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PRELIMINARY INSIGHTS INTO RESEARCH MOTIVATIONS OF AFRICAN INFORMATION SYSTEMS RESEARCHERS

BY

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THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL IN MANAGEMENT INFORMATION SYSTEMS DEGREE.

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DECLARATION

I do hereby declare that this work is a result of my own research and has not been presented by anyone for any academic award in this or any other university. All references used in the work was fully acknowledged.

I bear sole responsibility for any shortcomings.

……. ……

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CERTIFICATION

I hereby certify that this thesis was supervised in accordance with procedures laid down by the university.

……..….. …….

PROF. RICHARD BOATENG DATE

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……..….. …….

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(Co-Supervisor)

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DEDICATION

I dedicate Preliminary Insights into Research Motivations of African Information Systems Researchers to the Almighty God who gave me knowledge and strength to carry out this work successfully. He has been my ever-present help in time of need. I also dedicate this study to my late dad, Mr. Gabriel Lartey Larkai and mum, Juliana Abiana Sackey, for her support throughout this project. Lastly, I dedicate this thesis to my future wife and children. I will be waiting for you.

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LIST OF ABBREVIATIONS

AIS	ASSOCIATION OF IS
AJIS	AFRICAN JOURNAL OF IS
BI	BUSINESS INTELLIGENCE
BMC	BIOMED CENTRAL
DOI	DIFFUSION OF INNOVATION
DSS	DECISION SUPPORT SYSTEM
E SCHOOL	ELECTRONIC SCHOOL
E-JOURNAL	ELECTRONIC JOURNAL
E-LEARNING	ELECTRONIC LEARNING
ICT	INFORMATION COMMUNICATION TECHNOLOGY
ICT4D	INFORMATION COMMUNICATION TECHNOLOGY FOR DEVELOPMENT
IS	INFORMATION SYSTEMS
IT	INFORMATION TECHNOLOGY
ITU	INTERNATIONAL TELECOMMUNICATION UNION
JMIR	JOURNAL OF MEDIA INTERNET RESEARCH
KM	KNOWLEDGE MANAGEMENT
MIS	MANAGEMENT IS
SA	SOUTH AFRICAN
SERVQUAL	SERVICE QUALITY
TAM	TECHNOLOGY ACCEPTANCE MODEL
TOE	TECHNOLOGY ORGANIZATION ENVIRONMENT
TPS	TRANSACTION PROCESSING SYSTEM
TTF	TASK TECHNOLOGY FIT
UTAUT	UNIFIED USE OF TECHNOLOGY ACCEPTANCE AND USE OF TECHNOLOGY

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ABSTRACT

The field of Information Systems (IS) over the last 5 decades of its existence has witnessed diverse research works in the advanced as well as the developing economies. As new concepts and issues in Information Communication Technologies (ICT's) continue to increase, continuous efforts are being made to document the research topics, theoretical applications and new trends. The advanced economies have predominantly set the pace and direction of research in the IS terrain. As a result, the IS field has further seen more research publications in the advanced economies. For the developing economies in Africa to catch up with the pace of ICT development in advanced economies, there is the need to understand how IS has been researched over the last decade in Africa. This study therefore did not only seek to explore the dominant trends, research themes and theories of IS in Africa but also serve as the basis to understanding motivations and trends in the development of IS in Africa over the last 5 years whilst making the study of ICT in Africa a good and attractive means of building knowledge in IS.

This study initially used systematic literature review of 5 important IS related databases. The massive database search resolved 1,832 research articles of which 202 were used for the study. These articles covered seventy-three Journals. African countries ranked in the top 20 of the International Telecommunication Union (ITU) index which were captured in the study. Subsequently, two rounds of Delphi interviews were used to garner responses from researchers across three geographical regions in Africa: South, East and the West African region. Both rounds of the Delphi technique had sixteen respondents each out of the 73 respondents invited to contribute to the study. The data from the first round was analysed by content analysis whilst the second round of Delphi was analysed by using content validity.

The findings established that the main research themes of studies undertaken by African IS researchers have been predominantly 'support and implementation' as well as the 'adoption

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and diffusion'. This finding was mainly prevalent in the Southern region of Africa namely: South Africa, Namibia, Zimbabwe and Malawi and West African region of Africa namely: Ghana and Nigeria. From the findings, most studies conducted in the African IS field are atheoretical (without theories). Hence there is a need for more theories in is research from Africa. Nevertheless, Technology Acceptance Model (TAM), Diffusion of Innovation (DOI) and Unified Use of Technology Acceptance and Use of Technology (UTAUT) were theories that were identified to be mostly used by African IS researchers from the findings.

Concerning the motivations that influence the selection of a publishing outlet or journal by an African IS researcher, the Research Topic and Area, Tier of the Journal, Recommendation from Other Researchers, Credibility with Respect to Peer ReviewLevel of Visibility, Ranking of Journal to mention a few, were the factors that the IS experts who partook in the studies agreed upon. The major motivations for studying certain research areas were determined as the 'courses studied', 'the academic background of the researcher', 'personal interest', 'impact of research on development', 'new research trends' as well as the 'technological trends in the environment'.

This study makes a key contribution to the existing body of IS knowledge and research by combining a rigorous systematic literature review as well as a Delphi technique in the same study to unearth the motivations that underpin the choices of African IS researchers. In relation to policy, it still remains true that the background of the researcher and the courses studied by the researcher influences some research decisions of African IS researchers. This provides the necessary basis to assert that policy makers must be ready to adjust the curriculum of universities and other higher learning institutions to provide sources of information that can stir up the interest of young researchers in emerging topics of research that have the potential

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

Information Systems (IS) as a discipline has been in existence for the last 5 decades (Willcocks & Whitley, 2009) and its pace and direction has been predominantly set by western and advanced economies of the world (Avgerou, 2008). Penetration of Information communication technologies (ICTs) in the late 2000s and early 2010s has increased across the African continent (Ponelis & Holmner, 2015) and this has reflected in the increasing number of research in IS in the various continents of the world: mainly the developing economies of Africa, Asia and the Latin America in diverse fields of study. However, studies from these developing economies have focused on a synthesis of the IS field and disciplines such as accounting (Amidu, Effah, & Abor, 2011), education (Boateng, Mbrokoh, Boateng, Senyo, & Ansong, 2016), healthcare (Vroom, Aryeetey, Boateng, Anto, Aikins & Gyapong, 2015) and marketing (Odoom, Narteh, & Boateng, 2017) to name a few.

These studies conducted in Africa are made up of a mixture of studies that have been empirically (Evans, Hackney, Raunier, Rawski, Yang & Johnson, 2014) and conceptually conducted (Heeks, 2010). Nonetheless, academic studies in IS have proved to be dynamic over time (Hanseth & Lyytinen, 2010; Liu, Li, & Zhang, 2014) and there is the need for African researchers to explore systematic ways in classifying the various research themes, theoretical underpinning as well as the motivations for using various theories in IS research (Hirschheim & Klein, 2012). Consequently, this view which is supported by Dwivedi, Mustafee, Williams and Lal (2009) that, majority of IS related research are constantly evolving over time, for instance, recent conceptualization of bright ICT (Lee, 2015), and therefore, there is the need to

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continually identify and document new theoretical developments that have been made with regards to IS research.

Nevertheless, researchers over time have found it difficult to remain knowledgeable of the countless number of facets and developments in the IS domain (Templier & Paré, 2015). A significant hindrance to scientific progress of researchers has been their limited ability to retain, organize and synthesize prior knowledge whilst remaining well-informed with new scientific contributions (Card, 2015). Thus, having a taxonomy of IS research is not only a tool for systematic sorting and statistical analysis, but it is also a good and attractive means of increasing knowledge and theoretical growth. This study will therefore map out the theories that are currently being used, previous and current developments in IS and how these are applied to existing theories (Eksioglu, Vural, & Reisman, 2009).

Thus, by reviewing literature of IS experts and scholars, a knowledge gap on IS has been identified. Therefore, to fill the gap, this study synthesizes research conducted over the last decade on IS in Africa to create a taxonomy of theories in several related areas and propose a research agenda (Han, Xu, & Chen, 2018). That is to say, the study synthesizes various IS research from diverse fields in Africa that would help draw up a roadmap of issues and pinpoint a list of elements: research theme, years of publication, theories, research methods and motivations. Thus, a review of prior literature and scholarly works provides a firm foundation to advance knowledge in the IS discipline (Eriksson & Kovalainen, 2015).

Additionally, an identified challenge in IS research has been the limited availability of academic work that have synthesized different economic underpinnings (George & Bock, 2011). Bound by the challenge mentioned earlier and other challenges of developing the field of IS research, the study seeks to identify and describe the research themes, trends and other

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characteristics of research works of African IS researchers by conducting a systematic review of literature regarding IS African researchers over the last decade.

1.2 Research Purpose

The study explores the dominant themes and theories of IS research in Africa. Furthermore, the study provides a categorization of the contemporary theoretical frameworks, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for future research.

1.3 Research Objectives

1. To explore the nature of IS research in Africa and identify an in-depth knowledge to why certain choices are made by IS researchers. This research objective is further broken into the following:
    a) To explore the dominant themes in IS research in Africa
    b) To explore technologies that have been studied in IS research in Africa
    c) To understand the motivations that underpin choices of researchers
2. To identify the significant scholarly trends relating to research issues, methodologies, conceptual approaches, topics considered as well as future research directions in the area.

1.4 Research Questions

1. What is the nature of IS research in Africa and why are certain choices made by IS researchers? This research question is further broken into the following:
    a) What are the dominant themes in IS research in Africa?

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b) What technologies have been studied in IS research in Africa?

c) What are the motivations that underpin choices of researchers?

2. What are the significant scholarly trends relating to research issues, methodologies, conceptual approaches, topics considered as well as future research directions in the area?

1.5 Significance of the Research

This study makes a key contribution to the body of IS knowledge and research by combining a rigorous systematic literature review as well as a Delphi technique in the same study. Thus, providing a foundation for researchers to explore the use of systematic literature review and Delphi technique. The study further seeks to provide understanding to the theories used in IS related research and to provide guidance to IS practice. Finally, the study will inform the policy making bodies on how to best improve the deployment and management of IS initiatives at the national and cross-country level.

1.6 Research Limitations

A key limitation of this study stays that, the email survey sent to the participant retrieved very low response rate. Also, the time allocation to the study limited the researcher from conducting more Delphi rounds to help scrutinize the relevant factors that were agreed upon by the participants.

1.7 Synopsis of the Study

The thesis is structured in six different chapters as explained below:

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Chapter One: Background: This chapter gave an outline of the research and it will cover the background of the research, research problem, research objectives of the study, the study's research questions and significance of the research and the synopsis of the study.

Chapter Two: Literature review: In this chapter, relevant literature to the study was reviewed. Literature on the field of IS research was mainly discussed. An empirical approach focused on the concept definition and the main research themes for the categorization in this study are discussed.

Chapter Three: Methodology: This chapter discussed the study's methodology adopted in conducting the research so as to find appropriate responses to the research questions posed. The research methodological approaches which highlights the research design, the systematic literature review, overview of the Delphi technique and the discussion of sampling techniques and size were utilized.

Chapter Four: Findings: In this chapter, the research data collected from the systematic literature review and the Delphi technique were presented.

Chapter Five: Analysis and Discussion; Analysis of findings and discussions were captured in this chapter.

Chapter Six: This chapter summarises the research, provides its implications and recommendations to research, practice and policy and highlights the future research directions.

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CHAPTER TWO

LITERATURE REVIEW

2.0 Chapter Overview

As noted in the previous chapter, the IS field of study has been studied globally and most of these studies conducted in the field of IS in Africa are a fusion of empirical and conceptual scholarly works. These IS studies in Africa need a systematic way to classify the various themes, theoretical underpinning as well as the motivations for using various theories in IS research. This chapter therefore seeks to review relevant literature in the field of IS. The chapter begins with an overview of IS field which pertains to the conceptual understanding of IS, in terms of its origins, definitions, components and classifications. This approach seeks to provide a basis for understanding IS as a field in modern day research.

2.1 Overview of IS Field

The concept of IS has been around since the 1960's when it was frequently denoted as "Management Information Systems (MIS)" (Hirschheim & Klein, 2012) and it been evolving over the decades. It was identified as the connection between management, computer science, and organizational theory, accounting and operations research (Davis & Olson, 1985). Each discipline conveyed a varying viewpoint regarding computer usage within organizations, but none of the various field focused specifically on the application of computers in organizations. However, IS as a field emerged and has evolved to do just that (Hirschheim & Klein, 2012).

Over the last five decades, the IS discipline has grown with new disciplines alongside new research communities. Major milestones that have supported the growth of IS include: the introduction of new journals (Journal of the Association of IS in the 2000s, Electronic Journal

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of IS in Developing Countries in the 2000s), new conferences (IS International Conference in 2011 and Conference on Information Technology and Organisations and Teams in 2007).

Furthermore, other researchers have strived to categorize IS research and its boundaries through the development of frameworks over the decades (Gorry & Scott Morton, 1971; Nolan & Wetherbe, 1980). These frameworks conflicted over time and hence led to various different names such as Information technology (IT), Information Management and MIS over time to label the field (Hirschheim & Klein, 2012). The fluid borderline of IS has also introduced the possibility of the field being dispersed into other fields both in research and academia overtime. For instance, in institutions of higher learning, departments like accounting offer courses in accounting IS whilst some marketing departments offer courses in Data mining and Ecommerce.

2.2 Defining IS Research

Many definitions provided to explain IS over the years have been done by researchers and book authors (Alter, 2008). Many of IS researchers have sought to define IS by describing it in two ways: (i) the components which make up the IS and, (ii) the contributions that the components make in an organization (Bourgeois & Bourgeois, 2012). Table 1.1 identifies how various researcher have defined IS over time.

It can be identified in the table that, earlier studies conducted in the 1990's and 2000's focused on defining IS as a human system (Falkenberg, 1998; Land, 1985; Symons, 1991) rather than highlight aspects that include the design and implementation of an IS. Most researchers identified the need to elaborate on the makeup and application of IS towards the latter years of the 2000. For instance, a study conducted by Jessup and Valacich (2008) and Kroenke (2008)

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discussed the components of IS, the relevance and the implementation of information in an organization.

The varying perspectives and definitions used to define IS by researchers can be extensively traced to the backgrounds, training and the differing interests of IS authorities like Keen (1987) who sought to shape the goal of IS research. Being mindful of the varying contributions in a holistic manner enables academicians to be effective and open minded rather than having a narrowed point of view to IS (ibid). Thus, an open mind towards IS enables researchers to capture emergent agendas that are arising as the IS field develops as well as the existence and other forms of IS (Galliers, 2003).

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Table 2. 1: Comparison of the definitions of IS.

Author	Context	Definition/ characteristics of IS	Hardware	Software	Data	People	Process
Land (1985)	IS	An IS is a social system, which has embedded in it information technology. The extent to which information technology plays a part is increasing rapidly. But this does not prevent the overall system from being a social system, and it is not possible to design a robust, effective IS, incorporating significant amounts of the technology without treating it as a social system.	✓	✓			
Symons (1991)	IS	An IS is a complex social object which results from the embedding of computer systems into an organization where it is not possible to separate the technical from the social factors given the variety of human judgments and actions, influenced by cultural values, political interests and participants particular definitions of their situations intervening in the implementation of such a system.	✓	✓		✓	
Falkenberg (1998)	IS	An IS is a subsystem of an organisational system, comprising the conception of how the communication- and information-oriented aspects of an organisation are composed (e.g. of specific communicating, information-providing and/or information-seeking actors, and of specific information oriented actants) and how these operate, thus describing the (explicit and/or implicit) communication-oriented and information-providing actions and arrangements existing within that organisation.				✓	✓

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Davis (2000)	IS	A simple definition might be that an IS is a system in the organization that delivers information and communication services needed by the organization.' 'This can be expanded to describe the system more fully. The IS or management IS of an organization consists of the information technology infrastructure, application systems, and personnel that employ information technology to deliver information and communication services for transaction processing/operations and administration/management of an organization.	✓	✓		✓	
Kroenke (2008)	IS	A group of components that interact to produce information. The five components of an IS are hardware, software, data, procedures, and people.	✓	✓	✓	✓	✓
Jessup and Valacich (2008)	IS	Assumed to mean computer-based systems, which are combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful information.	✓	✓	✓	✓	
Huber, Piercy and McKeown (2008)	IS	An organized collection of people, information, business processes, and information technology designed to transform inputs into outputs, in order to achieve a goal.	✓	✓		✓	
Laudon and Laudon (2011)	MIS	Interrelated components working together to collect, process, store, and disseminate information to support decision making, coordination, control, analysis, and visualization in an organization.			✓		✓

Source: Zervas, Proserpio and Byers (2015)

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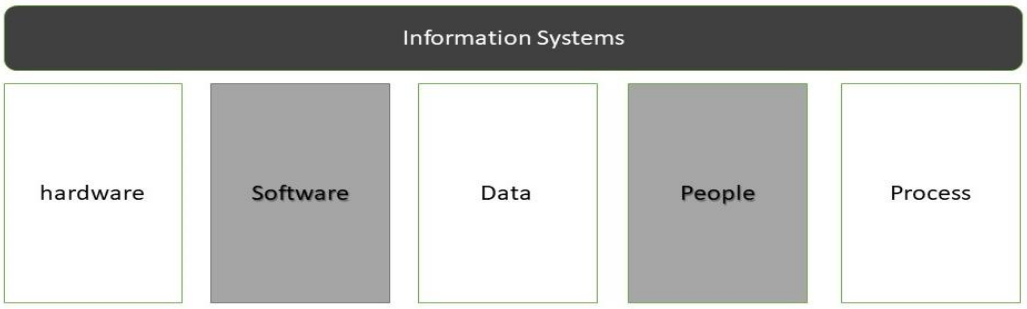
Though different authors conceptualize the definition of IS differently, common themes emerged among these various definitions as shown in table 1.1 above. For the purpose of this study, the definition given by Kroenke (2008) as "a group of components; mainly hardware, software, data, procedures, and people, that interact to produce information" was adopted. Kroenke's definition was adopted because, it highlights all the major components of IS.

2.3 Components of IS

The first three components in Figure 2.1 can be fitted under the technology category, are largely what most persons consider when defining IS (Bourgeois & Bourgeois, 2012). Nevertheless, the last two components, people and process, are what isolates the concept of IS from more practical fields, such as computer science. To be able to properly comprehend IS, there is the need to briefly explain how all the components work together to bring value to practitioners and academia.

Figure 2.1: Components of an IS



Source: Adapted from Sousa and Oz (2014)

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2.3.1 Hardware

The hardware component of the IS comprises of the physical components of the IS system that user touch and interact with (Laudon & Laudon, 2015; Rainer & Brad, 2016; Sousa & Oz, 2014).

2.3.2 Software

The software refers to the intangible set of instructions that informs the hardware on what to do (Laudon & Laudon, 2015; Rainer & Brad, 2016; Sousa & Oz, 2014).

2.3.3 Data

The data component refers to a cluster of facts that enable users of an IS make decisions (Laudon & Laudon, 2015; Rainer & Brad, 2016; Sousa & Oz, 2014).

2.3.4 People

People refers to the essential people who are involved with the IS (Laudon & Laudon, 2015; Rainer & Brad, 2016; Sousa & Oz, 2014).

2.3.5 Process

The latter component of IS process refers to a sequence of steps undertaken to achieve a desired outcome (Laudon & Laudon, 2015; Rainer & Brad, 2016; Sousa & Oz, 2014).

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2.4 Types of IS

The different types of interests, specialties and levels in an organization gives rise to the different types of IS (Laudon & Laudon, 2015). The authors further identified four main types of IS for management; transaction processing systems, management IS (MIS), decision-support systems and systems for business intelligence.

2.4.1 Transaction Processing Systems

A Transaction Processing Systems (TPS) is a computerized system that accomplishes and records the daily routine transactions necessary to conduct business (Stair, Moisiadis, Genrich, & Reynolds, 2011). The principal purpose of systems at this level is to answer routine questions and to track the flow of transactions through the organization (Laudon & Laudon, 2015). Furthermore, TPS are used in environments like the stock exchanges to handle stock trading and facilitate other salient activities like high request rates of information during peak times (Su & Iyengar, 2013). Other examples of TPS include payroll software like BambooHR and OnPay as well as sales order entry software like Megaventory and NuOrder.

2.4.2 Management Information Systems

Management Information Systems (MIS) can be defined as a system that uses the information needed by the management of an organization at every level in making strategic, tactical and operational decisions to support the planning, controlling and operational functions of an organization (Laudon & Laudon, 2015; Shah, 2014). MIS designates a precise category of IS which stands to serve management, by providing managers with data and reports on the organization's current performance (Tian, Wang, Li, Li, & Wang, 2007). Data on the

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organization's basic operations is supplied by transaction processing systems is summarized and provided to MIS (Laudon & Laudon, 2015). This information is further used to monitor the business and predict future performance. Thus, MIS consequently identifies as a tool which can help shape raw data of an organization into meaningful and ready information that can make impact in the organization's management (Behl & Singh, 2014).

2.4.3 Decision-Support Systems

Decision-Support Systems (DSS) can be defined as a system that assists a single manager or a proportionately small group of managers who are working on the solution of a semi structured problem as a problem-solving team by providing information or making suggestions concerning specific decisions (McLeod & Schell, 2007). Additionally, DSS focuses on problems that are unique and rapidly changing which are non-routine, for which the procedure for arriving at a solution may not be fully predefined in advance. Although DSS use internal information from TPS and MIS, they often bring in information from external sources, such as current stock prices or product prices of competitors. These systems use a variety of models to analyse the data and are designed so that users can work with them directly (Laudon & Laudon, 2015). Furthermore, many new technologies have been integrated into the development of DSS. These new developments include: DSS application in the macroeconomy regulation as well as DSS application in enterprise operations management (Tian et al., 2007).

2.4.4 Systems for Business Intelligence

Systems for Business Intelligence (BI) was proposed much earlier in the 1950's (Liang & Liu, 2018). Luhn (1958) initially began to describe BI as an automatic system that disseminates information and supports decision making process. BI has recently been defined as a system that is made up of both organizational and technical elements that offers past information to

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its users for analysis, query and reporting, to aid effective decision making and management support with the aim of increasing the business process performance (Trieu, 2017). Additionally, BI can be defined as a contemporary term for data and software tools for organizing, analysing, and providing access to data to help managers and other enterprise users make more informed decisions (Laudon & Laudon, 2015). BI systems enhance strategic management of organizations by enabling them to retrieve, store and analyse colossal data involving operations and in so doing help organizations gain competitive advantage of the industry (Herschel & Jones, 2005; Owusu, 2019). BI applications are not restricted to middle managers but can be found at the senior management level including systems for organizations at large. For instance, a study conducted by Owusu, Agbemabiasie, Abdurrahaman and Soladoye (2017) revealed that BI implementation amongst Ghanaian banks are far advanced. In this same regard, Owusu (2017) found out that BI systems adoption positively impacted the learning and growth, internal business process and customer performance of Ghanaian Banks. Additionally, Higher Educational Institutions (HEIs) in Malaysia's adoption of BI systems are influenced by Absorptive Capacity, Competitive Pressure, Complexity, IT Infrastructure, Presence of Champion, Top Management Support, and Vendor Selection (Owusu, Ghanbari-Baghestan, & Kalantari, 2017). Some benefits of BI systems that have been theorized include: provision of faster and more accurate reporting, improved decision-making process, improved customer satisfaction, increased revenues and increased competitive advantage (Owusu & Moyaid, 2016). Examples of BI include software and solutions provided by vendors such as SAS, Business Objects and COGNOS (Elbashir, Collier, & Davern, 2008).

2.5 Theories

A theory can be defined from varying perspectives depending on the objective of the definition (Boateng, 2018). Two important perspectives to defining a theory include the components or consistent elements of a theory and the purpose of the theory.

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The former, in terms of defining a theory according to its components or its consistent elements, can be defined as a system of constructs and prepositions that conjointly demonstrates a logical and yet systematic and coherent account of a phenomenon bounded by some assumptions and conditions (Bacharach, 1989). That is to say, a theory can provide a body of webbed knowledge that can be used for studying phenomenon with certain specific conventions serving as a guide.

The latter, defining a theory in terms of its purpose, can be defined as a 'coherent set of general prepositions used as principles of explanation, understanding and/or prediction of the apparent relationships of certain observed phenomena' (Zikmund, Babin, Carr, & Griffin, 2013). In its crux, a theory presents a way a phenomenon's concepts or variables can be studied with the purpose of finding the solution to a research problem (Boateng, 2018).

2.5.1 Purpose of Theories

According to Gregor (2006), there are four primary goals of a theory which can, debatably, be used as a taxonomy for classifying theories. The first goal is keenly aligned with analysis and description. He posited that theories provide an explanation of the phenomenon in question, further analyses the relationship amid those constructs, the degree to which the theory can be generalised within the relationships, and the boundaries with which relationship and observations hold. Additionally, theories help others to achieve thoughtful insights into the phenomenon of interest provide explanation. Also, theories enable prediction of future occurrences given that certain preconditions stand.

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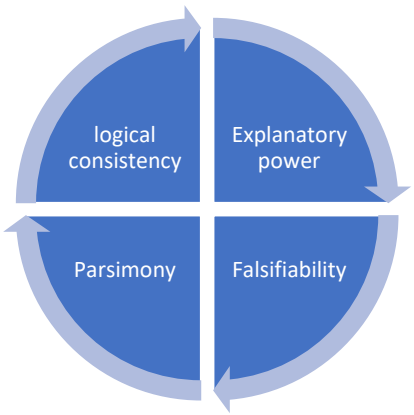
2.5.2 Attributes of A Theory

Apart from the above mentioned purposes being mostly associated with informing research and practice, Boateng (2018) highlights other benefits of theories that Bhattacherjee (2012), identifies as the characteristics of a theory such as providing an fundamental logic of the phenomenon of a social or natural phenomenon by further elucidating what the salient drivers as well as the relevant outcomes of the target phenomenon. He further postulated that, when a theory is associated with a phenomenon, it assists in providing explanations to the identified phenomenon. This means that theories must hold the overall power to explain or predict the behaviour of the phenomenon. the falsifiability characteristic elucidates that theories can be refuted or proved to be false. That is, it should be possible to disprove theories if the empirical data realized by researchers does not match with the theoretical constructs or propositions of the theory. Also, he further cited the parsimony of a theory as a characteristic of a theory. This characteristic of parsimony can be explained as theories are meant to be highly simplified and generalizable enlightenments of the phenomenon.

Figure 2.2: Attributes of A Theory



Source: Adapted from Boateng (2018)

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2.6 Classification of Research

Over the years, researchers have fashioned out most of the classification frameworks in IS research based on several dimensions. A greater number of studies that paid attention to meta-analysis articles based on two or more of the following dimensions: research topic, research methodology, research frameworks and paradigmatic research approach (Palvia, Kakhki, Ghoshal, Uppala, & Wang, 2015). For example, Boateng, Molla and Heeks (2009) who reviewed theoretical frameworks and approaches of E-Commerce in developing economies studied the Potential and Constraint, Adoption and Diffusion and Support and Implementation. Senyo, Addae and Boateng (2018) also examined literature on meta-analysis of cloud computing research in IS with the aim of taking stock of literature and their associated research frameworks, research methodology, geographical distribution, level of analysis as well as trends of these studies over the period of 7 years. With the aim of understanding the advancement and direction of IS studies Africa, it has become prudent to develop a robust logical and classificatory framework that aids in understanding and making sense of the trends in the IS field and subsequent analysis. Hence the classification scheme of Boateng, Molla and Heeks (2009) was adapted with some modifications in order capture the changes in IS research. Their study identified three major themes with sub themes. This study stands to build on their classification to include Design and Application as well as Impact.

2.6.1 Research Themes

As mentioned earlier, the theme classification was based on five key themes. These are potential and constraint, adoption and diffusion, support and implementation**,** design and application as well as impact.

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2.6.1.1 Potential Benefits and Constraints

This theme discusses publications that elicit the potential benefits and barriers to IS.

Opportunities

This sub theme pertains to scholarly works that identifies literature pertaining to the potential benefits of IS discussed in studies conducted by African IS researchers. These benefits span opportunities of higher productivity, reduction in transaction cost, access to new markets and opportunities to enable countries participate in international trade (Boateng et al., 2009).

Constraints

This sub theme refers to literature that argues the fundamental performance limitations that hinder the operationalization of IS (Chen, Fang, & Ishii, 2019) discussed by the researchers. It further comprises of publications that specifically discusses constraint to IS in African countries.

Adoption and Diffusion

This theme comprises of literature that discuss adoption as well as diffusion problems of various IS discussed by African IS researchers (Boateng et al., 2009; Molla & Licker, 2005).

Technology

This further includes literature that discusses the technological determining factors of IS adoption and diffusion discussed by African IS researchers. It also further comprises of the compatibility of existing technology, complexity as well as ease of use (Boateng et al., 2009).

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Managerial

This sub theme includes scholarly works that report on the managerial factors of IS adoption and diffusion by African IS researchers. The strategic vision and decision making of managers, commitment of top management and the innovativeness of managers are included in this sub theme (Boateng et al., 2009; Raza, Adenola, Nafarieh, & Robertson, 2015).

Organizational

This sub theme addresses literature that pertains to the factors of IS adoption diffusion by African IS researchers that basks the internal structure of the organization (Crespo, Rodrigues, Samagaio, & Silva, 2019). These include organizational readiness, functional differentiation and organizational innovativeness (Boateng et al., 2009; Weerd, Mangula, & Brinkkemper, 2016).

Cultural

This sub theme identifies literature that discusses the cultural factors of IS adoption and diffusion by African IS researchers (Boateng et al., 2009; S.-G. Lee, Trimi, & Kim, 2013). They include language, norms and values.

Environmental

This sub theme is also comprised of scholarly works that discusses the environmental factors of IS adoption and diffusion by African IS researchers (Boateng et al., 2009). These factors are mostly external to the organization or country and they include the readiness of organizational underpinnings and external pressures from industry, partners and entrants (Fu, Kok, Dankbaar, Ligthart, & van Riel, 2018)

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Interrelated

This sub theme includes literature that addresses a combination factors of IS adoption and diffusion discussed above. It also pertains to the adoption and diffusion factors that exist in the both the internal and external settings of the organization or country in question (Boateng et al., 2009).

2.6.1.3 Support and Implementation

This theme comprises of scholarly works that discusses support and implementation topics of various IS discussed by African IS researchers capable of influencing the institutionalization of IS after adoption (Boateng et al., 2009).

Strategy

This comprises of literature that discusses the strategies used by nations, organizations and industries with the aim of addressing the challenges of various IS. On the national level, these scholarly works deliberate and assess policies that empower countries to put up a complete IS structure to buttress institutional policies and make the intended impact to develop the nation (Darko & Chan, 2018). Also, pertaining to the organizational level, literature that evaluate and assess the strategies that delve beyond the IS adoption to identify the means of institutionalizing and entrenching IS into institutional procedures to attain the latent benefits (Boateng et al., 2009).

Consumer Behaviour

This sub theme discusses the scholarly works on topics interrelated to consumer behaviour in the operationalization of IS (Ali, Azad, Centeno, Hao, & van Moorsel, 2019; Boateng et al., 2009).

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Public Policy

This sub theme encompasses trust, legal and security issues that pertain to the use of IS (Khan & Salah, 2018). Agreements and policy which include trust, rights and trade policies that are carefully developed to facilitate IS usage amongst parties (Boateng et al., 2009).

Service Evaluation

This sub theme discusses publications that assess services provided by nations, organizations, industries and individuals using IS (Boateng et al., 2009; Lai & Bower, 2019).

Knowledge and learning

This sub theme encompasses literature on IS education, teaching, learning which influence the implementation of IS after adoption (Boateng et al., 2009).

Design and Application

This theme includes publications that discuss the technical design and application of IS. These encompass the functionality and features provided, and the technical development tools, systems and components used in IS (Olszak, Bartuś, & Lorek, 2018).

2.6.3 Impact

This theme identifies publications that evaluate IS net benefits as perceived by all key stakeholders. IS are long term investments expected to yield continuing flow of benefits (Joshi, Akbari, & Svensson, 2019; Litescu, Viswanathan, Lees, Knoll, & Aydt, 2015).

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2.6.4 Research Methodology Adopted in Articles Reviewed

Qualitative, quantitative, mixed methods, experiment, design science and 'no method classification were the main basis for the classification for the research methodology (Boateng, 2018; Palvia, Kakhki, Ghoshal, Uppala & Wang, 2015). The qualitative grouping pertained to articles that used qualitative techniques as a research method and collected data through observations and interviews. The quantitative grouping included those articles that used research techniques and approaches like the survey and questionnaires which are considered to be affiliated to the positivist paradigm. The mixed methods category included articles of both qualitative and quantitative methods(Myers & Liu, 2009). The experiment category referred to the category that sought to test a new idea using a computer program and setting. Design science category refers to articles that used design science as the research methodology (Senyo et al., 2018).

2.6.5 Geographical focus

The categories under this classification focused on articles based on the African country were the study engrossed or research data was gathered (Boateng, 2018). The cross-country category referred to articles that included more than one African country (Boateng, 2018; Senyo et al., 2018).

2.6.6 Level of analysis

This category considered the targeted group as well as the stage at which the study sought to investigate. IS research can be classified under 3 main categories; micro, meso and macro (Senyo et al., 2018). The micro level category pertains to individual whereas, the meso level

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category pertains to the organization or industries. Articles focused on the country or/and association of countries, for instance sub Saharan countries are classified under the macro category (Boateng, 2018).

2.6.7 Year of Publication

This category focused on the years in which the various articles reviewed were published (Boateng, 2018). Categorization by year of publication aids researchers to understand the rate at which the number of IS related articles published, increased or decreased over the coming years (Senyo et al., 2018).

2.7 Stakeholder involvement in IS Research

The stakeholders in a particular discipline of study are involved in influencing the nature and focuses of researches and projects undertaken most researchers (Phillipson, Lowe, Proctor, & Ruto, 2012; Sidorova, Evangelopoulos, Valacich, & Ramakrishnan, 2008). It has further been identified that a discipline's scope is built through an interaction process that takes place amongst stakeholders (Sidorova et al., 2008). These stakeholders in academia include scholars both within and from varying disciplines, private and public funding institutions as well as general phenomena in society. Furthermore, journal editors and editorial board members of key journals may be key in the nature and focus of researchers in the IS discipline. The main stakeholders for this research are the academicians and researchers that actively engage in research.

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2.8 Summary

The chapter began with an overview of IS field which pertains to the conceptual understanding of IS, in terms of its origins and definitions. The various components of an IS were then discussed. The classifications framework based on the research themes: potentials and constraints, adoption and diffusion, support and implementation, design and application as well as impact was discussed. Other themes of classification that were also discussed include: research methodology adopted in articles reviewed, geographical focus and level of analysis. The definition for theories, purpose of theories, as well as the attributes of theories used in IS research were discussed. Furthermore, the themes as well as sub-themes used in the classification of IS research was discussed.

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CHAPTER 3

METHODOLOGY

3.0 Chapter Overview

Understanding the various classification framework used by various IS researchers was the focus of the previous chapter. Chapter 2 illustrated the various key terms and themes employed in this study in the light of other classification studies conducted. With that background, this chapter focuses on the research methodological position employed in reviewing the various articles of IS research in Africa. This chapter discusses the research methods and strategies, Delphi method, panel selection and identification, data collection method and data analytical approach.

3.1 Research Design

Literature review can be undertaken in four varying ways within the qualitative and quantitative field, namely; descriptive, vote counting, narrative and meta-analysis approaches (King & He, 2006; Schmidt & Hunter, 2014). As such, this research espoused the meta-analysis technique for its literature review. Meta-analysis approach was selected because it provides a thorough description of an event or occurrence along with providing a valuation of the influence of the method of investigation on findings (Timulak, 2009). Furthermore, meta-analysis has been identified as a known choice due to the fact that it is able to provide statistical support for the study being undertaken (Senyo et al., 2018).

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3.2 Methodology for Systematic Literature Review

To acquire the right panel for this study, the researcher first conducted a systematic literature review of some electronic databases as this practice has become observable among IS researches (Petter & McLean, 2009; Senyo et al., 2018; Senyo, Liu, & Effah, 2019). Hereafter, using electronic databases were deemed appropriate. The articles reviewed underwent two phases of search. First, the Web of Science was searched. Web of Science, developed by Thomson Scientific, is a multidisciplinary research platform which enables simultaneous cross-searching of a range of citation indexes and databases, and it remains the most widely used indexes available (Falagas, Pitsouni, Malietzis, & Pappas, 2008; Sheffield, 2019). Secondly, a wider search was conducted in other electronic databases like the Ebscohost and ScienceDirect. These database sources have been considered to cover a prevalent number of the top fifty IS journals. Additionally, these databases were selected as a result of the supply of prime journals they provide in IS research. The search further narrowed down to empirical studies and peer-reviewed articles from 2008 and till 2018. Peer review according to Solomon (2007) is generally seen as vital for the role of forming an archive of knowledge and distributing rewards. Furthermore, peer review keenly plays a key role in validating the quality of research in a field. The assessed articles were screened manually to eliminate editorials; conference papers, review articles; and reports since the study set out to include only empirical and peer-reviewed articles in the review. The researcher further went ahead to conduct further checks to remove duplicates and other articles from other disciplines that did not use an IS perspective for their study.

To help capture relevant publications by African IS researchers and improve the quality of journal articles assessed for the study, the top 20 African countries from the 2017 ICT Development Index (IDI) of the International Telecommunication Union (ITU) was used. This was deemed necessary because the researcher considered that the level of ICT development in countries can influence the nature of studies carried out. The IDI is an amalgamated measure

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of 11 indicators that serve as a valid measure for assessing the development status of information and telecommunication technologies (ICT) at the country level since a nation's ICT achievement level is a significant driver of its socio-economic change. Furthermore, supplementary scrutinization was undertaken by visiting the profiles of each author of a selected publication using various databases like research gate, google scholar and the various websites the authors were found to be associated with.

The ICT Development index ranks countries by their general performance in ICT by regions and other categories year on year. Since the focus of the study was on African IS researchers, the African region ICT performance report was assessed pertained to the Africa. The figure below identifies the shortlist African countries.

Figure 3. 1: Distribution of ICT Development Index Top 20 African Countries

ICT Development Index 2017

#ITUdata

IDI 2017 Rank | IDI 2017 Map | IDI 2017 by Region

Select an option

IDI 2017 Regional Rank: Africa

	IDI 2017 Rank	Economy	IDI 2017 Value	IDI 2016 Rank	IDI 2016 Value	Rank Change
1	72	Mauritius	5.88	75	5.51	↑
2	90	Seychelles	5.03	92	4.80	↑
3	92	South Africa	4.96	88	4.91	↓
4	93	Cape Verde	4.92	91	4.83	↓
5	105	Botswana	4.59	102	4.51	↓
6	114	Gabon	4.11	118	3.62	↑
7	116	Ghana	4.05	113	3.88	↓
8	118	Namibia	3.89	123	3.33	↑
9	131	Côte d'Ivoire	3.14	134	2.84	↑
10	132	S. Tomé & Principe	3.09	131	2.91	↓
11	133	Lesotho	3.04	130	2.94	↓
12	136	Zimbabwe	2.92	133	2.85	↓
13	138	Kenya	2.91	137	2.67	↓
14	142	Senegal	2.66	142	2.48	–
15	143	Nigeria	2.60	143	2.44	–
16	144	Gambia	2.59	145	2.43	↑
17	146	Zambia	2.54	149	2.19	↑
18	149	Cameroon	2.38	150	2.14	↑
19	150	Mozambique	2.32	147	2.23	↓
20	152	Uganda	2.19	158	1.90	↑

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Source: International Telecommunications Union (ITU)
(https://www.itu.int/net4/ITU-D/idi/2017/index.html#idi2017byregion-tab)

The databases, Ebscohost and Science Direct were queried using a keyword-based search with the search string: "Information", "systems", "IS", "cloud computing", "Digital platforms", "Social Media" and "Big Data". "IS AND Africa", on the abstracts, keywords and titles across the databases.

The search was only limited to peer-reviewed scholarly journal articles from 2008 and till 2018. The resulting articles were subjected to manual filtering where editorials; review articles and reports were eliminated since only peer review articles were set out to be used in the study. In addition, conference papers, dissertations, book reviews and working papers.

From the searches undertaken across the databases, the table below displays the various databases searched, the total number of papers downloaded and the research papers that met the criteria of the study.

Table 3.1: Distribution of Databases and number of articles retrieved from search

Database searched	Number of Search results	Number of papers that met the criteria
WOS	936	102
AIS	234	65
AJIS	301	55
EBSCOHOST	175	49
ScienceDirect	186	61
Total	**1832**	**332**

Source: Author's own construct

From the table above, Web of Science yielded 936 articles from which 102 met the criteria. The AIS returned 234 articles whilst only 65 articles met the criteria. The AJIS also yielded

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301 articles whilst only 55 of the articles met the criteria. The broader search results from Ebscohost yielded 175 results with only 49 articles meeting the criteria. Science direct returned 186 search results whilst the number of papers that remained relevant to the study were 61. After duplication checks were carried out, only 202 out of 332 research articles were used for this study.

3.2.1 Ranking Experts by Number of ICT Published Papers and Geographic Regions

After acquiring a large list of experts, the number of ICT publications of these experts were compared, ranked in priority for the invitation to partake the study and categorized into the sub lists. These sub lists aided the researcher to create separate questionnaires to capture the motivations per number of ICT publications. The experts were also segmented into geographic regions for the Delphi interview.

3.3 Overview of the Delphi Method

The Delphi method has been posited to have originated in a series of studies conducted by Dalkey and Helmer (1962) for the RAND Corporation. The main objective of the Delphi technique was to present a way to obtain the most reliable consensus and consistency from a group of experts apropos a topic or area of interest (Okoli & Pawlowski, 2004; Paré, Cameron, Poba-Nzaou, & Templier, 2013).

The Delphi method primarily consists of a sequence of structured group processes, each referred to as a round, to survey expert opinion in order to reach a group response (Burt et al., 2009). Responses collected which may be in the form of opinions, beliefs, and judgments are organized in an orderly fashion that focuses primarily on building consensus on dissenting views (Steurer, 2011). The principles that back Delphi studies include individual feedback

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concerning a given area or questionnaire, valuation of the group's judgment or views, opportunities for individuals to revise their views and the anonymity for individual responses (Lilja, Laakso, & Palomäki, 2011; Worrell, Di Gangi, & Bush, 2013).

The Delphi technique is currently being used in extant studies relating to accounting, healthcare, communication, education and other scientific disciplines (Boulkedid, Abdoul, Loustau, Sibony, & Alberti, 2011; Keller & Heiko, 2014; Worrell, Di Gangi, & Bush, 2013).

Although, the traditional survey method could have been used to garner data from the sample size chosen concerning the motivations that underpin research work of African IS researchers, the Delphi method was judged to be a stronger methodology for an extremely thorough and careful query of experts. When the Delphi method compared to the traditional survey method, several advantages were highlighted over the later. The table below summarises various comparisons levels Delphi method and the Traditional survey.

Table 3.2: Comparison of Delphi Method with Traditional Survey

Evaluation Criteria	Delphi Study	Traditional Survey
Representativeness of sample	The Delphi method investigates questions and issues of high uncertainty, thus, a general population or a subset of the general population might not be sufficiently knowledgeable to answer the question accurately.	Using statistical techniques, researcher can randomly select a sample size that is representative of the population of interest.
Sample Size for significant findings	Delphi method literature recommends 10 -18 experts on a Delphi panel. Furthermore, the sample size for a Delphi study does not depend on statistical power but rather on group dynamics for consensus amongst exerts to be achieved.	The aim of a traditional survey is to generalize findings; thus, researchers are required to select a sample size large enough to detect statistically significant effects in the population.

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Individual Vs. Group response	Research has explicitly shown that for questions requiring expert judgment, the averages produced by group decision processes is by far, more superior than the average of individual responses.	Individual responses are averaged out by researchers to determine the average response for the sample which is generalized to the relevant population.
Anonymity	The respondents of a Delphi technique are always anonymous to each other but are never anonymous to the researcher. This gives the researchers more opportunity to follow up for clarifications and further qualitative data.	Respondents are almost always anonymous to each other, and often anonymous to the researcher.
Attrition effects (participant drop-out)	Attrition tends to be low in Delphi studies, and the researchers usually can easily ascertain the cause by talking with the dropouts.	Attrition for single traditional surveys is a non-issue. For multi-step repeated survey studies, researchers should investigate attrition to assure that it is random and non-systematic
Richness of data	Delphi studies inherently provide richer data because of their multiple iterations and their response revision due to feedback. Furthermore, Delphi participants tend to be open to follow-up interviews.	The richness of data depends on the form and depth of the questions, and on the possibility of follow-up, such as interviews. Follow-up is often limited when the researchers are unable to track respondents.
Construct Validity	In addition to what is required of a traditional survey, the Delphi method can employ further construct validation by asking experts to validate the researcher's interpretation and categorization of the variables. The fact that Delphi is not anonymous to the researcher permits this validation step, unlike many surveys.	Construct validity in a traditional survey is mainly assured by careful survey design and by pretesting.
Reliability and response revision	Delphi method pretesting is also an important reliability assurance. However, test-retest	An important criterion for evaluating surveys is the reliability of the measures.

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	reliability is not relevant, since researchers expect respondents to review their answers	Researchers are naturally able to assure this by pretesting and by retesting to assure test-retest reliability.

Source: Okoli and Pawlowski (2004)

3.4 Survey Structure and Design

3.4.1 Round 1 Delphi questionnaire

The first round of Delphi questionnaire sought to unearth the motivations that underpin studies undertaken by African IS Researchers. A draft survey was developed ad piloted by 2 individuals with similar profile to the targeted panellists which informed the final version that was developed after the piloting. The Delphi round 1 survey was limited to 8 open ended questions to allow panellist to express themselves. The open-ended questions identified participant opinions for use in round 2 as feedback. The round 1 survey had two parts; the first part had four questions elicited current personal opinions whilst the second part of the survey also had 4 questions that sought opinions on future directions.

3.4.2 Round 2 Delphi questionnaire

The round 2 questionnaire themed quantitative questions which contained 7 closed questions answered with a three-point scale (either “Agree”/ “Yes”, “May consider”/ “Neutral” and “Disagree”/ “No”).

3.5 Delphi Sample Population

The sample population for a Delphi study does not depend on a statistical sample that attempts to be representative of any population (Okoli & Pawlowski, 2004). Rather a group decision mechanism requiring qualified experts who have deep understanding of the research topic in

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question is required. Hence, one of the important aspects of a Delphi study is the selection of qualified experts. This study employed a two-tier selection process in order to ensure that the right experts are used for the study: reviewing literature to identify IS expert research who have journal publications and shortlisting the list to single IS experts who have more than 10 research publications. A total of 73 individuals were contacted with round 1 questionnaire from whom 16 usable responses were received, corresponding to 21.9 percent. The round 2 received 18 responses which corresponded to 24.65 percent response rate. A purposive and convenience sampling methods were adopted in the administration of the research questionnaire. Purposive sampling refers to the sampling technique that singles out a sample based on the researcher's judgement about some appropriate characteristics required of the sample (Boateng, 2018; Zikmund et al., 2013; Tongco, 2007) whereas convenient sampling technique refers to sampling technique of selecting respondents who are most conveniently available to respond to the study (Neuman, 2011). Since the study required certain characteristics of the respondents: respondents must be IS researchers from Africa and have a minimum of 5 research publications, it was deemed prudent to select purposive sampling as a sampling technique. Subsequently, convenience sampling was also selected as it was easier to access IS lecturers and Information Systems PHD students from the University of Ghana Business School who met the necessary criteria to partake in the study.

Cluster sampling which refers to a sampling technique where the entire population is divided into clusters or groups usually of geographic areas (Acharya, Prakash, Saxena, & Nigam, 2013) was adopted . The African continent was clustered into 5 geographic regions, namely: The North Africa, the South Africa, the East Africa, the West Africa and the Central Africa to aid the researcher in analysing the findings per region. North and Central African regions were deleted from the list of African regions used in the analysis since none of the selected expert

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respondents responded to the questionnaire sent to them, there by leaving the analysis to be undertaken between the South, East and West African regions.

3.6 Delphi Panel selection and identification

The Delphi method by its basic definition expedites a group consensus building technique (Habibi, Sarafrazi, & Izadyar, 2014; Rodríguez-Mañas et al., 2012). Since the quality of data from a Delphi study is only as good as the calibre of panel (Madsen et al., 2016), a lot of consideration went into IS experts were selected to serve on the panel for this study. The main criteria for selection was that the respondents must be an African and must have published not less than 5 research papers on ICT.

3.7 Delphi Data Collection Method

The main objective of this study was to explore what influences the research topics, choice of use of theories and the research interests of African IS researchers. Thus, from the knowledge and expertise of the panel of experts, a was consensus regarding the essential factors that underpin the research works of African IS researchers used as a basis to design the questionnaire.

The Delphi method was chosen as the data collection tool for this study due to the fact that it provides a basis for a consensus that would unearth the experiences and knowledge of the panel of experts from an IS perspective, provided the underlying premise from which group consensus was built is met (consensus level of 0.70). The Delphi study had two rounds. The first round of the Delphi study included eight opened ended questions designed to try to obtain a broad range of responses. These eight opened ended questions had two main parts. The first part involved questions that sought to find out more about the factors that affect the current

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choices of respondents in research. The second part of the interview guide involved questions that focused on the future directions of IS research in the African domain. The questions posed to the panel of experts have been listed in the Appendix B.

3.7.1 Mechanism for administering the questionnaire

The Delphi questionnaires was administered using emails and WhatsApp. These media were chosen because they enabled a quick turnaround time between the questionnaires.

3.8 Delphi Data Analysis

Both Qualitative and quantitative data were retrieved from the data collected. The sub sections below discuss in detail the procedure that were used to analyse both the qualitative and quantitative data.

3.8.1 Qualitative Analysis

The responses from the first round of the Delphi were qualitative in nature, thus, they were amalgamated. Separate list of answers was unearthed to echo the input for each question. Thus, similar responses from each question were consolidated. This then served as the basis for the second round of the Delphi study. The second round of the Delphi study included instructions for the Panel of experts to rank the responses provided in from the open-ended question in Delphi 1. Explicitly, the participants were asked to indicated whether they ‘Agree’, ‘Remain Neutral’ or ‘Disagree’ to each of the responses from the factors that influenced their area of research, the factors that influenced their choice of theoretical frameworks for research, factors that influenced their choice of research methodology used to conduct a research, the factors that influenced their choice of publishing outlet researchers chose, the likely areas they are considering to research into in the next two years, the top research areas they consider under-

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researched in Africa and the research areas that they assume would be very relevant to Africa in the next five years. Individual responses from the second round of the Delphi study were collated, weighted and the individual responses generated from Delphi round 2.

3.8.2 Quantitative Analysis

The analysis of the quantitative data collected from the Delphi study was largely undertaken using Content validity data analysis technique as used by Polit and Beck (2006).

Content Validity

Content validity has been described over the years in varying studies and Table 3.3 summarizes some definitions of content validity by some authors.

Table 3.3:Definitions of Content Validity

Author	Definition
Wynd, Schmidt and Schaefer (2003)	The extent to which an instrument adequately samples the research domain of interest when attempting to measure phenomena.
Polit and Beck (2004)	The degree to which an instrument has an appropriate sample of items for the construct being measured.
Waltz, Strickland, Lenz and Soeken (2005)	Whether or not the items sampled for inclusion on the tool adequately represent the domain of content addressed by the instrument.
Polit and Beck (2006)	A posteriori effort to evaluate the relevance of the scale's content through expert assessment.

Source: Author's Own Construct

A careful look at these definition from the table above elucidates a general agreement that content validity, is related to the degree to which a sample of items inclusively constitute a

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suitable operational definition of an idea. Thus, content validity is a method of quantifying the degree of agreement amongst experts regarding the content relevance of a proposed instrument. The most widely stated measure of content validity is the Content Validity Index (CVI). But the CVI has received a fair share of criticism from researchers. For example, Wynd, Schmidt and Schaefer (2003) argued that the CVI discards information by collapsing expert's multipoint ordinal ratings into two categories, that is, relevant or not relevant.

Item Content Validity Index (I-CVI)

Researchers have been identified to compute the I-CVI. The item CVI refers to the content validity of individual items. Researchers generally use the I-CVI computed information to guide them in revising, deleting, or substituting items (Polit & Beck, 2006).

To determine the I-CVI, the "Agree"/ "Yes" responses for each individual item was added and then it was divided by the total number of experts who responded to that item expressed as a percentage (Polit & Beck, 2006). This could be mathematically represented in an equation as;

$$\text{I-CVI} = \frac{\sum x}{E} \text{ x } 100 \text{ percent}$$

where *x* refers to the number of "Agree"/"Yes"

E refers to the number of experts

A response may be deemed valid when it attains a pre-set level of consensus (agreement between experts). The pre-set consensus level in some studies vary between 51 percent and 80 percent. It is however worthy to note that, the larger the number of participants, the lower the level of consensus expected (Keeney, Hasson, & McKenna, 2006). Being mindful of the fact that the larger the expert number, the harder it is to attain consensus (agreement), the pre-set

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item consensus level for this study was set at 70 percent. This level of consensus was identified as being strong for fewer participant numbers (less than 20).

3.9 Summary

This chapter provided a synopsis for the methodology that was employed in this study. A review of the scope of the panel selection and identification was presented. the section procedures for the sample (panel of experts) was reviewed.

Justification to the indicate that the Delphi method was an effective methodology to use to build group consensus regarding the complex topic of explore what influences the research topics, choice of use of theories and the research interests of African IS researchers. A review of data collection, data analysis, and impact of data on subsequent rounds of the Delphi were discussed.

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CHAPTER FOUR

RESEARCH FINDINGS

4.0 Chapter Overview

The previous chapter described the methodology for this study. It further presented the research design, an overview of the Delphi method and the data collection method used for this study. This chapter first presents the findings from the literature review to provide a foundation for the presentation of the Delphi study findings. The Delphi study findings are then presented in order of the rounds in which they were conducted, Delphi round 1 and Delphi round 2. This will serve as a footing for the analysis and discussion of the findings in the next chapter.

4.1 Findings from the Systematic literature Review

4.1.1 Publication outlets

Table 4.1 below presents the publication outlets and the number of journal articles published.

Table 4.1: Distribution of Publishing Outlets

Publishing Outlet	Totals	Percentage
AJIS	98	48.8
Others (Outlets with less than Two Articles)	63	31.5
South African Journal of information Management	6	3.0
Information Technology for Development	6	3.0
Information development	5	2.5
International Journal of Medical Informatics	4	2.0
International Journal of Information Management	4	2.0
Telematics and informatics	4	2.0
Emerald Emerging Markets Case Studies	4	2.0
Plos one	4	2.0

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Publishing Outlet	Totals	Percentage
Telecommunications policy	3	1.5
Health Information Management Journal	3	1.5
Future Generation Computer Systems	3	1.5
SA Journal of Human Resource Management	3	1.5
International Journal of Information Security Science	3	1.5
The Electronic Journal on IS in Developing Countries	3	1.5
Electronic Commerce Research and Applications	2	1.0
BMC medical education	2	1.0
BMC health services research	2	1.0
JMIR medical informatics	2	1.0
Government information Quarterly	2	1.0
International Journal of Educational Sciences	2	1.0
Procedia Social and Human Behaviour	2	1.0
Health policy and Technology	2	1.0
Journal of Enterprise Information Management	2	1.0
Global Health Action	2	1.0

Source: Author's Construct

The AJIS had 98 research articles from the findings. This finding was not surprising as the African Journal of Information Systems mainly deals with African related research articles. The focus of this research was on African researchers, hence the reason that most of the research articles were from the AJIS.

Outlets with less than Two Articles referred to articles that recorded only one (1) article from their journal. They include Journal of Biomedical informatics, Journal of the American medical informatics association, Methods of information in medicine, South African Journal of Science, Research in comparative and international education, African journal of business management, Financial innovation amongst others.

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4.1.2 Research Themes

The presentation of articles classified under the IS research themes are as follows. The adoption and diffusion theme recorded (31.9 percent), design and application (11.3 percent), potential and constraints (7.3 percent), support and implementation (33.1 percent) and impact (16.5 percent).

Figure 4.1 Distribution of articles under the respective research themes.

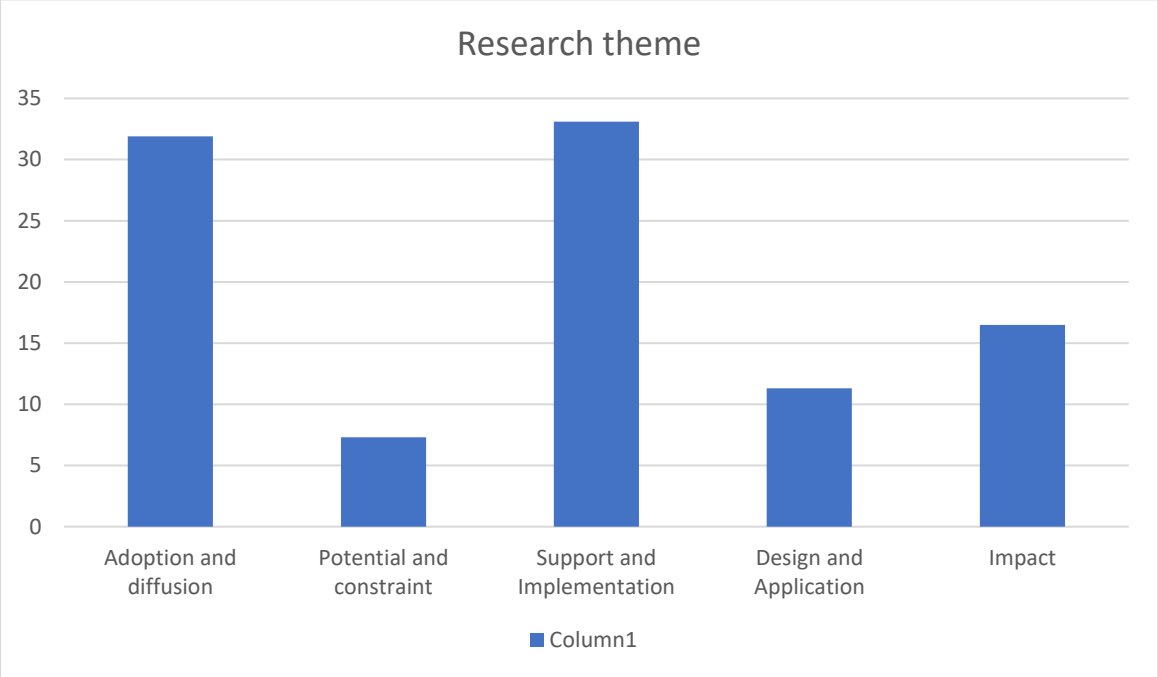

Figure 4. 1: Research Themes

4.1.3 Year of Publication

The categorization by year of publication presented a growing trend of articles published by African IS researchers. Figure 4.2 displays the distribution of articles by year of publication. In the year 2008, 4 articles were recorded. The next year, 2009, saw a rise in the number of articles (6) recorded and then it reduced in the year 2010 to 5 articles. Successive years recorded a progressive rise in the number of articles published by IS researchers.

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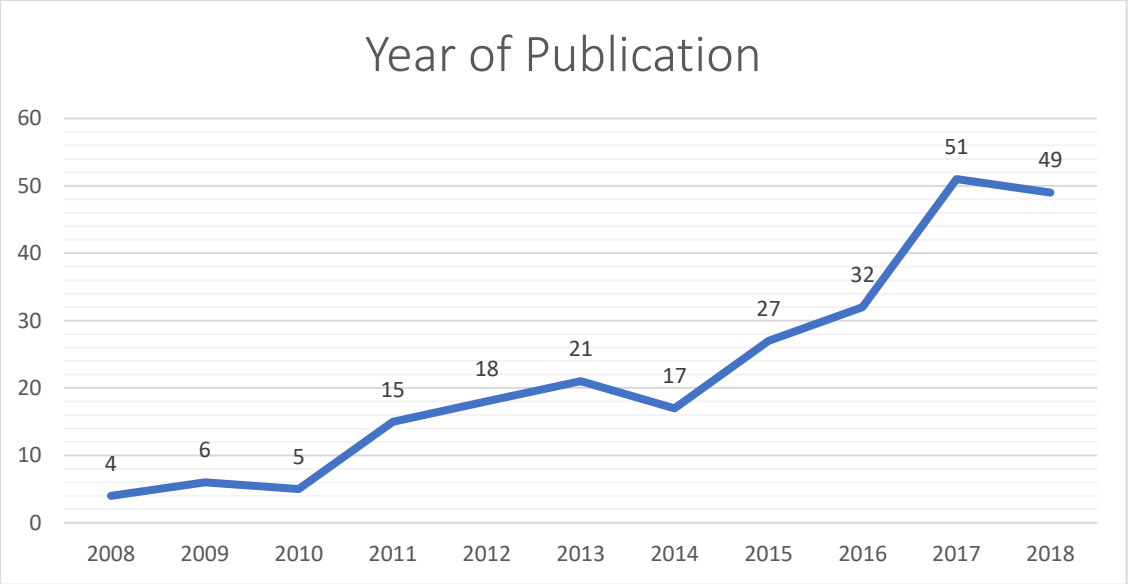
The year 2011 saw 15 articles published, followed by 2012 with 18 articles, then 2013 with 21 articles, followed by 17 articles in 2014, 2015 saw a sharp rise in the number of articles published with 27 articles, then 2016 with 32 articles, and 2017 together with 2018 recorded 51 articles and 49 articles respectively. In view of the increasing number of articles over the years, it can be predicted that there is a steady rise in the number articles published by IS researcher and these number would continue to rise.

Figure 4.2: Year of Publication



Source: Author's Own Construct

4.1.4 Research Methodology adopted in articles reviewed

With regards to the research methodologies utilized in the articles reviewed, most studies conducted by IS researchers that are more quantitative in nature recorded the highest tally of 36.6 percent, followed by qualitative studies with 33.3 percent and then mixed method 13.5 percent. The remainders are simulation/experimentations (11.4 percent), design science (2.4 percent) was first recorded in the data set in 2014 (0.4 percent) and was fairly being used by most IS researchers in 2018 (1.8 percent). Studies classified as under "other methodologies" category, 2.8 percent, refer to those studies which included data envelopment analysis, case

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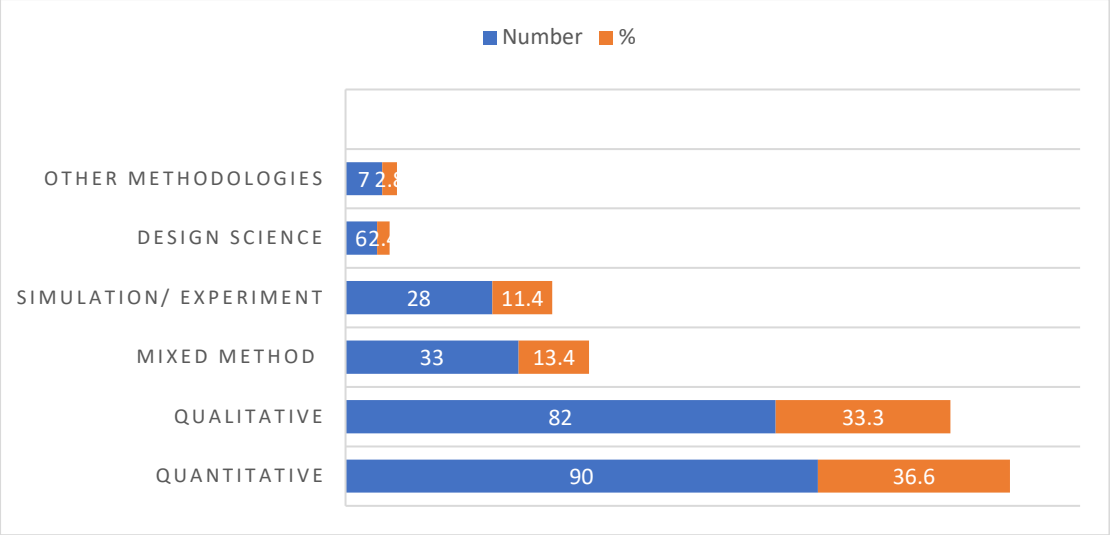
building and living lap methodologies. Figure 4.3 displays the distribution of the articles per research methodologies utilized according to their number and percentages.

Figure 4.3: Research Methodology adopted in articles reviewed



Source: Author's Own Construct

4.1.5 Level of Analysis

This section (Figure 4.4) pertains to the levels at which the studies reviewed were conducted. The findings in this sub section were however not surprising that majority of the articles were in the "micro" category (62.2 percent) as most of these articles were in adoption and diffusion. Thus, these IS articles provide a body of knowledge that are applicable to individuals. Grounded articles selected for this study, the statistics proved that, studies conducted under the "meso" category and the "macro" were 27.9 percent and 14.1 percent respectively.

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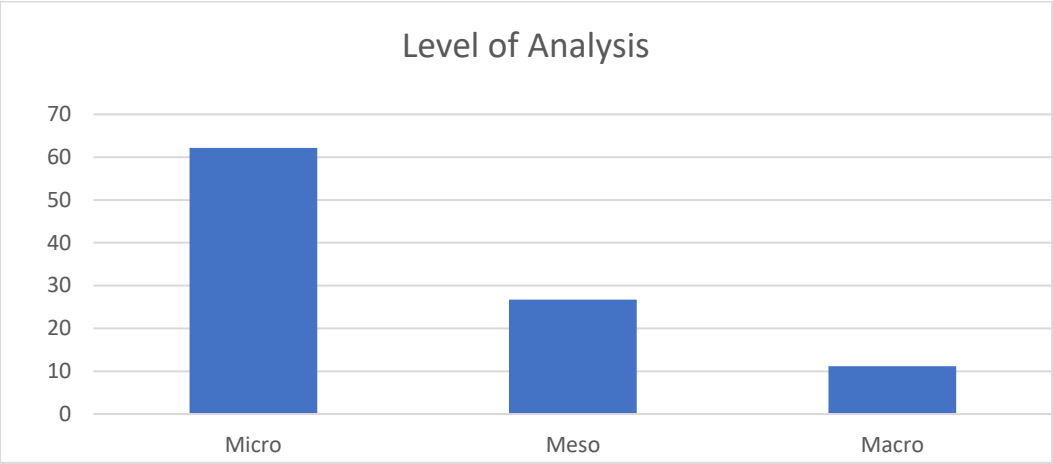
Figure 4.4: Level of Analysis



Source: Author's Own Construct

4.1.6 Geographical Focus

The evidence gathered from articles in various journals for this study indicates, that South Africa (37.3 percent) has more IS researches conducted in the country and about the country. Articles in the "cross country" category (13.3 percent) cover studies in two or more countries. The rest of the distribution are as follows, Ghana (13.3 percent), Kenya (8.4 percent), Nigeria (5.6 percent), Uganda (4.4 percent), Tanzania (3.6 percent), Ethiopia (2.0 percent), Malawi (1.6 percent), Botswana (1.6 percent), Namibia (1.2 percent), Zimbabwe (1.2 percent), Mozambique (0.8 percent), Mauritius (0.8 percent), Rwanda (0.8 percent), Libya (0.4 percent), Burundi (0.4 percent), Mali (0.4 percent), Congo (0.4 percent), Sierra Leone (0.4 percent), Egypt (0.4 percent), Cameroon (0.4 percent), Senegal (0.4 percent), Burkina Faso (0.4 percent) and Morocco (0.4 percent). Figure 4.5 shows the distribution of articles.

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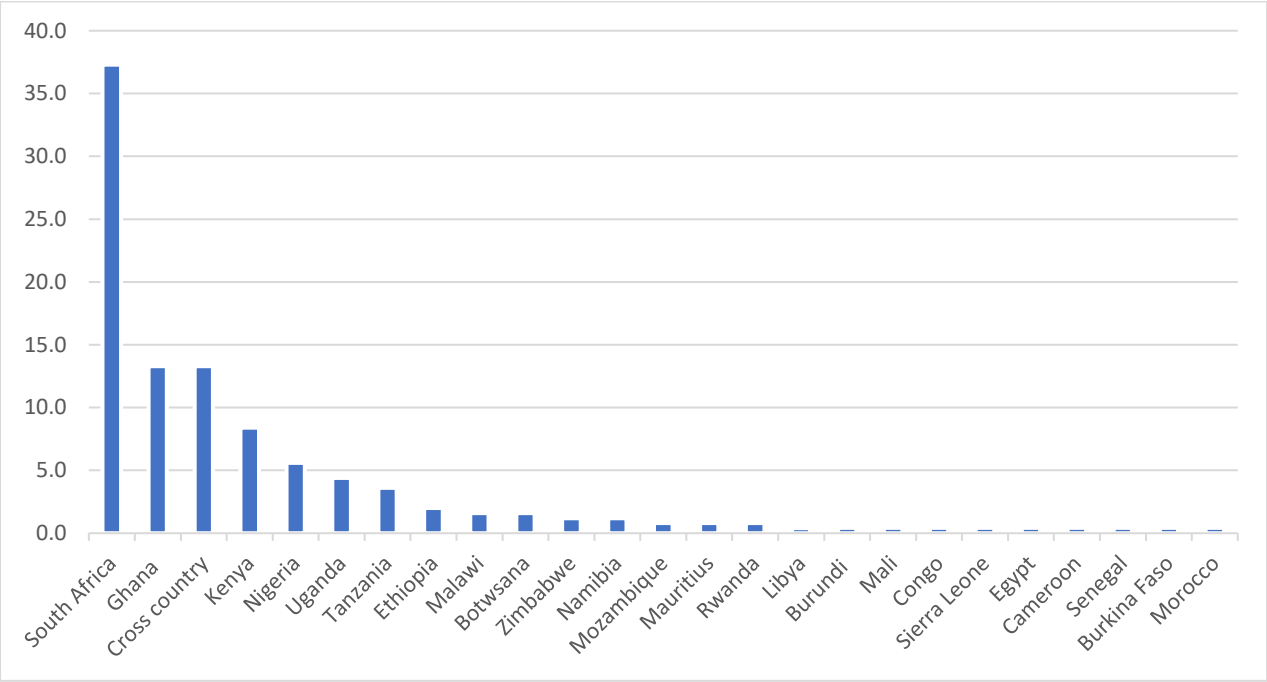
Figure 4.5: Geographical Focus



Source: Author's Own Construct

4.1.7 Research Frameworks

Based on the research frameworks, model and theories articles reviewed were categorized. The findings indicated that, most of the studies did not use theories frameworks (55.2 percent). Nevertheless, the frameworks used in some of the articles include TAM (Eelu & Nakakawa, 2018), UTAUT (Olasina, 2015), Diffusion of Innovation (Ogunyemi & Johnston, 2015), Actor Network theory (Effah & Nuhu, 2012;), TOE (Kademeteme, Kalema & Pretorius, 2016), grounded theory (Brandon, 2013), Structuration theory (Bernardi, 2017), design theory (Khanyile & Coetzee, 2018), Delphi technique theory and Unified Model of Electronic Government Adoption (UMEGA).

Amid the articles reviewed, TAM recorded 4.1 whilst UTAUT recorded 3.4 percent, Diffusion of Innovation recorded 3 percent and TOE had 2.6 percent. Some other publications combined

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two or more theories in their study. Table 4.2 illustrates the distribution of the articles by their respective research frameworks.

Table 4.2: List of Theories Extracted from Reviewed Publications

Research theory	No.	Percentage
No Theory	148	55.6
TAM	11	4.1
Diffusion of Innovation	8	3.0
UTAUT	6	2.3
Structuration Theory	5	1.9
TOE	4	1.5
Grounded Theory	3	1.1
Critical Social Theory	2	0.8
Social Ecological Theory	2	0.8
Theory of Planned Behaviour	2	0.8
Unified Model of Electronic Government Adoption (UMEGA)	2	0.8
Activity Theory	2	0.8
Resource Based Theory	2	0.8
SERVQUAL	2	0.8
Absorptive Capacity	1	0.4
Analysis and Development Framework	1	0.4
Attitudinal Theory	1	0.4
Attribution Theory	1	0.4
Batho Pele Framework	1	0.4
Boundary Resources	1	0.4
Cognitive Theory	1	0.4
Contingency Model	1	0.4
Critical Discourse Analysis	1	0.4
Data Analysis Envelopment (DEA) Model	1	0.4

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Delone And Mclean Is Success Model	1	0.4
Delphi Technique Theory	1	0.4
Dependency Theory	1	0.4
Discrepancy Theory	1	0.4
Disruptive Innovation Theory	1	0.4
Economic Growth Theory	1	0.4
Economic Production Theory	1	0.4
Ehealth Behavior Management Model	1	0.4
Electronic Marketplace Theory	1	0.4
Equity Theory	1	0.4
E-School Success Model	1	0.4
Farrell Framework	1	0.4
Generational Cohort Theory	1	0.4
Improvisation Theory	1	0.4
IS Success Model	1	0.4
Institutional Theory	1	0.4
Intellectual Capital	1	0.4
Intermediation	1	0.4
Johnson's Model	1	0.4
KM Theory	1	0.4
Knowledge Based	1	0.4
Modernization Theory	1	0.4
Network Theory of Social Capital	1	0.4
Neutralization Theory	1	0.4
Open System Theory	1	0.4
Service Management Model	1	0.4
Situational Awareness Theory	1	0.4
Social Cognitive	1	0.4
Social Contract Theory	1	0.4
Social Exchange Theory	1	0.4

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Soft Set Theory	1	0.4
Speech Act Theory	1	0.4
Theory of Emancipation	1	0.4
Theory of Reasoned Action	1	0.4
Transparency Theory	1	0.4
Probit, Ordered Probit Model and Tobit Model	1	0.4
Batho Pele Framework and SERVQUAL	1	0.4
Critical Social Theory, Theory of Emancipation	1	0.4
Diffusion of Innovation and TAM Model	1	0.4
Diffusion of Innovations Theory and The Toe Model	1	0.4
Equity Theory and Discrepancy	1	0.4
Intellectual Capital, Resource Based, Knowledge Based	1	0.4
Intermediation, Electronic Marketplace Theory, and Transparency Theory	1	0.4
Organisational Onion and Organizational Morphology	1	0.4
Situational Awareness Theory, Disruptive Innovation Theory	1	0.4
TAM 2 and Indicator of Resilience Model	1	0.4
TAM and Diffusion of Innovation Theory	1	0.4
TAM, TTF And Social Cognitive	1	0.4
Task Technology Fit and UTAUT	1	0.4
Technology, Individual, Process-Fit Model	1	0.4
Theory of Planned Behaviour and Diffusion of Innovation Theory	1	0.4
Theory of Trust in Social Exchange, IS Success Model and Attribution Theory	1	0.4
TOE Model and UTAUT Model	1	0.4
TOE, TAM, Social Identification Theory	1	0.4
UTAUT 2 and E-government Adoption Model	1	0.4
Theory of Planned Behaviour and TOE	1	0.4
Social Contract Theory, Social Ecological Theory	1	0.4
	266	100.0

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Source: Author's Own Construct

4.2 Presentation of the Delphi Round 1 Findings

The first round of the Delphi study included the eight open-ended questions that were designed to try to obtain a broad range of responses (Appendix B).

A total number of 16 respondents partook in the first round of the Delphi interview. The responses from the first round of the Delphi were consolidated. Also, similar responses to each of the questions were also consolidated. Separated lists were advanced to reflect responses to each question. Checks were made to eliminate non related or incomplete responses.

The table 4.3 below elucidates the interview questions submitted to the panel of experts and the responses in each of the areas of inquiry for the Delphi round one. The first column lists the question posed to the respondents and the second column contains the responses pertaining to the questions asked.

Table 4.3: Interview questions submitted to the panel of experts and their responses

Interview Question	Delphi Round One Responses
1. What influences your choice of area of research?	1 Courses studied
	2 Academic background
	3 Personal interest
	4 Current social Issues
	5 Impact of research on development
	6 Ability to impact development
	7 Supervisor's preference
	8 Research problems
	9 Research gaps
	10 New trends
	11 Industry problems
	12 Institutional research environment
	13 Technological trends
	14 Scholarly relevance
	15 Policy relevance
	16 Challenges in current environment
	17 Scalability of the research to other contexts
	18 Call for papers
	19 Global trends
	1. Research questions

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2.What influences your choice of theoretical frameworks for research?	2. Awareness of the theoretical framework
	3. Relevance of framework to the study
	4. Research problem identified
	5. Desired outcome of the study
	6. Type and context of the research.
	7. Personal research orientation
	8. Research paradigm
	9. Ability to contribute to the theory
	10. Fitness of the theory
	11. Experience and knowledge
	12. Research objectives
	13. Application of the theory in extant literature
	14. Relevant factors to be studied
	15. Applicability of the theory to the context
	16. Ability to make modifications to the theory
3. What influences your choice of research methodology used to conduct a research?	1. Research's background of study
	2. Nature of courses studied
	3. Methods used by existing research
	4. Relevance to the study
	5. Time allocated to the study
	6. Value that I may from the responses
	7. Level of familiarity
	8. The problem at hand
	9. Nature and context of the study
	10. Research paradigm
	11. Research questions
	12. Personal skills and training
	13. Application in the extant literature
	14. Its robustness and relevance to the problem statement
	15. Its consistency with the data behavior
	16. Available funds
	17. Type of data required for meaningful and relevant results.
	18. Type of data to be gathered
	19. Theoretical framework used
	20. Stated purpose of the study
4. What influences the choice of publishing outlet researchers chosen? *	1. Research topic and area
	2. Tier of the journal
	3. Impact score
	4. Recommendation from other researchers
	5. Scopus index
	6. Accredited by the ministry of higher education for subsidy purposes
	7. Credibility with respect to peer review
	8. Level of visibility
	9. Publication forums with higher impact factor for my paper to get cited

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	10. Ranking of journal
	11. Potential of being published very fast
	12. The nature of topic
	13. Where I can make more impact
	14. Academic status
	15. Career trajectory
	16. Quality of manuscripts
	17. Co-authors
	18. Suitability
	19. Institutional environment
	20. Ranking of the journal
	21. The area of specialization of the journal and its readership
	22. Supervisors' recommendations
	23. The list of approved publishing outlets in my department
	24. Level of acceptability
5. What are the top 2 research areas you have undertaken in the past 5 years?"	1. Cyber crime
	2. Mobile application development
	3. Information security and privacy
	4. Social media engagement
	5. Telework
	6. Ict4d
	7. Health informatics
	8. ICT in agriculture
	9. ICT in health
	10. Learner analytics
	11. E-learning
	12. E-commerce
	13. Nexuses between information technology and development outcomes
	14. ICT in education
	15. Technology enhancing learning
	16. IS for disaster management
	17. Cloud computing
	18. Big data analytics
	19. Impact of ICT on reading culture and research in developing countries
	20. Innovation diffusion
	21. Information security
	22. E-learning
	23. Digital business strategy
	24. Acceptance of eLearning systems
	25. Management theory
6. What are the top 2 research areas you are considering to research in the next 5 years? *	1. Artificial intelligence
	2. Church IS adoption
	3. Information security
	4. Ethical computing

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	5. Ict4d
	6. Health informatics
	7. Blockchain
	8. ICT in Health
	9. ICT in Education
	10. BI
	11. Social media analytics
	12. Pre cognitive systems
	13. Sustainable digital transformation
	14. Digital business innovation
	15. Machine learning
	16. Educational quality assurance
	17. Adoption of medical decision support systems in developing countries
	18. Extension of mobile virtual network operations into the delivery of competitive mobile provision in developing countries
	19. Enterprise informatics
	20. Cyber psychology
	21. Digital business strategy
	22. Internet of things
	23. Cryptocurrency
	24. The sharing economy
	25. Artificial intelligence
	26. Robotics
7. Are there any areas in ICT in the African context you consider under researched which researchers can take advantaged?	1. IT investment
	2. Blockchain
	3. Big data
	4. ICT and the SDG's
	5. Natural language processing
	6. Machine learning (supervised and unsupervised)
	7. Developing academic textbooks to Teach ICT in Africa
	8. Culture and AI
	9. Digital agriculture
	10. Socio-political impact of emerging technologies (in some countries social
	11. Media is destroying the socio-political fabric)
	12. Learning analytics
	13. Educational quality assurance
	14. Mobile banking adoption
	15. Development of smartphone apps to support sustainable farming and advertising
	16. Of farm produce through apps to larger markets
	17. ICT usage in mobile and remote healthcare delivery and diagnosis of diseases
	18. Cyber psychology
	19. Privacy of data

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	20. Cryptocurrency
	21. Ict4d
	22. Sharing economy
	23. Artificial intelligence
	24. Robotics
	25. Outsourcing it capabilities
8. In your opinion, which ICT areas of research that would be very relevant to Africa in the next 5 years?	1. ICT for Development
	2. Distributed teamwork
	3. Mobile computing
	4. Blockchain
	5. Big data
	6. ICT and poverty eradication
	7. Natural language processing
	8. Machine learning (supervised and unsupervised)
	9. Socio-economic development
	10. Data Analytics in Government
	11. Sustainable digital transformation of different economic sectors (agriculture,
	12. Health, education; governance etc.)
	13. Learning analytics
	14. Using mobile and smartphones for all aspects of business, health and education
	15. Through cloud hosted services and big data
	16. Enterprise informatics
	17. Cyberpsychology
	18. Data mining
	19. Digital Business strategy
	20. Data driven culture
	21. BI
	22. Cryptocurrency
	23. Internet fraud

Source: Author's Own Construct

4.3 Findings from Delphi Round 2

The round 2 of the Delphi study comprised of instructions for the panellists to rate the responses provided from the open-ended session above. Sixteen responses were received by April 2019. The participants were asked to rate the responses on the influence the area of research, the influence on the choice of a theoretical framework, the influence on the choice of research methodology adopted, the influence on their choice of publishing outlet, the top research areas they would be considering to research in the next 5 years, the areas in research

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they thought were under researched that could be taken advantage of and the research areas that would be very relevant to Africa in the next 5 years. The method of rating was a three point scale (either "Agree"/"Yes", "May consider"/"Neutral" and "Disagree"/"No").

The responses from the Delphi round 2 were coded in excel and the data was compiled. Since the second round of Delphi was quantitative in nature, the data analysis primarily followed Parratt, Fahy, Hutchinson, Lohmann and Hastie (2016) which was consistent with (Popham, 1999). The quantitative analysis of the Delphi round 2 involved calculating for the Item Content Validity Index (I-CVI) (Polit & Beck, 2006).

Table 4.4: The I-CVI computation of responses from question one of the questionnaire

Title	A(f)	(f/No. respondents) 100 percent	of *	Accept or Reject
Courses Studied	14	0.875		Accept
Academic Background	13	0.8125		Accept
Personal Interest	12	0.75		Accept
Current Social issues	7	0.4375		Reject
Impact Of Research On Development	12	0.75		Accept
Ability To Impact Development	9	0.5625		Reject
Supervisor's Preference	10	0.625		Reject
Research Problems	10	0.625		Reject
New Trends	14	0.875		Accept
Industry Problems	5	0.3125		Reject
Institutional Research Environment	9	0.5625		Reject
Technological Trends	16	1		Accept
Scholarly Relevance	10	0.625		Reject
Policy Relevance	5	0.3125		Reject
Challenges in Current Environment	8	0.5		Reject
Scalability of The Research to Other Contexts	5	0.3125		Reject
Call for Papers	10	0.625		Reject
Global Trends	10	0.625		Reject

Source: Author's Own Construct

The table above elicits the I-CVI computation for the first question. The courses studied, personal interest, academic background, impact of research on development, the new trends

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and Technological Trends had I-CVI's that were above the pre-set consensus level of 70 percent. Thus, there was a high level of agreement amongst the experts that these factors were more likely to influence the research area of the African IS researchers. Furthermore, the courses studied and the academic background had an I-CVI score of more than 80 percent which indicated a higher level of consensus amongst all the participants. The technological trends had an I-CVI score of 1. This meant that all the experts agreed that the technological trends available at a t time affected the area of research Thus, it can be said that, an African IS researcher's area of focus is mainly as a result of his exposure and training.

Table 4.5: The I-CVI computation of responses from question two of the questionnaire

Title	A(Ғ)	(Ғ/No. Of Respondents) * 100 percent	Accept or Reject
Research Questions	15	0.9375	Accept
Awareness of The Theoretical Framework	14	0.875	Accept
Relevance of Framework to The Study	16	1	Accept
Research Problem Identified	11	0.6875	Reject
Desired Outcome of The Study	6	0.375	Reject
Type and Context of The Research.	10	0.625	Reject
Personal Research Orientation	9	0.5625	Reject
Research Paradigm	8	0.5	Reject
Ability to Contribute to The Theory	7	0.4375	Reject
Fitness of The Theory	16	1	Accept
Experience and Knowledge	12	0.75	Accept
Research Objectives	12	0.75	Accept
Application of The Theory in Extant Literature	10	0.625	Reject
Relevant Factors to Be Studied	10	0.625	Reject
Applicability of The Theory to the Context	11	0.6875	Reject
Ability to Make Modifications to The Theory	9	0.5625	Reject

Source: Author's Own Construct

Table 4.6 elicits the I-CVI computation for the second question. The research questions, awareness of the theoretical framework, relevance of framework to the study, fitness of the theory, experience and knowledge and research objectives obtained an I-CVI value of more than 70 percent. Thus, the experts expressed a higher consensus with these factors. It is not

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surprising that the relevance of framework to the study and fitness of the theory came out as two of the most agreed factors in the domain. Since the theory is the lens through the analysis of the study is conducted, it is prudent that much emphasis is placed on the whether the theory is well placed to address the phenomenon being studied.

Table 4.6:The I-CVI computation of responses from question three of the questionnaire

Title	A(Ƒ)	(Ƒ/No. Respondents) * 100 Of percent	Accept or Reject
Research's Background of Study	13	0.8125	Accept
Nature of Courses Studied	9	0.5625	Reject
Methods Used by Existing Research	15	0.9375	Accept
Relevance to the Study	13	0.8125	Accept
Time Allocated to the Study	6	0.375	Reject
Value That I May from the Responses	9	0.5625	Reject
Level of Familiarity	15	0.9375	Accept
The Problem at Hand	11	0.6875	Reject
Nature and Context of the Study	10	0.625	Reject
Research Paradigm	11	0.6875	Reject
Research Questions	11	0.6875	Reject
Personal Skills and Training	12	0.75	Accept
Application in The Extant Literature	11	0.6875	Reject
Its Robustness and Relevance to the Problem Statement	10	0.625	Reject
Its Consistency with the Data Behavior	7	0.4375	Reject
Available Funds	4	0.25	Reject
Type of Data Required for Meaningful and Relevant Results.	9	0.5625	Reject
Type of Data to Be Gathered	15	0.9375	Accept
Theoretical Framework Used	10	0.625	Reject
Stated Purpose of The Study	9	0.5625	Reject

Source: Author's Own Construct

Table 4.5 elicits the I-CVI computation for the third question. Research's background of study, methods used by existing research, the methodology's relevance to the study, level of familiarity, personal skills and training and type of data to be gathered were the responses that attained the pre-set level of consensus of 70 percent. Thus, all the respondents to the round 2 of the Delphi study agreed on the relevance of these factors to the choice of methodology. The

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existing research methodology adopted in the articles reviewed exhibited the highest level of consensus that indicated that the kind of methodology being used in the topic area impacts the researcher's choice of a methodology.

Table 4.7: The I-CVI computation of responses from question four of the questionnaire

Title	A(F)	(F/No. Respondents) * Of 100 percent	
Research Topic and Area	15	0.9375	Accept
Tier of the Journal	12	0.75	Accept
Impact Score	11	0.6875	Reject
Recommendation from Other Researchers	13	0.8125	Accept
Scopus Index	9	0.5625	Reject
Accredited by The Ministry of Higher Education for Subsidy Purposes	5	0.3125	Reject
Credibility with Respect to Peer Review	15	0.9375	Accept
Level of Visibility	13	0.8125	Accept
Ranking of Journal	15	0.9375	Accept
Potential of Being Published Very Fast	11	0.6875	Reject
Where I Can Make More Impact	13	0.8125	Accept
Academic Status	3	0.1875	Reject
Career Trajectory	6	0.375	Reject
Quality Of Manuscripts	8	0.5	Reject
Co-Authors	5	0.3125	Reject
Suitability	14	0.875	Accept
Institutional Environment	6	0.375	Reject
The Area Of Specialization Of The Journal And Its Readership	15	0.9375	Accept
Supervisors' Recommendations	12	0.75	Accept
The List Of Approved Publishing Outlets In My Department	9	0.5625	Reject
Level Of Acceptability	13	0.8125	Accept

Source: Author's Own Construct

The I-CVI computation for the fourth question is elicited in the Table 4.7. Larger number of individual items in this domain attained the pre-set consensus level as compared to the previous questions. The research topic and area, tier of the journal, recommendation from other researchers, credibility with respect to peer review, level of visibility, ranking of journal, where more impact can be made, suitability of the research for the journal, the area of specialization of the journal and its readership and the level of acceptability were the factors that attained the

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preset level of consensus. The research topic and area, credibility with respect to peer review and ranking of journal were highly agreed upon as they attained a consensus level above 90 percent. The high level of consensus of these three factors amongst the rest indicated that, some journals are mostly noted to attract research papers from certain fields, thus, African IS researcher would prefer to select journals that match their topic and area of focus. Also, all IS researchers want to have their articles published in peer reviewed journals as this guarantees their articles as being counted as good after they have been reviewed and published. Hence, they would prefer to publish in peer reviewed journals. Journals with good rankings tend to attract good audience and readership. the search article published in them get to be cited more often than not. Hence, it is not surprising that the experts highly agreed on these top three factors.

Table 4.8: The I-CVI computation of responses from question five of the questionnaire

Title	A(f)	(f/No. of respondents) * 100 percent	Accept or Reject
Artificial Intelligence	10	0.625	Reject
Church IS Adoption	3	0.1875	Reject
Information Security	13	0.8125	Accept
Ethical Computing	6	0.375	Reject
ICT4D	13	0.8125	Accept
Health Informatics	12	0.75	Accept
Blockchain	6	0.375	Reject
ICT In Health	11	0.6875	Reject
ICT In Education	12	0.75	Accept
BI	11	0.6875	Reject
Social Media Analytics	12	0.75	Accept
Pre-Cognitive Systems	2	0.125	Reject
Sustainable Digital Transformation	12	0.75	Accept
Digital Business Innovation	13	0.8125	Accept
Machine Learning	7	0.4375	Reject
Educational Quality Assurance	4	0.25	Reject
Adoption of Medical Decision Support Systems In Developing Countries	8	0.5	Reject
Extension Of Mobile Virtual Network Operations Into The Delivery Of Competitive Mobile Provision In Developing Countries	7	0.4375	Reject
Enterprise Informatics	7	0.4375	Reject
Cyber Psychology	5	0.3125	Reject

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Digital Business Strategy	11	0.6875	Reject
	10	0.625	Reject
Internet Of Things			
	7	0.4375	Reject
Cryptocurrency			
	10	0.625	Reject
The Sharing Economy			

Source: Author's Own Construct

The computation in table 4.8 elicits the I-CVI values for the fifth question. The responses that adhere to the pre-set consensus level of 70 percent are Information Security, ICT4D, Health Informatics, ICT In Education, Social Media Analytics, Sustainable Digital Transformation and Digital Business Innovation. Nonetheless, Information Security, ICT4D, Digital Business Innovation attained greater consensus or level of agreement amongst all the relevant responses.

Table 4.9: The I-CVI computation of responses from question six of the questionnaire.

Title	A(f)	(f/No. respondents) Of * 100 percent	Accept or Reject
AI	14	0.875	Accept
Robotics	14	0.875	Accept
IT investment	4	0.25	Reject
Blockchain	9	0.5625	Reject
Big data	10	0.625	Reject
ICT and the SDG's	10	0.625	Reject
Natural language processing	12	0.75	Accept
Machine learning (supervised and unsupervised)	7	0.4375	Reject
Developing academic textbooks to Teach ICT in Africa	13	0.8125	Accept
Culture and AI	13	0.8125	Accept
Digital agriculture	10	0.625	Reject
Socio-political impact of emerging technologies (in some countries social media is destroying the socio-political fabric)	11	0.6875	Reject
Learning analytics	5	0.3125	Reject
Educational quality assurance	6	0.375	Reject
Mobile banking adoption	9	0.5625	Reject
Development of smartphone apps to support sustainable farming and advertising of farm produce through apps to larger markets	9	0.5625	Reject

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ICT usage in mobile and remote healthcare delivery and diagnosis of diseases	12	0.75	Accept
Cyber Psychology	7	0.4375	Reject
Privacy of data	10	0.625	Reject
Cryptocurrency	8	0.5	Reject
ICT4D	12	0.75	Accept
Sharing economy	12	0.75	Accept

Source: Author's Own Construct

Out of the above I-CVI computations obtained from Table 4.9, AI, Robotics, Natural language processing, developing academic textbooks to Teach ICT in Africa, Culture and AI, ICT usage in mobile and remote healthcare delivery and diagnosis of diseases, ICT4D and Sharing economy attained the pre-set consensus level of 70 percent. That is, the experts interviewed agreed that that they consider these topics under researched and the African Is researchers should consider these research areas.

Table 4.10: The I-CVI computation of responses from question seven of the questionnaire.

Title	A(f)	(f/No. respondents) * Of 100 percent	Accept or Reject
AI	8	0.5	Reject
Robotics	12	0.75	
Outsourcing IT Capabilities	6	0.375	Reject
ICT for Development	10	0.625	Reject
Distributed Teamwork	8	0.5	Reject
Mobile Computing	12	0.75	
Blockchain	10	0.625	Reject
Big data	8	0.5	Reject
ICT and poverty eradication	11	0.6875	Reject
Natural language processing	11	0.6875	Reject
Machine learning (supervised and unsupervised)	14	0.875	Accept
Socio-Economic Development	11	0.6875	Reject
Data Analytics in Government	11	0.6875	Reject
Sustainable digital transformation of different economic sectors (agriculture, health, education; governance etc.)	12	0.75	Accept
Learning analytics	9	0.5625	Reject

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Using mobile and smartphones for all aspects of business, health and education through cloud hosted services and big data	11	0.6875	Reject
Enterprise informatics	15	0.9375	Accept
Cyberpsychology	9	0.5625	Reject
Data mining	7	0.4375	Reject
Digital Business strategy	13	0.8125	Accept
Data driven culture	11	0.6875	Reject
BI	10	0.625	Reject
Cryptocurrency	10	0.625	Reject
Internet fraud	13	0.8125	Accept

Source: Author's Own Construct

Table 4.10 above displays the I-CVI computations for the responses retrieved from round 2 of the Delphi study. The following responses met the pre-set consensus level of 70 percent; Robotics, Mobile Computing, Machine learning (supervised and unsupervised) Sustainable digital transformation of different economic sectors (agriculture, health, education; governance etc.), Enterprise informatics, Digital Business strategy and Internet fraud.

4.4 Summary

This chapter provided a presentation of findings from the data. Data concerning the Publishing Outlets, Research themes, Year of Publication, Research Methodology adopted in articles reviewed, Level of Analysis, Geographical Focus and Research Frameworks were present. Furthermore, the data from the round one and round two of the Delphi technique were presented

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CHAPTER FIVE

ANALYSIS AND DISCUSSION OF FINDINGS

5.0 Chapter Overview

The purpose of study is to explore what influences the research topics, choice of use of theories and the research interests of African IS researchers. The previous chapter elicited the methodology for this study. It further presented about the scientific means used to select the respondents for the study, an overview of the Delphi Technique, panel selection and identification and the data collection rounds. This chapter discusses the data and findings of the study. The chapter presents the data for examination, analysis and discussion of the findings from the data collected through the Delphi rounds. The findings of this study are first presented under the sub questions for the study and are then discussed.

5.1 Answering the Research Questions

This subsection of this thesis seeks to find answers to the first set of research questions posed in (Section 1.4):

What is the nature of IS research and identify an in-depth knowledge to why certain choices are made by IS researchers?

a) What are the dominant themes in IS research in Africa?

b) What explore technologies have been studied in IS research in Africa?

c) What are the motivations that underpin choices of researchers?

5.1.1 Dominant themes of African IS Research

The nature of the IS research describes the dominant themes, years of publications, technologies researched, publishing outlets and the research methodologies used in

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undertaking research in the IS field. From the findings, it is indicative that the dominant themes in African IS research are 'support and implementation' and 'adoption and diffusion'. This finding was mainly prevalent in the Southern region of Africa namely: South Africa, Namibia, Zimbabwe and Malawi and West African region of Africa namely: Ghana and Nigeria. These countries had high ranking representations in the ITU ICT development index 2017. Hence, it can be argued that most countries that had high ITU ICT Development index ranking had more 'support and implementation' and 'adoption and diffusion' related research being carried out which represented about 70 percent of research articles used in the study. Given that, IS mostly requires support after they have been adopted, implemented and used in organizations or in the lives of people and institutions, it was not surprising that a number of the support and implementation studies had the greater article share and they recorded more studies than adoption and diffusion. This position was not very surprising as Boateng, Heeks, Molla and Hinson (2011) reported a similar finding that the support and implementation theme which mainly involved the strategy, consumer behaviour, public policy, service evaluation and the knowledgeable and learning procedures was a dominant theme in e commerce research. This position is further strengthened in a study conducted by Sittig and Singh (2015), as they highlighted the importance of support and implementation through measuring, monitoring and evaluating both intended and unintended cost of IS use. Subsequently, figure 5.1 further provides a graphical breakdown of countries that had research article contributing to the support and implementation theme. The individual countries that contribute to making support and implementation the most dominant themes are as follow; Cross country('studies conducted in more than one country') (21.5 percent), Ghana (20 percent), Kenya (10.8 percent), Libya (1.5 percent), Malawi (1.5 percent), Mozambique (1.5 percent), Namibia (1.5 percent), Nigeria(4.6 percent), South Africa (24.6 percent), Tanzania (4.6 percent), Uganda (6.2 percent) and Zimbabwe (1.5 percent). . Furthermore, the mass representation of the support and

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adoption articles confirms that less attention has been paid to other themes such as the potential and constraints, design and application and impact.

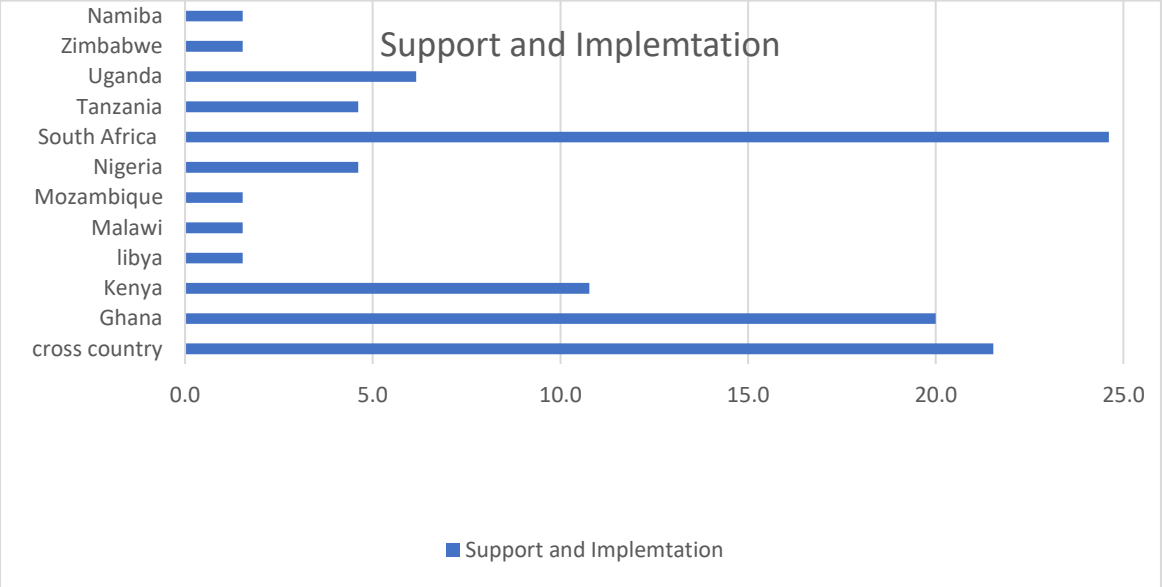

Figure 5.1 Breakdown of support and implementation theme by country.

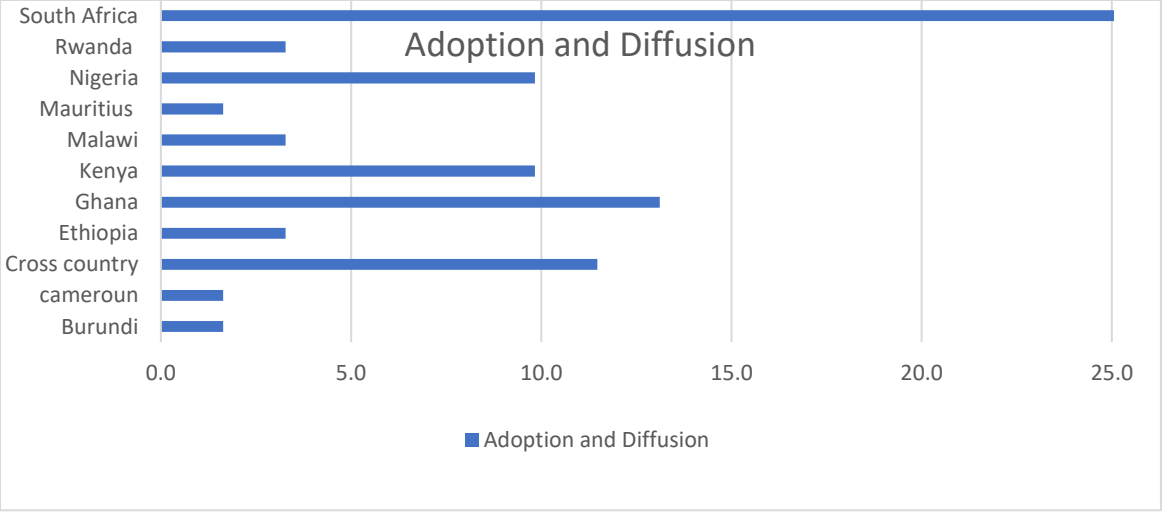

Figure 5.2. Breakdown of Adoption and Diffusion theme by country.

From figure 5.2 above, the individual African countries that have contributed research articles to this study include: Burundi (1.6 percent), Cameroun (1.6 percent), Cross country (11.5),

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Ethiopia (3.3 percent), Ghana (13.1 percent), Kenya (9.8), Malawi (3.3 percent), Mauritius (1.6 percent), Nigeria (9.8 percent), Rwanda (3.3 percent) and South Africa (41 percent).

The findings from Figure 5.1 and Figure 5.2 reveals that, South Africa was the country with the largest number of research article covering adoption and diffusion. Since it is the dominant country with most research articles in this study, it is not very surprising that they had most of the research articles under this review.

5.1.2 Technologies have been Studied in IS Research in Africa

Concerning the technologies that have been studied in IS in Africa, the respondents of the Delphi round 1 when asked to mention the top research areas they have studied in the last 5 years revealed that they had researched *cybercrime* (Orji, 2019; Quarshie & Martin-Odoom, 2012), *mobile application development* (Flora, 2018), *information security and privacy* (Yaokumah & Dawson, 2019), *social media engagement* (Bidwell, 2016), *telework* (Morrison, 2017), *ICT4D* (Ojo, 2016), *health informatics* (Nkengasong, Djoudalbaye, & Maiyegun, 2017), *ICT in agriculture* (Tata & McNamara, 2016), *ICT in health* (Adeola & Evans, 2018), *learner analytics* (Lemmens & Henn, 2016), *e-learning* (Boateng et al., 2016), *e-commerce* (Boateng et al., 2011), *nexuses between information technology and development outcomes* (Aker & Mbiti, 2010), *ICT in education* (Oyelere, Suhonen, & Sutinen, 2016), *enhancing learning* (Mtebe, 2015), *IS for disaster management* (Raemaekers & Sunde, 2017), *cloud computing* (Senyo et al., 2018), *big data analytics* (Marfo, Boateng, & Effah, 2017), *impact of ICT on reading culture and research in developing countries* (Piper, Zuilkowski, Kwayumba, & Strigel, 2016), *innovation diffusion* (Acheampong et al., 2017), *digital business strategy* (Oppong, Singh, & Pathak, 2018), *acceptance of e-learning systems and Management theory* (Awidi & Cooper, 2015).

Noting that the number of respondents to the Delphi round 1 were 16, it is inconclusive to suggest that a significant representation of all the topics that have been researched in Africa.

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However, since the responses to the study emanated from experts geographically dispersed on the African continent, one can posit that, these are some of the top research areas that have been researched in Africa.

5.1.3 Motivation for Research Choice of African Researchers

This sub section presents the findings that hopefully provided a basis for a comparative consensus analysis, hence enabling the researcher to selectively identify the motivations that underpin the choices of African IS researchers across three African sub regions: The Southern, Eastern and Western Regions. The Western region of Africa was specifically included to include University of Ghana business school IS lecturers (UGBS lecturers) and the Year 2 PHD IS students of the University of Ghana.

5.1.3.1 Motivations for selecting Research topics

Table 5.1:Motivations for selecting Research topics

Region	Themes					
	Courses Studied	Academic Background	Personal Interest	Impact of Research on Development	New Research Trends	Technological Trends
1. South Africa	✓	✓	✓	✓		✓
2. East Africa				✓		
3. West Africa	✓		✓			
4. UGBS lecturers					✓	
5. PHD Students			✓	✓	✓	

Source: Author's Own Construct

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Table 5.1 above outlines the factors that influence research topics of African IS researchers in the various Africa sub regions.

From the Delphi rounds, it appears that the 'courses studied' received a high level of agreement with a variable index of 0.88. Some researchers from Southern and Western Africa, who were two and three respectively, strongly recommended 'courses studied' as a motivating factor when it came to selecting a research topic. Thus, the 'Courses studied' was therefore accepted as a motivating factor for further testing. Godwin, Potvin, Hazari and Lock (2016) believed that some courses studied in previous academic institutions can influence an individual's choice for studying a field of study like engineering. Nonetheless, there was scanty literature to further to support this claim. In this same regard, Altinay, Paraskevas, and Jang (2015) postulated that the most common source for a research topic generation is the researcher's own course of study and the topics that are present in different lecture sessions.

'Academic Background' which was only cited by IS researchers from Southern region of Africa in the first round of the Delphi study realized a variable index of 0.81 in the second round of Delphi interview and is therefore accepted as a motivating factor. This position is supported by Broström (2019) who identified that PHD students trained with funding for their PHD research can have their thesis topics as well as career destination altered by their funders to get what they want in terms of research content.

'Personal Interest' and 'Impact of Research on Development', which were both mentioned by African IS researchers from the Southern and Western Africa respectively, realized a variable index of 0.75. This factor which did not receive a strong agreement as the previous two factors mentioned above was selected as a motivating factor since it met the acceptance level of 0.70. Furthermore, 'Impact of Research on Development' was the only factor mentioned by

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researchers from Eastern Africa that was accepted as a factor that influences the choice of a research topic.

'New Research Trends' from the environments were mentioned by 3 academics as an important factor to selecting a research topic in the first round of the Delphi interview. It realized a variable index of 0.88 in the Delphi study. Sehra, Brar, Kaur and Sehra (2017) argued that patterns and new trends identified through research can help in finding the potential research areas. Hence, the 'new research trends' was accepted as a necessary factor to selecting a research topic.

'Technological Trends' received an enormous support by all the experts interviewed to give the factor a variable score of 1. This clearly indicated that the current 'technological trends' in the environment does influence researchers interviewed when it came to the selection of a research topic.

5.1.3.2 Motivations that influence the choice of Theoretical Framework

Table 5.2 elicits the responses on factors that influence the choice of theoretical framework for research of African IS researchers in the various sub regions of Africa.

'Research Questions and Objectives' had a variable index of 0.94 and 0.75 receptively. These two factors were recommended by researchers from Southern Africa and Western Africa. Since both factors can be deduced from one another, it made sense that both factors attained the necessary levels of consensus. The main research question and any sub-questions of a study should represent notable aspects of the theoretical framework and articulate the theoretical framework in a manner by which it can be further explored by a research (Osanloo & Grant,

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2016). Since the research objectives of the study are derived from the research questions, it is in the right to argue that both factors influence the theoretical framework used in a study

'Awareness of The Theoretical Framework' was suggested by a research from Eastern African region and it attained a variable score of 0.88 which met the criteria set for consensus. Thus, a researcher's awareness of the existence of a particular framework does determine whether it would be used or not. There was no significant literature to support this claim.

'Relevance of Framework to the Study' received an overwhelming support with a variable index of 1 in the interviews. This factor was first suggested by respondents from all the three regions that were considered for the study in the first round of the Delphi interview. It was highly agreed upon by all the respondents in the second round of the interview with a variable index of 1.

'Fitness of the Theory' which was suggested by UGBS lecturers from the West African region also attained a high level of acceptance and support with a variable index of 1. Hence, fitness of the theory was undoubtedly accepted.

'Experience and Knowledge of the researchers' as mentioned by a researcher from the South African region was accepted as it attained a variable score of 0.75.

Table 5.2: Motivations that influence the choice of Theoretical Framework

Region	Themes					
	Research Questions	Awareness of The Theoretical Framework	Relevance of Framework to The Study	Fitness of The Theory	Experience and Knowledge	Research Objectives
1. South Africa	✓		✓		✓	✓
2. East Africa		✓	✓			

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3. West Africa	✓					✓
4. UGBS lecturers				✓		
5. PHD Students	✓		✓			✓

Source: Author's Own construct based on findings

5.1.3.3 Motivational Factors that influence the choice of Research Methodology adopted in articles reviewed

Table 5.3 elicits the responses of African IS researchers when interviewed by what influences their choice of research methodology used to conduct a research in the various sub regions of Africa.

'Researcher's Background of Study' was described in both rounds of the Delphi interview as important by three researchers from the West African region in the first round and later attained a variable index of 0.81 in the second round of the study.

'Methods Used by Existing Researchers' and 'Level of Familiarity', which can be explained as research methods that researchers are privy to, attained a variable score of 0.94. Both factors have been reported by a greater number of respondents from all the three regions, as important to the selection of a research methodology. Researchers from the South and West regions of Africa, both mentioned the 'Methods Used by Existing Researchers' as a factor they would identify with when choosing their research methodology whilst researchers from the West African region only mentioned the 'level of familiarity' as salient to consider when choosing the research methodology.

'Relevance to the Study' also received a high level of agreement amongst the respondents during the Delphi interview process. This factor which attained a variable index of 0.81 was

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strongly recommended and accepted by researchers from the Southern and Eastern regions of Africa.

'Personal Skills and Training' which attained a variable index of 0.75 was identified by researchers from the South and West African regions. The factor was accepted since this factor met the required variable index level of 0.70 for acceptance.

'Type of Data to Be Gathered' was mentioned by one PHD academic of the West African region as an important factor to the selection of a research methodology. This factor also attained one of the highest variable index levels within this category.

Table 5.3: Motivational Factors that influence the choice of Research Methodology adopted in articles reviewed.

Country	Themes					
	Researcher's Background of Study	Methods Used by Existing Research	Relevance to the Study	Level of Familiarity	Personal Skills and Training	Type of Data to Be Gathered
1. South Africa		✓	✓		✓	✓
2. East Africa			✓			
3. West Africa		✓		✓		
4. UGBS lecturers	✓	✓		✓	✓	
5. PHD Students	✓	✓		✓	✓	✓

Source: Author's Own construct based on findings

5.1.3.4 Motivations that influence the selection of a publishing outlet or journal

Table 5.4 elicits the factors that have been mentioned by African IS researchers in the sub region as influential to the selection of a publishing outlet or journal.

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'Research Topic and Area' as cited by two researchers from the West African region attained a variable index of 0.94 which was relatively high as compared to the 'Tier of the Journal' and the recommendation from other researchers. Thus, it was accepted as being influential to the selection of a publishing outlet or journal.

'Tier of the Journal' which was also recommended by researchers from all the three regions that partook in the study attained a variable index of 0.75. as such, the 'Tier of the Journal' was deemed relevant in the selection of a journal outlet.

'Recommendation from Other Researchers' as cited by 2 researchers from the West African region in the first round of the Delphi interview and late attained a relatively high level of consensus with a variable index number of 0.81 in the second round of interview. This then indicated that the factor recognized as important to the selection of a publishing outlet.

Credible peer review journals aim to communicate high quality research articles (Bohannon, 2013). 'Credibility with Respect to Peer Review' was mentioned by a researcher from the Eastern Region of Africa attained 0.93 which indicated an acceptance by a larger number of respondents.

'The level of visibility of a journal', when poor, is identified as a serious challenge to scholarly publishing in Africa (Ezema, 2011). Where journals are not visible enough on research repositories, duplication of research articles could easily be done (Bello, 2008) by other researchers since the main research article remains unseen. A researcher from South African region cited this factor as important and in the second round of interviews, 'the level of visibility of a journal 'scored 0.81. Therefore, it is accepted as a factor that influences publishing outlet selection.

The 'Ranking of a Journal' a researcher publishes in, is arguably important for the allocation of prestige, funds (Hall, 2011) and sometimes can be seen as an institutional requirement for

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some researchers. This can be used to justify why three African IS Researchers from both Eastern and Western African regions cited the 'journal ranking' as an important factor to selecting a publishing outlet, and subsequently attaining a high level of agreement with a variable index of 0.94 amongst the other respondents.

'Where I Can Make More Impact' involves the publishing outlet where the findings of researchers can be referenced in research articles to make impact in the environment. The variable index for factor that was proposed by 2 researchers, a UGBS lecturers and a PHD student was 0.81. Thus 'Where I Can Make More Impact' was selected.

'Suitability' and 'Supervisors' Recommendations' both received high supports with variable index of 0.88 and 0.75 respectively. Both factors were also suggested by researchers from researchers from the South and West African regions. Both factors were later accepted as important to influencing the choice of a publishing outlet since the met the pre-set consensus level of 0.70

'Journal Specialization and Readership' as identified by two researchers from the South and West African regions received an overwhelming support with a variable index score of 0.94. this undoubted confirmed that, the journal's specialization did influence researcher's decisions.

Table 5.4: Motivations that influence the selection of a publishing outlet or journal.

Region	Themes									
	Research Topic and Area	Tier of the Journal	Recommendation from Other Researchers	Credibility with Respect to Peer Review	Level of Visibility	Ranking of Journal	Where I Can Make More Impact	Suitability	Journal Specialization and Readership	Supervisors' Recommendations
1. South Africa		✓			✓			✓	✓	
2. East Africa		✓		✓		✓				
3. West Africa	✓	✓	✓							
4. UGBS lecturers						✓	✓			

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5. PHD Students	✓		✓			✓	✓	✓	✓	✓

Source: Author's Own construct based on findings

5.1.3.5 Research areas being considered by African IS researchers over next 5 years

Table 5.5 draws out the responses of experts concerning the top 2 research areas they are considering to research in the next 5 years. These responses further helped to understand what are the future direction of researchers.

'Information Security' of organizations and 'ICT4D' were mentioned by two academicians as salient areas of research that should be considered for the next five years. Since organizations would be churning out large amounts of data from their activities, 'information security' was identified by West African IS researchers as an important research area to consider and hence, a variable index of .81 indicating acceptance of the 'information security' as a topic worth studying. 'ICT4D' was cited by IS researchers from the East African Region as an important area of research that they were considering to research in the next 5 years. This topic was accepted when it realized a variable score of 0.81 which indicated a fairly strong agreement amongst all the experts who responded to the interview.

'Health Informatics' which was also cited by one IS researcher from the Eastern Region attained a variable index score of 0.75. The recommendation, though made by one researcher was agreed upon by other experts during the second round of the interview process.

Amongst all the topics suggested by IS researchers from the South African region, 'ICT In Education' was the only research area that attained the necessary level of consensus with a variable index score of 0.75.

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'Social Media Analytics' as suggested by a lecturer from West African region (UGBS lecturers) of the attained a variable index of .75 in the second round of the Delphi interview. There, social media analytic is accepted in this research as an area that would be relevant to study in the next 5 years.

'Sustainable Digital Transformation' and 'Digital Business Innovation' attained a variable index of 0.75 and 0.81 respectively. Researchers from South Africa proposed both factors and the other IS experts garnered their support for them.

Table 5.5: Research areas being considered by African IS researchers over next 5 years

Region	Themes						
	Information Security	ICT4D	Health Informatics	ICT In Education	Social Media Analytics	Sustainable Digital Transformation	Digital Business Innovation
1. South Africa				✓		✓	✓
2. East Africa		✓	✓				
3. West Africa	✓						
4. UGBS lecturers					✓		
5. PHD Students	✓						

Source: Author's Own construct based on findings

5.1.3.6 Research areas considered to be under researched in Africa

Table 5.6 elicits the responses of experts concerning the areas in ICT in the African context they consider under researched which researchers can take advantaged.

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'Artificial Intelligence' (AI) which attained a high variable index of 0.88 was mentioned by researchers from all the various regions that partook in the research important but unresearched by African IS researchers.

'ICT4D' which was mentioned by IS researchers from the East and West African regions of African as a necessary topic that has been under researched in Africa. Twelve African IS researchers registered their support for the fact that 'ICT4D' which has been a prevailing topic amongst most developing African countries has not received the necessary attention it should have and that reflected in a variable index of 0.75.

'Sharing Economy' was also identified by one researcher in the first round of the Delphi interview from the West African region as understudied. The interview reported a variable index of 0.75 which indicated an acceptance of the fact that the 'sharing economy' has been understudied in the African regions represented by the various respondents.

Table 5.6: Research areas considered to be under researched in Africa

Region	Theme							
	AI	Robotics	Natural language processing	Developing academic textbooks to Teach ICT in Africa	Culture and AI	ICT usage in mobile and remote healthcare delivery and diagnosis of diseases	ICT4 D	Sharing Economy
1. South Africa								
2. East Africa							✓	
3. West Africa								
4. UGBS lecturers								
5. PHD Students							✓	✓

Source: Author's Own construct based on findings

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5.1.4 Significant scholarly trends relating to issues, methodologies, topics considered as well as future research directions in the area

5.1.4.1 Conceptual approaches help in understanding IS in Africa

Regarding the conceptual underpinnings that help in understanding IS in Africa, it was evident in the findings that most studies had no theoretical underpinning. In that same regard, *Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovation (DOI) and Technology Organization Environment (TOE)* were the most widely used conceptual models identified in this research. This is not surprising as these theories study the adoption of technology.

5.1.4.2 Key research trends relating to issues, methodologies, issues addressed and future research directions in the area

5.1.4.2.1 Year of Publication

The findings of this study indicated that, research studies undertaken by African IS researchers conducted started gaining considerable numbers in 2011 and rose steadily over the years. It was evident that research works conducted in previous years; 2008, 2009 and 2010 realised low numbers in journals articles. It is in the right to predict that more studies will be conducted by African IS researchers in the coming years (Senyo et al., 2018). This position is further supported by the augmented global use of Information Communication technologies. However, more research is needed to create awareness of new and emerging IS.

5.1.4.2.2 Research Methodology adopted in articles reviewed.

Since the field of IS has been identified to be around for more than 5 decades (Willcocks & Whitley, 2009), much of the studies reviewed used well established research methodologies. It was observed that quantitative and qualitative methodologies together with other research methodologies were used in the studies reviewed. Out of 246 journal articles reviewed, 205

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used either quantitative (90), qualitative (82) and mixed research methodologies (33). This observation points to the fact that, more quantitative studies have arguably been conducted in IS than other methodologies. Very few journal articles out of the total number articles reviewed in this study did not use methodologies. Unlike a study conducted by Senyo, Addae and Boateng (2018) on cloud computing that identified that most articles did not make use of research methodologies because they were technical in nature. Thus, it can be said that IS topics that are more technical were conducted devoid of using the traditional methodologies due to the reason that, the traditional procedure used to investigate the research problem were not enough to encapsulated technical variations of new and emerging. This insight gives room to future IS studies in terms of research methodology in order to add more rigour to their studies and also help understand why researchers use untraditional methodologies in their study. Thus, the Delphi study is necessary to throw more light on the motivations in using various research methodologies.

5.1.4.2.3 Level of Analysis

Individual, organizational, national and the global perspectives were the main categorizations considered for the African IS. Evidence from the study points to the fact that majority of studies in the IS field were in the 'micro category' in nature. In spite of this, a significant number of studies were conducted at the institutional level (meso category), which were driving towards the adoption, diffusion and implementation of IS technologies (Darko & Chan, 2018; Oliveira, Thomas, & Espadanal, 2014). The review conducted indicates that, studies conducted at the national level in Africa were very few and this gives credence to the fact that African IS researchers needs to tackle issues in IS from the national level. That notwithstanding, I believe that extra research focus on individual and organizational levels will be relevant at informing happenings on the ground as far as IS is concerned.

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5.1.4.2.4 Geographical Focus

This section defines the outcome of the categorization of literature according to their geographical focus. In this regard, we classified IS literature under the respective African countries and the 'cross-country' perspective. The outcome suggested that most of the studies conducted were focused on individual African countries. Such studies particularly used data source from the individual African countries and not discuss the issues of IS in a global perspective. This finding corroborates with the finding under the level of analysis that IS articles published between the period under review had specific geographical focus in that they seek to provide localized understanding of IS. Furthermore, the findings also pointed to the fact that studies in IS by African researchers nosedived in the various African countries. Thus, there were significant number of papers published with respect to South Africa, Ghana, Kenya, Nigeria, Uganda and Tanzania. As evident, most studies in IS by Africa researchers are country focused, it has become imperative therefore to conduct studies with data sources from cross country perspective. This will help in unveiling IS activities of Africa to the global community on the perspectives of IS activities peculiar to the African continent.

Table 5.7 Analysis of Country representations from the ITU ICT Development Index 2017

ITU ICT Development Index Ranking	Top 20 African Counties from ITU Ranking	Ranking from Findings	African Countries Represent from the Findings	Number of Research Articles
1	Mauritius	1	South Africa (*)	68
2	Seychelles	2	Ghana (*)	32
3	South Africa	3	Cross country (**)	29
4	Cape Verde	4	Kenya (*)	19
5	Botswana	5	Nigeria (*)	11
6	Gabon	6	Tanzania (**)	7
7	Ghana	7	Uganda (*)	7
8	Namibia	8	Malawi (**)	3
9	Côte d'Ivoire	9	Botswana (*)	3

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10	S. Tomé & Principe	10	Zimbabwe (*)	3
11	Lesotho	11	Ethiopia (**)	2
12	Zimbabwe	12	Mozambique (*)	2
13	Kenya	13	Namibia (*)	2
14	Senegal	14	Mauritius (*)	2
15	Nigeria	15	Rwanda (**)	2
16	Gambia	16	Libya (**)	1
17	Zambia	17	Burundi (**)	1
18	Cameroon	18	Mali (**)	1
19	Mozambique	19	Congo (**)	1
20	Uganda	20	Sierra Leone (*)	1
		21	Egypt (*)	1
		22	Cameroon (*)	1
		23	Senegal (*)	1
		24	Burkina Faso (**)	1
		25	Morocco (*)	1

The table above identifies the top 20 African countries from the ITU ICT development Index 2017 ranking. Countries with single Asterix (*) in the table are the African countries that are listed in the top 20 ITU index countries. Whilst countries with a double Asterix (**) even though listed as part of the findings in this study were not amongst top 20 countries ranked in the ITU ICT development index.

Twelve (12) countries from the ITU index ranking were represented with research articles whilst eight (8) countries from the ITU index ranking were not represented in the findings as indicated in the table above.

Only two countries, South Africa (68) and Ghana (32), that were ranked high in the ITU index have more research works being carried where countries. Mauritius (2), Botswana (3) and Namibia (2) who had high rankings in the ITU index had low research being carried out in their respective countries. On the other hand, countries with low ranking like Uganda and Kenya who had 7 and 17 respectively, indicated more research works than some of the top ranked

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countries like Seychelles and Cape Verde who had no research articles discovered in the findings.

Thus, it can be said that, countries ranked in the 10 top of the ITU index which were captured in the study: Mauritius (2), South Africa (68), Botswana (3), Ghana (32), Namibia (2) had more research being carried out (107 research articles) as compared to the countries that ranked low in the top 20 ITU index ranking, Zimbabwe (3), Kenya (19), Senegal (1), Nigeria (11), Cameroon (1), Mozambique (2) and Uganda (7) who attained only 95 research articles.

5.1.4.2.5 Publication Outlet

As clearly seen from the findings of the study, IS literature cuts across most disciplines thereby attracting interest from eight-one different journals from various disciplines in the systematic literature review conducted. The researcher believes that these numbers will rise in the near future with calls for IS related papers in the Journal of IS and African Journal of IS (Conrad & Sydow, 2016). Further a plausible reason for this development could be as a result of the nature with which IS has been studied over a period of time. That is, IS has been studied socially as more focus has been placed on adoption and implementation of IS technologies.

A perilous look at the table of publication unsurprisingly revealed that the AJIS recorded the highest number of studies. This finding was not surprising as the AJIS is mostly dedicated research work undertaken by African researchers. Moreover, one of the key criteria for the literature review search was that the articles should be authored by African researchers. Since most of the articles assessed in the searching period concerned South Africa, it was not surprising that the South African Journal of information Management was a part of the journal that had most African articles being published in.

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5.2 Summary

The Chapter provided a thorough discussion on the analysis and findings from the data. The analysis and discussion were to answer the research questions posed at the beginning of the study. The analysis section provided findings on the nature of IS research in Africa and identify an in-depth knowledge to why certain choices are made by IS researchers. This research question is further broken into the following: a) What are the dominant themes in IS research in Africa? b) What technologies have been studied in IS research in Africa? c) What are the motivations that underpin choices of researchers?

The findings established that the main research themes of studies undertaken by African IS researchers have been predominantly ‘support and implementation’ as well as the ‘adoption and diffusion’. Concerning IS topics that have received much attention over the last 5 years by African IS researchers, ‘cybercrime’, ‘mobile application development’, ‘information security and privacy’, ‘social media engagement’, amongst others were identified

Furthermore, the motivations that influence the selection of a publishing outlet or journal by an African IS researcher, the Research Topic and Area, Tier of the Journal, Recommendation from Other Researchers, Credibility with Respect to Peer Review, Level of Visibility, Ranking of Journal, Where I Can Make More Impact, Suitability, Journal Specialization and Readership and Supervisors' Recommendations were the factors that the IS experts who partook in the studies agreed upon. The major motivations for studying certain research areas were determined as the ‘courses studied’, ‘the academic background of the researcher’, ‘personal interest’, ‘impact of research on development’, ‘new research trends’ as well as the ‘technological trends in the environment’.

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CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.0 Chapter Overview

The previous chapters presented the introduction to the study, review of literature, the methodology of the study, findings, analysis and discussion of the findings. This closing chapter focuses on presenting a summary of the key findings of the study, discussion on the contribution to research, policy and practice. It additionally presents the limitations of the study and recommendations for future research

6.1 Summary of the Research Process

This study conducted a systematic literature review of articles published by African IS researchers. It further investigated the motivations that underpin the various choices African IS researchers make when undertaking a research.

In coda to this research, the following objectives were formulated:

1. To explore the nature of IS research and identify an in-depth knowledge to why certain choices are made by IS researchers:
    a) To explore the dominant themes in IS research in Africa.
    b) To explore technologies that have been studied in IS research in Africa.
    c) To understand the motivations that underpin choices of researchers?
2. To identify the significant scholarly trends relating to research issues, methodologies, topics considered as well as future research directions in the area

In addressing these objectives, a systematic literature review was conducted to help understand the current trends of research articles published by African IS researchers. A Delphi Technique

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was adopted to help understand the motivations of African IS researchers. The Delphi technique was chosen for the reason that, Delphi studies provide expert judgement on matters of high uncertainty that general populations might not have knowledge about (Wang, Gao, & Guo, 2012). Again, the choice of a Delphi technique was as a result of its ability to inherently provide richer data because of their multiple iterations and their response revision due to feedback (Okoli & Pawlowski, 2004). This made the Delphi technique the best fit for studying the motivations that influenced the choices of African IS researchers in their studies.

After an extensive systematic review of literature, experts with multiple publications were shortlisted and invited to partake in the Delphi study. A 2 round Delphi approach was adopted in this study as an appropriate method to elicit expert opinions (Raley, Ragona, Sijtsema, Fischer, & Frewer, 2016). Ensuing the data collection method, was the presentation of findings which was then scrutinised and discussed in chapter five in relation to the research questions. The analysis in chapter five unearthed a number of research findings. These findings are mapped to each research question and the respective contribution to research and practice in the section that follows.

6.1.1 What is the nature of IS research and identify an in-depth knowledge to why certain choices are made by IS researchers?

6.1.1.1 Dominant Themes in IS research in Africa

After the rigorous analysis of the systematic literature review data, 3 findings were revealed. The foremost finding indicates that, Support and Implementation is the most dominant theme amongst African IS researchers over the last 10 years. This was not very shocking as IS mostly require support after they have been adopted, implemented and used in organizations or in the lives of people and institutions, it was not surprising that number of the support and

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implementation studies had the greater article share and they recorded more studies than adoption and diffusion.

Another interesting finding was that, Adoption and diffusion theme was also largely used by most African IS researchers but not as much as the Support and Implementation. Thus, the mass representation of the support and adoption articles confirms that less attention has been paid to other themes such as the potential and constraints, design and application and impact.

Lastly, South Africa was the country with the largest number of research article covering adoption and diffusion. Since it is the dominant country with most research articles retrieved from the choice databases in this study, it is not very surprising that they had most of the research articles under review.

6.1.1.2 Technologies studied in IS Research in Africa

The second research objective of the study required the analysis of the first round of the Delphi technique to unearth the answers to this question.

The results from analysing the responses indicated that, the following topics have been research by some African IS researchers: cybercrime, mobile application development, information security and privacy, social media engagement, telework, ICT4D, health informatics, ICT in agriculture, ICT in health, learner analytics, e-learning, e-commerce, nexuses between information technology and development outcomes, ICT in education, technology, enhancing learning, IS for disaster management, cloud computing, big data analytics, impact of ICT on reading culture and research in developing countries, innovation diffusion, information security, e-learning, digital business strategy, acceptance of e-learning systems and Management theory.

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6.1.1.3 Motivations for Research Choice of African Researchers

Concerning the motivations that underpin the selection of research topics, the research findings identified ‘courses studied’, ‘academic background’, ‘personal interest’, ‘impact of research on development’, ‘new research trends’ and ‘technological trends’ were the factors identified as important.

‘Research questions’, ‘awareness of the theoretical framework’, ‘relevance of framework to the study’, ‘fitness of the theory’, ‘experience and knowledge’ and ‘research objectives’ were identified in the findings as important motivations to the selection of a theoretical frameworks for a research.

Furthermore, the findings indicated that the motivations that underpin the choice of a research methodology include: ‘researcher's background of study’, ‘methods used by existing researchers’, ‘relevance to the study’, ‘level of familiarity’, ‘personal skills and training’ and ‘type of data to be gathered’.

With regards to factors that influence the selection of a publishing outlet, the findings revealed that: ‘research topic and area’, ‘tier of the journal’, ‘recommendation from other researchers’, ‘credibility with respect to peer review’, ‘level of visibility’, ‘ranking of journal’, ‘where i can make more impact’, ‘suitability institutional environment’, ’journal specialization and readership’ and ‘supervisors' recommendations’ were identified to be important.

The findings identified ‘information security’, ‘ICT4D’, ‘health informatics’, ‘ICT in education’, ‘social media analytics’, ‘sustainable digital transformation’ and ‘digital business innovation’ as the future research areas they were considering.

It was also identified in the findings that, the under researched areas in IS included: ‘AI’, ‘robotics’, ‘natural language processing’, ‘developing academic textbooks to teach ICT in

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Africa', 'culture and AI', 'ICT usage in mobile and remote healthcare delivery and diagnosis of diseases', 'ICT4D' and 'sharing economy'

Lastly, the findings indicated that some research areas that would be relevant to Africa in the next 5 years include: 'machine learning (supervised and unsupervised)', 'sustainable digital transformation of different economic sectors', 'enterprise informatics', 'digital business strategy' and 'internet fraud'

6.1.3 Significant scholarly trends relating to research issues, methodologies, conceptual approaches, topics considered as well as future research directions in the area

The second main research objective demanded the significant scholarly trends relating to research issues, methodologies, conceptual approaches, topics considered as well as future research directions in the area.

With regards to the research trends, the findings of this study revealed that, journal articles of African IS researchers started gaining considerable numbers in academic journals in 2011 and continued to rise steadily over the years till date. This finding suggests that, the number of IS researchers in Africa has increased and perhaps the longstanding researchers over the years have increased the number of their publications.

The findings further indicated that, much of the studies reviewed used well established research methodologies, that is the quantitative and qualitative research methodologies, nonetheless, there has been more use of quantitative methods than qualitative methods.

Furthermore, evidence from the study points to the fact that majority of studies in the IS field were in the 'micro category' in nature. In spite of this, a significant number of studies were conducted at the institutional level (meso category), which were driving towards the adoption, diffusion and implementation of IS technologies. The review conducted further indicated that,

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studies conducted at the national level in Africa were very few and this credence to the fact that African IS researchers needs to tackle issues in IS from the national level.

Additionally, the findings revealed that most of the studies conducted nosedived into individual African countries with South Africa having the most published IS journal articles. IS literature in this study cuts across most disciplines thereby attracting interest from eight-one different journals from various disciplines in the systematic literature review conducted. A further plausible reason for this development could be as a result of the nature with which IS has been studied over a period of time. That is, IS has been studied socially as more focus has been placed on adoption and implementation of IS technologies. In this same regard, countries ranked in the 10 top of the ITU index which were captured in the study: Mauritius, South Africa, Botswana, Ghana and Namibia had more research being carried out as compared to the countries that ranked low in the top 20 ITU index ranking: Zimbabwe, Kenya, Senegal, Nigeria, Cameroon, Mozambique and Uganda who attained only 95 research articles.

Concerning conceptual approaches that have been used to help understand IS in Africa, it was evident that although most studies from the findings have been undertaken devoid of conceptual underpinnings, the *Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovation (DOI) and Technology Organization Environment (TOE)* were the most widely used conceptual models identified in this research. Since most of the conceptual approaches identified are generally used for studying the support, implementation, adoption and diffusion of technologies or diverse phenomena, it supports the assertion that support and implementation as well as adoption and diffusion themes have been widely studied.

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6.2 Mapping out Research Objectives with Research Findings and Contributions

Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	**Sub Objective**	**Research Findings**	**Extant Literature**	**Contributions, Implications and Recommendations**
1. To explore the nature of IS research and identify an in-depth knowledge to why certain choices are made by IS researchers	a) To explore the dominant themes in IS research in Africa	1. The foremost finding indicates that, Support and Implementation is the most dominant theme amongst African IS researchers over the last 10 years. 2. Adoption and diffusion theme was the second theme that was largely used by most African IS researchers. Thus, the mass representation of the support and adoption articles confirms that less attention has been paid to other themes such as the potential and constraints, design and application and impact.	Sittig and Singh (2015) identified the importance of support and implementation in an organization.	The study provides a breakdown of the various themes researched in African IS research and outlines why 'support and implementation' as well as 'adoption and diffusion' emerged as the most researched themes in the various African countries This study brings to bear the need for IS researchers to extend their studies to cover less

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
		3. South Africa was the country with the largest number of research article covering adoption and diffusion. Since it is the dominant country with most research articles retrieved from the choice databases in this study.		researched themes like Impact and 'potentials and constraints' of IS since there were limited papers covering these themes in the study. Research on the less dominant themes were mostly few in literature in the last 10 years. Thus, further examination of these themes must be critically considered to promote IS research in Africa.

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
	b) To explore technologies have been studied in IS research in Africa	4. The results from analyzing the responses indicated that, the following topics and technologies have been research by some African IS researchers: cybercrime, mobile application development, information security and privacy, social media engagement, telework, ICT4D, health informatics, ICT in agriculture, ICT in health, learner analytics, e-learning, e-commerce, nexuses between information technology and development outcomes, ICT in education, technology, enhancing learning, IS for disaster management, cloud computing, big data analytics, impact of ICT on reading culture and research in developing countries, innovation diffusion, information security, e-learning, digital business	Adera, Waema and May (2014) Boateng and Jonathan (n.d.) Krauss and Turpin (2010) Quarshie and Martin-Odoom (2012)	Noting that the number of respondents to the Delphi interview were 16, it is inconclusive to suggest that a significant representation of all the topics that have been researched in Africa are listed. However, since the responses to the study emanated from responses of experts geographically dispersed on the African continent, one can posit that, these are some of the top research areas have researched in Africa. Future research should delve deeper to identify

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	**Sub Objective**	**Research Findings**	**Extant Literature**	**Contributions, Implications and Recommendations**
		strategy, acceptance of e-learning systems and Management theory.		the gaps identified in these topics and provide a classification taxonomy of them.
	c) To understand the motivations that underpin choices of researchers?	5. Concerning the motivations that underpin the selection of research topics, the research findings identified 'courses studied', 'academic background', 'personal interest', 'impact of research on development', 'new research trends' and 'technological trends' were the factors identified as important. 6. 'Research questions', 'awareness of the theoretical framework', 'relevance of framework to the study', 'fitness of the theory', 'experience and knowledge' and 'research objectives' were identified in the findings as important motivations to the selection	Altinay et al. (2015) Godwin et al. (2016) Sehra et al. (2017) Bello (2008) Bohannon (2013) Ezema (2011) Osanloo and Grant (2016)	This research is arguably one of the first to inculcate a Delphi technique to assess expert views on various factors that influence the choices of African IS researchers from three African sub regions, thereby, providing an in-depth knowledge to why certain decisions are made in research.

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
		of a theoretical frameworks for a research. 7. Furthermore, the findings indicated that, the motivations that underpin the choice of a research methodology include: 'researcher's background of study', 'methods used by existing researchers', 'relevance to the study', 'level of familiarity', 'personal skills and training' and 'type of data to be gathered'. 8. With regards to factors that influence the selection of a publishing outlet, the findings revealed that 'research topic and area', 'tier of the journal', 'recommendation from other researchers', 'credibility with respect to peer review', 'level of visibility', 'ranking of journal', 'where i can make more impact', 'suitability institutional environment', 'journal		The study offers independent research motivations on various research areas within a broader IS field.

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
		specialization and readership' and 'supervisors' recommendations' were identified to be important. 9. The findings identified 'information security', 'ICT4D', 'health informatics', 'ICT in education', 'social media analytics', 'sustainable digital transformation' and 'digital business innovation' as the future research areas they were considering. 10. It was also identified in the findings that, the under researched areas included: 'AI', 'robotics', 'natural language processing', 'developing academic textbooks to teach ICT in Africa', 'culture and AI', 'ICT usage in mobile and remote healthcare delivery and diagnosis of diseases', 'ICT4D' and 'sharing economy' 11. Lastly, the findings indicated that some research areas that would be		

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
		relevant to Africa in the next 5 years include: 'machine learning (supervised and unsupervised)', 'sustainable digital transformation of different economic sectors', 'enterprise informatics', 'digital business strategy' and 'internet fraud'		
2. To identify the significant scholarly trends relating to research issues, methodologies, conceptual approaches, topics considered as well as future research directions in the area.		12. The second main research objective demanded the significant scholarly trends relating to research ISues, methodologies, conceptual approaches, topics considered as well as future research directions in the area. 13. With regards to the research trends, the findings of this study revealed that, journal articles of African IS researchers started gaining considerable numbers in academic journals in 2011 and continued to rise		This study provides a taxonomy that organizes research topics, methods, models, and research approaches, and it identifies varied trends in the IS field. By providing the patterns and trends for the topics and research methods, this study acts as a guide

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
		steadily over the years till date. This finding suggests that, the number of IS researchers in Africa has increased and perhaps the longstanding researchers over the years have increased the number of their publications. 14. The findings further indicated that, much of the studies reviewed used well established research methodologies, that is the quantitative and qualitative research methodologies, nonetheless, there has been more use of quantitative methods than qualitative methods. 15. Furthermore, evidence from the study points to the fact that majority of studies in the IS field were in the 'micro category' in nature. In spite of this, a significant number of studies		for researchers in selecting relevant topics and methods. This study provides the topics and methods that are appealing to African IS researchers, and it further provides a good guide for authors considering a proper avenue for publishing their work. Additionally, based on prior history of publications in journals, thesis supervisors, lecturers, editors and reviewers can mentor potential authors and point them in fruitful

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
		were conducted at the institutional level (meso category), which were driving towards the adoption, diffusion and implementation of IS technologies. The review conducted further indicated that, studies conducted at the national level in Africa were very few and this credence to the fact that African IS researchers need to holistically approach research issues in IS from the national level. 16. Additionally, the findings revealed that most of the studies conducted nosedived into individual African countries with South Africa having the most published IS journal articles. IS literature cuts across most disciplines thereby attracting interest		direction for inquiry based on topics and methodologies.

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
		from eight-one different journals from various disciplines in the systematic literature review conducted. A further a plausible reason for this development could be as a result of the nature with which IS has been studied over a period of time. That is, IS has been studied socially as more focus has been placed on adoption and implementation of IS technologies. 17. Concerning conceptual approaches that have been used to help understand IS in Africa, it was evident that although most studies from the findings have been undertaken devoid of conceptual underpinnings, the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of		

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Research Purpose: The study will explore the dominant themes and theories in IS in Africa. Furthermore, the study will seek to provide a categorization of the contemporary theoretical frameworks and themes, research methodologies, current research trends of IS researchers in Africa and provide knowledge gaps for the future research.				
Research Objectives	Sub Objective	Research Findings	Extant Literature	Contributions, Implications and Recommendations
		Innovation (DOI) and Technology Organization Environment (TOE) were the most widely used conceptual models identified in this research. 18. Since most of the conceptual approaches identified are generally used for studying the support, implementation, adoption and diffusion of technologies or diverse phenomena, it supports the assertion that support and implementation as well as adoption and diffusion themes have been widely studied.		

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6.3 Implications for Research

This study makes a key contribution to the body of IS knowledge and research by combining a rigorous systematic literature review as well as a Delphi technique in the same study. Thus, providing a foundation for researchers to explore the use of systematic literature review and Delphi technique.

With regards to research, the study contributes to the existing body of knowledge on the motivations that underpin the choices of African IS researchers by offering expert consensus through the use of a Delphi Technique. This understanding, particularly from a Delphi based perspective, was in some measure silent in literature. This study can possibly be identified as one of the first to use a Delphi technique to establish the above understanding amongst African IS researchers.

Nevertheless, the findings tend to be relevant in varying African countries as the respondents for the study were geographically dispersed. Again, the study uses the Delphi technique to understand both the current opinions as well as the future directions of African IS researchers. For instance, the experts were able to agree on certain areas that they think would be relevant to the African continent in the next five years.

6.4 Implications for Policy Makers

In relation to policy, it still remains true that having an enabling environment in the form of good educational infrastructure, the right government policies, support and programs will foster high standard research works conducted by African IS researchers. Detailed educational policies and reforms will provide the necessary comprehensive guideline and approach to help boost the quality of research undertaken by IS researchers in general. Also, consensus was developed on the background of the researcher, courses studied by the researcher and the

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technological trends. This provides the necessary basis to assert that policy makers must be ready to adjust the curriculum of universities and other higher learning institutions to provide sources of information that can stir up the interest of young researchers in emerging topics of research that have the potential to be relevant to the African continent and the world at large.

6.5 Implications for Practice

The study contributes to practice by drawing the attention of African IS researchers and academicians to the current research trends, specific factors that influence the choices of African IS researchers, as well as future directions in topics for researchers. Thus, new researchers who are venturing into IS research have a basic understanding of the nature of African IS research, a knowledge that was arguably not available to African IS research. Hence, valuable insights that would help new IS researchers develop their skills in research have been highlighted.

Again, IS researchers who want to widen their scope of research whilst improving upon their research skills can discern critically from the findings of this study and conduct research that pertain to some of the topics identified as relevant to the African region in the coming years.

6.6 Limitations and Future Research Directions

All research studies are bound to experience a number of limitations (Salamzadeh & Kawamorita Kesim, 2017; Velte & Stawinoga, 2017) and this study is no different from such studies. The primary limitation to the study was the fact that, the email survey sent to the participant retrieved very low response rate. Non-response became a major limitation to the Delphi email survey even though quite a lot of participants were contacted for this study, but only a few participants respondent to the survey. This was mainly due to the fact that the

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participant were experts in their various institutions of work and made less time to answer to email surveys.

The second limitation is that the time allocation to the study limited the researcher from conducting more Delphi rounds to help scrutinize the relevant factors that were agreed upon by the participants. When contacting potential participants, the researcher electronically mailed the Delphi round I instrument to the participants which included an introduction of the researcher and a description of the study. Interested participants pointed out their intent to participate by replying and submitting the completed Delphi I instrument via email. Even though this action was proposed to streamline the panel construction and successive data collection, it actually presented some problems with the preliminary data collection.

The amount of time spent to create the initial responses was longer than anticipated by the researcher. Therefore, initial respondents who submitted Delphi round I responses early in the process were required to wait until the initial responses were fully retrieved and analysed before receiving the second round of Delphi questionnaire.

Also, access to some database was limited hence the researcher could access some relevant articles from the databases. Thus, the researcher was left to using articles from databases that were readily available.

Reader convenience had to be considered as against the issue of data collection surfaced in Delphi round 2. Since the researcher focused on collecting the required rather than reader's convenience, the Delphi round 2 data collection instrument was extremely lengthy. The researcher believed that, the lengthy nature of Delphi round 2 was intimidating to the respondents and that they may have felt it too lengthy to continue with participation.

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Lastly, the respondents in this study are not representative of the general population of African IS researchers. In order to attain the purpose of the study, the construction of an expert panel is central to the success of the Delphi methodology. The experts who partook in this study are regarded as experts and are highly regarded in their field but they are not geographically representative of the entire number of African IS researchers.

Future research and other IS development initiatives should replicate this study to consider comparing the trends of IS in the western economies with that of countries in the African diaspora to provide a better taxonomy of the IS field. A study that explicitly focuses on exploring these comparisons will help to better provide an understanding of the growth and survival of information communication technologies over time.

This study is not in any way exhaustive of the number of journal articles authored by African IS researchers but rather these findings provide a definition to IS research in Africa which is rapidly expanding. Much more effort is required in practice, industry and future research to identify more IS related articles, journals and databases to widen the scope of findings of this study.

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APPENDIX A Publication Outlet Distribution

Publishing Outlet (journal)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Totals	Percentage
AJIS	1	3	1	6	7	11	8	16	11	15	19	98	48.8
BMC Medical Informatics and Decision Making			1		2	3	1		1		1	9	4.5
South African Journal of information Management								1		5		6	3.0
Information Technology for Development					2			2	1	1		6	3.0
Information development						1	1	1	1		1	5	2.5
International Journal of Medical Informatics							1		1	1	1	4	2.0
International Journal of Information Management			1						2		1	4	2.0
Telematics and informatics									2	1	1	4	2.0
Emerald			1	2		1						4	2.0
Plos one		1			1						2	4	2.0
Telecommunications policy										2	1	3	1.5
Health information management journal							1			1	1	3	1.5
Future generation computer systems								1		1	1	3	1.5
SA journal of human resource management										3		3	1.5
Wiley online library	1									2		3	1.5

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International journal of information security science											3	3	1.5
The Electronic Journal on IS in Developing Countries					1		1			1		3	1.5
ResearchGate	1								1		1	3	1.5
Electronic Commerce Research and Applications											2	2	1.0
BMC medical education											2	2	1.0
BMC health services research						1					1	2	1.0
Libri				1					1			2	1.0
JMIR medical informatics											2	2	1.0
Government information Quarterly				1	1							2	1.0
International Journal of Educational Sciences									2			2	1.0
Oxford university press								2				2	1.0
Procedia Social and Human Behaviour						1				1		2	1.0
Health policy and Technology					2							2	1.0
Journal of Enterprise Information Management								1		1		2	1.0
Global health action						1		1				2	1.0
Journal of Biomedical informatics											1	1	0.5
Journal of the American medical informatics association		1										1	0.5
Methods of information in medicine				1								1	0.5
South African Journal of Science										1		1	0.5

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Research in comparative and international education										1		1	0.5
African journal of business management			1									1	0.5
Financial innovation									1			1	0.5
The International Journal of Information and Learning Technology									1			1	0.5
ASLIB Journal of Information Management										1		1	0.5
JMIR Mhealth and Uhealth											1	1	0.5
Journal of Medical Internet Research										1		1	0.5
Electronic journal of e-learning									1			1	0.5
Journal of Organizational Computing and Electronic Commerce											1	1	0.5
Strategic change-briefings in entrepreneurial finance											1	1	0.5
Journal of Information Technology Education											1	1	0.5
African Journal of Science, Technology, Innovation and Development									1			1	0.5
Library management										1		1	0.5
Education and training								1				1	0.5
IS and e-business management						1						1	0.5
International journal of project management										1		1	0.5

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International review of research in open and distributed learning									1			1	0.5
Library hi tech		1										1	0.5
BMC Medical and Decision Making							1					1	0.5
Journal of Science & Technology Policy Management							1					1	0.5
Public administration and development				1								1	0.5
Information, communication & Society									1			1	0.5
Journal of health Communication					1							1	0.5
Journal of knowledge management					1							1	0.5
International federation of library Associations and Institutions										1		1	0.5
Journal of Librarianship and information science										1		1	0.5
Global Media and Communication									1			1	0.5
E-Learning and Digital Media										1		1	0.5
Computers and Education							1					1	0.5
Procedia computer science											1	1	0.5
World development										1		1	0.5
Journal of IT and Economic Development							1					1	0.5
Journal of Infection in developing countries										1		1	0.5

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South African Journal of Industrial Engineering									1			1	0.5
Upjournals.co.za										1		1	0.5
Information knowledge systems management						1						1	0.5
Library Philosophy and Practice (e-journal)											1	1	0.5
Journal of the Association for IS										1		1	0.5
Weekly Epidemiological record										1		1	0.5
Panafrican Medical Journal								1				1	0.5
The electronic journal IS evaluation										1		1	0.5
African evaluation journal											1	1	0.5
Journal of IS Education				1								1	0.5
Accounting and Management IS											1	1	0.5
Journal of Educational Technology Systems										1		1	0.5
Journal of Systems and Information Technology				1								1	0.5
Banks and Bank Systems	1											1	0.5
International Conference on Informatics and Semiotics in Organisations									1			1	0.5
Journal of Information Technology Impact				1								1	0.5

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APPENDIX B: Delphi Round One Questionnaire

UNIVERSITY OF GHANA BUSINESS SCHOOL
DEPARTMENT OF OPERATIONS AND MANAGEMENT INFORMATION SYSTEMS.

MOTIVATIONS THAT UNDERPIN STUDIES UNDERTAKEN BY AFRICAN IS RESEARCHERS

Dear Respondent,

Thank you for agreeing to partake in a survey exercise for this research project. Your participation will be completely confidential and you will remain completely anonymous throughout this process. The data gathered within this survey will not be not be subject to any public disclosure and is for use only as part of a MPhil research project.

The MPhil project aims to explore what influences the research topics, choice of use of theories and the research interests of African IS researchers.

The following survey is stage 1 of a Delphi questionnaire. This is designed to obtain your personal opinion relating to a key ISue.

The Delphi process involves questioning you on three separate occasions:

- Round 1: Some general open-ended questions will be submitted to you requiring your response. These are below for you to reply to now.

At a later date:

- Round 2: Your answers (and those from the other panellists) from round 1 will be summarized and formulated into a series of more specific questions that you will be asked to respond to.
- Round 3: Round 2's questions will be submitted to you again but this time you will also be able to see the average reply of the other panellists and you will then be asked if you would like to adjust your answer from the second round or not.

The identity of all panellists will remain confidential at all times

The 5 questions listed below are designed to seek your personal opinion. Please reply to each one but please do not feel limited in the length or style of your answers.

A reply to these by email is fine.

1. What influences your choice of area of research?
2. What influences your choice of theoretical frameworks for research?
3. What influences your choice of research methodology used to conduct a research?
4. What influences the choice of publishing outlet researchers choose?

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Future research directions

5. What are the top 2 research areas you have undertaken in the past 5 years?
6. What are the top 2 research areas you are considering to research in the next 5 years?
7. Are there any areas in ICT in the African context you consider under researched which researchers can take advantaged?
8. In your opinion, which IS would prove ICT areas of research that would be very relevant to Africa in the next 5 years?

Thank you,

Desmond Ateh Larkai.

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APPENDIX C: Delphi Round Two Questionnaire

DELPHI ROUND II

ROUND 2 OF THE MOTIVATIONS THAT UNDERPIN STUDIES UNDERTAKEN BY AFRICAN IS RESEARCHERS

Below are answers from you (and those from the other panelists) from round 1 have been summarized and formulated into a series of more specific answers, which you are asked to respond to Agree, Disagree or remain Neutral.

The 7 questions listed below are designed to seek your personal opinion.

Please SELECT, for each answer, the box that you think influence each criteria.

Part A: Current Research perceptions

Below are responses for questions posed to the panellists about the factors that affect the current choices of IS researchers.

Kindly indicate Agree, Neutral or Disagree in the spaces provided below the table.

1. Which of the following below is more likely to influence the area of research of an African IS researcher?

	Agree	Neutral	Disagree
Courses studied			
Academic background			
Personal interest			
Current social issues			
Impact of research on development			
Ability to impact development			
Supervisor's preference			
Research problems			
New trends			
Industry problems			
Institutional research environment			
Technological trends			
Scholarly relevance			

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Policy relevance			
Challenges in current environment			
Scalability of the research to other contexts			
Call for papers			
Global trends			

2. Which of these do you think is more likely to influence the choice of theoretical frameworks used by African IS researchers for research?

	Agree	Neutral	Disagree
Research questions			
Awareness of the theoretical framework			
Relevance of framework to the study			
Research problem identified			
Desired outcome of the study			
Type and context of the research.			
Personal research orientation			
Research paradigm			
Ability to contribute to the theory			
Fitness of the theory			
Experience and knowledge			
Research objectives			
Application of the theory in extant literature			
Relevant factors to be studied			
Applicability of the theory to the context			
Ability to make modifications to the theory			

3. Which of these below do you think is more likely to influence the choice of research methodology used by an African IS researcher to conduct a research?

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	Agree	Neutral	Disagree
Research questions			
Awareness of the theoretical framework			
Relevance of framework to the study			
Research problem identified			
Desired outcome of the study			
Type and context of the research.			
Personal research orientation			
Research paradigm			
Ability to contribute to the theory			
Fitness of the theory			
Experience and knowledge			
Research objectives			
Application of the theory in extant literature			
Relevant factors to be studied			
Applicability of the theory to the context			
Ability to make modifications to the theory			
Type of data required for meaningful and relevant results.			
Type of data to be gathered			
Theoretical framework used			
Stated purpose of the study			

4. Which of these do you think is more likely to influence the choice of publishing outlet of researchers?

	Agree	Neutral	Disagree
research topic and area			
tier of the journal			
impact score			

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recommendation from other researchers			
scopus index			
accredited by the ministry of higher education for subsidy purposes			
Credibility with respect to peer review			
level of visibility			
ranking of journal			
potential of being published very fast			
where I can make more impact			
academic status			
career trajectory			
quality of manuscripts			
co-authors			
suitability			
institutional environment			
The area of specialisation of the journal and its readership			
Supervisors' recommendations			
The list of approved publishing outlets in my department			
level of acceptability			

5. Which of the following are the top research areas you are considering to research in the next 5 years?

	Agree	Neutral	Disagree
Artificial intelligence			
Church IS adoption			
Information Security			
Ethical Computing			
ICT4D			

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Health Informatics			
blockchain			
ICT in Health			
ICT in Education			
Business intelligence			
Social media analytics			
Pre cognitive systems			
Sustainable digital transformation			
Digital business innovation			
Machine Learning			
ICT in education			
Educational quality assurance			
Adoption of medical decision support systems in developing countries			
Extension of mobile virtual network operations into the delivery of competitive mobile provision in developing countries			
enterprise informatics			
Cyber psychology			
Digital business strategy			
Internet of things			
Cryptocurrency			
the sharing economy			

6. Which of the following areas in ICT in the African context do you consider under researched which researchers can take advantaged?

	Agree	Neutral	Disagree
AI			
Robotics			

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IT investment			
Blockchain			
Big data			
ICT and the SDG's			
Natural language processing			
Machine learning (supervised and unsupervised)			
Developing academic textbooks to Teach ICT in Africa			
Culture and AI			
Digital agriculture			
socio-political impact of emerging technologies (in some countries social media is destroying the socio-political fabric)			
learning analytics			
educational quality assurance			
Mobile banking adoption			
Development of smartphone apps to support sustainable farming and advertising of farm produce through apps to larger markets			
ICT usage in mobile and remote healthcare delivery and diagnosis of diseases			
Cyber Psychology			
Privacy of data			
Cryptocurrency			
ICT4D			
sharing economy			

7. In your opinion, which ICT areas of research below would be very relevant to Africa in the next 5 years?

AI	Agree	Neutral	Disagree
Robotics			

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Outsourcing IT Capabilities			
ICT for Development			
Distributed Teamwork			
Mobile Computing			
Blockchain			
big data			
ICT and poverty eradication			
Natural language processing			
Machine learning (supervised and unsupervised)			
Socio-Economic Development			
Data Analytics in Government			
Sustainable digital transformation of different economic sectors (agriculture, health, education; governance etc.)			
learning analytics			
Using mobile and smartphones for all aspects of business, health and education through cloud hosted services and big data			
enterprise informatics			
cyberpsychology			
Data mining			
Digital Business strategy			
Data driven culture			
Business Intelligence			
Cryptocurrency			
Internet fraud			