previously published or presented in any other institution.

Signed: .... Date: 02/09/2021

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This research project has been submitted for examination with my approval as university supervisor.

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ABSTRACT

The exploitation of data by media organizations has always played an important role, where audiences spend more time online interacting with various sources of information, generating data through their devices. This study mainly evaluates competitive advantage in media organizations through use of big data. Theoretical foundation underpinning this study include Resource Based View and Organization Learning Theory. The conceptual framework research borrows from Mikalef et al, framework that separates IT resources from IT capabilities to bring out the relationship that can be used to obtain a competitive edge. It is further enhanced with UTAUT framework that unifies different earlier models and theories of Acceptability of technology and its usage and Taxonomy framework of IS evaluation which builds on past research on assessing information system use gains by considering the main forces and their interaction in an organization context. The study uses a descriptive, cross sectional method with a mono method for assessing influence of moderating variables to the usage of big data to get an edge in media organizations. The sample was separated into strata by means of a stratified sampling approach while simple random sampling picked specific representation from each category of the sample. A five-point Likert scale questionnaire was administered via Google forms for survey data collection. 74 responses were received out of a target 111 which was a 67% response rate. SPSS was the tool used to analyze data. A test of normality was done to find out whether the collected data met the assumptions of parametric testing. The null hypothesis was rejected for the statistical significance was below 0.05. Ordinal logistic regression analysis and Spearman Correlation analysis were the specific non-parametric tests carried out. The study explored the moderating effect of stakeholders, internal and environmental factors on use of big data technologies in media organizations for competitive advantage gains. 0.23 was the Nagelkerke value which is similar to R-Square for linear regression. Level of big data use was a significant predicator to competitive advantage. There was a predicted jump of 0.777 in the log-odds of dropping at a higher level on competitive advantage for every unit increase in big data utilization. Stakeholders was a significant predicator to competitive advantage. There was a predicted jump of 0.823 in the log-odds of dropping at a higher level on competitive advantage for every unit increase in stakeholders. External Factors was a significant predicator to competitive advantage. There was a predicted fall of 1.093 in the log-odds of dropping at a higher level on competitive advantage for every unit increase in external factors.

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ACRONYMS AND ABBREVIATIONS

IT   Information Technology

IS   Information System

IS/T   Information System/Technology

ICT   Information communication and technology

CA   Communication Authority of Kenya

RBV   Resource Based View

DCV   Dynamic Capabilities View

OLT   Organization Learning Theory

UTAUT Unified Theory of Acceptance and Use of Technology

SIP   Social Information Processing Model

PII   Personal Identifiable Information

CHAPTER ONE: PROBLEM STATEMENT

1.1 Introduction

By virtue of every device such as smartphones, laptops, wearables and sensors being online, the volume of data being produced by various human activities has been increasing at an exponential rate. As a result, there has been a growing need for handling big data which is considered to be a dominant factor due to the added value one can gain through working with this kind of data. (Veglis et al, 2020) Use of data by media organizations has always played an important part, where audiences spend more time online interacting with various sources of information, generating data through their devices. (Stone, 2014) Use of big data has been facilitated by new technological innovations that have automated and to some extent simplified data analysis.

The origin of the term big data can be traced back to Roger Mougalas who coined it for the first time in 2005 only a year after the term web 2.0 was created (Sangeetha et al, 2015). Kitchin (2014) suggests that big data is massive in size to the recent levels of Zettabytes or in Yottabytes and still growing, real time in nature while rapid in velocity, structured or unstructured being in variety, comprehensive in scoping targeting to capture the universe of things and elastic. Big data is simply large sets of data almost impossible to work with using relational database systems and traditional database systems respectively.

Big data is an area that has been developing for some time where ensuing technology has offered new ways of squeezing value from the immense information (Lippell, 2006). The knack to meritoriously work on data and create actionable insights is more than ever before a compelling need for most organizations to survive and gain competitive advantage. Hence, it is likely that most organizations in all possible sectors and institutions are discovering and attempting to use big data as a strategic Information Technology (IT), investment (Sivarajah et al, 2016).

Information, Communication and Technology (ICT) has completely revolutionized organizations' models in Kenya, being denoted a disrupter. With the advent of internet, new ways of delivering news online emerged that could broadly be categorized via website or social media. Over time social media has grown up with so many channels coming up such as YouTube primarily for video content, Facebook, Twitter, Instagram, WhatsApp and Tik Tok. Daily consumption of content and engagement with this content results to voluminous data being generated about behavioral traits of users when online.

Media organizations primarily generate content to inform, educate and entertain. Ever since the birth of internet and later social web, this content has been generated indifferent media file, formats and distributed via various channels. With the significant growth in volume, velocity, variety and veracity of these media files and associated metadata, data acquisition, employee retention and utilization has become a major issue. The Media Council of Kenya report (2016), agrees that the way media creates content, packages and distributes for user consumption have to forcefully change to be able to meet audience demands in an effort to remain afloat economically in response to the new digital technologies. Formulating a broad definition from world wide web resources then all types of internet enabled gadgets that generate, store or process data in the form of binary code constitute digital technologies. A stable and effective internet connection is required to view high resolution pictures, videos, audio and other formats. Communication Authority of Kenya (CA) puts the internet penetration to Kenya to be at 89.7% as of June 2019. Both the proliferation of smartphone since 2014 and the growing internet penetration in Kenya propelled a significant transition away from traditional media towards on-demand entertainment, as well as a shift from anonymous mass experiences to known and personalized ones. This puts great control and flexibility in the hands of users who have the choice of both when to consume their content and on which channel. Users end up having the power of choice on method and type of content at preferred time. This provides media organizations with opportunities to collect insurmountable user behavior data over time that creates an opportunity for data analysis to understand the audience and serve personalized content for better engagement among other capabilities. This requires heavy investment by media organizations in the infrastructure to assist and store significant amount of personalized data types on content, audiences, providers or their own personnel.

Over time, digital technologies have impacted media operations and strategy. The systems, structures and processes of traditional media are not compatible to the progressing digital technologies. The modes of content generation, distribution and consumption have been distorted and altered by digital technologies. Further, editorial workforce having the right digital skill set have a wide additional skills placing them at an advantageous point of being able to work on multiple platforms compared to those without. They not only collect, organize and present content in video, text or audio formats, but they provide headlines and captions to their articles and consider with importance how their content gains traction aided by measurement tools. Digital

technologies seem to be having far reaching implications on the various sector structures, expected value, institution tactics and processes (Kung et al, 2008). Nevertheless, volumes of data continue to be generated in zettabytes and growing hence the need to assess competitive advantage gains over time.

1.2 Problem Statement

Properly leveraging big data technologies for competitive advantage possesses many challenges. Big data puts rigorous demands on networks, storage and servers. It does change rapidly adding some level of complexity on how it can be uploaded in real time. Moreover, besides being uploaded requires linking such that important information can be extracted. (Ayesha, 2020) categorizes these into capacity and performance issues. The process of extracting, manipulating, curation, analysis and interpretation of big data requires a high level skillset. (Opdahl and Nunavath, 2020) state that big data requires intensive competency which is vastly greater than supply. (Barton and Court, 2012) Further, use of appropriate analytical models emerge as a critical factor in organizations which is not simple as stated. Various analytical models exist and new are created every other day that have specific use cases which tend to overlap. By virtue of most methods and tools having been developed for competent or rather expert scientists and decision makers, creates a challenge on how best to share analysis results to the intendent recipients. (Opdahl and Nunavath, 2020) identify that how to best deliver the findings of big data analyses requires unique presentation techniques. Valuable insights that lead to competitive advantage need to be shared with decision makers in an understandable way. Big data must be available in a comprehensive, timely, and accurate manner if it is to be used to make timely decisions. This makes big data management and governance process increasingly complex creating the need to make it available in standardized format for competitive advantage. Data privacy and security has become a growing concern in recent times. Most of the available data consists of personal identifiable information (PII) and when enriched with data from complimenting sources exposes new facts about a person. Possibly, these kinds of facts about the data owner are private and ought not to be disclosed to the data processor or controller or any other person. As a result, laws and regulations are being made governing the storage and use which may be a challenge to competitive advantage. An organization's cultural aspect may be an obstacle to competitive advantage because it determines the reaction and pro-actions to insights. (Sadovskyi et al. 2014) Other barriers exist such as integrating internal data sets with external data sets. These challenges are common in organizations

which media does not escape. As a result, this study assesses the extent to which media houses have been able to exploit big data to increase competitive advantage.

1.3 Research objectives

    i.   Main objective

The leading goal of this research was to evaluate competitive advantage in media organizations through use of big data.

    ii.   Specific objectives

1. To figure out the level of big data use in media organizations for competitive advantage.
2. To find out stakeholders and management role and level of appreciation on usage of big data to get an edge.
3. To find out organization's existing internal factors and how they have been reinforced through usage of big data to get an edge.
4. To establish the main environmental factors at play and their moderating effect on usage of big data to get an edge.

1.4 Significance of the research

This study examines the realized advantage by media organizations from use of big data, focusing not only on enabling technologies but also large nexus of associations infused with organization capabilities, that findings can be applied for results in other areas.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Media organizations are changing at an exceptional pace in response to increased penetration of ubiquitous technologies, such as smartphones and wearable devices, generating insurmountable data that when utilized it results in remarkable gains. MarKo et al (2019) noted that the contemporary IT infra-structure has started to struggle with the storage, processing, analysis and knowledge extraction capacities that required maintaining such large amounts of data, therefore various novel solutions such as autonomous and elastic cloud are being developed in order to deal with this new big data phenomenon. Audiences are getting connected to a new word of information and entertainment as a result of these disruptive technologies. On the flip side, possible reach is extended creating room to harness more data that requires use of big data and the apps that go with it to gain better insights into existing yet unexploited opportunities.

2.2 Theoretical frameworks

Theoretical foundation underpinning this research include Resource Based View (RBV) by Baradwaj (2000) and Organization Learning Theory (OLT) advanced by Marvis (1996). Wade and Hullad (2004) acknowledge the Resource Based View theory to be one of the most used theoretical perspective when examining IT investment impact at the organization level of analysis. Baradwaj (2000) identifies the core arguments of RBV to be resources are vital, use case specific and inseparable from the building blocks of a competitive advantage. He further distinguishes the resources into noticeable such as infrastructure, skilled personnel, and imperceptible like culture. As a result, researchers and practitioners have been able to ascertain the diverse kinds of IT resources their organizations should aim to attain and fortify. Recently, the Dynamic Capability View (DCV) has attracted the interest of Information Systems (IS) scholars driven by the fast changing landscape to help figure out how an IT-based competitive advantage can be realized. Teece (2007) while considering turbulent and uncertain setting mentions that dynamic capability of an organization is paramount to realize competitiveness which is supported by a growing body of literature. Eisenhardt & Martin (2000) when studying DCV posit that when an organization adjusts in response to external pressures by use of its own resources and capabilities signifies competitive performance. OLT speaks to the reality that for an organization has to continuously reflect on its goals and steps taken to get there to survive in the environment it exists (Larsen & Eargle, 2015). Buhasho et al (2020) further states, those in management within organizations must

consciously change strategy in response to change in the landscape, which should be well thought and lead to anticipated measurable results for learning to happen. OLT is included in this study because it is a nascent and relevant research area to understand how big data output enriches learning. Which ought to create new knowledge that leads to competitive advantage.

2.2.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al (2003) came up with UTAUT by systematic review and consolidation of various preceding research on acceptance and use of technology captured in earlier extensive theories. The UTAUT is an effort to fuse the vocabulary of variables of different but considered related models of acceptability of technology and its usage. It is anchored on four theoretical paradigms demonstrating factors of intention to use, which are considered to be important in discussing technology acceptance. These four builds from extensive research include:

a. Performance Expectancy - the level to which a user has confidence that system use does significantly help in better performance results
b. Effort Expectancy - how easy a user considers when using the system
c. Social Influence - the significance a user attaches to the views from others about the system use.
d. Facilitating Conditions - the level of belief a user has about the organization availing all prerequisite tools and materials that enable system use

The theory further considers moderating factors in addition to the above listed constructs that moderate the relationships between the different variables and intentions to use. They include gender moderating all the above constructs except facilitating condition; age moderating all the above constructs except social influence; experience moderating all the above constructs except performance expectancy and finally voluntariness of use moderating social influence construct only.
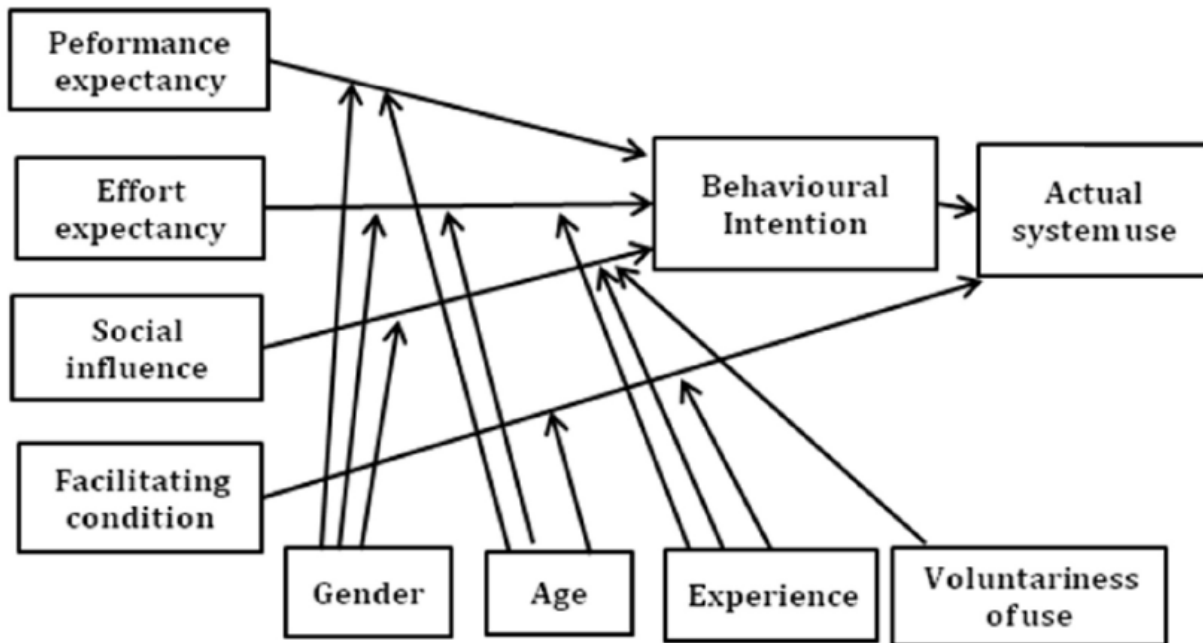
Figure 1: The UTAUT Model (Venkatesh et. al. 2003)

Based on existing literature job fit, outcome expectations, perceived usefulness, relative advantage and extrinsic motivation are the five paradigm for performance expectancy. Further, perceived ease of use, ease of use and complexity are considered as the three constructs for effort expectancy. On the other hand, social factors, image and subjective norm relate to social influence. Many studies have examined social influence finding out its intricate influence to how a new technology is accepted (Davis et al, 1989; Malhotra et al, 2005). Lastly, facilitating condition has two other different constructs that include compatibility and perceived behavioral control.

The UTAUT model has been widely used in research to support arguments or critic theory as well as tested as a theory. In some instances, the results showed significant but weak relationship between the constructs while in others the relationship was strong. Actual use of the system is considered as an indication of complete technology adaption.

2.2.2 Taxonomy Framework – IS/T Evaluation

Taxonomy Framework of IS evaluation builds on past research on assessing information system use gains by considering the main forces and their interaction in an organization context. This model is structured in a such a way that the constructs user, systems, organization, task and stakeholder interactions are studied.
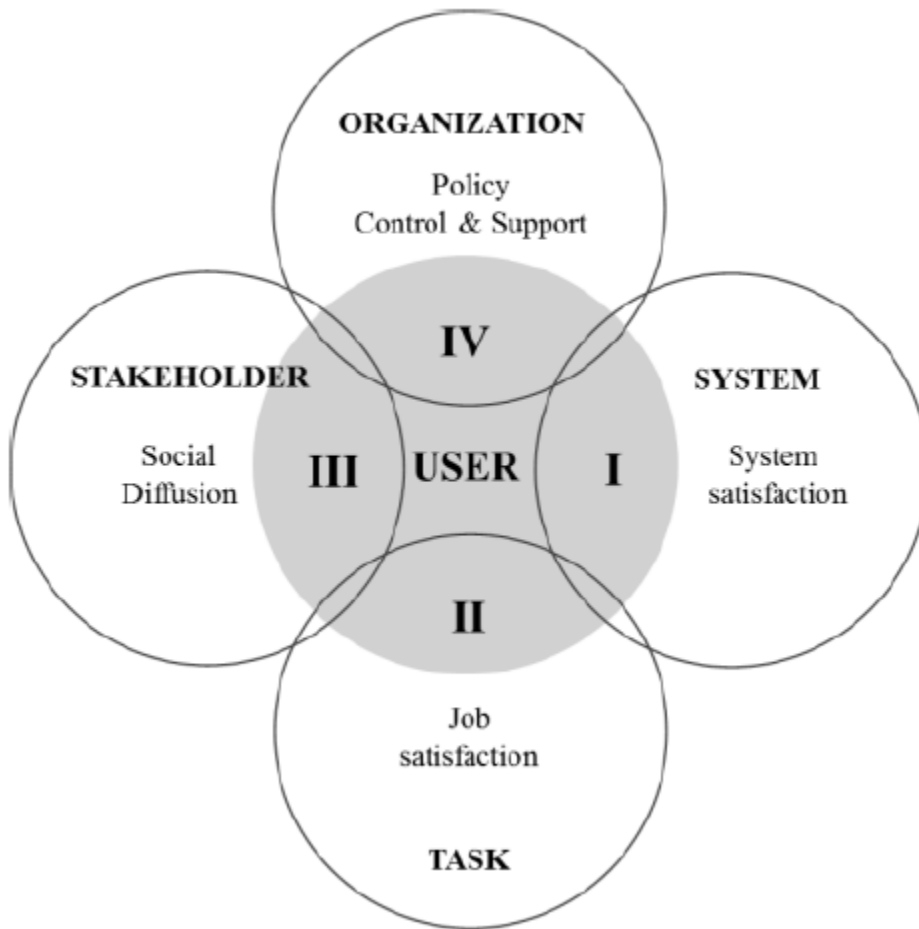
Figure 2: Taxonomy framework of IS evaluation (Lu et al, 2012)

The structural model's first interaction which is between user and system interaction primarily looks at level of satisfaction with the system. Factors observed for this include performance and the quality. The structural model's second interaction which is between user and task interaction primarily looks at the attitude of a user towards a task. The level of suitability of a technology for a given task is observed. The structural model's third interaction which is between user and stakeholder interaction primarily looks at the contribution by social actions. This third structural

interaction is tested by constructs such as complexity, observability and compatibility. Muylle et al (2004) posit that user fulfilment studies have shown how satisfaction is realized from actual use of system for specific needs besides the willingness to use the system. In addition, social interactions of an individual, community and institute are identified to equally impact on the intention of Information System or technology IS/T usage. Crick & Dodged (1994) through the Social Information Processing Model (SIP) highlight that the synthesis of social information by an individual relies on what is known from past experience and acquired knowledge wholly within an information review perspective. The structural model's fourth interaction, the last, which is between user and organization interaction primarily looks at organization's good will for the system and level of persuasion or dependability on the use of an available system. Factors observed for this include policies put in place to drive use.

2.2.3 Big Data and Strategy research framework

Research framework on big data and strategy helps illuminate the channels that use of big data can generate performance gains competitively (Mikalef et al, 2016). The research framework is anchored on previous theoretical studies on the interaction between information technology and business building on RBV and DCV of the organization.
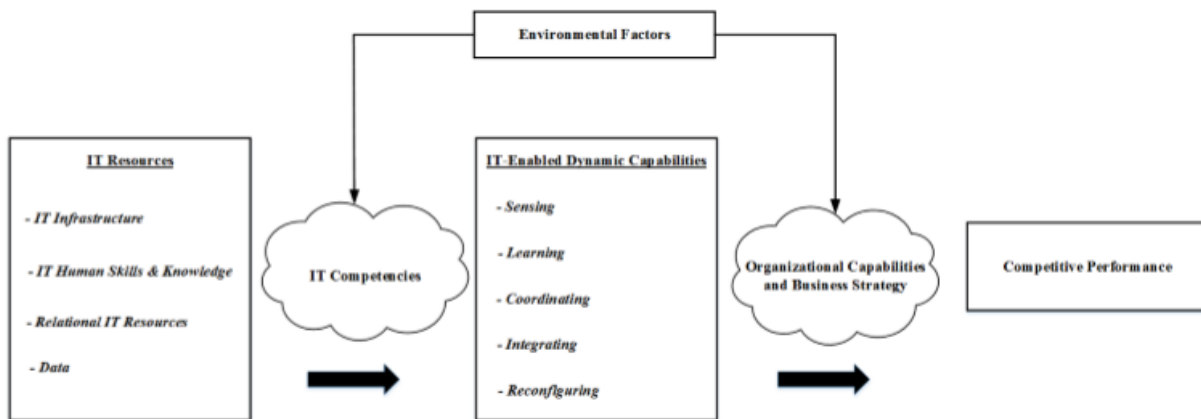
Figure 3: Big Data Strategy and Research Framework; Mikalef et al (2016)

With an aim of gaining in depth knowledge on how an organization in relation to its resources can attain competitive advantage, the framework splits information technology into technical resources and dynamic capabilities. Scholars have pursued to examine the concept of dynamic capabilities by finding discrete and computable competences (Pavlou and El Sawy, 2010; Mikalef and Pateli,

2016; Teece, 2007). Seven capabilities are identified and detailed a bit more but first listed which include reconfiguring, learning, sensing, integrating and coordinating. (Teece, 2007) states that sensing capability does concern the capacity of an organization to constantly monitor and amicably respond to threats and opportunities in its operating surrounding. Through use of big data to constantly engage stakeholders to deliver on their needs, product and service quality reviews and even analysis of competitor moves could firm up an organization's sensing ability (He et al, 2013; Risius and Beck, 2015). On the other hand, the ability to detect, project and use new information by observing patterns and trends obtained from data is a capability to learn (Zahra and George, 2002). Though learning may seem to be a similar capability to sensing it is different such that it not only depends on detecting new information but processes and deeply analyzes the new information for competitive moves. Pavlou and El Sawy (2011) suggest that assigning duties, tracking progress to ensure completion on schedule and effectively collaborating on group tasks with participants is a sign of coordinating capability. Social media has not only simplified but enhanced this capability such that the channel can be used for communication, discussion, and updates on tasks besides getting product and service review responses for improvement leading to better quality. Basquero et al (2013) argue that coordinating is improved through analysis of real time logs during a process. The ability to refine and incorporate resources obtained externally in novel or titivated ways is considered a capability to integrate (Woldesembent et al, 2012). Integrating can be reinforced through use of big data to acquire more information from various sources and aggregating to enrich data set. Lin & Wu (2014) propose that an organization is able to reconfigure when it acts strategically and shows resilience in adversity. It is the ability to change when circumstances necessitate a shift.

Big data and strategy framework for research considers resources though split into technological assets and technological dynamic capability to be internal constructs while technological competencies and business strategy to be environmental constructs for competitive performance.

2.3 Empirical Review

Big data has generated considerable interest in recent years necessitating guided discussion on how research in this area can be used to identify and appreciate benefits produces by such technologies. Extensive literature on information system already considered this by testing various theories to the extent of marrying operations research with strategic management. As a result, researchers

have been able to find out and distinguish specific technological resources are necessary but perhaps deficient within the organization.

Fernando and Engel (2018), identify that big data is more related to technology and the structure is the outcome of the dissimilar sources the data is acquired from. Big data is generated from transactions, websites hits from users, device to device transmission, social connections and interactions (Chen et al, 2012; Shim et al, 2015). Ebner et al (2014) suggest that big data characteristics makes use of traditional data management resources and practices impossible due to their limiting nature. Hence creating the need for advanced techniques and databases such as NoSQL and Hadoop. However, to obtain meaningful insights from big data requires the use of analytics which make use of the existing data by first mining, transacting, loading, scrutinizing and finally presenting actionable insights (Watson 2014). However, this is easier said but tends to be complex when it comes to doing. Baesens et al, (2016) agrees it is indeed a challenge generating data insights from big data due to its characteristics. Davenport (2006) identifies two main aspects in an organizations' behavior, that are critical to navigate these challenges and emerge competitive through use of big data. They are widespread use of advanced data processing techniques for modeling and optimization, and senior executive advocate. Watson (2014) also mentions the alignment of big data strategy as well as the overall business strategy as a requirement for success. Past research in this area has identified top management to play a critical role in the acceptance and use of a system because they influence and have greater control on processes and performance. (Nedev 2014; Ahmad et al, 2016; Hung et al, 2016; Salleh and Janczewski 2016). Their conviction in the system delivering is paramount. Chen et al (2015) suggests that top management are change agents within organization greatly influencing culture advancing how important their role in is when it comes to system acceptance and use. Hence critical to define and understand norms and values for an organization. This enables management to adopt a problem solving culture highly dependent on data insights. An organization where the governing body depends on data insights having confidence in the results constantly making decisions based on the data, inspires other parts within the organization enabling a facilitating condition. The UTAUT framework identifies common system belief, training and clear messaging to inform as the main factors in facilitating condition construct.

Big data entails rapid data processing and aggregation across platforms at a high precision to ensure quality of data. Quality is considered important since it directly impacts the decisions. The data is relied on to arrive at logical conclusions hence poor data leads to misjudgments. (Malaka and Brown, 2015; Fredriksson, 2015; Zhu et al, 2016). Over time the volume of data available has created concerns on information sensitivity touching on what use extend and who can access this data. Salleh and Janczewski (2016) agree by mentioning big data attributes have an effect to the inimitable threats that amplify the issues concerning safe data storage. The aim is to guard against unintended data modification or loss. Hence data privacy policy formulation and ensuring regulatory compliance becomes critical.

Big data management does have some level of intricacy. Information technology complexity not only considers infrastructure proficiencies but also the availability of skilled personnel in the organization (Dexter et al, 2001). Having the right human resource by evaluating how the IT skills and data operations performance capability fit the tasks is very important (Chen et al, 2015). Earlier research on possible causes of big data utilization failures expose a shortage of human resource having the required skills (Fredriksson, 2015).

Competitive advantage describes value creation activities of an organization (Fernando and Engel, 2018). Research literature on big data highlights significant improvement in productiveness, shortened time taken to respond, lowered costs, better stakeholder value, customer contentment, increased revenue, building new models and organization growth (Singh et al, 2006; Narayanan 2014; Holley et al, 2014; Chen et al, 2016). Big data platforms offer increased operational efficiencies as well as organization growth. This empirical review suggests the viewpoint that use of big data does have measurable results to an organization.

2.4 Conceptual Framework

This research evaluates competitive gains realized as a result of the utilization of big data technologies in media organizations. The conceptual framework research borrows from Mikalef et al, (2016) framework that separates IT resources from IT capabilities to bring out the relationship that can be used to acquire a competitive advantage. It is further enhanced with UTAUT framework that unifies different earlier models and theories of acceptability of technology and its usage illustrated by Venkatesh et. al, (2003) and Taxonomy framework of IS evaluation which builds on

past research on assessing information system use gains by considering the main forces and their interaction in an organization context. (Lu et al, 2012).

Independent Variable

Dependent Variable

Emerging Technology (Use of Big Data)
- Big Data availability
- Access complexity
- Widespread use of advanced data processing techniques for modelling, analysis and optimization
- Big Data perceived ease of use

H1

Competitive Advantage
- Increased productivity
- Reduced reaction time
- Customer satisfaction
- Growth in organization value

H4

H

H3

Stakeholders
- Top management advocate big data technology
- Peer influence on use of big data technology
- Sufficient budget allocation

Internal Factors
- Availability of human resource expertise
- Decisions made out of insights derived from Big Data
- Data policy control and support
- Organization open to learning

Environmental Factors
- Competitive Pressure
- Regulatory requirements
- Access to cloud services

Moderating Variables

Figure 4: Conceptual Framework

The above conceptual framework was mainly informed by big data analytics and firm performance domains having one dependent variable (competitive advantage), one independent variable (use of big data) and three moderating variables (stakeholders, internal and external factors). Specific variables for each construct were conceptualized from empirical review and are further described below.

Construct	Variable	Description
Use of big data	Big data availability	Huge amount of data in various types generated continuously for storage
	Access complexity	Connections and integrations that enable data movement
	Widespread use of advanced data processing techniques for modelling, analysis and optimization	Nature and extent of data application
	Big Data perceived ease of use	Behavioral intentions on use
Stakeholders	Top management advocate big data technology	Top down organization champion and participatory approach on use of big data
	Peer influence on use of big data technology	To what persuasive extent colleagues have on use of big data
	Sufficient budget allocation	Finances made available for spending on big data
Internal Factors	Availability of human resource expertise	Availability of users with special skills in big data and application
	Decisions made out of insights derived from Big Data	A data driven decision making culture
	Data policy control and support	Internal organization data management
	Organization open to learning	Continuous learning and improvement from data analytics and insights
Environmental Factors	Competitive pressure	Competitor data strategy influence to organization
	Regulatory requirements	Organization level of adherence to external data management regulations
	Access to cloud services	Use of cloud for big data infrastructure used
Competitive Advantage	Increased productivity	Improved employee and quality product output
	Reduced reaction time	Shortened decision making time resulting to an always high turnaround time
	Customer satisfaction	Good and happy customers who identify with the brand

	Growth in organization value	Increased revenue and shareholders value

Table 1: Conceptual Framework Description

Conceptual framework explores the moderating effect of stakeholders, internal and environmental factors on big data usage technologies in media organizations for competitive advantage gains. Moderating intends to show how the relationship between independent variable (Big Data use) denoted by X and dependent variable (CA) denoted by Y. Ordinal regression is used such that:

Let Y be an ordinal outcome with J categories. Then $P(Y \leq j)$ is the cumulative probability of Y less than or equal to a specific category $j = 1, \cdots, J - 1$. Note that $P(Y \leq J) = 1$. The odds of being less than or equal to a particular category can be defined as

$$\frac{P(Y \leq j)}{P(Y > j)}$$

for $j = 1, \cdots, J - 1$ since $P(Y > J) = 0$, and dividing by zero is undefined.

The ordinal logistic regression model is defined as

$$logit(P(Y \leq j)) = \beta_{j0} + \beta_{j1}x_1 + \cdots + \beta_{jp}x_p$$

for j = 1, …, j-1 and p predicators. Due to the parallel lines assumption, the intercepts are different for each category but the slopes are constant across categories, which simplifies the equation above to

$$logit(P(Y \leq j)) = \beta_{j0} + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4$$

Therefore, below four hypotheses are formulated for the study:

H1: There is a significant relationship between use of big data and competitive advantage

H2: There is a significant relationship between stakeholders' moderation on use of big data and competitive advantage

H3: There is a significant relationship between internal factors moderation on use of big data and competitive advantage

H4: There is a significant relationship between external factors moderation on use of big data and competitive advantage

2.5 Operationalization of the variables

Variables		Indicators	Measures	References
Independent	Use of Big Data	Big Data availability	Availability	Ayesha (2020), Ebner et al. (2014), Davenport (2006), Watson (2014)
		Big Data access complexity	Ease of access	
		Widespread use of advanced data processing techniques for modeling, analysis and optimization	Actual Use	
		Big Data perceived ease of use	Complexity	
Moderating	Stakeholders	Top management advocate big data technology	Management Influence	Hung et al. (2016), Nedev (2014), Malhotra et al (2005)
		Peer influence on use of big data technology	Peer Influence	
		Sufficient budget allocation	Budget Availability	
	Internal Factors	Availability of skilled human resource	Skills Availability	Fredriksson (2015), Manyika et al. (2011)
		Decisions made out of insights derived from big data	Culture	
		Data policy control and support	Observability	
		Organization open to learning	Learning	
	Environmental Factors	Regulatory requirements	Compliance	Opdahl & Nunavath

		Access to cloud services	Resources Availability	(2020), Ayesha (2020)
		Competitive pressure	Adaptability	
Dependent	Competitive Advantage	Increased productivity	Performance quality	Holley et al. (2014), Singh et al. (2006), Narayanan (2014)
		Reduced reaction time	Responsiveness	
		Customer satisfaction	Nature of feedback	
		Growth in organization value	Increased value	

Table 2: Operationalization of the variables

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers research technique by introducing the research concept, followed by a road plan for data collection, measurement, and analysis. It includes research philosophy, research design, population, sample design, data collection then lastly data analysis and presentation.

3.2 Research Philosophy

This encompasses key assumptions on the way the researcher views the world. Goes (2014) argues the ever increasing streams of data stretching existing storage space while on the other hand providing usable data jolted all alike to explore ways to adjust to this phenomenal area of big data. Hence, an epistemological view was adopted to carry out positivist research on competitive advantage in media organizations in Kenya through use of big data. Research in big data has continued to find out the existing circumstances and available pathways for organizations to intertwine Information Technology (IT) and data driven opportunities within a firm's competitiveness in its strategy for digital (Rogier et al, 2019). Whereas academicians explore methods to make sense of the universe in exceptional ways, organizations are in search of technological innovation that grants competitive advantage. This has resulted in extreme hopes in big data to catapult the society into exciting age of unfathomed innovation leading to a deductive process being employed to test the hypotheses and theory adopted in the framework.

3.3 Research Design

The study used a descriptive, cross sectional method with a mono approach to evaluate the effect of moderating variables on the usage of big data to get an edge in media organizations. Quantitative data was collected for analysis. Leedy and Ormrod (2001) described quantitative research as being able to explain relationships that exist through variables that are measurable. In contrast qualitative research attempts to explain theories considered complex describing it from researcher's view point. Survey research method was adopted in this research design. The survey encompassed data collection from a pre-determined targeted group of people in regards to the specific subject area under study. Here the researcher scrutinized this phenomenon which exists in the environment independent of his actions (Kothari, 2004).

3.4 Population

A population describes a set of people with commonalities or rather similar evident characteristic (Mugenda, 2012). This research was on media organizations in Kenya. Few media organizations have existed in the past but the digital disruption age opened up the space to more organizations. By the year 2020 there were a huge number of media organizations mostly focusing and growing in the digital front. The study relied on body that regulates sector for the available list of media organizations. According to Media Council of Kenya, an institution that regulates media in the conduct and discipline of journalists in Kenya, online website as of 2020 there were 68 accredited listed media entities. This formed the population size. The media organization where survey was carried out were narrowed down and selected through a criterion. The people within the media organizations interviewed were purposefully selected. Research focused on top 5 organization based on variety of channels i.e. print, broadcast, news website and social or huge social following. Media Council of Kenya report on status of media 2019 reported Facebook, WhatsApp and YouTube respectively as top social channels. Facebook and YouTube following is publicly available hence used to determine organization with social following as at June 2021. The following two criteria were used to select the media organizations.

    i.   Organization with variety of channels selected.

		Channels			
	Organization	Print	Broadcast (TV/Radio)	News Website	Social Pages
1	Standard Group	Yes	Yes	Yes	Yes
2	MediaMax	Yes	Yes	Yes	Yes
3	Nation Media Group	Yes	Yes	Yes	Yes
4	Radio Africa	Yes	Yes	Yes	Yes
5	Royal Media Service	No	Yes	Yes	Yes

Table 3: Organization selection first criteria

ii. Organization with huge social following in descending order

	Organization	Social Pages (Broadcast (TV) Following in millions)	
		Facebook	YouTube
1	Royal Media Service	5.15	2.67
2	Nation Media Group	4.23	1.52
3	MediaMax	1.12	1.08
4	Standard Group	0.81	1.91
5	Radio Africa	0.01	0.02

Table 4: Organization selection second criteria

3.5 Sample Design

A probabilistic sampling method was used to statistically reduce errors (Diamantopoulos and Schlegelmilch, 2005). Both simple random and stratified sampling were blended for this research. Stratified sampling technique was used to split the sample to strata while simple random sampling picked specific representation from each category of the sample. The sample was divided into 5 strata which include senior managers, online editors/ sub editors, marketers, senior editors and ICT specialists. The sample size was determined by the following formula recommended for determining sample size (Nassiuma, 2000). The target group size was arrived at by finding out the actual population size of each strata having been obtained from respective organization's human resource departments.

$n = Nc^2 / (c^2 + (N-1) e^2)$

Where;

n = Sample size

N = Population size

c = Coefficient of variation

e = Margin of error

Nassiuma (2000) endorses between 2% to 5% error margin and between 20% to 30% coefficient of variation. Below table summarizes the sample.

Target Group	Size	Margin of error %	Coefficient of variation %	Sample size
Senior Managers	168	3	20	35
Online Editors/Sub Editors	36	3	20	20
Marketers	20	3	20	14
Senior Editors	31	3	20	19
ICT Specialists	45	3	20	23
Total	300			111

Table 5: Sample summary

3.6 Data Collection

A questionnaire was administered to collect quantitative data. Delivery of the questionnaire was done through Google forms. The survey questions were created in Google forms and link made available to the target respondents. The questionnaire used five-point Likert scale to obtain responses. The choices ranged from strongly agree to strongly disagree. This method of data collection was selected to quickly reach out to the target group with ability to easily access the questionnaire on mobile devices.

3.7 Data Analysis and presentation

Data analysis involved looking at patterns in the data to be able to draw conclusions (Oates, 2005). Descriptive statistics was used in the research to perform data analysis. Main tool for analysis and visualization was SPSS. Statistical measures were used to summarize descriptive survey data, frequencies, the measure of central tendencies among others. Statistical studies were conducted to see if there was a link between big data usage or moderating variables on big data use and competitive advantage gain.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.0 Introduction

The findings of research study and the relationship between the study variables are presented in this chapter. The questionnaire was piloted with a sample of the target audience resulting in amendments on how some questions had been framed. Descriptive statistics was done primarily to obtain the standard deviation which is a measure of dispersion and the mean a measure of central tendency and i.e. shows magnitude of the deviation of the value from their mean. The hypotheses were tested through inferential statistics primarily ordinal logistic regression at 95% level of confidence to establish any casual effect relationship between use of big data technology, independent variable and competitive advantage, dependent variable having the moderating effect of stakeholders, internal factors and environmental factors. Cronbach's alpha was used to assess the reliability of the questionnaire and found to be 0.8. A reliability of 0.7 or higher is considered good.

4.1 Response Rate

111 questionnaires were sent out and 74 responses received resulting to a 67% response rate. This rate was considered good enough and above the recommended 60% for study (Mugenda and Mugenda, 2003)

	Responses	Percentage
Completed	74	67%
Not Completed	37	33%
Total	111	

Table 6: Response Rate

4.2 Interpretation of Results

The aim of this phase is to transform the data collected into credible evidence about media organization's competitive advantage through use of big data.

4.2.1 Demographic analysis by Gender

The bar graph below shows the gender breakdown of responses. Out of the 74 responses 65% were male while 35% were female.
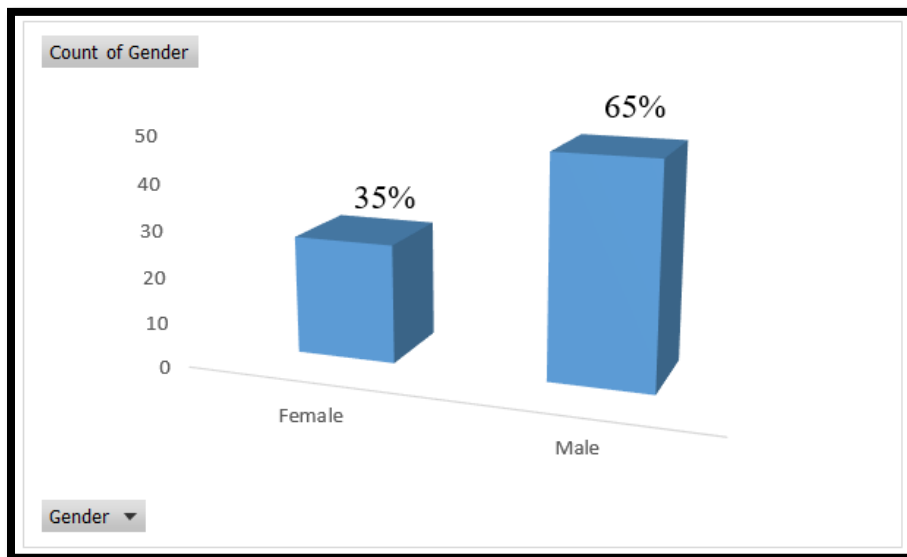
Figure 5: Analysis on Responses by Gender

4.2.2 Demographic analysis by Age

The bar graph below shows the age breakdown by respondents. Out of the 74 responses 87% were aged between 25 and 44 years, 12% were 45 years and above while 1% were between 18 and 24 years.
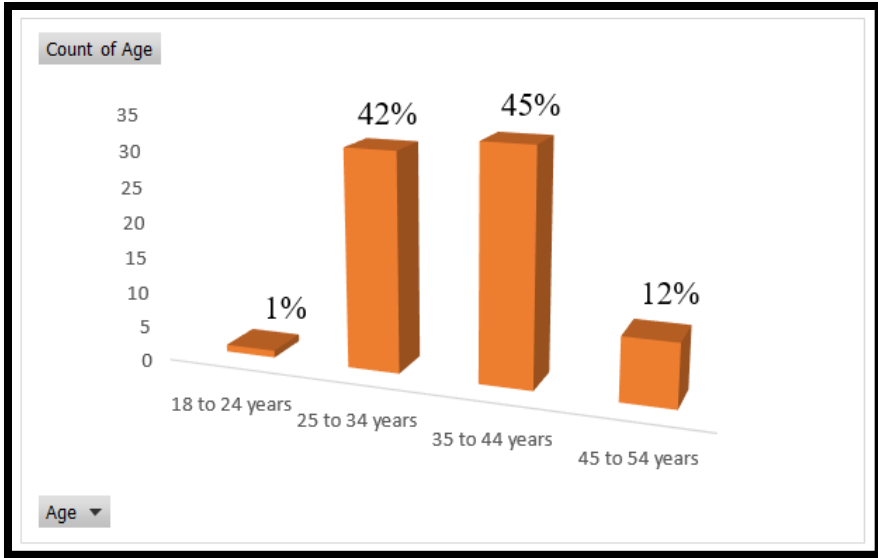
Figure 6: Analysis on Responses by Age

4.2.3 Education Level

The bar graph below shows the level of education breakdown by respondents. Out of the 74 responses 50% had a masters, 49% had a first degree while 1% had a doctorate. The results show respondents to be highly educated.
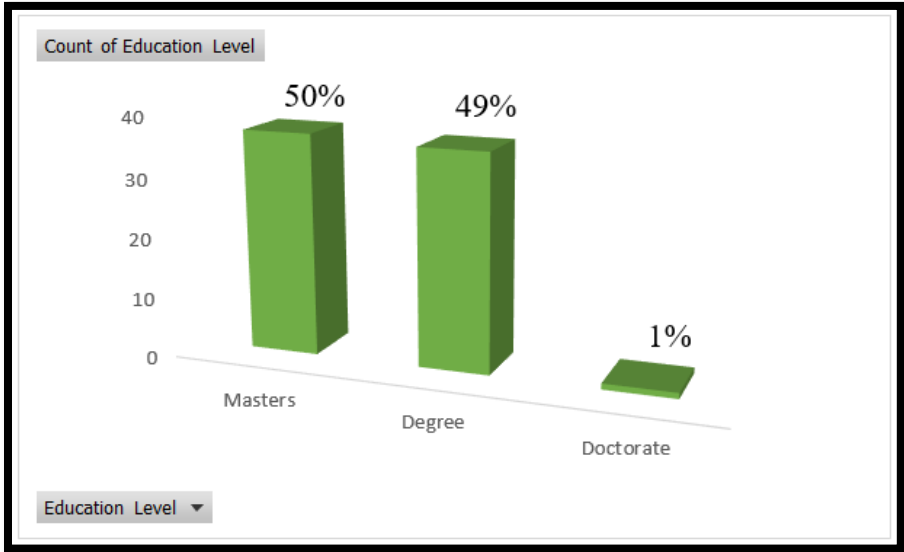
Figure 7: Analysis on Responses by Education Level

4.2.4 Respondents grouped by Organization

The bar graph below shows the distribution of the respondents grouped by organization name. The number of respondents from these organizations was determined by population size of the organization for each stratum. Out of the 74 responses, Nation Media Group had the highest number of respondents at 30% while Radio Africa Group had the lowest number of respondents at 11%.
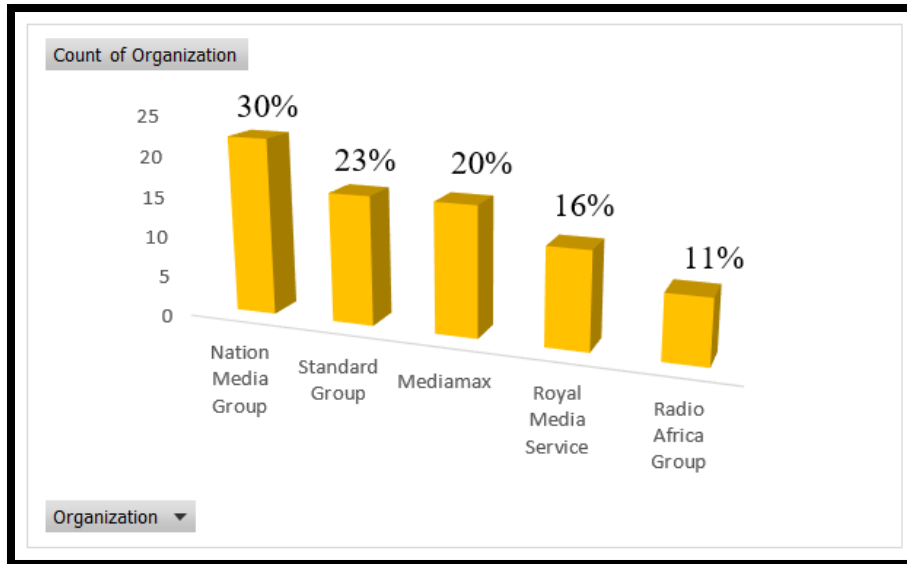
Figure 8: Analysis of Respondents grouped by Organization

4.2.5 Organization's usage of big data to get an edge

Availability of big data is completely different from utilization within media organizations. The researcher asked respondents whether they were familiar with big data and if it was utilized for competitive advantage. Majority of the respondents were neutral with a very small percentage feeling big data was not used optimally within the organization.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The media organization I work for regularly processes and STORES voluminous data from various sources	3%	4%	57%	19%	17%
2	Skilled users in the organization are able to identify relevant data and extract for analysis with EASE		4%	55%	19%	22%

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
3	Skilled users in the organization USE advanced data techniques for modeling, optimization and analysis		5%	62%	17%	17%
4	We use big data across the organization for decision making with EASE	0.4%	7%	40%	37%	16%

Table 7: Responses on Use of big data

4.2.6 Stakeholders moderation on usage of big data to get an edge

A series of questions were asked to ascertain level of influence by top management and peers on use of big data. As shown in studies earlier discussed stakeholders have and could influence information use. 42% of the respondents on average either agreed or strongly agreed indeed stakeholders influenced big data usage.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The executive management ADVOCATES use of big data across the entire organization	2%	10%	48%	29%	11%
2	My organization has a key stakeholder who REPRESENTS big data interests in top management	1%	8%	47%	30%	14%
3	Colleagues INFLUENCE my progressive use of big data	1%	14%	46%	28%	11%
4	My organization ALLOCATES and approves sufficient budget for big data	0.4%	9%	48%	30%	12%

Table 8: Responses on Stakeholders moderation on use of big data

4.2.7 Internal factors moderation on usage of big data to get an edge

Big data studies have considered internal factors to be key in adoption and use cases. One of them being skill availability that the researcher asked respondents in the context of media organization. Majority of the respondents agreed or were neutral on how internal factors influence big data usage within the organization.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Key users are technically KNOWLEDGEABLE in exploiting big data technology	2%	7%	49%	30%	11%
2	Decisions in the organization are GUIDED by insights derived from big data	1%	7%	49%	31%	12%
3	My organization HAS a set of processes, responsibilities, rules, standards, and metrics in place to guarantee that data is used effectively and efficiently	1%	7%	48%	29%	15%
4	The organization is OPEN to acquiring new knowledge that leads to continuous change	0.4%	12%	45%	32%	11%

Table 9: Responses on Internal Factors moderation on use of big data

4.2.8 Environmental factors moderation on usage of big data to get an edge

The researcher also went ahead and asked respondents on whether environmental factors influenced usage of big data to get an edge in the organization. Use of cloud services for big data came out as common. Big data requires highly specialized technology that would be cost effective on cloud than on premise driving this trend.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	My organization RELIES on cloud services for big data infrastructure	1%	10%	46%	31%	12%
2	My organization is familiar with government law on data protection and has taken initiative to COMPLY	2%	11%	44%	32%	11%
3	My organization's use of big data technology is INFLUENCED by what competition uses	2%	13%	49%	26%	10%
4	Market leaders regardless of industry INFLUENCE my organization's big data strategy	2%	14%	45%	29%	11%

Table 10: Responses on Environmental Factors moderation on use of big data

4.2.9 Organization's competitive advantage through use of big data

Use of big data in media organization is aimed for competitive advantage. The researcher sought to find out realized competitive advantage and most respondents were positive as shown below.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Use of big data has IMPROVED productivity in the organization	1%	13%	42%	33%	11%
2	Use of big data has SHORTENED organization's response time	0.4%	12%	45%	30%	13%
3	Use of big data has resulted in GOOD feedback from customers to the organization	2%	10%	43%	31%	14%
4	Use of big data has resulted to GROWTH in organization value	1%	12%	42%	33%	11%

Table 11: Responses on Competitive Advantage

4.3 Tests of Normality

A test of normality was done to find out whether the Likert scale data met the assumptions of parametric testing. Below show two tests of statistics namely Kolmogorov-Smirnov recommended for data set above 100 and Shapiro-Wilk recommended for data set less than 100. In normality test the null hypothesis is that data are normally distributed. If the significance is less than 0.05 we reject the null hypothesis that data is normally distributed. Shapiro-Wilk statistical significance of all variables is less than 0.05 that means the data was not normally distributed. Hence non parametric tests were done. Ordinal logistic regression analysis and Spearman Correlation analysis were the specific non-parametric tests carried out.

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Use of Big Data	0.223	74	0.001	0.903	74	0.001
Stakeholders	0.281	74	0.001	0.637	74	0.001
Internal Factors	0.367	74	0.001	0.548	74	0.001
External Factors	0.253	74	0.001	0.667	74	0.001
Competitive Advantage	0.221	74	0.001	0.850	74	0.001
a. Lilliefors Significance Correction						

Table 12: Tests of Normality

4.3.1 Model fitting information

The model fitting information tells how well the model fits the data. It was statistically significant since the value below was less than 0.05 which meant the model fitted the data very well.

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	251.548			
Final	232.141	19.407	4	0.001
Link function: Logit.				

Table 13: Model Fitting Information

4.3.2 Pseudo R-Square

Focus is on Nagelkerke which is similar to R-Square for linear regression. A 24% change in competitive advantage was as a result of use of big data moderated by stakeholders, internal factors and environmental factors.

Cox and Snell	0.231
Nagelkerke	0.239
McFadden	0.077
Link function: Logit.	

Table 14: Pseudo R-Square

4.3.3 Test of Parallel Lines

Important to look at test of parallel lines before parameter estimates to ensure test of proportional odds was not violated. This tests verifies the null hypothesis of proportional odds, which states that the chances for each estimated variable are consistent across different outcome variable thresholds. The statistical significance should be above 0.05 to not have violated test of parallel lines. The significance value below shows the test of the proportionate odds assumption was not violated.

Test of Parallel Lines[a]				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	232.141			
General	162.225[b]	69.916[c]	28	0.260
The null hypothesis says that all answer categories have the location parameters (slope coefficients).				
a. Link function: Logit.				
b. After maximum number of step-halving, the log-likelihood value cannot be increased any more				
c. The Chi-Square statistic is calculated using the log-likelihood value of the general model's previous iteration. The test's validity is debatable.				

Table 15: Test of Parallel Lines

4.3.4 Parameter Estimates

Parameter Estimates								
							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Dependent Variable	[Competitive Advantage = 1.00]	-1.960	1.853	1.119	1	0.290	-5.592	1.672
	[Competitive Advantage = 1.75]	-1.259	1.714	0.539	1	0.463	-4.618	2.101
	[Competitive Advantage = 2.75]	-0.836	1.663	0.252	1	0.615	-4.096	2.424
	[Competitive Advantage = 3.00]	2.351	1.591	2.183	1	0.030	-0.768	5.471
	[Competitive Advantage = 3.25]	2.934	1.601	3.358	1	0.037	-0.204	6.072
	[Competitive Advantage = 3.50]	3.353	1.610	4.339	1	0.037	0.198	6.507
	[Competitive Advantage = 3.75]	4.391	1.636	7.205	1	0.007	1.185	7.598
	[Competitive Advantage = 4.00]	7.118	1.948	13.357	1	0.000	3.301	10.936
Independent Variable	Use of Big Data	0.777	0.473	2.703	1	0.020	-0.149	1.703
Moderating Variables	Stakeholders	0.823	0.440	3.498	1	0.011	-0.039	1.686
	Internal Factors	0.067	0.362	0.034	1	0.023	-0.643	0.778

External Factors	-1.093	0.344	10.092	1	0.001	-1.768	-0.419

Link function: Logit.

Table 16: Parameter Estimates

This is a very important table. Each variable is interpreted while founded on the odds. Level of big data use is a significant predicator to competitive advantage. For every unit growth on use of Big Data there is a forecasted growth of 0.777 in the log-odds of falling at an upper level on competitive advantage. Stakeholders moderation on use of big data is a significant predicator to competitive advantage. For every unit increase on stakeholders' moderation on big data usage there is a forecasted growth of 0.823 in the log-odds of falling at an upper level on competitive advantage. Internal Factors moderation on use of big data is a significant predicator to competitive advantage. For every unit increase on internal factors moderation on big data usage there is a projected increase of 0.067 in the log-odds of decreasing at an upper level on competitive advantage. External factors moderation on use of big data is a significant predicator to competitive advantage. For every unit increase on external factors moderation on the use of big data there is a forecasted decrease of 1.093 in the log-odds of decreasing at a higher level on competitive advantage.

4.4 Correlation of Variables

The correlation coefficient was utilized to determine the strength of the link between the variables. Correlation coefficient can range from -1 to 1, where both extreme boundaries indicate a perfect relationship. Positive coefficients imply a direct link, meaning that when one variable increases so does the other. When one variable rises, the other decreases, therefore negative coefficients suggest an inverse connection. Pearson correlation coefficient was computed to assess the connection between the hypothesized variables.

Correlations			Use	Advantage	SUse	IUse	EUse
Spearman's rho	Use of Big Data	Correlation Coefficient	1.000	-0.042	-0.127	0.013	-0.058
		Sig. (2-tailed)		0.720	0.279	0.910	0.622
		N	74	74	74	74	74
	Competitive Advantage	Correlation Coefficient	-0.042	1.000	.334**	0.205	0.034
		Sig. (2-tailed)	0.720		0.004	0.079	0.776
		N	74	74	74	74	74
	Moderation by Stakeholders	Correlation Coefficient	-0.127	.334**	1.000	.438**	.430**
		Sig. (2-tailed)	0.279	0.004		0.000	0.000
		N	74	74	74	74	74
	Moderation by Internal Factors	Correlation Coefficient	0.013	0.205	.438**	1.000	.344**
		Sig. (2-tailed)	0.910	0.079	0.000		0.003
		N	74	74	74	74	74
	Moderation by External Factors	Correlation Coefficient	-0.058	0.034	.430**	.344**	1.000
		Sig. (2-tailed)	0.622	0.776	0.000	0.003	
		N	74	74	74	74	74
**. Correlation is significant at the 0.01 level (2-tailed).							

Table 17: Spearman's Correlation

Confidence Intervals of Spearman's rho				
	Spearman's rho	Significance(2-tailed)	95% Confidence Intervals (2-tailed)[a,b]	
			Lower	Upper
Use of Big Data – Competitive Advantage	-0.042	0.720	-0.275	0.195
Use of Big Data – Moderated by Stakeholders	-0.127	0.279	-0.352	0.111
Use of Big Data – Moderated by Internal Factors	0.013	0.910	-0.222	0.248
Use of Big Data – Moderated by External Factors	-0.058	0.622	-0.289	0.179
Competitive Advantage – Moderated by Stakeholders	0.334	0.004	0.107	0.527
Competitive Advantage – Moderated by Internal Factors	0.205	0.079	-0.031	0.420
Competitive Advantage – Moderated by External Factors	0.034	0.776	-0.203	0.267
Stakeholders Moderation – Internal Factors Moderation	0.438	0.000	0.226	0.610
Stakeholders Moderation – External Factors Moderation	0.430	0.000	0.217	0.604
Internal Factors Moderation – External Factors Moderation	0.344	0.003	0.118	0.536
a. Estimation is based on Fisher's r-to-z transformation.				
b. Estimation of standard error is based on the formula proposed by Fieller, Hartley, and Pearson.				

Table 18: Confidence Intervals of Spearman's Correlation

There was a positive significant correlation between stakeholders' moderation on the use of big data and competitive advantage (r = 0.334, p = 0.004), implying that as the rate of stakeholder moderation influence on the use of big data increases so does the competitive advantage increase. There was a positive significant correlation between stakeholders' moderation and internal factors moderation (r = 0.438, p = 0.001). There was also a positive significant correlation between stakeholders' moderation and external factors moderation (r = 0.430, p = 0.001).

4.5 Hypothesis Test

Ordinal logistic regression was done as test of hypothesis. The model of ordinal logistic regression is defined as

$$logit(P(Y \leq j)) = \beta_{j0} + \beta_{j1}x_1 + \cdots + \beta_{jp}x_p$$

for j = 1, …, j-1 and p predicators. The intercepts are different for each cluster due to the parallel lines assumption, whereas the slopes are consistent across categories, simplifying the equation above to

$$logit(P(Y \leq j)) = \beta_{j0} + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4$$

Hypothesis testing was carried out by using p-value which helps to find the significance of the outcome. Hypothesis tests aim to ascertain validity of a demographic assertion. The p-value is used to weigh the strength of the evidence. Thus, the lower the p-value the more certain the claim that the discrepancy between the observed and anticipated means is statistically significant. An alpha value of 0.05 is recommended by most disciplines. If the p-value is less than 0.05, the difference is considered statistically significant.

	Hypothesis	**p-value**
H1	There is a significant relationship between use of big data and competitive advantage	0.020
H2	There is a significant relationship between stakeholders' moderation on the use of big data and competitive advantage	0.011
H3	There is a significant relationship between internal factors moderation on the use of big data and competitive advantage	0.023
H4	There is a significant relationship between external factors moderation on the use of big data and competitive advantage	0.001

Table 19: Hypothesis Test

The table above shows H1 has a statistically significant value of 0.020. The null hypothesis is not rejected because the p-value is less than 0.05. H2 also has a statistically significant value of 0.011 hence the null hypothesis is not rejected. H3 has a statistically significant value of 0.023 The null hypothesis is not rejected because the p-value is less than 0.05. H4 also has a statistically significant value of 0.001 hence the null hypothesis is not rejected.

4.6 Discussion

In this section the findings of the study are discussed in a bit more detail within context of the study undertaken.

4.6.1 Use of big data in media organizations for competitive advantage

The study realized big data is widely used in media organizations in Kenya. It was evident that data, in many cases big data, are generated from the digitization of the journalistic process and stored in a manner that can be retrieved whenever needed with speed. The data is not only extracted but put into meaningful use across the organization with skilled users. Veglis (2012) agrees that by using content to generate consumption data that can be studied, media organizations can realize information that is useful and helpful in designing and executing publishing strategies that lead to growth in revenues. Evens and Van Damme (2016) emphasizes this by mentioning that media organizations utilize big data to understand why users subscribe and unsubscribe to their services. The study realized that for each unit growth on use of Big Data there is a forecasted growth of 0.777 in the log-odds of falling at an upper level on competitive advantage.

4.6.2 Perceived usefulness on use of big data moderated by stakeholders for competitive advantage

Study finding is that top management in media organizations have largely embraced big data significantly contributing to its use within the organization. Stone (2014) similarly identifies that media organizations relied on a real-time statistical dashboard and analytics platform to power the entire editorial process. This is an analytical approach to decision making that improves user and advertiser experience. Stakeholders' moderation on the use of big data is a significant predicator to competitive advantage. For every unit increase on the moderation of stakeholders on use of big data there is a forecasted growth of 0.823 in the log-odds of falling at an upper level on competitive advantage. Results show big data interests are represented at top management with sufficient

budget not only allocated but also approved for use. Big data application in media organizations requires use of tools and some of the good tools require licensing fee paid. Having an approved budget helps in use of various tools and techniques for big data analytics.

4.6.3 Organization's internal factors moderation effect on the usage of big data to get an edge

Internal factors moderation effect on big data usage is a significant predicator to competitive advantage. For every unit increase on moderation of internal factors on the big data use there is a forecasted growth of 0.067 in the log-odds of falling at an upper level on competitive advantage. Results found key users to be technically knowledgeable in exploiting big data and the organizations having in place practices that put big data into maximum use. These findings are consistent with (Veglis & Bratsas, 2017) who found out that in order for media organizations to be able to utilize big data a significant variety of skills required should exist. A data culture was present in the media organizations in driving change. There was significant reliance on big data for insights and decisions on user offerings. Although there were little insights into users' behavioral traits regarding personalized news preference, similar research commonly found out, audiences believe use of algorithms to decide factoring users' prior consumption behavior is far more enticing than editorial curation in terms of getting news out (Bodó et al., 2019).

4.6.4 Organization's external factors moderation effect on usage of big data to get an edge

With the growing importance of data privacy and enactment of laws globally, this study provides implications that are important for practice. Firstly, the study suggest that environmental factors have a significant moderating effect on usage of big data to get an edge. The finding shows there is huge awareness and efforts towards compliance with all regulations. It is further realized that competitive environment significantly influences use of big data. Media organizations are keen to know how competitors are using big data to inform their choices and big data strategy. Use of cloud services was also evident an indication of media organization utilizing the cloud infrastructure for big data applications. (Opdahl and Nunavath, 2020) identify that cloud computing makes it easy to access and exploit big data infrastructure and easily scale with increase in computing demands. (Tan & Su, 2011) agree that use of cloud computing services in media for processing is inevitable since the processing requires enormous computing power and resources available on cloud at modest costs. The major traffic of internet has become media content which

keeps on increasing rapidly. Moreover, with the digitization of the processes in media organization as a result of the internet age multiple distribution channels have been created (Veglis et at, 2020).

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1 Introduction

This section finalizes the study by first doing a high level review of the successes of the research based on the initially set goal, then draws conclusions and implications at the tail end.

The research set out to know how well media organizations have used big data for competitive advantage.

The chapter is organized into sections the first revisiting all chapters from the start to end reviewing the study. Then the research contributions are argued in the following section. After which broad conclusions based on results are stated. The final sections of the chapter complete the research by highlighting limitations of the research and moves to suggest opportunities for additional research.

5.2 Research Overview

Chapter one of the study, presented the origin of big data in the context of media detailing various challenges in realizing competitive advantage from the use, introducing the problem area of study at this point and proceeding to state the aim of research, objectives and significance. The chapter illustrates how digital technologies disruption affected media organizations' structure, operations and strategy. There were rapid shifts within organizations brought about by the fast changing digital technologies that gave users more control and choice on content to consume as well as how and when to consume. In the midst of all these was data generated from users' actions as well as content output that when put into meaningful use had all the signals for immeasurable value to the organizations.

The second chapter detailed theoretical grounds for the organizational usage of big data to get an edge. Extensive literature touching on themes about big data use discipline were explored in this chapter.

The literature review hinged on two theories, the resource based view and the organization learning was presented. The resource based view of the firm, a grounding theory for the research was used and included typology of key IS resources as well as both complementarity and moderating factors that have implications on the steady progress of an organization.

The organization learning aspect to the use method and the association to organization benefits was done. Discussed theories were empirically reviewed leading to the operationalized variables that were listed and defined.

The study strategy was detailed in the next chapter which was chapter three. The target of the study was to evaluate competitive advantage in media organizations through use of big data. A quantitative, cross sectional research survey approach was used for the study. Tools used for data retrieval and analysis were outlined as deployed in the research area.

In chapter four, data collected from the study was analyzed. Towards the tail end of the analysis the researcher provides interpretation as presented in chapter four. The interpretation represented explanations for both use and moderation effect on the usage of big data to get an edge. The findings did agree with extant literature, and a primary finding was indeed there exists competitive gains from wide use of big data in media organizations. The conceptual framework was left as used in research without any later adjustments.

5.3 Conclusion

The main goal of this study was to evaluate competitive advantage in media organizations through use of big data. This research focused on top five media organizations in Kenya that were selected through a detailed criterion. They included the Royal Media Services (RMS), the Nation Media Group (NMG), the Standard Group (SG), Mediamax and Radio Africa. There were four specific objectives of study; to determine level of big data use in media organizations for competitive advantage, to find out stakeholders' moderation on level of appreciation and effect on usage of big data to get an edge, to find out internal factors moderation effect on usage of big data to get an edge and lastly to establish environmental factors moderation effect on usage of big data to get an edge. The result of the study showed use of big data as well as the three moderating variables effect on the use were statistically significant for competitive advantage. With growing interest in big data and its application across the organizations, this study advances an evaluation model for competitive advantage within organizations. Although several studies have focused on adoption, this study illuminates the hits by organization from the use. Overall, use of big data in media organizations in Kenya enhances competitive advantage. Usage is driven by primarily the availability of voluminous data, management influence and the belief it does enhance organization

performance. Hence, the study findings show decision making across the organization significantly depends on use of big data.

5.3.1 Use of big data in media organizations for competitive advantage

It was concluded that there was a significant relationship between use of big data and competitive advantage (p-value of 0.020). It was evident that indeed media organizations processed and stored voluminous data types from various sources. This required specialized skills, tools and techniques to meaningfully utilize the data which were also found to exist within the organizations. It was also evident that skilled users are able to easily identify relevant data and extract for analysis. Continued widespread use across the organization and investment in big data resources influences decision making that increases organization value.

5.3.2 stakeholders' moderation on big data use in media organizations for competitive advantage

It was determined that there was a substantial link between stakeholders' moderation on the use of big data and competitive advantage (p-value of 0.011). It was established that management does play an important role in championing the use hence a key determinant on the depth of big data use in the organization. Peer influence on use of big data was noteworthy. Users considered with importance peer views on the use of big data.

5.3.3 Internal factors moderation on the use of big data in media organizations for competitive advantage

It was determined that there was a substantial link between internal factors moderation on the use of big data and competitive advantage (p-value of 0.023). It was evident that the right skills and tools were crucial in utilizing big data. Big data required expertise to identify important data sets, transform the data into information and the information into presentable actionable insights with the target audience in mind to clearly communicate.

5.3.4 External factors moderation on big data use in media organizations for competitive advantage

It was determined that there was a substantial link between external factors moderation on the use of big data and competitive advantage (p-value of 0.001). Media organizations keenly monitor competitor moves to inform big data strategy. Market leaders are used to benchmark resources more often and influence organization choices for competitive advantage.

5.4 Limitation

This study focused on top media organizations in Kenya. It would be interesting to widen scope and carry out a comparative study with small and medium organization in future studies. Number of employees within organizations was not publicly available information hence relied on respective human resource offices to find out the population size and arrive at sample frame for the study.

5.5 Further Work

Study could be carried out on middle and small sized media organizations for further research. There could also be other factors not covered in this study having significant influence on competitive advantage worth exploring as well.

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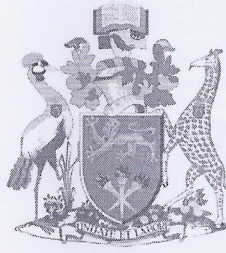
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Our Ref: UON/CBPS/SCI/MSC/ITM/2015   14 June 2021

TO WHOM IT MAY CONCERN

Dear Sir/Madam

<u>**RE: BRIANE MAKOKHA: REG.NO. P54/79086/2015**</u>

This is to confirm that the above named is a bona fide student of the University of Nairobi, School of Computing and Informatics.

He is pursuing M.Sc. in Information Technology Management course and would like to collect data for his research project entitled: **"An Evaluation of Organization Competitive Advantage through Use of Big Data - Case of Media in Kenya"** under the supervision of Prof. Agnes N. Wausi

Any assistance accorded to him will be highly appreciated.

Yours faithfully

School of Computing & Informatics
University of NAIROBI
P. O. Box 30197

PROF. ROBERT O. OBOKO
DIRECTOR
<u>**SCHOOL OF COMPUTING & INFORMATICS**</u>

ROO/dmi

Questionnaire

Section A: General Information

Please indicate and tick in the box where appropriate

1. Please select your gender
   a. Male [   ]
   b. Female [   ]
   c. Other [   ]

2. Choose your age bracket
   a. 18 – 24 years [   ]
   b. 25 – 34 years [   ]
   c. 35 – 44 years [   ]
   d. 45 – 54 years [   ]
   e. Above 54 years [   ]
3. Indicate your education level
   a. Diploma [   ]
   b. Degree [   ]
   c. Masters [   ]
   d. Doctorate [   ]
   e. Other [   ]

4. What is your position or department in the organization?
   a. Senior Manager [   ]
   b. Online Editor / Sub Editor [   ]
   c. Editor [   ]
   d. ICT [   ]
   e. Marketing [   ]
   f. Other [   ]

Section B: Organization's use of big data technology

5. For how long has your organization used big data analytics to drive decision making?
   a. Never used [   ]
   b. 1 – 5 years [   ]
   c. 6 – 10 years [   ]
   d. 11 – 15 years [   ]
   e. 16 – 20 years [   ]
   f. More than 20 years [   ]

6. To what extent do you agree or disagree with the following views regarding your organization's usage of big data to get an edge

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My organization regularly processes and STORES voluminous data from various sources					
Skilled users in the organization are able to identify relevant data and extract for analysis with EASE					
Skilled users in the organization USE advanced data techniques for modeling, optimization and analysis					
We use big data across the organization for decision making with EASE					

Section C: Organization's stakeholders influence on use of big data technology

7. To what extent do you agree or disagree with the following views regarding your organization's stakeholders influence on usage of big data to get an edge

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Top management ADVOCATES use of big data across the entire organization					
My organization has a key stakeholder who REPRESENTS big data interests in top management					
Colleagues INFLUENCE my progressive use of big data					
My organization ALLOCATES and approves sufficient budget for big data					

Section D: How organization's internal factors influence use of big data technology

8. To what extent do you agree or disagree with the following views regarding how your organization's internal factors influence usage of big data to get an edge

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Key users are technically KNOWLEDGEABLE in exploiting big data technology					
Decisions in the organization are GUIDED by insights derived from big data					
My organization HAS a collection of processes, roles, policies, standards, and metrics that ensure the effective and efficient use of data					
The organization is OPEN to acquiring new knowledge that leads to continuous change					

Section E: How organization's environmental factors influence use of big data technology

9. To what extent do you agree or disagree with the following views regarding how your organization's external factors influence usage of big data to get an edge

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My organization RELIES on cloud services for big data infrastructure					
My organization is familiar with government law on data protection and has taken initiative to COMPLY					
My organization's use of big data technology is INFLUENCED by what competition uses					
Market leaders regardless of industry INFLUENCE my organization's big data strategy					

Section F: Organization's competitive advantage through use of big data technology

10. To what extent do you agree or disagree with the following views regarding your organization's competitive advantage through use of big data technology

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Use of big data has IMPROVED productivity in the organization					
Use of big data has SHORTENED organization's response time					
Use of big data has resulted in GOOD feedback from customers to the organization					
Use of big data has resulted to GROWTH in organization value					