INFLUENCE OF LEADERSHIP ORCHESTRATION ON ELECTRONIC READINESS ACCESSION IN HIGHER EDUCATION INSTITUTIONS IN KENYA

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(Leadership and Governance)

JOMO KENYATTA UNIVERSITY OF

AGRICULTURE AND TECHNOLOGY

2018

Influence of Leadership Orchestration on Electronic Readiness Accession in Higher Education Institutions in Kenya

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A Thesis Submitted in Partial Fulfilment for the Degree of Doctor of Philosophy in Leadership and Governance in the Jomo Kenyatta University of Agriculture and Technology

2018

DECLARATION

This thesis is my original work and has not been presented for any degree in any other University.

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This thesis has been submitted for examination with our approval as University Supervisors.

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DEDICATION

This work is dedicated to the Lord God Almighty, the creator of heaven and earth; who bestowed me the opportunity to belong and to co-create as a king and a priest unto Him; who ordained that the bondage of foolishness and wickedness from me vanish and that holiness and righteousness in me be found on account of Jesus Christ. To the Lord God Almighty be the Kingdom, the power and the glory, forever and ever. Amen.

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS AND ACRONYMS

COBIT - Control Objectives for Information and Related Technology

ERA - Electronic Readiness Accession

CID - Center for International Development

CUE - Commission for University Education

CMMI - Capability Maturity Model Integration

FGD - Focus Group Discussion

HEI - Higher Education Institution

ICT - Information and Communication Technology

JKUAT - Jomo Kenyatta University of Agriculture and Technology

KENET - Kenya Education Network

KEMU - Kenya Methodist University

MOEST - Ministry of Education, Science and Technology

PPT - People, Process and Technology

SQ - Service Quality

VIF - Variable Inflation Factors

VUCA - Volatile; Uncertain; Complex; and Ambiguous

USIU - United States International University

OPERATIONAL DEFINITION OF TERMS

Accession: The act or process by which someone/something rises to a position of honor or power (Merriam-Webster, 2018) or the act of entering upon or attaining to an office, right or condition (Collins English Dictionary, 2018) or the attainment of a dignity or rank.

Architect: An architect is someone engaged (a) to implement the wishes of the customer or (b) in the role of creating something beyond what the customer is able to express (Wallin, 2006).

Auctioneer: An auctioneer is someone able to watch the audience to identify the slightest indication of interest; tries to maintain lots of excitement and the momentum that keep bidders active and has mastered the pace, poise, preparation tremendous panache and brilliant instinct (Wallin, 2006).

Conductor: A conductor is someone able to mobilize other actors into a joint value-creating activity including customers; co-producers, competitors and to utilize orchestration efficiency and creativity (Wallin, 2006). The art of getting others to perform based on one's vision.

Developer: A developer is someone able to provide employees with needed skills, articulating the value of digital technologies to the organizations future, taking risks, building skills to realize the strategy, developing digital strategies with an eye on transforming the business and fostering a culture to change and

invent the new (Kane, Palmer, Philips, Kiron, & Buckley, 2015). A developer is able to facilitate horizontal development which can be learned (from an expert), help people to pursue vertical development which must be earned (by oneself) (McGuire & Rhodes, 2009).

Digital convergence: is defined as the union of audio, video, and data communication and its processing into a single source received on a single device, delivered by a single connection (Wallin, 2006).

E-leadership: is the accomplishment of a goal that relies on ICT through the direction of human resources and uses of ICT; consisting of skills in the three domains of skills ICT skills, market skills and strategic/tactical skills (European Commission, 2014).

E-readiness (electronic readiness): is a measure of the degree to which a country, nation, economy or sector may be ready, willing or prepared to obtain benefits which arise from ICTs (Dada, 2006) or a e-readiness measures how well a society is positioned to utilize the opportunities provided by ICT, where ICT infrastructure, human capital, regulations, policies and internet penetration are all crucial components of e-readiness (Alaaraj & Ibrahim, 2014). In the advent of the information age and the digital age, digital age readiness may be used in place of e-readiness.

E-readiness accession is the rise in rank in the ability and the capability to utilize and harness the opportunities of the digital age technologies (Kashorda & Waema, 2011). In the advent of the information age and the digital age, digital age readiness accession may be used in place of e-readiness accession.

Orchestration: is the capability to mobilize and integrate resources for the purpose of providing an offering to a customer and simultaneously create value for the customer, the orchestrator, and the network members involved. The orchestrator considers the constraints, based on which conversations are nurtured, to define and execute the purposeful resource allocation to create, produce, and provide the customer with the offering (Wallin, 2006).

Promoter: A promoter is someone able to let people do things because they want to do them, not because the leader wanted them to; provide personal motivation; create passion around the task as a way of making the world a better place and as a way of having fun; stimulate dreams and aspirations; and institutionalize the new way of doing things (Wallin, 2006).

ABSTRACT

The world has increasingly become knowledge-centric driven by advancements in the information society and created a need for digital-age leadership skills. Digital age leaders with clear digital strategies are in great demand across the globe. Higher education institutions are not insulated given the observed low levels of e-readiness accession in recent KENET e-readiness surveys of 2006, 2008 and 2013. This calls for a review of leadership in higher education institutions for the improvement of e-readiness accession. The general objective of the study was to investigate the influence of leadership orchestration on the e-readiness accession in higher education institutions in Kenya. The specific objectives of the study were: to examine the influence of the leader as a conductor on e-readiness accession in higher education institutions in Kenya; to examine the influence of the leader as an architect on e-readiness accession in higher education institutions in Kenya; to examine the influence of the leader as an auctioneer on e-readiness accession in higher education institutions in Kenya; to examine the influence of the leader as a promoter on e-readiness accession in higher education institutions in Kenya; and to examine the influence of the leader as a developer on e-readiness accession in higher education institutions in Kenya. To operationalize the study an e-readiness assessment model based on people, process, and technology nexus and service quality nutshell was developed. A cross-sectional survey design was used with stratified random sampling of 336 respondents from a purposive sample of 9 higher education institutions in Kenya. An online closed questionnaire was used and triangulated with a focus group discussion and interview guide. Correlation and linear regression was used to analyze the data with F-test being applied to the test hypothesis at $\alpha < 0.05$. Content analysis was used for the qualitative data. The results and findings herein demonstrate that the leader dimensions: leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer have a strong, significant and positive correlation with e-readiness accession. Individually, each predictor is a significant predictor of e-readiness accession while jointly in step-wise multiple regression only the

leader as a conductor and as a developer are significant co-predictors of e-readiness accession. It is therefore recommended that investment be made in leadership orchestration for e-readiness accession in higher education institutions in Kenya to tap the benefits of the digital age, for quality education and societal impact. It is also recommended that e-readiness accession be assessed on the basis of people, process and technology nexus and the service quality nutshell. Primary data to assess leadership orchestration and e-readiness accession for which further research may be done using longitudinal research design with snapshots of primary data annually or biannually, as well as, using secondary data collected by KENET on e-readiness in higher education institutions in Kenya. Further studies may be done to deconstruct and re-construct a new set of variables and, perhaps, form a different combination(s) of predictors of leadership orchestration and e-readiness accession as well as unravel the effect of moderating, mediating and intervening variables beyond the scope of this study.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Since global competition is becoming increasingly knowledge-centric, skills related to the specific requirements of information-intensive societies (e-skills) are becoming increasingly strategic (European Commission, 2014). The private sector is naturally concerned about its ability to create and maintain competitive advantage around an appropriate skill-mix across its human resources. Governments also look at these questions as priorities, both from the point of view of adapting national education and innovation policies to the requirements and challenges of global competition, and from that of employment creation and inclusion (Lanvin & Pamela, 2008). The MIT Sloan Management Review finds that what separates digital leaders from the rest is a clear digital strategy combined with a culture and leadership poised to drive the transformation (Kane, Palmer, Philips, Kiron, & Buckley, 2015). This lays emphasis for a different approach to leadership in the information age.

The Kenya National ICT Master Plan 2012 posits that ICT offers a powerful tool that, if deployed equitably can ensure citizens are empowered and government can deliver services more effectively. This idea that ICTs would play a central role in the economic development in the 21st century has been posited for over three decades. ICT was envisioned in the year 2000 as having the potential to help Africa to leapfrog intermediate stages of development by avoiding costly investments in time, resource and the generation of new knowledge (The World Bank, 2000). In this thrust, the Ministry of Information and Communication of Kenya adopted a three pronged approach in ICT affairs; to deliver citizen needs, the need to strengthen industry through ICT and encouragement of the creation of ICT businesses (Kenya ICT Board, 2012). ICT therefore emerges as both a means and an enabler.

This state of affairs is also true to the education sector in general and higher education sector in particular whether in public or private higher education institutions in Kenya. The reinforcement of education through ICT integration in education is especially important given that education and knowledge is considered the greatest determinant of long-term growth and improvement of social life besides being a major foundation for every citizen's promotion of nationhood (Government of Kenya, 2009). ICT in education is an essential ingredient for quality research, training and innovation in higher education. It is noteworthy that a high degree of e-readiness also contributes significantly towards the realizations of a university's academic and administrative goals (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013).

The Universities Act 2012, Kenya, identifies several objectives of university education including advancement of knowledge through teaching, scholarly research, and scientific investigation as well as the promotion of learning in the student body and society generally (Kenya National Assembly, 2012). The university education, in the prism of public universities, is in itself part of public service. In this regard, university education has to be responsive, prompt, effective, impartial and equitable, demonstrate efficient, effective, economic use of resources as well as promote transparency and provision of timely and accurate information as stipulated in the Constitution of Kenya (Government of Kenya, 2010). It is also noteworthy that the education and training is considered fundamental to the success of the achievement of the middle income economy status as envisioned in the Kenya Vision 2030 (Government of Kenya, 2007).

In this regard, the Kenya vision 2030 identifies the need to re-orient education to focus, among other technological trends to drive the achievement of national dreams (Government of Kenya, 2007). This is also reinforced by the National ICT Master Plan of Kenya which recognizes that ICT will ensure connectivity for all students, to improve access to online resources, increase adult participation and improve the quality of education (Kenya ICT Board, 2012). Scholarly and expert research on university

governance internationally also identifies that ICT and its potential lies at the core of the transformation of outmoded, ivory tower towards the rational new type university (Schuetze, Bruneau, & Grosjean, 2012).

Harnessing the full potential for ICT in higher education requires skills for the management, governance and leadership in the information age. The e-skills required for innovation, competitiveness and employability in this age (Lanvin & Pamela, 2008) are ICT user skills, required for effective application of ICT systems and devices by the individual; ICT practitioner skills, required for researching, developing and designing, managing, producing, consulting, marketing and selling, integrating, installing and administrating, maintaining, supporting, and servicing ICT systems; and e-business skills, needed to exploit opportunities provided by ICT, notably the Internet, to ensure more efficient and effective performance of different types of organizations, to explore possibilities for new ways of conducting business and organizational processes, and to establish new businesses.

The world has experienced a very rapid development in the field of ICT which has had a great impact on the leadership of institutions (Ibrahim, 2014). The rapid emergence of the information age has led to the 'new knowledge economy' in which education must be 'constantly' reformed to meet the demands of the 'rapidly changing global economy' (Bartlett, 2013). With the advancements in the modern technology and its permeation in every sector of the society education cannot lag behind especially since education exists in a socio-cultural context, and thus must change as well in order to adapt to the emergent needs of an increasingly digital public (Franciosi, 2012). The role of new technologies in advancing quality and accessible education is amplified with UNESCO citing ICT as being able to help in the achievement of the "education for all goals" including broadening access, eliminating exclusion, and improving quality (Wallet & Melgar, 2014).

The senior leadership have to measure and monitor the strategic e-readiness indicators in order to achieve significant accession in all 17 e-readiness indicators in higher education (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). Hence, it is feasible to state that the responsibility to build e-skills and other capabilities to tap the benefits of the digital age rests on the leadership (McCusker & Babington, 2015). Organizational leadership that takes on and follows through on the process of cultural transformation in support of other large changes consistently succeeds in terms of larger performance goals, while other organizations generally fail to change and struggle to survive (McGuire & Rhodes, 2009). The contention that colleges and universities are challenged not only by the shortage of and competition for the specific technical skill sets needed to advance institutional strategies related to ICT but also by the need to ensure effective information technology leadership at the highest levels (Hawkins, Rudy, & Wallace, 2002) rings as true today as it was in 2002.

To drive multicultural (and often geographically dispersed) teams, and to attract talents from afar, new qualities are required from leaders in higher education. E-leaders are expected to understand the pervasive application of technology to organizational processes and to turn innovation into productivity gain (Lanvin & Pamela, 2008). The advancement of ICT – the Internet, advanced analytical capabilities, cloud computing, e-services – requires new capacities for leading organizational and economic transformation (Ochara, 2013).

ICTs continue to advance in scope and impact on the organizations. New concepts such as e-governance, e-business, e-education, e-health, virtual organization and social networking among others in the spheres of connectivity, collaboration and communication are emerging dynamically. Whereas in the earlier years e-government was considered as a tool for dissemination of information and delivery of services online, in current times going into the future it is a mechanism to transform government through use of ICT (Pina, Torres, & Royo, 2010). These changes are not only true in the

spheres of e-government but in all other spheres and especially leadership that must transform the systems therein.

It is therefore imperative to study e-management, e-governance and e-leadership skills for the information especially in the higher education domain that plays a great role in the development of human resources and capabilities for social, economic and political development. The researcher focuses on the influence of leadership on e-readiness accession (ERA) in higher education in Kenya.

1.2   Statement of the Problem

ICT is an essential ingredient for quality research, training and innovation in higher education. It is noteworthy that a high degree of e-readiness accession contributes significantly towards the realizations of a university's academic and administrative goals (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). There are many economic and other benefits from the use of digital technology (Economic Intelligence Unit, 2010) in the higher education sector. E-leadership skills are in high demand (Lanvin & Pamela, 2008) to be able to reap the benefits of digital age. The success of the management of education institutions is pegged on effective e-leaders (Valle, 2015). Effective senior leadership of higher education institutions is necessary in order to achieve significant accession in the e-readiness indicators in higher education (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). Improvement in the levels of e-readiness can be best achieved in consideration of people, process, and technology (Emerson Network Power, 2013), (Husby, 2012), (Williams & Leask, 2011) and service quality (Rabaa'i, 2010), (Tarvid, 2008). E-readiness assessment models need to focus not only on technology and related issues but also on people, process and the overarching service quality considerations for the higher education ecosystem.

Although e-readiness has been studied for over a decade, most studies have mainly focused on countries with some researchers developing organization-specific e-readiness assessment models (Tarvid, 2008). Most e-readiness indices are related to particular themes such as e-commerce and e-government, while other category includes general indices which measure the capacity of ICT, internet diffusion and other access-related issues without any particular focus on specific aspects of information society (Alaaraj & Ibrahim, 2014). The existing indices are thus limited to the extent of adequate understanding of e-readiness in unique sectors such as higher education. There has been limited accession to higher stages of e-readiness accession in higher education institutions in Kenya for most of the 17 indicators between 2008 and 2013 (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013) based on KENET's CID E-Readiness Assessment Framework. Although leadership research has increased in diversity, subtlety and intricacy, including the fields of education leadership and educational technology, e-leadership research in education, by contrast, has barely emerged into public recognition as a research concept within the recognizable surface of scholarly endeavor (Jameson, 2013). A UNESCO Report on e-readiness in schools in Asia argues that as ICT adoption and use in the wider socio-economic context of countries becomes more prevalent, it becomes clear that ICT adoption and policies in education are areas that require further study (Wallet & Melgar, 2014) – underpinning the need for addition studies on e-readiness and related issues in education.

Noteworthy also, a lot of research in the recent past has focused more on leadership in technology-mediated virtual organizations while the success of the management of education institutions is pegged on effective e-leaders (Valle, 2015). Most e-readiness assessments have focused technology (infrastructure and information) as exemplified by the CID E-Readiness Assessment Framework (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013), Addom's E-Readiness Assessment of HEIs in Ghana and Machado's E-Readiness Assessment Model (Tarvid, 2008). Considerations of the nexus of people, process and technology as well as service quality

have been brief and anecdotal with service quality coming in as an improvement in the Tarvid's E-Readiness Model. This is despite the assertion that technology contributes 20%, process contributes 30% and people issues contribute 50% in the effective digital age transformation (Kumar, 2017). Leadership in the information era, in essence e-leadership, is an essential element for the achievement of quality education (Leonard & Leonard, 2006), (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). Nevertheless, the role of leadership has also barely featured in e-readiness studies.

In recognition of the importance of the improvement of e-readiness accession in higher education institutions in Kenya in order to be able to reap the benefits of the digital age technologies the author seeks to, one, study the role of leadership orchestration (Wallin, 2006) and leadership development for better e-readiness of higher education institutions, two, focus on a different approach to e-readiness that accounts for the people, process, technology (Emerson Network Power, 2013), (Husby, 2012), (Williams & Leask, 2011) and service quality (Rabaa'i, 2010), (Tarvid, 2008) as an ecosystem for better e-readiness.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of the study was to investigate the influence of leadership orchestration on the e-readiness accession in higher education institutions in Kenya.

1.3.2 Specific Objectives

The specific objectives of this research were:

1. To examine the influence of the leader as a conductor on e-readiness accession in higher education institutions in Kenya.

2. To examine the influence of the leader as an architect on e-readiness accession in higher education institutions in Kenya.
3. To examine the influence of the leader as an auctioneer on e-readiness accession in higher education institutions in Kenya.
4. To examine the influence of the leader as a promoter on e-readiness accession in higher education institutions in Kenya.
5. To examine the influence of the leader as a developer on e-readiness accession in higher education institutions in Kenya.

1.4 Hypotheses

The null hypotheses, H_0, were:

H_{01} : The leader as a conductor has no significant influence on e-readiness accession in higher education institutions in Kenya.

H_{02} : The leader as an architect has no significant influence on e-readiness accession in higher education institutions in Kenya.

H_{03} : The leader as an auctioneer has no significant influence on e-readiness accession in higher education institutions in Kenya.

H_{04} : The leader as a promoter has no significant influence on e-readiness accession in higher education institutions in Kenya.

H_{05} : The leader as a developer has no significant influence on e-readiness accession in higher education institutions in Kenya.

1.5   Significance of the Study

The access and quality of education lies at the core of the realization of Kenya national aspirations (Government of Kenya, 2007). Effective and efficient delivery of services is a critical focus of the Constitution of Kenya (Government of Kenya, 2010). Fundamentally, ICT is identified as a core component of the improvement of education and needs to be reinforced under the national ICT master plan (Kenya ICT Board, 2012). ICT is also considered necessary and essential to the re-orientation of the modern university ecosystem from the traditional, outmoded ivory tower to a more flexible, rational institution (Schuetze, Bruneau, & Grosjean, 2012). Universities provide leadership in the management and utilization of new technologies (Schuetze, Bruneau, & Grosjean, 2012). Universities that invest in good ICT strategy, financing and human capacity have the potential of better development in their e-readiness status (Kashorda & Waema, E-Readiness Survey of East African Universities (2008), 2009).

It is also noteworthy that apart from internet availability, affordability and reliability of power supply which are external factors, all others are generally internal to the universities (Kashorda & Waema, E-Readiness Survey of East African Universities (2008), 2009). ICT leadership and governance within the institutions should therefore be an area of keen focus by the institutional leaders and managers. It is also noteworthy that lack of involvement of management, lack of rational decision making, poor leadership styles, culture and bureaucracy are identified as some of the key inhibitors of good ICT project implementation (Gichoya, 2005). Many projects suffer total failure, partial failure or sustainability failure.

All these point to the need for effective leadership in an ICT-mediated institutions and especially so in the higher education eco-system. The digital fluency, the ability to articulate the value of digital technologies to the organization's future, of the leaders is a key ingredient of the organization's capability to tap into the benefits of the digital age (Kane, Palmer, Philips, Kiron, & Buckley, 2015).

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It is expected that the results of this study shall provide leaders in higher education with indicators of the leadership orchestration needed to steer higher education institutions towards improved e-readiness accession as a means of survival, sustainability and improved service experiences in the information age.

The study also proposes an assessment model of e-readiness accession that blends people, process and service quality to the existing models which focus on technology – a novel way that could transform the way e-readiness is studied and improved in the digital age. The results of the study will provide researchers and scholars of e-readiness and e-leadership with an alternative model for e-readiness assessment and leadership orchestration required to leverage on ICT for better quality education in the digital age.

1.6   Scope of the Study

This study focused on leadership orchestration and its influence on e-readiness accession in higher education in Kenya. The scope was therefore the purposively selected higher education institutions recognized as universities in Kenya by the Commission for University Education.   These were 5 public universities and 4 private universities, making a total of nine universities. The nine universities were dispersed in 5 counties in the Republic of Kenya namely Nairobi, Nyeri, Kiambu, Narok and Meru. The category "Other" universities were spread in 7 counties namely Nandi, Kiambu, Kirinyaga, Laikipia, Machakos, Nairobi and Tharaka-Nithi with 4 public and 3 private universities. The category "Other," in which respondents were obtained by simple random sampling, was part of the triangulation measures used in the data collection alongside focus group discussion and interviews.

The results are generalized to the rest of the higher education ecosystem in Kenya given that e-readiness accession studies carried out in Kenya in 2006, 2008 and 2013 highlighted the role of leadership in the accession of higher education institutions into

the digital age capabilities, and hence the study on the influence of leadership orchestration on e-readiness accession in higher education institutions in Kenya.

1.7   Limitations of the Study

There were shortcomings in the study that could not be controlled by the researcher and that placed restrictions on the methodology and conclusions. These included the amoebic nature of students and staff population across semesters in the target universities such that the actual number of students and staff would not be stabilized in the period of November 2016 November 2017 when the research was approved. Challenges were experienced in implementing random sampling based on a ratio of proportional allocation. Stratified random sampling was used with each university as a stratum and simple random sampling being used within each university.

Caution of approximation was employed within each university with the known larger universities having more respondents. Prior knowledge and experience with the higher education institutions in Kenya was used to gauge the approximate population size. University populations being large a sample size of 385 was used.

CHAPTER TWO

LITERATURE REVIEW

2.1   Introduction

This chapter examines the theoretical framework for the purpose of identifying the issues associated with leadership orchestration, e-readiness accession and how e-readiness accession can be better assessed, presents the conceptual framework, empirical review, critique of existing literature, research gaps and the summary of literature review.

2.2   Theoretical Framework

Harnessing the full potential for ICT in higher education requires skills for the management, governance and leadership in the information age including ICT user skills, required for effective application of ICT systems and devices by the individual; ICT practitioner skills, required for researching, developing and designing, managing, producing, consulting, marketing and selling, integrating, installing and administrating, maintaining, supporting, and servicing ICT systems; and e-business skills, needed to exploit opportunities provided by ICT, notably the Internet, to ensure more efficient and effective performance of different types of organizations, to explore possibilities for new ways of conducting business and organizational processes, and to establish new businesses (Lanvin & Pamela, 2008).

2.2.1   Business Orchestration Approach

Realizing the need for a different approach to leadership in the information age, Professor David Yoffie of Harvard, argued that for digital convergence to be realized greater managerial creativity was mandatory. This notion leads to the emergence of business orchestration as the alternative leadership in the digital age. In essence the

leadership role is to orchestrate people, information and processes to solve business problems and achieve business objectives, from defining customer needs, to developing products, to distributing products, to servicing them (Wallin, 2006).

Although derived from the study or practice of music in which orchestration refers to the arrangement of a musical composition for performance (Merriam-Webster, 2015), (Dictionary.com, 2015), the term orchestration has found new life in the information age. In this sense, orchestration is defined as the capability to mobilize and integrate resources for the purpose of providing an offering to a customer and simultaneously create value for the customer, the orchestrator, and the network members involved. The orchestrator considers the constraints, based on which conversations are nurtured, to define and execute the purposeful resource allocation to create, produce, and provide the customer with the offering (Wallin, 2006).

The digital age is characterized with many disruptive technologies, innovations, solutions and approaches that may cause an entire paradigm shift in the way leaders orchestrate better performance and sustainability. From an innovation perspective, a Deloitte Report titled "Innovating for a digital future: The leadership challenge," by Davis & Canwell (2012) identifies four key issues dubbed the true leadership challenge in the age of digital transformation and knowledge based society being the ability to have an explicit approach to building a portfolio of innovations, create a culture which embraces experimentation and a degree of risk taking, building compensating mechanisms that make innovation everyone's job and having a relentless focus on acquiring the right talent and building an environment where their people can flourish (Davies & Canwell, 2012).

Other definitions of orchestration have emerged specific to the area of information and communication technologies. One of the most outstanding is the view that orchestration is simply the coordination of automated tasks and activities across teams, tools, and environments in which case orchestration coordinates tasks and processes for managing

IT incidents, changes to services, system-generated events, service requests, routine tasks and activities and ad hoc activities (Hewlett-Packard, 2013).

The emergence of business orchestration is underpinned by the very nature of the digital age/information age with the following characteristics (Wallin, 2006): changes from the industrial structures; from vertical to horizontal with systemic innovation emanating from alliance networks; availability of many options of learning hence awareness of more things, experience with more that is faster and better and deeper insights; opportunities for the less privileged; entrepreneurial individuals across the globe have equal chance to explore and exploit new opportunities; increased transparence with everyone aware of products, services, product and service reviews as well as the ranking of the institutions; pervasive computing with greater computing power now available, permeation of ICT into everyday lives, reduced prices for better, newer functionality as well as new services; extended enterprises founded on the need to exploit global comparative advantages; effectiveness and flexibility; emergence of virtual communities to recover human behavior lost during the industrial age, which was marked by the individualization of the society, to a society hewn by technology-mediated social networks, customer communities, professional networks and other movements. The justification for orchestration as a way of leadership (Wallin, 2006) in the digital age is summarized by the diagram:
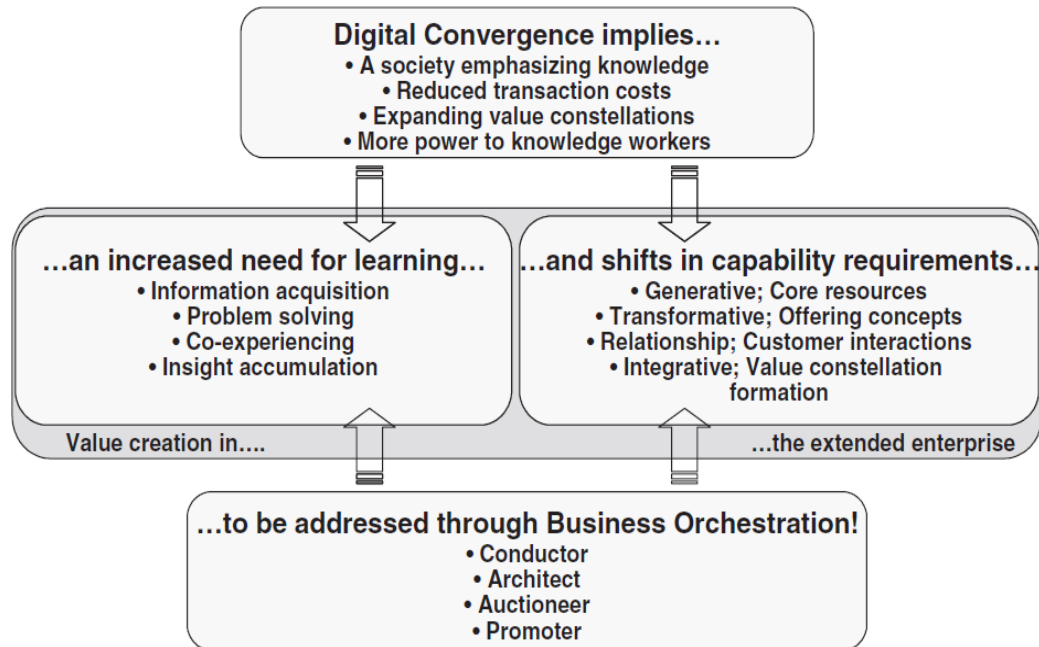
Figure 2.1: Wallin's Business Orchestration Leadership Model, Source: Wallin (2006)

Orchestration most naturally fits into a collaborative culture, emphasizing community relationships over individual autonomy. In many respects the existing shareholder-centric business philosophy and the emphasis on 'competitive' strategy has discouraged business people from considering this perspective. Also incentive systems and management practices have glorified the effort of the single individual, highlighting individual accountability and responsiveness. This has put the attention on the individual as a standalone knowledge worker, and not as a member of a learning social community. The business orchestration identifies four qualities of a leader in the information age. The four qualities are conceptualized as follows (Wallin, 2006):

a) The Leader as a Conductor

An orchestrator (Wallin, 2006) in music seeks to be able to modify his performance to match the audience, the skills of the players, and his own continuing exploration of rhythm, melody, and harmony. The role of a successful conductor in music is to apply the orchestration skills both internally when conducting and externally when shaping the context wherein the orchestra can perform. Working around the core, the conductor systematically builds up the performing capacity of the orchestra. The learning is about perfecting the performance. But then there is the complementing task of renewing the program. Here the work is much more about involving the external world. What are the expectations of the audience? The sponsors? Are there interesting guest artists that could be available? In this role the challenge is to come up with new ideas and present a new repertoire that thrills the audience and makes the musicians enthusiastic.

Leadership in the information age is increasingly about collaborating and making decisions as things evolve. Hence the need for an inclusive game plan. Such a plan provides the network members with a shared view of how to integrate and synchronize efforts and actions that are taking place throughout the network. The more complex the operations to undertake, the more there is a need for a plan that guides the actions within the frame of the whole in order to reduce the risk of sub-optimization. The success of the conductor is how well he could mobilize the artists to perform against a predefined target.

b) The Leader as an Architect

The architect (Wallin, 2006) is a problem solver working very closely with the external constituents to be able to sense and transform the expectations into a physical artifact. An architect can be engaged to implement the wishes of the customer, but he can also be in the role of actually creating something beyond what the customer is able to express. In the context of orchestration, it is especially the latter role of the architect that is of

interest. In urban planning this means that if a new building is enough of a draw, it can revitalize a city or region as effectively as the most comprehensive master urban plan.

Traditionally architecture could shape the environment as standalone artifacts; today buildings increasingly have to integrate the activity of the surrounding environment to create attention and form people's opinions.

There are many areas where the principles of architecture are applicable outside the profession of designing buildings. One such area is when companies consider how to establish ways of combining different skills and capabilities to come up with new competitive products and services.

c) The Leader as an Auctioneer

An auctioneer (Wallin, 2006) has to watch the audience to identify the slightest indication of interest in a potential buyer and through his own behavior motivate the buyer to put forward a bid. A good auctioneer tries to maintain lots of excitement and the momentum that keeps at least two bidders active.

The auctioneer controls the room, enjoys a lively rapport with the audience, varies the pace, and, most importantly, keeps the audience awake. It is an essential sixth sense to know when a bidder still has a little more gas in the tank – the bidder who has stopped reluctantly – because with timing and judgment, the auctioneer can encourage him or her to go to one more bid. The auctioneer is exceptional if he can push the limits of the market far beyond the expected levels.

d) The Leader as a Promoter

The job of the leader as a promoter (Wallin, 2006) is to let people do things because they wanted to do them, not because the leader wanted them to. The people working on Linux participated because they loved programming. They loved being part of a global

collaborative effort, dedicated to building the best and most beautiful technology that was available to anyone who wanted it.

In-depth expositions of the four archetypes of orchestrators: conductors, architects, auctioneers, and promoters. In connection with each of these roles one orchestration architecture area of particular importance has been highlighted. For the conductor it was the game plan, for the architect the operational architecture, for the auctioneer the information architecture, and for the promoter the social architecture. Together these architectural components form a whole that can be called the orchestration architecture.

e) The Leader as a Developer

With new and dynamic changes in the leadership arena and in the advent of the information society new ways of developing leadership are required. For a long time, we have thought about leadership development as working out what competencies a leader should possess and then helping individual managers to develop them–much as a bodybuilder tries to develop different muscle groups. We may be arriving at a point where we face diminishing returns from teaching managers more about leadership (McGuire & Rhodes, 2009); (Petrie, 2014).

The new leadership must take into account the characteristics of the digital age including information overload; the interconnectedness of systems and business communities; the dissolving of traditional organizational boundaries; new and dynamic technologies that disrupt old work practices; the different values and expectations of new generations entering the workplace and the increased globalization leading to the need to lead across cultures (Petrie, 2014), (European Commission, 2014). The new leadership environment is summarized in the VUCA concept: volatile: change happens rapidly and on a large scale; uncertain: the future cannot be predicted with any precision; complex: challenges are complicated by many factors and there are few single causes or solutions; and ambiguous: there is little clarity on what events mean and what effect they may have.

Organizations have grown skilled at developing individual leader competencies, but have mostly ignored the challenge of transforming their leader's mind-set from one level to the next. Today's horizontal development within a mind-set must give way to the vertical development of bigger minds (McGuire & Rhodes, 2009).

Generally, the horizontal development that dominates today is the development of new skills, abilities, and behaviors and is characteristically more of technical learning. It is most useful when a problem is clearly refined and there are known techniques for solving it. Surgery training is an example of horizontal development. Students learn to become surgeons through a process known as "pimping," in which experienced surgeons continually question students until the point when the student cannot answer and is forced to go back to the books to learn more information. While the process of learning is not easy, there are clear answers that can be codified and transmitted from expert sources, allowing the students to broaden and deepen their surgical competency (Petrie, 2014).

The proposal for a new form of leadership development encompasses vertical development. Vertical leadership development challenges the existing notion that leadership development is simply a progression of knowledge and skill development coupled with the application and refinement of those skills (Gifford, 2015). Vertical development, refers to the "stages" that people progress through in regard to how they "make sense" of their world. While we notice children progressing through stages of development as they grow, conventional wisdom assumes that adults stop developing at around 20 years old and thus the use of the term "grown up".

The assumption has been challenged by developmental researchers who have shown that adults continue to progress (at varying rates) through predictable stages of mental development and at each higher level of development, they "make sense" of the world in more complex and inclusive ways–their minds grow "bigger." The horizontal and vertical leadership development are conceptualized simply that horizontal development

is like pouring water into an empty glass in which case the vessel fills up with new content (you learn more leadership techniques) while vertical development aims to expand the glass itself. This means advancement to higher levels or stages in the ability to deal with complexity and ambiguity (McGuire & Rhodes, 2009), (Petrie, 2014), (Fraser, 2015).

The methods for horizontal development are very different from those for vertical development. Horizontal development can be learned (from an expert), but vertical development must be earned (for yourself). Vertical development has to occur when people feel consistently frustrated by situations, dilemmas, or challenges in their lives which cause them to feel the limits of their current way of thinking, affects in an area of their life that they care about deeply and there is sufficient support that enables them to persist in the face of the anxiety and conflict (McGuire & Rhodes, 2009).

Leader development in the information age has to take into account the nurturing of innovations. This includes not just the tasks directly related to the development of innovations, but also the tasks needed to facilitate innovation, mature concepts, and translate these concepts into real operational capabilities for the organization (Alberts, 2002). Providing employees with needed skills, articulating the value of digital technologies to the organizations future, taking risks, building skills to realize the strategy, developing digital strategies with an eye on transforming the business and fostering a culture to change and invent the new is considered central in leading successful institutions in the information (Kane, Palmer, Philips, Kiron, & Buckley, 2015).

2.2.2 E-Readiness

E-readiness, electronic readiness, is a measure of the degree to which a country, nation, economy or sector may be ready, willing or prepared to obtain benefits which arise from ICTs (Dada, 2006). In the context of the higher education sector e-readiness is a measure

of the sectors (and individual higher education institutions) readiness, willingness or preparedness to tap the benefits and opportunities arising from ICTs (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013).

E-readiness has tended to focus on the hardware, networks, software and information but limited in depth with respect to people, process and the leadership orchestration necessary to make these work for the success of organizations and socio-economic sectors. Nevertheless, even in the current form, e-readiness is an essential element in the advancement of ICT in higher education to the extent that in helps us to understand the readiness to tap into the benefits of ICT in higher education. ICT helps institutions to make innovations that are much more successful because it dramatically lowers the costs associated with four essential dimensions of innovation: measurement, experimentation, sharing and replication. It does so by digitizing these dimensions into bits of information and therefore making it possible to create, store and transmit them at virtually no-cost (Directorate-General, Taxation and Customs Union, 2014). This would derive great value in the higher education segment whose special mandate is to drive research and innovation.

E-readiness studies have been done on countries, economic blocks, regions or globally for over a decade. The models used differ for different studies and researchers (Tarvid, 2008). A few researchers have developed e-readiness assessment models that can be applied in the higher education environment.

a) CID E-Readiness Assessment Framework

The Kenya Education Network has used an e-readiness assessment tool originally developed by the Center for International Development at Harvard University (http://www.readinessguide.org) and modified for e-readiness assessment in Kenya and East Africa for the e-readiness surveys of 2006, 2007 and 2013 (Kashorda & Waema,

The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). The framework contains 17 indicators grouped into five categories.

The categories and respective indicators include network access (information infrastructure, internet availability, internet affordability, network speed and quality), networked campus (network environment, e-campus), networked learning (enhancing education with ICTs, developing the ICT workforce, ICT research and innovation, ICTs in libraries), networked society (people and organizations online, locally relevant content, ICTs in everyday life, ICTs in the workplace) and institutional ICT strategy (ICT strategy, ICT financing, ICT human capacity) (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). Evidently, these indicators confine to the domains of hardware, software and brainware with a trifle attention given to management, governance and leadership issues impacting e-readiness.

b) Addom's E-Readiness Assessment of HEIs

An e-readiness assessment model for HEIs in Ghana by Benjamin Addom in 2004 (Tarvid, 2008) identified five categories of variables. The categories include, one, human resources with a focus on the existence of ICT support personnel; two, ICT facilities which focuses on computers, networks and media production facilities, three, academic programs reviewing programs inviting students to study and apply ICT as well as research and internship opportunities for students and staff to study and apply ICT; four, outreach policies that advance the cause of a university without walls and finally, faculty posture focusing on the proficiency in ICT as well as progressiveness and innovativeness in the use of ICT for teaching, learning and outreach.

This model has the strength of being a general framework that is applicable to any HEI environment although it is also considered too simplistic for application in detailed e-readiness assessment or advanced institutions.

c) Machado's E-Readiness Assessment Model

The e-readiness assessment model advanced by Carlos Machado in 2007 (Tarvid, 2008) identified three categories of indicators. These indicators are, one, the ability of HEI stakeholders to execute current policy and develop future strategy, two, the capacity of the learning stakeholders with respect to knowledge, teaching and learning styles, instructional methodology and techno-cultural acceptance and finally, the facilities including infrastructure and network services.

This model identifies the core stakeholders that the model would target for the e-readiness assessment and maps the specific indicators relevant to the respective indicators. The stakeholders identified include the administration (the ability and provision of facilities including motivation, training, performance appraisal and support for access), faculty/lecturers (capacity including its way of thinking, resistance-acceptance, understanding of new methods and skills) and the students/learners (capacity in terms of behavior, resistance-acceptance, understanding of new methods and skills).

The model has the key advantages of being general enough to be applicable to HEIs and two having identified key stakeholders and mapped their functions to the categories of variables with respect to e-readiness. It, however, lacks concrete definitions of variables.

d) Tarvid's E-Readiness Assessment Model

Focused on the twin goals of model re-usability (de-linked from a particular moment in time) and inclusion of categories of variables rarely used Carlos Tarvid in 2008 developed an e-readiness assessment model for HEI (Tarvid, 2008) that attempts to take advantage of the strengths of pre-existing models and mitigate their weaknesses.

Tarvid's e-readiness model (Tarvid, 2008) identifies three distinctive variables. Infrastructure focuses on policies and procedures in administering the infrastructure (especially on governance and the application of best practices/international standards)

as well as usage and quality specifically on the application of formal guidelines for service management (help desk management), governance and performance management. Information, on the other hand, focuses on access of information services such as website and electronic journals. Human capacity (skilled workforce) focuses on the level of education, experience measured by the number of years in service and service quality measured by reliability, responsiveness, rapport and tangibles. Service quality is a function of the ICT function of an organization charged with the responsibility to provide support services including hardware and software maintenance, upgrades and installation, data backup and recovery and to provide these services in a time-effective manner (Rabaa'i, 2010).

The service quality has specific importance in e-readiness. Service quality variables of reliability - ability to perform promised services dependably and accurately; responsiveness - willingness to help users and to provide prompt service; rapport - ability to convey a rapport of knowledgeable, caring, and courteous support and tangibles - physical facilities, equipment, and appearance of personnel (Rabaa'i, 2010) are thus an important inclusion in Tarvid's e-readiness model for HEI e-readiness assessment. The model however does not focus on ICT proficiency of the users (students and staff) on the premise that this is difficult to measure.

e) **People, Process and Technology Approach**

The existing e-readiness assessment models have a strong focus on technology infrastructure, information and human skills. The weakness of granting all attention to technology and anecdotal effort on other aspects of technology readiness is well expounded by the observation that "organizations apply technology to solve complex challenges only to find that the technology multiplies the impact and visibility of the problem" – a technology-first tactic that provides only a temporary fix (Williams & Leask, 2011). Firm specific factors such as technology resources, the management and the commitment of the individuals involved are important for e-readiness accession

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(Dada, 2006). Dada (2006) gives management and the commitment of the individuals a special impetus and in essence introduces the second dimension of e-readiness; people!

The importance of visualizing the nexus of people and technology is further highlighted by the postulation of the World Summit on the Information Society that "a well-developed information and communication network infrastructure and applications, adapted to regional, national and local conditions, easily-accessible and affordable, and making greater use of broadband and other innovative technologies where possible, can accelerate the social and economic progress of countries, and the well-being of all individuals, communities and peoples" (Alvarez, 2015). Underscoring the importance of enlarging focus wider than merely technology, the Global Information Technology Report 2015 stated that "progress will not be about technology alone" and that technology needs to be developed and applied in the context of government policy (including regulation that stimulates high-quality, low-cost network access) and, of course, a sustainable approach to wealth creation.

An analysis of the failure of ICTs to improve learning outcomes has posed that education policymakers and technology advocates have tended to focus on the technology itself to the exclusion of the educational reason for it – taking the approach to provide the technology and then to think about how it might be applied (Behar & Mishra, 2015). This means that, besides technology, the process of delivering quality outputs and outcomes becomes an essential element of consideration in e-readiness accession including the ability to incorporate technology in the pedagogy (Behar & Mishra, 2015). This brings into focus, process and thus completes the triangle of people, process and technology.

The nexus of people, process and technology is further visualized in the transformation of the health care sector through connected care (information and infrastructure), empowering people (clients and service providers) as well as effective and efficient systems (seamless sharing of data and information, integrated processes) (Wiggins,

2015). Wiggins (2005) reinforces the need for interoperability of data, processes, software systems and networks as well as the transformation of mindsets – emphasizing the people, policy and technology nexus.

The building blocks of Enterprise 2.0, an entity that is able to leverage business and IT strategy to increase effectiveness and efficiency of technology initiatives, are the people, processes and technology that make up the organization (Williams & Leask, 2011), (Husby, 2012). Enterprise 2.0 would, in this case, can suitably be considered an e-ready organization able to leverage ICT to materialize its vision and advance societal development goals. Another study posits that operational efficiency requires an approach that optimizes the relationships between people, process and technology (Emerson Network Power, 2013).

Improving the management of business documents, the information within them and their value across an organization requires close examination not just of the technology used to access and distribute information, but of the processes that underpin how it is managed and the way employees create and use the information – hence the approach is to look at the people, processes and technology within an organization – and optimize each element (Ricoh, 2016). Success depends on the process while the right people make an organization profitable (Widjaya, 2014). Without delicate management of people, process and technology, an organization can falter (Leeuwen, 2014).

Several studies have attempted to develop possible ways of analyzing or measuring the nexus of people, process and technology. The People, Process and Technology Strategy (PPTS) advocates making the people and processes within the organization more efficient and then giving them the tools and technology to make them more effective (Williams & Leask, 2011). Ruikar (2006) developed an e-readiness assessment prototype application for construction companies in terms management, people, processes and technology perspective (Fathian, Akhavan, & Hoorali, 2008). The PPTS

Strategy combines people and strategy together then brings in technology as shown in Figure 2.2:

People and Processes
1. Establish partnerships with clients to identify root challenges
2. Analyze the organization's mission(s) so it is well understood and articulated
3. Review short-term and long-term goals and strategy
4. Assess processes for efficiency and effectiveness toward achieving the organization's mission(s)
5. Streamline and validate the collection and dissemination of data
6. Identify stakeholders, champions, and potential opposition
7. Ensure continued stakeholder management, flexibility, and adaptability to changing needs

Technology
1. Define the objective(s) of the technology initiative
2. Define the benefits of the technology initiative to the organization in quantifiable terms
3. Define metrics to measure process and technology success criteria
4. Assess the current technology environment to determine whether viable alternatives exist
5. Define technology strategy surrounding people and process to support goals
6. Evaluate metrics to continuously improve the ability to meet mission objectives

Figure 2.2: People and Process then Technology Source: Williams and Leask (2011)

Emerson Network Power's White Paper on Data Center Efficiency identifies the key aspects to review for people: increased understanding of relationship between systems, greater ability to see the big picture, increased collaboration across the business, greater need for analytical skills, greater need for business skills, greater need for vendor management; process: well-defined processes, automated processes, integrated operating data, decisions based on data (rather than instinct); and technology: higher availability

(uptime), efficiency, scalability (ease-to-expand) and timely upgrades (Emerson Network Power, 2013).

A study on collaborative studies identifies the key issues around people as empowerment, timely response of applications, suitable availability of applications, good internal public relations that generates excitement; process as adopting best practices, involving stakeholders, removing unnecessary process steps and simplifying process interactions; and on technology as optimal performance, optimal availability, failover services/business continuity services, friendly and useful applications (Coleman, 2013).

In the realm of people, process and technology there are three critical challenges on the flipside. These challenges are the process challenge – resulting in delays in service delivery; the technology challenge meaning that the technology options of the organization are not congruent with the goals of the organization and people challenges meaning people have outdated skills and new knowledge (Leeuwen, 2014).

An IT readiness evaluation criteria for government organizations (Yesser, 2007) reinforces the process readiness as one of the three proposed dimensions for IT readiness evaluation – the other two dimensions being architecture readiness and infrastructure readiness. With respect to process readiness, the criteria identified support processes, process automation and data/information flow as the sub-criteria.

2.2.3 Service Quality

E-readiness studies can be reinforced by service quality measured by reliability, responsiveness, rapport and tangibles (Tarvid, 2008). Service quality as a measure of maturity for e-readiness or an indicator for e-readiness accession is an indicator of the ability of the ICT function of an organization, higher education institution in this case, to provide effective and efficient support (Rabaa'i, 2010) to the people, process and

technology eco-system of that organization. It has been considered a key element of e-readiness accession (Tarvid, 2008).

Whereas ICT service quality indicators differ, they revolve around reliability (ability to perform promised ICT support service dependably and accurately), responsiveness (willingness to help users and do so promptly), rapport (ability to convey a caring and courteous attitude) and tangibles (the nature of physical facilities, equipment and appearance of personnel) (Tarvid, 2008) (Rabaa'i, 2010). The tool is applied for this study as advanced by these studies.

2.3   Conceptual Framework

The conceptual framework for this study is developed on the basis of the business orchestration approach to leadership and the proposal for leadership development as a constant in the enterprise environment. The variables in the conceptual framework are subsequently represented as: Leader as a Conductor, Leader as an Architect, Leader as an Auctioneer, Leader as a Promoter, Leader as a Developer as the five independent variables and E-Readiness Accession (ERA) as the dependent variable. The conceptual framework for this study is illustrated in Figure 2.3:

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┌─────────────────────────────┐
│ Leader as a Conductor       │
│ • Nurturing creativity      │────────────────┐
│ • Building trust            │                │
│ • Inspiration              │                │
│ • Coherent performance     │                │
└─────────────────────────────┘                ▼
┌─────────────────────────────┐        ┌──────────────────────┐
│ Leader as an Architect      │        │ E-Readiness          │
│ • Customer focus            │        │ Accession            │
│ • New Knowledge            │───────▶│ • PPT Nexus          │
│ • Problem solving          │        │ - People             │
│ • Team/Partnership spirit  │        │ - Process            │
└─────────────────────────────┘        │ - Technology         │
┌─────────────────────────────┐        │ • Service Quality    │
│ Leader as an Auctioneer     │        │   Nutshell           │
│ • Sensing the market        │───────▶│ - Reliability        │
│ • Setting up systems       │        │ - Responsiveness     │
│ • Governing the market     │        │ - Rapport            │
└─────────────────────────────┘        │ - Tangibles          │
┌─────────────────────────────┐        └──────────────────────┘
│ Leader as a Promoter        │
│ • Charisma                  │───────▶
│ • Managing projects        │
│ • Institutionalization     │
└─────────────────────────────┘
┌─────────────────────────────┐
│ Leader as a Developer       │
│ • Ownership of agenda       │───────▶
│ • Developing leaders       │
│ • Leadership culture       │
└─────────────────────────────┘
```

Figure 2.3: Conceptual Framework

The KENET e-readiness surveys of 2006, 2008 and 2008 (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013) pointed at the importance of effective leadership in e-readiness accession in HEIs. The backbone of this study was to investigate the influence of leadership orchestration on the e-readiness accession in higher education institutions in Kenya. This involved correlation of the independent variables with the dependent variable individually in bivariate correlation, in multiple regression and test of hypothesis.

2.4   Review of Literature on the Variables

2.4.1   Leadership Orchestration

The independent variable is the variable that affects another variable or whose values we can manipulate to study its effect on another variable (Kaur, 2013). Leadership orchestration for this study consists of five variables namely conductor, architect, auctioneer, promoter (Wallin, 2006) and developer. The five independent variables are computed as indexes for purposes of data analysis, hypothesis testing and reporting.

   a)   The Leader as a Conductor

As a conductor (Wallin, 2006) the role of the leader is to make sure that the ongoing activities of the group are timed correctly and performed in the proper sequence to achieve results. An orchestrating leader has to live with a constant pressure for efficiency and sustained good performance. At the same time the leader has to nurture creativity, build trust, and inspire professionals. When doing this the orchestrator often has to conciliate between different stakeholders with alternative opinions.

The performance of the leader as a conductor is measured on the basis of the ability to nurture creativity, build trust, inspire professionalism, conciliate between stakeholders (customers, co-producers and competitors), and reconcile alternative/differing opinions, listening and diagnosis. The conductor is expected to provide inspiring feedback (irrespective of whether the actions leading to the feedback are positive or negative), coaching and leading by doing. The conductor must nurture effective communication skills, apply the principle of subordination (that each team member, part of the job or project is subordinate to achievement of the common goal), relationship on the basis of mutual respect, acknowledgement of expertise of team members, proactivity, right timing and right speed, situational awareness, balancing efficiency and creativity, delegating responsibility and convincing others to perform according to the common game plan (business plans, strategic plans, policies and resolutions).

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b) The Leader as an Architect

In-depth studies have shown that the role of communication channels, information filters, and problem-solving strategies were the major factors explaining why the established market leaders failed to implement the new architecture, even if they possessed the component technologies needed (Wallin, 2006). Organizations build information filters and communication channels that are aligned with the dominating ideas embodied in the present architecture. Because the individuals rely on their existing knowledge, they misunderstand and misinterpret signals about new products and processes. And even if they are able to understand the threat posed by the new architecture, the need to 'unlearn' the existing way of thinking and build and apply new architectural knowledge requires time and resources.

The leader as an architect (Wallin, 2006) in crafting solutions has to be able to analyze situations, problem scenarios and specifications and design appropriate solutions through modeling solution scenarios with expert inputs/review, attention to details and articulation of related issues. The solution architect must be able to not only implement the desires of customers and stakeholders but also creating solutions beyond the customers and stakeholders' ability to articulate as well as being able to integrate art and aesthetic value into the solution. The solution architect must be able to combine new skills and capabilities to come up with new competitive products and services.

In the environment of diverse customer requirements, communication channels, information filters and problem solving strategies must be in place. That means that the leader must be able to identify dominating ideas in the present situation, products and services, unlearn the existing ways of thinking, apply new knowledge, and introduce new approaches to the solution architecture.

This means that the leader has to acquire and assimilate new ideas to accomplish tasks in the process of crafting solutions including being able to balance the level of expertise (a pre-requisite for effective internal communication and rapid learning) and the diversity of background (embed new complementary information) while maintaining team cohesion in the field of differing perspectives and contributions.

An effective leader architect lays emphasis on problem solving and expertise; nurtures skills for engagement of multiple internal and external stakeholders; creates environment for joint problem solving and creative undertaking and makes the crafting of an effective solution the basis for engagement/locus for team pride and excitement/great experiences.

To be an effective leader and architect effective solutions in the information age the leader has to be ICT savvy, be business savvy and be able to offer strategic leadership (Tobias, 2015).

c) The Leader as an Auctioneer

The auctioneer (Wallin, 2006) exerts significant influence in choosing and administering a selling strategy and, as a market maker, whose success depends on how well he manages externalities without jeopardizing the trust of the buyers and sellers (Hossain, Khalil, & Shum, 2014).

An auctioneer's success is measured on the basis of pace, the speed of actions; the poise, the fluency of actions; the preparation including knowledge of the merchandise (in this case, the subject); the panache, the ability to entertain and lull to achieve the right mood as well as the brilliance, which is the ability to identify opportunities and extract the right bid (Wallin, 2006). To seamlessly manage the five characteristics of pace, poise, preparation, panache and brilliance the leader has to be watchful, engaging and confident.

d) The Leader as a Promoter

Promoters (Wallin, 2006) are considered able to sustain networks of people who are knowledgeable and interested with high energy, enjoyable to be around, creative imagination, initiates relationships, motivating, competitive spirit and goal oriented (Lyons, 2011), (Sayers, 1978). They encourage personal motivation, anti-status quo sentiment, sustain political and technical trust, act as the center figure to stimulate thoughts and dreams, mobilize interest, influence peoples creativity and willingness, exhibit charisma and together-we-will-make-it approach (Wallin, 2006).

e) The Leader as a Developer

Individual leadership development can be evidenced by people taking ownership of their ongoing development when anyone in the organization can confidently tell (McGuire & Rhodes, 2009), (Petrie, 2014): what is the one thing they are working on that will require that they grow to accomplish it, how they are working on it, who else knows and cares about it, and why this matters to them. Organizations want to create lasting change must develop the leadership culture at the same time they are developing individual leaders. This works by elevating the senior leadership culture before targeting those managers at the middle of the organization. The convergence of horizontal and vertical leadership development is a necessary and essential ingredient for organizational development because personal vertical development impacts individuals while vertical development impacts organizations.

Developer capabilities are evidenced at the organizational level by (McGuire & Rhodes, 2009): executive teams at the top decree the change and enthusiastically rally and invite everyone to get on board – engaged as both enabler and participant; experience with and appreciation for leadership development as a means of building organizational capability – leadership development is part of the organizations cultural history; team sees compelling reasons for change - senior leaders know that the missing piece is change in

the leadership culture; organizational cultural change is not a management program with guaranteed deliverables; rather, it's a trail that leaders blaze as they go forward – senior team is willing to engage in emergent work; and senior team recognizes the need for cross-boundary – cross - boundary work is essential work.

These developer capabilities are evidenced at the individual level by (McGuire & Rhodes, 2009): intentionality is a measure of three things: your perceivable clarity about the rightness of a cause that is of a higher order than self - interest, the perceivable connection of your own human spirit and passion to that cause, and the perceivable strength of your courage and commitment to stick with that cause; control source – leading change means advancing into unknown territory and therefore leaders need to assess and measure their comfort with the change process against their need to control the uncertain, unexpected, and unpredictable. Individually and as a group, they need to find an internal compass whose needle points the way between their own needs for control and control that is shared by others in the interests of cultural transformation; and time sense – the pressures of time raise constant anxiety: we never believe we have enough time.

The combination of intentionality, keen understanding of control source, and great time sense turns skeptics and nonbelievers into people willing to take more responsibility, make decisions, and work fast and effectively beyond directives from above. Leaders need to develop a safety net for their staff, letting them know that trying new approaches and defining new alternatives is something that is rewarded (Hawkins, Rudy, & Wallace, 2002). A developer will help people to identify the right course of action, commit to the achievement of that cause effectively and efficiently, advance into unknown territories, attain skills to transform, nurture ability to take responsibility, make decisions. A leader as a developer, through the prism of Abraham Maslow, has transcended self-actualization needs: realizing personal potential, self-fulfillment, seeking personal growth and peak experiences and is able to help others to achieve their self-actualization (Businessballs, 2017).

2.4.2 E-Readiness Measurement

The dependent variable in this study is e-readiness accession; the level and the improvement thereof of the readiness to leverage on ICT for quality higher education. A dependent variable is a variable that depends upon or is a consequence of the other variable (Kothari, 2004). The dependent variable is the consequent or the variable that is affected by the independent variable (Kaur, 2013).

The assessment of e-readiness for the purpose of this study is based on the three components of people, process and technology being the elements central to the success of an e-ready organization ecosystem (Coleman, 2013) (Williams & Leask, 2011) (Emerson Network Power, 2013). The study derives the indicators and sub-indicators from people: increased understanding of relationship between systems, greater ability to see the big picture, increased collaboration across the business, greater need for analytical skills, greater need for business skills, greater need for vendor management; process: well-defined processes, automated processes, integrated operating data, decisions based on data (rather than instinct); and technology: higher availability (uptime), efficiency, scalability (ease-to-expand) and timely upgrades (Emerson Network Power, 2013); people's as empowerment, timely response of applications, suitable availability of applications, good internal public relations that generates excitement; process's adopting best practices, involving stakeholders, removing unnecessary process steps and simplifying process interactions; and on technology's optimal performance, optimal availability, failover services/business continuity services, friendly and useful applications (Coleman, 2013) and enriched with suitable components derived from other studies. Some of the critical things to consider about people are their involvement, communicated to and trained while technology is defined by hardware, software, systems architecture and information flows (King-Turner, 2016).

The eco-system of the study is captured as a unit consisting the people, process and technology with the service quality of the core support function and the intersection of the Venn diagram representing the most desirable state – the e-ready HEI.
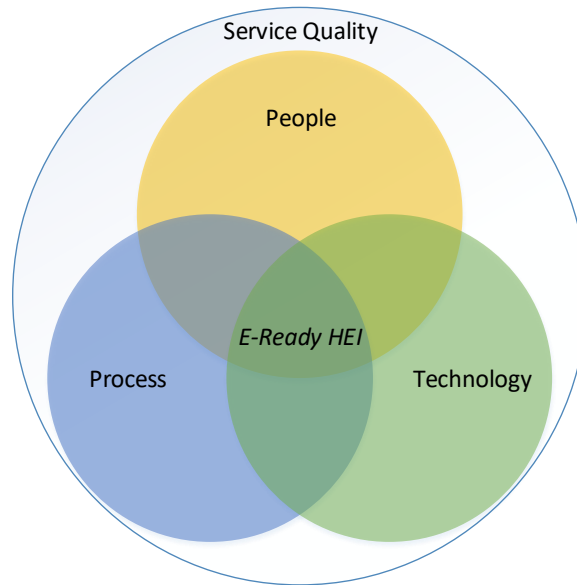
Figure 2.4 HEI E-Readiness Ecosystem

It is argued that given a good performer in a bad system, the system wins, every time (Ramias, 2007). Ramias (2007) argues that people are the performers, process, the work and technology the enabler. It is also argued that people + process = performance (Doner, 2016). For the purpose of evaluating the intersections of people and process, process and technology as well as people and technology the author makes that the assumption that people + process = work is performed; process + technology = worked is enabled, people + technology = the performer is enabled but no work and that people + process + technology = the performer is enabled to work better.

This assumption could be used to derive insight from the intersections and can, perhaps, inform further research in the area. The scope of this study was insufficient to analyze the relationships posed in the Venn Diagram and thus leaving an area of further research using Venn Diagram Visualization,

a data visualization that offers ability to see how much of an overlap there is between data elements (Greco, 2016).

2.5   Empirical Review

The importance of leadership in the development of digital age capabilities (McCusker & Babington, 2015) has been alluded in past e-readiness surveys in the Republic of Kenya. The overall objective of this study is to investigate the influence of influence of leadership orchestration on the e-readiness accession in higher education institutions in Kenya.

The KENET e-readiness survey of 2013 carried out on 30 universities in the Republic of Kenya indicated that all senior leaders considered ICT to be critical to achieving the strategic outcomes of the respective higher education institutions. The report further indicated that accession to higher stages of e-readiness is a slow process and the universities were not able to achieve Stage 3, on a scale of 1 to 4, on the indicators that require strong leadership. The situation had been unchanged between 2008 and 2013. KENET uses the staging model for analysis of e-readiness accession of HEIs.

Further, the report posited that the drive of the vice chancellors and senior leaders of the universities was essential to accession in human capacity development in digital age skills, networked environment, research and innovation. The report indicated that anecdotal evidence had shown that in most Kenyan universities ICT was considered a technical issue to be handled by the ICT directors and technical staff than a strategic

issue and thus a recommendation was made that capacity building be done for the senior leadership to understand and treat ICT as a strategic leadership matter.

Of special interest was the finding that only 11% of students in the 2012/2013 academic year in the 30 Kenyan universities surveyed took blended learning and the observation that senior leadership in the schools and faculties was essential to drive adoption of digital age teaching and learning approaches.

Using factor analysis with 20 criteria (questions) to identify the critical factors affecting e-readiness four factors were identified as organizational features (ICT management, policy, financial support for ICT and revenue on electronic services); ICT infrastructure (network speed and quality); ICT availability; and security and legal environment were identified as the core ingredients to e-readiness accession in SMEs in Iran (Fathian, Akhavan, & Hoorali, 2008).

Recognizing the importance of leadership in e-readiness accession other studies have included leadership as part of the assessment. Assessments have also been done on the basis of e-connectivity, human capital, business climate and leadership among others. Bayo-Morionez and Lera-Lopez (2007) focused on environment, firm structural characteristics, human capital, competitive strategy, and internal organization and devised both quantitative and qualitative indices. These indices were used to evaluate and rank countries on the e-readiness scale. Ruikar (2006) an e-readiness assessment prototype application for construction companies in terms management, people, processes and technology perspective (Fathian, Akhavan, & Hoorali, 2008).

In view of the importance of leadership in e-readiness accession as noted in the KENET e-readiness assessment reports of 2006, 2008 and 2018 and in a view to ascertain the correlation between leadership and e-readiness accession this study correlated leadership in the four dimensions posed by Wallin (2006) fused with the proposals for leadership development by McGuire & Rhodes (2009) with e-readiness acession. Given that e-

readiness accession has been assessed on the basis of technology, this study used the people, process and technology nexus and the service quality nutshell to establish an e-readiness accession index. The five dimensions of leadership are each computed as indices and correlated with the e-readiness index. This is the contribution to the existing body of knowledge in the correlation of leadership with the ability to harness the benefits of the digital age and the development of appropriate methodologies and approaches for better assessment of the abilities to develop or harness digital age capabilities (McCusker & Babington, 2015).

2.6   Critique of Existing Literature

E-readiness as measure of the degree to which a country, nation, economy or sector may be ready, willing or prepared to obtain benefits which arise from ICTs are considered to have a number of limitations largely on the premise that the measures are simplistic solutions to extremely complex solutions (Dada, 2006). The measures have received refinements over the years and in the specific sectors as with the enhancement of Harvard CID e-readiness tools modified and utilized for e-readiness measurements in the higher education in Kenya (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013) as well as e-readiness studies in other countries such as Ghana (Tarvid, 2008).

The KENET E-Readiness Survey revolves around a set of seventeen indicators categorized into network access (information infrastructure, Internet availability, Internet affordability, network speed and quality); networked campus (network environment, e-campus); networked learning (enhancing education with ICTs, developing the ICT workforce, ICT research and innovation, ICTs in libraries); networked society (people and organizations online, locally relevant content, ICTs in everyday life, ICTs in the workplace) and institutional ICT strategy (ICT strategy, ICT financing, ICT human capacity) (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). Evidently lacking is a way to assess the

leadership and leadership role in driving the e-readiness. There is a great focus on technology. However, an authoritative school of thought has emerged that brings e-leadership at the core of the digital age leadership focusing on being ICT savvy, business savvy and providing strategic leadership (Tobias, 2015), (European Commission, 2014) and reinforcing the need for a different leadership in the information age that does not necessarily need a mastery of technology but ability to orchestrate leveraging on ICTs (Kane, Palmer, Philips, Kiron, & Buckley, 2015). Although Fathian, Akhavan, & Hoorali (2008) noted that SMEs in Iran were still traditional and their school of thought outdated and that global changes dictated a new model of thinking as a basic requirement the leadership of the SMEs did not feature as an essential element to drive the transformation of mindset and culture.

The formal frameworks have marginal requirements for a leadership that is able to orchestrate business leadership to leverage on the digital age technologies. Attempts are made to look at the leadership aspects in ICT management, governance and leadership. This is evidenced by the specific module on service strategy in ITIL ICT service model (itMSF, 2007), (ITIL, 2011) as well as ISACA's IT Governance (National Computing Centre, 2005) focus on improving the management and control of Information Technology for the benefit of the primary stakeholders but lacking and the Control Objectives for Information and Related Technology (COBIT) Governance Framework identifies five core areas of focus in effective IT governance (ISACA, 2009).

The attempt to evaluate the success of the organization in the information age as a function of leadership or the evaluation of the role of leadership in the ability to tap into the benefits of the digital age is anecdotal at best. Where such is evident, it is through the prism of technology, yet strategic leadership is considered more valuable in deriving benefits from the digital technologies than in the ICT savviness of the leaders (Kane, Palmer, Philips, Kiron, & Buckley, 2015). An e-readiness assessment prototype application was developed for construction companies in terms management, people, processes and technology perspective (Fathian, Akhavan, & Hoorali, 2008).

The proposal for leadership orchestration (Wallin, 2006) in itself focuses on the leader and the ability of the leader to orchestrate organization success in the digital age. Wallin (2006), in his business orchestration proposal, evidently ignores or subsumes the need to successively develop individual and corporate leaders for the greater success of the entities of interest into the future.

Nevertheless, the evidence of interest in studying the advent of the digital age, its impact on organizations and the role of leadership in leveraging digital age technologies for survival and sustainability in the information age cannot be ignored. The area of study has picked up as witnessed with the quest to raise e-leaders for Europe (European Commission, 2014) and the reinforcement of the need for digital fluency in organization leadership (Kane, Palmer, Philips, Kiron, & Buckley, 2015).

Leadership in the digital age may not, however, necessarily fit into the traditional leadership mindset, approaches, styles or structures. Leadership in the digital age will move to fluid heterarchy and ad hoc meritocracy where leaders emerge on the basis of the quality of their contributions to the respective communities and diminishes at the decline of the quality of their contributions (Bruns, 2009). This view de-emphasizes the traditional notion of leadership and advocates for a new model of leadership based on open participation and communal evaluation, fluid heterarchy and ad hoc meritocracy, unfinished artefacts and continuing process, and common property with individual rewards as key principles of success in the digital age. The basis for argument is that with the digital age there is a steady deviation from the traditional concept of production to the digital age marked with collaborative production and usage of digital age artefacts as an ongoing process of produce-use. This study focuses on the correlation of leadership and readiness for the digital age while acknowledging the important argument on leadership posed in the new leadership in the digital age of "produsage".

2.7 Research Gaps

Whereas e-readiness accession is considered key to the improvement of Kenya's higher education and that leadership is considered central in driving institutions to leverage on the digital age technologies the focus has largely remained on the technology aspects of e-readiness.

The KENET e-readiness accession reports have pointed at the importance of leadership on the improvement of e-readiness. However, statistical correlation has not been studied. There is need to review the influence of leadership orchestration (Wallin, 2006) in the state of e-readiness accession. There is need to expand the scope of e-readiness accession beyond technology to include people, process and service quality.

Companies have used hardware, software and brainware to offer products, goods and services that add value to the society and enrich the quality of life (Byars, Rue, & Zahra, 1996). These information assets remain especially critical in the information age. However, it is perhaps time to begin investing in leadware; a new domain of leadership that facilitates institutions to leverage on digital age technologies to create new frontiers of success. The digital age, the information society and their infusion of a disruptive period, signified with multiple disruptive solutions, means that success into the future will be based on completely different criteria, business models and competition in which leaders have to nurture learning and orchestrate for value creation (Wallin, 2006). A Deloitte Report titled "Innovating for a digital future: The leadership challenge," identifies four key issues, dubbed the true leadership challenge, being the ability to have an explicit approach to building a portfolio of innovations, create a culture which embraces experimentation and a degree of risk taking, building compensating mechanisms that make innovation everyone's job and having a relentless focus on acquiring the right talent and building an environment where their people can flourish (Davies & Canwell, 2012). The extent to which this is true for higher education in Kenya is a subject for further research. This makes this particular study imperative.

Leadership orchestration is considered the key driver and the missing ingredient in the ability to manage institutions in the digital age (Wallin, 2006). A comparison of growth enrolment ratio between 2008 and 2013 in the e-readiness survey of 2013 on 17 universities in Kenya showed that enrolment had more than doubled at 109% while the number of teaching staff had increased by 30.9% - meaning that growth in student numbers was not matched with growth in teaching staff. The report posited that the only way for the faculty to cope with the increased teaching workload was to adopt greater use of ICT in teaching and learning. Adoption of digital age approaches in teaching and learning cannot be over-emphasized. The need for leadership e-readiness accession is thus necessary and essential. The proposed leadership model which encompasses leader as a conductor, architect, auctioneer and/or promoter has not been tested in the Kenyan higher education ecosystem under the regime of e-readiness assessments done in 2006, 2008 and 2013 in Kenya by KENET. Leadership development which is also considered a critical element of the success of organizations in the digital age (McGuire & Rhodes, 2009), (Petrie, 2014) is not articulate enough in the e-readiness assessment tool used by KENET or the other ICT governance models, frameworks and theories.

This study sought to address the gap by correlating and testing of hypotheses on leadership orchestration fused with leadership development with the level of institutional e-readiness accession observed in higher education institutions in Kenya. The study also enhanced the focus of e-readiness accession to include people, process, technology and service quality. This narrow focus on technology was addressed through the formulation of the people, process and technology nexus and the service quality nutshell.

2.8   Summary

Leadership has been identified as a critical element in e-readiness accession in higher education institutions in Kenya. E-readiness accession is a necessary and essential for an enterprise to thrive in the digital age. Business orchestration with the leader as a conductor, as an architect, as an auctioneer and as a promoter are postulated as important leadership dimensions in the digital age environment. Other studies reinforce the role of the leader as a developer. E-readiness studies have mainly focused on technology. However, e-readiness accession is herein demonstrated to cover more than technology including the role of people and processes as well as service quality. These, in summary are the emergent issues in the literature review that form the core part of the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1   Introduction

This chapter explains the research design, the target population, sampling and sampling techniques, data collection instruments, data collection methods, pilot testing and data analysis. It also discusses the operationalization of variables, data collection techniques and methods of data analysis.

3.2   Research Design

A good research design involves the consideration of the following factors (Kothari, 2004): the means of obtaining information; the availability and skills of the researcher and his staff, if any; the objective of the problem to be studied; the nature of the problem to be studied; and the availability of time and money for the research work. These factors have been carefully considered in the selection of the research design herein highlighted.

The research design selected for this study was cross-sectional survey with data being collected to help answer research questions of interest on the basis of what is going on at a point in time (Olsen & George, 2004). The study takes a snapshot of data on the state of leadership orchestration and e-readiness in higher education institutions in Kenya.

3.3   Target Population

This is the population from which a sample was obtained and for which the conclusions are made or the group of individuals to which the findings, discussion of the findings, and the implications of the research are to be generalized (Sampson, 2012). The target is herein described to clarify the characteristics of the entities that would eventually

benefit, either directly or indirectly, from the knowledge gained from this research. The target population for the study constitutes the 70 institutions of higher education in Kenya as recognized by the Commission for University Education (CUE) as of 2016 (Commission for University Education, 2016). The respondents in this study were the students and the staff of the institutions in the sample drawn from the target population. The target population is of particular interest because enhanced educational attainment, in the form of higher education, accrues both individual and societal benefits including higher earnings, greater labor productivity, better informed civic participation, lower crime rates and improved performance in a host of socio-economic measures (Hill, Hoffman, & Rex, 2005), healthier lifestyles, lower healthcare costs and better acumen for child upbringing (Baum, Ma, & Payea, 2013).

The focus on higher education is because the sub-sector has a special place in the Kenya Vision 2030. The Kenya Vision 2030 identifies university education as a critical component in the attainment of the national vision and seeks to re-align university education with changing needs of the economy and emphasizes the need to constantly review universities' role against the goals and objectives of Vision 2030 (Government of Kenya, 2007).

3.4   Sampling Frame

The sampling frame is the list containing all the sampling units; or the list of items from which the sample is drawn (Kothari, 2004), (Mukanzi, 2014). For the purpose of this study the sampling frame consisted of the 40 full-fledged public and private higher education institutions in Kenya (Commission for University Education, 2016) from the categories of institutions in the higher education eco-system in Kenya shown in Table 3.1.

Table 3.1: Categories of Accredited Higher Education Institutions in Kenya

S/No.	Category	Number of Institutions
1.	Public Chartered Universities	23
2.	Public University Constituent Colleges	10
3.	Private Chartered Universities	17
4.	Private University Constituent Colleges	5
5.	Institutions with Letter of Interim Authority	14
6.	Registered Private Institutions	1
	Total	70

Source: (Commission for University Education, 2016)

The study was based on the 23 public and 17 private chartered universities. This was purposively done on the notion that constituent colleges or institutions under interim authority operate under mentorship of other universities (MOEST, 2014) and, in effect, would reflect the mentoring university. The list of the universities selected for the study is presented in Table 3.2.

Table 3.2: List of Full-Fledged Public and Private Universities in Kenya

Public Universities		Private Universities	
1.	University of Nairobi (UoN)	1.	University of Eastern Africa, Baraton
2.	Moi University (MU)	2.	Catholic University of Eastern Africa (CUEA)
3.	Kenyatta University (KU)	3.	Daystar University
4.	Egerton University (EU)	4.	Scott Christian University
5.	Jomo Kenyatta University of Agriculture and Technology (JKUAT)	5.	United States International University

Public Universities	Private Universities
6. Maseno University (Maseno)	6. St. Paul's University
7. Dedan Kimathi University of Technology	7. Pan Africa Christian University
8. Chuka University	8. Africa International University
9. Technical University of Kenya	9. Kenya Highlands Evangelical University
10. Technical University of Mombasa	10. Africa Nazarene University
11. Pwani University	11. Kenya Methodist University
12. Kisii University	12. Strathmore University
13. Masinde Muliro University of Science and Technology (MMUST)	13. Kabarak University
14. Maasai Mara University	14. Great Lakes University of Kisumu
15. South Eastern Kenya University	15. KCA University
16. Meru University of Science and Technology	16. Mount Kenya University
17. Multimedia University of Kenya	17. Adventist University of Africa
18. Jaramogi Oginga Odinga University of Science and Technology	-
19. Laikipia University	-
20. University of Kabianga	-
21. University of Eldoret	-
22. Karatina University	-
23. Kibabii University	-

Source: (Commission for University Education, 2016)

3.5 Sample and Sampling Technique

3.5.1 Sample Size

Sampling is the method of selecting participants who are involved in the research, or the method of selecting a single participant to allow readers, researchers and other users of the research to evaluate whether or not the sampling method appropriately identifies an individual or individuals who are representative of the population identified in the research question (Sampson, 2012), (Kothari, 2004).

A sample of 10 universities was purposively drawn from the 40 full-fledged public and private universities recognized by the Commission for University Education as at December, 2016. The sampling unit was the individual respondent. University populations are large. Therefore the formula shown here below was applied in determining the sample size (Israel, 2015):

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where n_0 is the sample size, Z^2 is the abscissa of the normal curve that cuts off an area α at the tails (1 - α equals the desired confidence level, that is 95%), e is the desired level of precision, p is the estimated proportion of an attribute that is present in the population, and q is 1-p. The value for Z is found in statistical tables which contain the area under the normal curve. We desire p=.5 (maximum variability); a 95% confidence level and ±5% precision. Therefore, the number of respondents was 385.

3.5.2 Sampling Technique

Stratified random sampling was used, within each stratum, for this study. Each university that was purposively selected (five from public universities and four from private universities) was treated as a stratum. The respective populations of students and

staff were amoebic during the period of data collection given inter-semester fluctuations, unexpected picketing breaks and prevalence of part-time teaching and therefore a ratio of proportional allocation, used to determine the number of respondents per institution to guarantee an equal share of the sample in all the universities sampled (Lehtonen & Djerf, 2008), was limited in application. Caution of approximation was taken to mitigate on proportionality (given the estimated size of the respective stratum) with the larger university being allocated approximately more respondents. Data was collected from the respective institutions (strata) with the respondents being selected through simple random sampling. Simple random sampling was used to mitigate against classification error and minimize the need for advance knowledge of the population (Mukanzi, 2014). Within each university students and staff randomly gathered into a computer lab environment and independently guided through the questionnaire.

3.6 Data Collection Instruments

The data collection method was designed to take care of the potential for systematic errors, including social desirability bias, acquiescence bias and leading questions as well as random errors in the data collection (Engel & Schutt, 2009). To avoid systematic error careful construction of scales and questions and the testing of these questions with different population groups was implemented. Control questions were also used.

Primary data was collected in this study. This was collected afresh and for the first time (Kothari, 2004), and thus happen to be original in character. The researcher used an online-administered questionnaire, to collect the primary data, hosted on Lime Survey, which is a tool for creating and administering surveys as well as managing and analyzing data for ease of administration (SurveyMonkey, 2015). The instruments were a closed questionnaire, focus group discussion and interview guide.

The closed online questionnaire was triangulated with the focus group discussion involving selected experts in higher education institutions, interviews with selected experts in the higher education eco-system, and administration of the closed online questionnaire to a pool of staff and students outside of the purposively selected universities (classified as "others" in the review of responses). Focus group discussions and interviews were used to facilitate acquisition of information which would not be easily collected using closed questionnaire (Gibbs, 2016).

3.7   Data Collection Procedure

Primary data for this research was collected through a closed questionnaire hosted online. Data was collected from the respective institutions (stratum) with the number of staff in each institution and each category being selected through simple random sampling. A focus group discussion (of 8people) was held with a group of experts drawn from ICT management, governance and leadership (Gibbs, 2016). The online-administered questionnaire was hosted on Lime Survey which is a tool for creating and administering surveys as well as managing and analyzing data for ease of administration (SurveyMonkey, 2015).

Interviews were applied because of their ability to safeguard against two response errors (respondents are not likely to forget the answers they have to choose from if they are given a chance to respond freely and does not allow them to disregard reading the questions), its ability to facilitate obtaining extra information as well as account for respondents feelings, attitudes and understanding of the subject (Colorade State University, 2016).

The interviews were conducted with six participants drawn from four universities (Embu University, Egerton University, KEMU), and the Kenya Education Network. The participants were purposively selected on the basis of experience as administrators, librarians, faculty or ICT practitioners in the respective institutions. Each interview

session took approximately 30-45 minutes. A focus group discussion was applied because of the ability to generate complex information as well as capture information drawn upon respondents' attitudes, feelings, beliefs, experiences and reactions in a way in which would not be feasible using other methods (Gibbs, 2016). The focus group discussion (FGD) was conducted with six participants drawn from three universities (USIU, Daystar and the University of Nairobi) and the Kenya Education Network (the national research and education network). The focus group discussion took two hours. The participants were purposively selected on the basis of experience as faculty or ICT practitioners or general experience in ICT governance and leadership in the respective institutions.

Content analysis was used to analyze the results of the focus group discussion and interviews. Emerging themes were summarized and reported in complement with the results of the quantitative data.

3.8   Pilot Study

A pilot study was done prior to the administration of the data collection with a small number of participants to provide an opportunity to evaluate the appropriateness of the research procedures, the administration of measures, and the use of any measures (including a participant demographic information forms) specifically created for the research (Thabane, et al., 2015), (Kothari, 2004). Pilot Study for testing the questionnaire was conducted to reveal the weaknesses, if any, of the questionnaire and the survey techniques besides being a replica and rehearsal of the main survey (Kothari, 2004). A well designed and executed pilot study would reduce the chances of committing a methodological error that compromises the findings of the dissertation (Sampson, 2012).

The pilot study targeted 35 participants from 3 different universities which is within the range of acceptable 10-40 participants (Youssef, Mansour, Al-Zahrani, Ayasreh, & Abd, 2015) to facilitate instrument revision, reliability tests and item discrimination (Hertzog, 2008). The results were utilized to improve the data collection tools (reframing of questions and addition of control questions) and the general administration of the research (NC3Rs, 2018). Consideration was given to reliability, the ability of an instrument to consistently measure what it is intended to measure, and validity, the extent to which an instrument measures what it is supposed to measure (Biddix, 2015), (Moser & Kalton, 2009), (Babbie, 2010).

3.8.1 Reliability

Reliability, also referred to as consistency, ensures that an instrument consistently measures what it is intended to measure (Biddix, 2015) such that another researcher or the same researcher would collect the same desired information as the previous study in the same target population (Mukanzi, 2014). Cronbach's Alpha Coefficient was computed with a Cronbach's Alpha Coefficient $\alpha \geq 0.70$ being accepted (Tavakol & Dennick, 2011). The formula for the standardized Cronbach's Alpha is as follows:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

where N is equal to the number of items, c-bar is the average inter-item covariance among the items and v-bar equals the average variance (IDRE, 2017).

The results of the pilot study were as follows: the leader as a conductor: $\alpha = 0.974$ with 21 items, the leader as an architect: $\alpha = 0.969$ with 21 items, the leader as an auctioneer: $\alpha = 0.962$ with 11 items, the leader as a promoter: $\alpha = 0.937$ with 9 items and the leader as a developer: $\alpha = 0.949$ with 18 items while ERA: $\alpha = 0.954$ with 40 items. The

outcome was used to improve the questionnaire with a re-framing of the questions and expansion of the questionnaire to include control questions.

3.8.2   Validity

Validity is the extent to which an instrument measures what it is supposed to measure and performs as it is designed to perform or how truthful the instrument is (Biddix, 2015), (Cable & DeRue, 2002). Validation involves collecting and analyzing data to assess the accuracy of an instrument to examine both external and content validity. External validity is the extent to which the results of a study can be generalized from a sample to a population. Establishing eternal validity for an instrument, then, follows directly from sampling while content validity refers to the appropriateness of the content of an instrument or whether the measures (questions, observation logs...) accurately assess what is to be studied (Biddix, 2015).

Content validity was assured by the extensive literature review while external validity was assured by the pilot study.

3.9   Data Analysis and Presentation

Data analysis techniques were used to test the hypotheses derived from the research objectives (Sampson, 2012). Descriptive statistics of the mean and standard deviation were used to analyze the data (Nicholas, 2010). The data was summarized by response rate per university, gender and the level of engagement in the respective institution. The means for each attribute were also computed. Histograms and Q-Q plots were used to estimate normal distribution. F-test statistic was used to test model validity while t-test statistic was used to test the significance of the variable. Content analysis was used to analyze the results of focus group discussions and interviews to identify and report on key themes emerging from the discussions and the interviews (SkillsYouNeed.com, 2018). Tables, histograms and plots were used to present the data.

Careful consideration was given to data analysis validity to provide evidence that the analytical techniques used in the research actually answered the hypotheses being examined with respect to: congruence, which involves providing a rationale that shows how the data analysis method for both quantitative and qualitative research fits the hypotheses being examined; and accuracy, which involves providing evidence that the analytical techniques used in the research provide correct answers to the research questions being asked or the hypotheses being posed.

Aggregation was done to obtain the leader dimension indices (leader as a conductor index, architect index, auctioneer index, promoter index and developer index), Leader Index and E-Readiness Accession Index. For the purpose of the econometric model the variables are labeled as Leader as a Conductor Index, X_1, Leader as an Architect Index, X_2, Leader as an Auctioneer Index, X_3, Leader as a Promoter Index, X_4, Leader as a Developer Index, X_5, Leader Index, X_c, and E-Readiness Accession (ERA), Y.

For the purpose of congruence, the statistical significance is $\alpha < 0.05$. To ensure accuracy the Statistical Package for Social Scientists (SPSS) version 23 was selected for data analysis being a well-established data analysis software with inbuilt quality control capability (Sampson, 2012). Pearson Moment Coefficient of Correlation was used to test for correlation between the independent and the dependent variables with values 0.0 to 0.2 being considered weak correlation, 0.2 to 0.4 being considered moderate correlation and 0.5 and above being considered strong correlation (SSRL, 2010), (Kent State University Libraries, 2017). Hypothesis testing was done with respect to the respective test hypotheses posed for this study to prove the existence of correlation (University of Strathclyde, 2015) between leadership orchestration and e-readiness accession.

The hypotheses was retained if a test of significance shows that if the research were repeated many times, similar results would occur in at least 95 out of 100 repetitions, or in other words if the p-value (probability of obtaining the results) is less than 5% (that

is $\alpha < 0.05$). This specific criterion of significance level is a convention (University of Strathclyde, 2015).

The following regression model was applied for the individual predictors (that is, for each of the independent variables) on the dependent variable:

$$Y=\beta_0+\beta_i X_i+\varepsilon \ (where \ i = 1, 2, 3, 4, 5)$$

The following regression model was applied for the aggregate index of the predictors on the dependent variable:

$$Y=\beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\beta_4 X_4+\beta_5 X_5+\varepsilon$$

To determine the significance of the predictor Xi, the hypothesis $H_0:\beta_i=0$ versus $H_1:\beta_i\neq0 \ (where \ i = 1, 2, 3, 4, 5)$ was used. If the null hypothesis is rejected ($\alpha < 0.05$), then predictor Xi was taken to have significant influence on Y. For easier comparison with other published works standardized co-efficients were used. The direction and magnitude of the influence was determined by the sign on the beta coefficient and the size of the standardized coefficients in relation to the rest.

3.9.1   Autocorrelation, Multi-Collinearity and Heteroscedasticity

With the use of regression models the three problems of autocorrelation, multi-collinearity and heteroscedasticity were anticipated (Pedace, 2016), (Asteriou & Hall), (Kiula & Namusonge, 2014). For the purpose of this study, autocorrelation which would be detected using the Durbin Watson Test and minimized using the Cochrane-Orcutt iterative procedure (Pedace, 2016), (Asteriou & Hall), was passed over because autocorrelation was ruled out - the data collected, analyzed and reported was a snapshot and not time series. Multi-collinearity was detected using variable inflation factor in SPSS (<10, acceptable) (Pedace, 2016) and addressed using variable centering expressed as: $centered \ variable, cv = variable \ index, x - mean \ of \ variable, mv.$ Variance of

the dependent variable varies across the data (The Institute for Statistics Education, 2014), heteroscedasticity, was detected through the predicted value-residual plot (Williams R. , Heteroskedasticity, 2015) (Kellogg School of Management, 2005).

3.9.2 Operationalization of Variables

The dependent variable, e-readiness accession, is made up of two main indicators of HEI e-readiness ecosystem (Williams & Leask, 2011), (Emerson Network Power, 2013), (Coleman, 2013) and service quality (Tarvid, 2008), (Rabaa'i, 2010). The HEI e-readiness ecosystem indicator has three sub-indicators being people, process and technology (PPT nexus). The service quality (SQ nutshell) indicator has four sub-indicators being reliability, responsiveness, rapport and tangibles. An aggregate of the two indicators (PPT nexus and SQ nutshell) was computed to determine the e-readiness accession index of the HEIs.

The independent variables in this study were the leader as a conductor, architect, auctioneer, promoter and developer (Wallin, 2006), (McGuire & Rhodes, 2009), (Petrie, 2014). An index for each independent variable was computed. An aggregate for the five independent variables was also be computed. The index for each independent variable individually as well as the aggregate of the independent variables was correlated with the dependent variable to investigate the influence of each and the aggregate on the level of e-readiness accession level attained in each of the respective institutions in the sample. The operationalization of each predictor and dependent variable is shown in Table 3.3.

Table 3.3: Operationalization of Variables

Variable	Objective	Indicator	Scale	Questionnaire
The Leader as a Conductor	To examine the influence of the leader as a conductor on e-readiness accession in higher education in Kenya	• Nurturing creativity • Building trust • Inspiration • Coherent performance	21 sub-items measured on a 5-point Likert scale	8
The Leader as an Architect	To examine the influence of the leader as an architect on e-readiness accession in higher education in Kenya	• Customer focus • New Knowledge • Problem solving • Team/Partnership spirit	12 sub-items measured on a 5-point Likert scale	9
The Leader as an Auctioneer	To examine the influence of the leader as an auctioneer on e-readiness accession in higher education in Kenya	• Sensing the market • Setting up systems • Governing the market	11 sub-items measured on a 5-point Likert scale	10
The Leader as a Promoter	To examine the influence of the leader as a promoter on e-readiness accession in higher education in Kenya	• Charisma • Managing projects • Institutionaliz	9 sub-items measured on a 5-point Likert scale	11

Variable	Objective	Indicator	Scale	Questionnaire
		ation		
The Leader as a Developer	To examine the influence of the leader as a developer on e-readiness accession in higher education in Kenya	• Ownership of agenda • Developing leaders • Leadership culture	18 sub-items measured on a 5-point Likert scale	12
E-Readiness Accession	To determine the level of e-readiness based on people, process and technology in higher education institutions in Kenya	• People • Process • Technology • Service Quality	40 sub-items measured on a 5-point Likert scale	13 & 14

3.9.3   Conductor Operational Attributes

Digital age leaders are expected to stand out in nurturing creativity, building trust, inspiration and facilitating coherent performance (leader as a conductor). The leader as a conductor is expected to be able to ensure ongoing activities of the organization are timed correctly and performed in the proper sequence to achieve the desired results. These are demonstrated by specific attributes as highlighted in Table 3.4.

Table 3.4: Digital Age Conductor Leadership Dimension

Indicator	Attributes
Nurturing creativity	Building up new ideas
	Facilitating situational awareness
	Bringing up new ideas timely
	Reconciling alternative opinions
	Recognizing innovation
	Rewarding innovation
Building trust	Inspiring feedback
	Leading by doing
	Learning from partners
	Engaging sponsors and guardians
	Relationship on basis of mutual respect
	Delegating responsibility
Inspiration	Inspiring professionals
	Building up the performance capacity of staff
	Keeping staff enthusiastic
	Keeping customers thrilled
	Convincing others to perform according to game plan
Coherent performance	Seeking coherence in performance
	Integrating and synchronizing efforts and actions
	Mobilizing teams to perform
	Subordination (loosing oneself for the benefit of the team)

3.9.4   Architect Operational Attributes

Digital age leaders are expected to be able to build the spirit of customer focus, new knowledge, problem solving, teams and partnerships (leader as an architect). This dimension of leadership orchestration is demonstrated by the attributes shown in Table 3.5.

Table 3.5: Digital Age Architect Leadership Dimension

Indicator	Attributes
Customer focus	Sensing customer expectations
	Transforming customer expectations into tangible solutions
	Implementing the wishes of customers
New knowledge	Assimilating new information
	Unlearning existing ways and applying new knowledge
	Blending diverse capabilities at different project stages
Problem solving	Emphasizing problems solving skills
	Engaging experts to play a role in solution development
	Creating solutions beyond customer expectations
Teams and Partnerships	Building up successful teams
	Working with stakeholders to develop solutions
	Building an environment that says "this is the place to be"

3.9.5 Auctioneer Operational Attributes

Digital age leaders are expected to be good at sensing the market, setting up systems, governing the market (leader as an auctioneer). This is demonstrated by the attributes shown on Table 3.6.

Table 3.6: Digital Age Auctioneer Leadership Dimension

Indicator	Attributes
Sensing the market	Listening to customers
	Sensing the needs of the market
	Seducing customers to products and services
Setting up systems	Setting up systems to manage customers
	Exploiting new solutions (tapping disruptive technologies)
	Pushing the limits to higher performance
Governing the market	Achieving the right pace (right speed)
	Achieving the right poise (keeping steady)
	Achieving the right preparation (knowing our products and services)
	Achieving the right panache (achieving the right mood)
	Achieving the right brilliance (sensing and exploiting opportunities)

3.9.6 Promoter Operational Attributes

Digital age leaders are expected to have charisma, endowed in managing projects and institutionalization (leader as a promoter). This leadership dimension is demonstrated by the attributes shown in Table 3.7.

Table 3.7: Digital Age Promoter Leadership Dimension

Indicator	Attributes
Charisma	Building a "together we will make it" spirit
	Generating personal motivation
	Stimulating dreams and aspirations
Managing projects	Managing projects effectively
	Initiating ideas and solutions
	Mobilizing people to get tasks done
Institutionalization	Institutionalizing new ideas (making them part of our culture)
	Leading without leading
	Setting up policies/procedures/processes

3.9.7   Developer Operational Attributes

Digital age leaders are expected to be good at creating ownership of the agenda, developing leaders and nurturing leadership culture (leader as a developer). They are able to help others to achieve their self-actualization. This dimension is demonstrated by the attributes shown in Table 3.8.

Table 3.8: Digital Age Developer Leadership Dimension

Indicator	Attributes
Ownership of agenda	Enabling people to take ownership of development agenda
	Retaining and attracting highly skilled employees
	Being engaged as both an enabler and participant
	Turning sceptics and nonbelievers into people willing to take more responsibility
	Helping staff to work fast and effectively beyond directives from above
	Allowing a sense of autonomy in the workforce
Developing leaders	Enhancing leadership capacity of individual members
	Enhancing leadership capacity of teams
	Providing employees with needed skills
	Appreciating leadership development as a means of building organizational capability
	Motivating people to move from one level in leadership competency
	Transforming leader's mind-set from one level to the next (developing of bigger minds)
Leadership culture	Seeing change in leadership culture as the missing link
	Articulating the value of digital technologies to the organization's future
	Taking risks
	Building skills to realize the strategy
	Developing digital strategies with an eye on transforming the business
	Fostering a culture to change and invent the new

3.9.8   E-Readiness Accession Operational Attributes

E-readiness (electronic readiness) is a measure of the degree to which a country, nation, economy or sector may be ready, willing or prepared to obtain benefits which arise from ICTs (Dada, 2006) or how well a society is positioned to utilize the opportunities provided by ICT (Alaaraj & Ibrahim, 2014).

In the context of the higher education sector e-readiness is a measure of the sectors (and individual higher education institutions) readiness, willingness or preparedness to tap the benefits and opportunities arising from ICTs (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). The indicators of e-readiness in this study are people, process and technology (PPT) nexus and service quality (SQ) nutshell as shown in Table 3.9.

Table 3.9: E-Readiness Assessment

Indicator	Attributes
E-Readiness Accession – People, Process and Technology Nexus	
People	We are excited with automation (new ICT solutions)
	We are empowered to serve in our roles
	We adapt change easily
	Our systems (ERPs, HRMISs, LMISs) give timely response
	Our systems (ERPs, HRMISs, LMISs) are up and running when we need
	We are involved in decision-making on technology acquisitions
	We are well updated
	We have technology skills
	We have business skills
	We have analytical skills
Process	Our processes are well defined
	We understand our processes
	We easily share data across departments and teams
	We have adopted best practices
	We continually improve our processes

Indicator	Attributes
	We make decisions based on data
	We monitor the performance of our processes
Technology	Our technology solutions are user-friendly
	Our technology solutions are useful for our work
	Our systems offer optimal performance
	Our systems are optimal uptime
	We have business continuity/failsafe mechanisms
	We get timely upgrades for hardware and software
	We apply best practices/standards in ICT management

E-readiness Accession – Service Quality Nutshell

Indicator	Attributes
Responsiveness	They are willing to help users
	They are ready to respond to users requests
Reliability	They provide services as promised
	They are dependable in handling user's service problems
	They perform services right the first time
	They maintain reliable technology and system
Rapport	They make users feel safer in computer transactions
	They are consistently courteous
	They have the knowledge to answer user's questions
	They give users individual attention
	They deal with users in a caring fashion
	They have the user's interest at heart
	They understand the needs of users
Tangibles	They have visually appealing facilities
	They appear professional
	They provide useful support materials (e.g. documentation, training, videos…)

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1   Introduction

This chapter captures the findings and the discussion of the study. The response rate by university, gender and levels of engagement in the rungs of the organizational structures of the HEIs. The analysis and discussion on the outputs is presented systematically with respect to the independent and dependent variables. The analysis and discussion covers the reliability of the scales, evaluation of normality of distribution, correlation between the variables, regression of the e-readiness on the respective independent variable, analysis of significance of the model and the significance of the variable and the discussions thereof.

4.2   Response Rate

The target number of respondents in this study was 385 obtained from 10 universities. The responses obtained were 312 from 9 universities and 24 from other universities making a total of 336 responses. This represents a response rate of 87.27%. The responses per university and category "Other" are summarized in Table 4.1.

Table 4.1: Response Rate

University	Frequency	Percent
Daystar University	42	12.5
Dedan Kimathi University of Technology	39	11.6
Jomo Kenyatta University of Agriculture and Technology	82	24.4
Kenya Methodist University	26	7.7
Maasai Mara University	11	3.3
Meru University of Science and Technology	44	13.1
Pan Africa Christian University	13	3.9
St. Paul's University	21	6.3
The Co-operative University of Kenya	34	10.1
Others	24	7.1
Total	336	100

There were 5 public universities and 4 private universities, making a total of nine universities. The nine universities were dispersed in 5 counties in the Republic of Kenya namely Nairobi, Nyeri, Kiambu, Narok and Meru. The category "Other" universities were spread in 7 counties namely Nandi, Kiambu, Kirinyaga, Laikipia, Machakos, Nairobi and Tharaka-Nithi with 4 public and 3 private universities. The category "Other," in which respondents were obtained by simple random sampling, was part of the triangulation measures used in the data collection alongside focus group discussion and interviews.

4.3 Gender of Respondents

The number of respondents per gender category is summarized as per Table 4.2.

Table 4.2: Respondents by Gender

Gender	Frequency	Percent
Female	104	31
Male	188	56
Gender Undeclared	44	13.1
Total	336	100

Fifty-six per cent (56%) of the respondents were male while 31 per cent were female. 13 per cent of the respondents did not declare their gender. Each student or staff, male or female, participating through simple random sampling within the respective stratum had an equal chance of participating in the study through an online questionnaire. At a female participation rate of 31%, female education and/or digital exclusion (Lima & Reis, 2011) is evident in the institutions surveyed. Leadership orchestration is necessary to mitigate gender-based education and digital exclusion.

4.4 Level in the Institution

The number of respondents with respect to the level of engagement in the institution as to whether student, staff, operational management, middle-level management or senior management is summarized in Table 4.3. This represents the level in the leadership ranks in the rungs of the organizational structures of the universities. The "staff" represents the general categories of employees not engaged as operational, middle or senior management in the respective HEIs.

Table 4.3: Respondents by Level of Engagement in the Institution

Level	Frequency	Percent
Student	199	59.2
Staff (general)	86	25.6
Operational Manager (COD, Section Head…)	12	3.6
Middle Level Manager (Registrar, Dean, Director, Manager, Finance Manager, Procurement Manager, Estates Manager, Deputy Director)	27	8
Senior Manager (VC, DVC, Principal)	1	0.3
Level Undeclared	11	3.3
Total	336	100

There are likely overlaps in the respective ranks depending on: whether the student was undergraduate or postgraduate with the postgraduate likely to be doubling as staff and students. The perception/frame of thought at the time of the response may determine whether the person chose to respond as a student, staff or in management.

4.5 Overview of Reliability, Normality and Regression

The general objective of this research was to investigate the influence of leadership orchestration (the leader as a: conductor, architect, auctioneer, promoter, developer) on the e-readiness accession (the people, process and technology nexus within the service quality nutshell) in higher education institutions in Kenya. The conductor, architect, auctioneer, promoter and developer attributes form the basis for the evaluation of the efficacy of the leaders and leadership for the digital age environment. E-readiness assessment is based on the people, process and technology nexus with an outer shell of service quality. An e-ready higher education institution would be said to have an equilibrium at the people, process and technology nexus encapsulated by an environment of the service quality nutshell.

The leader as a conductor was measured by 21 sub-items; leader as an architect by 12 sub-items, leader as an auctioneer by 11 sub-items, leader as a promoter by 9 sub-items, leader as a promoter by 18 sub-items while the e-readiness accession was measured by 40 sub-items. One control question each was used for the leader as a conductor, architect, auctioneer, and promoter; two for the leader as a developer while five control questions were used in the e-readiness accession.

Reliability, also referred to as consistency, ensures that an instrument consistently measures what it is intended to measure (Biddix, 2015) such that another researcher or the same researcher would collect the same desired information as the previous study in the same target population (Mukanzi, 2014). Cronbach's Alpha Coefficient was computed to examine whether every item measured what it was intended to measure and the internal consistency of the respondents with values $\alpha >= .7$ being acceptable (Tavakol & Dennick, 2011). The attributes for each of the five dimensions of leadership were measured on a Likert scale with 5: strongly agree, 4: agree, 3: neutral, 2: disagree and 1: strongly disagree. The Cronbach's Alpha Coefficient obtained for each dimension of the leadership orchestration is presented against each dimension in Table 4.4.

Table 4.4: Summary of Cronbach's Alpha, Mean and Standard Deviation

Variable	No. of Items	Cronbach's Alpha	Mean	Std. Dev.	N
Conductor Index	21	0.953	3.5998	0.68418	309
Architect Index	12	0.946	3.5585	0.77233	290
Auctioneer Index	11	0. 941	3.576	0.76554	280
Promoter Index	9	0.911	3.6068	0.72959	268
Developer Index	18	0.947*	3.6118	0.74356	266
E-Readiness Accession Index	40	0.960*	3.8792	0.54965	267

* Cronbach's Alpha value is the overall with multiple control questions included in computation

The leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer as well as e-readiness accession all yielded Cronbach's Alpha Coefficient value $\alpha >= .7$ as seen in the analysis of individual variables. These results did not differ significantly with the reliability test results in the pilot study.

Given the ranges shown in Table 4.5 the perceived level of performance in the mold of a leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer as well as e-readiness accession revolves about satisfactory and good. The institutional leadership demonstrates these leader dimensions satisfactorily.

Table 4.5: Summary of the Observed Means

Range	Value	Explanation
1-1.8	1	Poor
1.8-2.6	2	Fair
2.6-3.4	3	Satisfactory
3.4-4.2	4	Good
4.2-5	5	Excellent

The level of competition and demand for value creation in the digital age requires a more robust demonstration of leadership acumen (Wallin, 2006).

Histograms for the variables were plotted to give an indication of the shape of the distribution (Samuels & Marshall, 2017). The normal Q-Q plot for the data was used to confirm whether data lies about the line as a complementary confirmation of normality of distribution. Since the sample was larger than 30, the Kolmogorov-Smirnov tests are skipped (Statistics Solutions, 2017). The independent and dependent variables were normally distributed as seen on the respective Q-Q plots in the following sections.

The following regression model is applied for the individual predictors (that is, for each of the independent variable) as well as the aggregate of the predictors and multiple regression the on the dependent variable:

$$Y=\beta_0+\beta_i X_i+\varepsilon \; (where \; i = 1, 2, 3, 4, 5)$$

The β_0 represents the value of E(Y) where the regression surface (or plane) crosses the Y axis - the expected value of Y when all the independent variables equal 0, β_i represents the change in E(Y) associated with a one-unit increase in Xi when all other independent variables are held constant while ε is the error term conceived as representing (1) the effects on Y of variables not explicitly included in the equation, and (2) a residual random element in the dependent variable (Williams R. , Review of Multiple Regression, 2015). The following linear regression model was applied for each of the predictors on the dependent variable:

$$Y=\beta_0+\beta_1 X_1+\varepsilon$$

If the null hypothesis is rejected ($p < 0.05$), then predictor Xi was taken to have significant influence on Y. The direction and magnitude of the influence was determined by the sign on the beta coefficient and the size of the standardized coefficients in relation to the rest.

The collinearity diagnostics for the multiple linear regression model indicate that the model does not suffer multi-collinearity with tolerance being within the range > 0.1 (or VIF < 10) for all variables (Statistics Solutions, 2017). The scatter plot in Figure 4.1 shows that the points generally followed the normal (diagonal) line with no strong deviations. This indicates that the residuals were normally distributed.
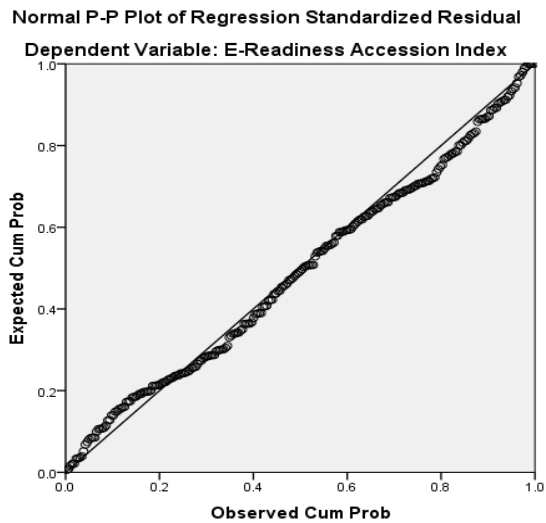
Figure 4.1: P-P Plot for E-Readiness Accession Index

A plot of the standardized residuals (ZRESID) against the standardized predicted values (SPRED) has a general random pattern, indicating no heteroscedasticity (Kellogg School of Management, 2005) (Pedace, 2016) as seen in Figure 4.2.
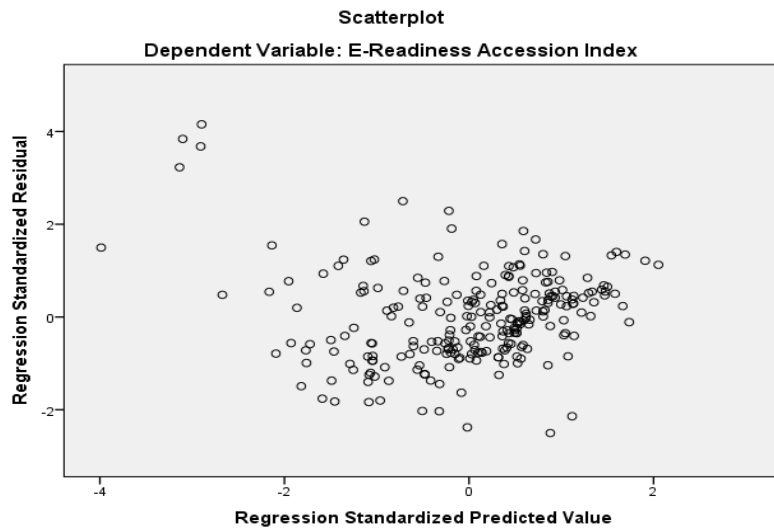
Figure 4.2: Predicted-Value and Residual Plot for E-Readiness Accession Index

4.6   Results of Leadership Orchestration

4.6.1   Output of the Leader as a Conductor

Digital age leaders are expected to be skilled at nurturing creativity, building trust, inspiration and facilitating coherent performance (leader as a conductor). The leader as a conductor is expected to be able to ensure ongoing activities of the organization are timed correctly and performed in the proper sequence to achieve the desired results. The specific objective was to examine the influence of the leader as a conductor on e-readiness accession in higher education institutions in Kenya.

For the purpose of this research 21 items were used to estimate the leader as a conductor dimension. A test of reliability of scale using the Cronbach's Alpha Coefficient yielded the value of α=.944 with 22 items as shown on Table 4.4. The 22nd item is the control question. The value α=.944 goes to α=.953 on deletion of the control question: "senior management are poor at building organizational capacity." The mean and standard deviation of each attribute used to measure the leader as a conductor are presented in Table 4.6.

Table 4.6: Results of Digital Age Conductor Leadership Dimensions

Item		Mean	Std. Dev.	N
a)	Senior management are good in building up new ideas	3.77	0.837	265
b)	Senior management are good in facilitating situational awareness	3.65	0.875	265
c)	Senior management are good in bringing up new ideas timely	3.47	0.954	265
d)	Senior management are good in reconciling alternative opinions	3.46	0.945	265
e)	Senior management are good in recognizing innovation	3.77	0.955	265
f)	Senior management are good in rewarding innovation	3.44	1.028	265

Item		Mean	Std. Dev.	N
g)	Senior management are good in inspiring feedback			
		3.45	0.988	265
h)	Senior management are good in leading by doing			
		3.43	1.067	265
i)	Senior management are good in learning from partners			
		3.62	0.906	265
j)	Senior management are good in engaging sponsors and guardians			
		3.69	1.024	265
k)	Senior management are good in relationship on basis of mutual respect			
		3.69	0.918	265
l)	Senior management are good in delegating responsibility			
		3.83	0.873	265
m)	Senior management are poor at building organizational capacity			
		2.89	1.123	265
n)	Senior management are good in inspiring professionals			
		3.65	1.009	265
o)	Senior management are good in building up the performance capacity of staff			
		3.63	0.985	265
p)	Senior management are good in keeping staff enthusiastic			
		3.37	0.965	265
q)	Senior management are good in keeping customers thrilled			
		3.4	0.965	265
r)	Senior management are good in convincing others to perform according to game plan			
		3.62	0.91	265
s)	Senior management are good in seeking coherence in performance			
		3.65	0.892	265
t)	Senior management are good in integrating and synchronizing efforts and actions			
		3.62	0.931	265
u)	Senior management are good in mobilizing teams to perform			
		3.66	0.928	265
v)	Senior management are good in subordination (loosing oneself for the benefit of the team)			
		3.18	1.15	265

The items were then aggregated to develop the leader as a conductor index. The conductor index has a mean = 3.5998 with a standard deviation =0.68418, N=309.

Test of Normality

A histogram for the conductor index was plotted to give an indication of the shape of the distribution (Samuels & Marshall, 2017). The resultant histogram is shown in the Figure 4.3.
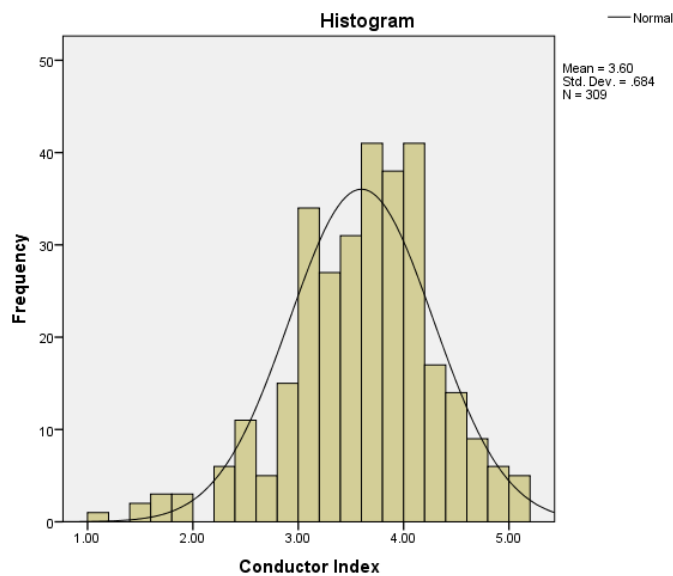
Figure 4.3: Histogram of Test of Normality of the Conductor Index

The data was approximately normally distributed given the curve approximately peaks in the middle and is fairly symmetrical, and therefore, the assumption of normality has been met.

The normal Q-Q plot for the data, as seen in the Figure 4.4, also shows that the scatter lies close to the line and thus asserts the assumption of normal distribution. Since the sample is larger than 30 we skip the Kolmogorov-Smirnov test (Statistics Solutions, 2017).

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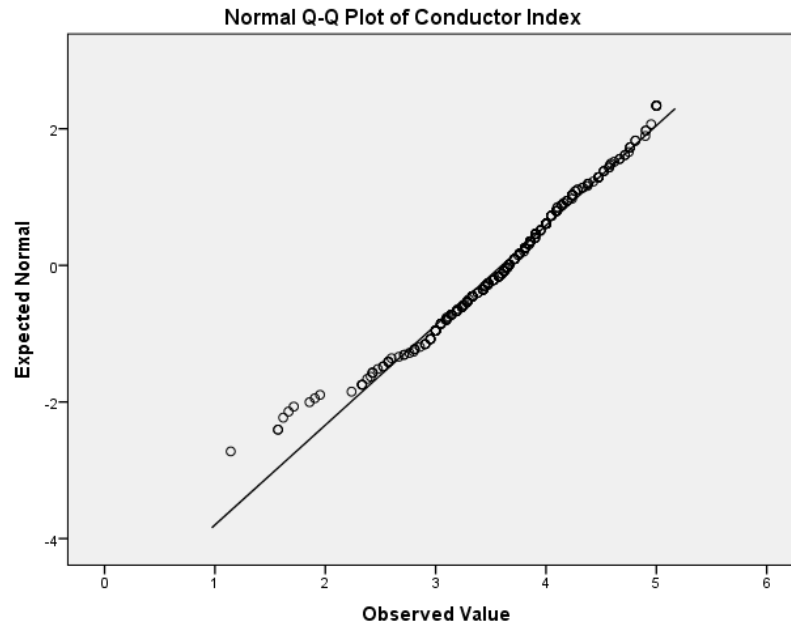
Figure 4.4: Q-Q Plot for Conductor Index

Correlation between Leader as a Conductor Index and E-Readiness Accession

The conductor index and e-readiness accession index are correlated as shown in Table 4.7. This indicates a strong significant and positive correlation (r=0.478, p<0.001) with 262 complete observations.

Table 4.7: Correlation between Leader as a Conductor and E-Readiness Accession

Correlations		Conductor Index	E-Readiness Accession Index
Conductor Index	Pearson Correlation	1	.478**
	Sig. (2-tailed)		.000
	N	309	262
E-Readiness Accession Index	Pearson Correlation	.478**	1
	Sig. (2-tailed)	.000	
	N	262	267

**. Correlation is significant at the 0.01 level (2-tailed).

Linear Regression between Leader as a Conductor Index and E-Readiness Accession

It was hypothesized that the leader as a conductor has no significant influence on e-readiness accession in higher education institutions in Kenya. This relationship was tested using a simple regression model of the form $Y=\beta_0+\beta_1X_1+\varepsilon$. The test of hypothesis proceeds as follows:

At a significance level, $\alpha = 0.05$ we test the hypotheses, H_{01}: $\beta_0=\beta_1=0$ (the leader as a conductor is not a significant predictor of e-readiness accession). The model was found to be statistically significant ($F (1, 260) = 76.898$, p-value < 0.001). Since p-value < 0.001, we reject the null hypothesis and conclude that, at $\alpha = 0.05$ level of significance, the leader as a conductor significantly predicts e-readiness accession.

The adjusted R^2 value indicates that 22.5% of the total variation in the dependent variable, e-readiness accession, can be explained by the independent variable, leader as a conductor. The adjusted R^2 value $= 0.225$ lies between 0.2 and 0.4 and therefore considered moderate (SSRL, 2010). The results of the linear regression of e-readiness on the conductor index are shown in Table 4.8.

Table 4.8: Results of Regression of E-Readiness on the Conductor Index

		Model Summary		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.478[a]	.228	.225	.48157

a. Predictors: (Constant), Conductor Index

			ANOVA[a]			
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.833	1	17.833	76.898	.000[b]
	Residual	60.297	260	.232		
	Total	78.130	261			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), Conductor Index

		Coefficients[a]				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.421	.170		14.243	.000
	Conductor Index	.403	.046	.478	8.769	.000

a. Dependent Variable: E-Readiness Accession Index

Using the standardized coefficients, the resultant regression equation $Y=\beta_0+\beta_1 X_1 +\varepsilon$ yields $Y= 0.478 X_1$ where Y is E-Readiness Accession Index and X_1 is Conductor Index. The variable is significant with $\beta_0 = 0.478$, t = 8.769, p-value < 0.001 indicating that for a unit increase in the leader as a conductor, e-readiness accedes by 0.478. The leader as a conductor is able to mobilize other actors into a joint value-creating activity. As higher education institutions improve in the dimension of a leader as a conductor they improve in the level of e-readiness and their ability to operate effectively in the digital age.

The focus group discussion and interviews revealed an attempt to emulate the capabilities of leaders as conductors. Leaders as conductors, with the ability to mobilize all other actors: staff, students, partners, to perform towards achieving the vision and mission, were perceived to do very well as visible in the mobilization of teams to

achieve a lot and facilitating others through provision of resources for actors to perform. The universities have visions, missions, core values and have implemented management systems standards as well as performance management regimes. Through these structures, the leaders orchestrate the identification and prioritization of projects and monitor the performance thereof on quarterly and annual basis.

4.6.2 Output of the Leader as an Architect

Digital age leaders are expected to be able to build the spirit of customer focus, new knowledge, problem solving, teams and partnerships (leader as an architect). The specific objective was to examine the influence of the leader as an architect on e-readiness accession in higher education institutions in Kenya.

For the purpose of this research 12 items were used to estimate the leader as an architect dimension. Test of reliability of scale using the Cronbach's Alpha Coefficient yielded the value of α=.923 with 13 items as shown on Table 4.4 earlier. The 13th item is the control question. The value α=.923 goes to α=.946 on deletion of the control question: "senior management are poor at crafting new solutions." The mean and standard deviation of each attribute used to measure the leader as an architect are presented in Table 4.9.

Table 4.9: Results of Digital Age Architect Leadership Dimensions

Item		Mean	Std. Dev.	N
a)	Senior management are good in sensing customer expectations	3.63	0.964	263
b)	Senior management are good in transforming customer expectations into tangible solutions	3.56	1.006	263
c)	Senior management are good in implementing the wishes of customers	3.46	1.014	263
d)	Senior management are good in assimilating new information	3.62	0.887	263
e)	Senior management are good in unlearning existing ways and applying new knowledge	3.32	1.108	263
f)	Senior management are good in blending diverse capabilities at different project stages	3.53	0.886	263
g)	Senior management are poor at crafting new solutions	2.98	1.127	263
h)	Senior management are good in emphasizing problems solving skills	3.59	0.916	263
i)	Senior management are good in engaging experts to play a role in solution development	3.65	0.968	263
j)	Senior management are good in creating solutions beyond customer expectations	3.35	1.062	263
k)	Senior management are good in building up successful teams	3.65	0.936	263
l)	Senior management are good in working with stakeholders to develop solutions	3.73	0.98	263
m)	Senior management are good in building an environment that says "this is the place to be"	3.51	1.062	263

The items were then aggregated to develop the leader as an architect index. The architect index has a mean = 3.5585 with a standard deviation =0.77233, N=290.

Test of Normality

A histogram for the architect index was plotted to give an indication an indication of the shape of the distribution (Samuels & Marshall, 2017). The resultant histogram is shown in Figure 4.5.
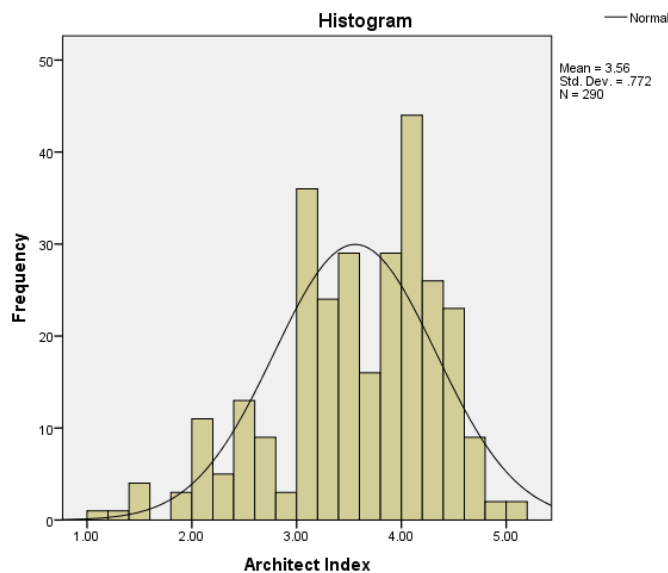
Figure 4.5: Histogram of Test of Normality of the Architect Index

The data is approximately normally distributed given the curve approximately peaks in the middle and is fairly symmetrical, and therefore, the assumption of normality has been met.

The normal Q-Q plot for the data, as seen in Figure 4.6, also shows that the scatter lies close to the line and thus asserts the assumption of normal distribution.
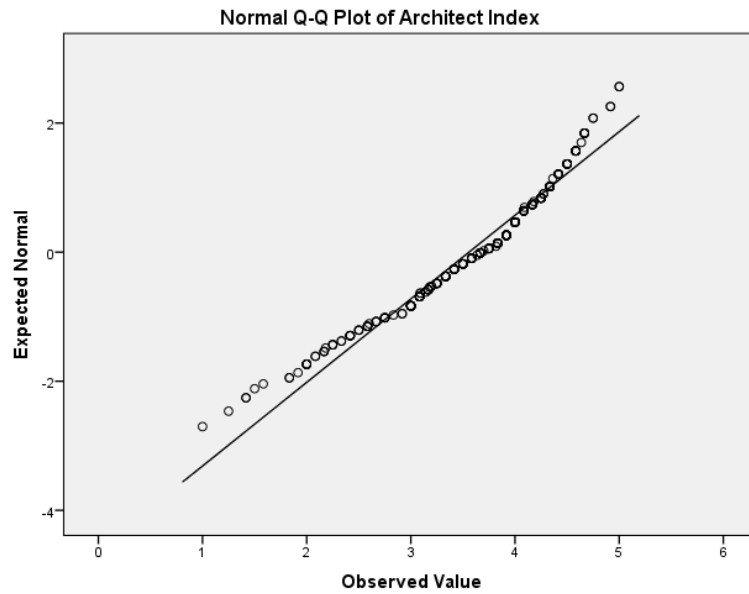
Figure 4.6: Q-Q Plot for Architect Index

Correlation between Leader as an Architect and E-Readiness Accession

The architect index and e-readiness accession index are correlated as shown in Table 4.10. This indicates a moderately significant positive correlation, r=0.452 (p<0.001) with 267 complete observations (Kent State University Libraries, 2017).

Table 4.10: Correlation between Leader as an Architect and E-Readiness Accession

<div align="center">Correlations</div>

		Architect Index	E-Readiness Accession Index
Architect Index	Pearson Correlation	1	.452**
	Sig. (2-tailed)		.000
	N	290	262
E-Readiness Accession Index	Pearson Correlation	.452**	1
	Sig. (2-tailed)	.000	
	N	262	267

**. Correlation is significant at the 0.01 level (2-tailed).

Linear Regression between Leader as an Architect and E-Readiness Accession

It was hypothesized that the leader as an architect has no significant influence on e-readiness accession in higher education institutions in Kenya. The relationship was tested using a simple regression model of the form $Y=\beta_0+\beta_2X_2 +\varepsilon$.

At a significance level, $\alpha = 0.05$ we test the hypotheses, H_{02}: $\beta_0=\beta_2=0$ (the leader as architect is not a significant predictor of e-readiness accession). The model was found to be statistically significant ($F (1, 260) = 66.713$, p-value < 0.001). Since p-value < 0.001, we reject the null hypothesis and conclude that, at $\alpha = 0.05$ level of significance, the leader as an architect significantly predicts e-readiness accession.

The R value represents the simple correlation which is 0.452 and indicates a moderate degree of correlation. The adjusted R^2 value indicates that 20.1% of the total variation in the dependent variable, e-readiness accession, can be explained by the independent variable, leader as an architect. The adjusted R^2 value = 0.201 lies between 0.2 and 0.4 and therefore considered moderate (SSRL, 2010). The results of the linear regression of e-readiness on the architect index are shown in Table 4.11.

Table 4.11: Results of Regression of E-Readiness on the Architect Index

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.452[a]	.204	.201	.49215

a. Predictors: (Constant), Architect Index

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.158	1	16.158	66.713	.000[b]
	Residual	62.975	260	.242		
	Total	79.133	261			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), Architect Index

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.678	.151		17.748	.000
	Architect Index	.334	.041	.452	8.168	.000

a. Dependent Variable: E-Readiness Accession Index

Using the standardized coefficients, the resultant regression $Y=\beta_0+\beta_2 X_2 +\varepsilon$ yields $Y= 0.452 X_2$, where Y is E-Readiness Accession Index and X_2 is Architect Index. The variable is significant with $\beta_0 = 0.452$, $t = 8.168$, p-value < 0.001 indicating that for a unit increase in the leader as an architect, e-readiness accedes by 0.452. The leader as an architect is a problem solver, solution designer or implementer of customer wishes. As higher education institutions improve in the dimension of a leader as an architect they improve in the level of e-readiness and their ability to operate effectively in the digital age.

The focus group discussion and interviews revealed an attempt to emulate the capabilities of leaders as architects. The capabilities of leaders as architects was evidenced in the efforts to develop solutions to emerging problems, working with teams to develop solutions, giving feedback to other actors and solution co-creators, influencing teams to find solutions geared towards customer satisfaction.

4.6.3   Output of the Leader as an Auctioneer

Digital age leaders are expected to be good at sensing the market, setting up systems, governing the market (leader as an auctioneer). The specific objective was to examine the influence of the leader as an auctioneer on e-readiness accession in higher education institutions in Kenya.

For the purpose of this research 11 items were used to estimate the leader as an auctioneer dimension. Test of reliability of scale using the Cronbach's Alpha Coefficient yielded the value of $\alpha=.919$ with 12 items as shown on Table 4.4 earlier. The 12th item is the control question. The value $\alpha=.919$ goes to $\alpha=.941$ on deletion of the control question: "senior management are not prepared for new customer/market needs." The mean and standard deviation of each attribute used to measure the leader as an auctioneer are presented in Table 4.12.

Table 4.12: Results of Digital Age Auctioneer Leadership Dimensions

Item		Mean	Std. Dev.	N
a)	Senior management are good in listening to customers			
		3.76	0.957	260
b)	Senior management are good in sensing the needs of the market			
		3.65	0.894	260
c)	Senior management are good in seducing customers to our products and services			
		3.59	0.992	260
d)	Senior management are good in setting up systems to manage our customers			
		3.58	0.985	260

Item		Mean	Std. Dev.	N
e)	Senior management are good in exploiting new solutions (tapping disruptive technologies)			
		3.5	0.981	260
f)	Senior management are good in pushing the limits to higher performance			
		3.63	0.968	260
g)	Senior management are not prepared for new customer/market needs			
		2.95	1.098	260
h)	Senior management are good in achieving the right pace (right speed)			
		3.49	1	260
i)	Senior management are good in achieving the right poise (keeping steady)			
		3.47	0.944	260
j)	Senior management are good in achieving the right preparation (knowing our products and services)			
		3.62	0.924	260
k)	Senior management are good in achieving the right panache (achieving the right mood)			
		3.48	0.988	260
l)	Senior management are good in achieving the right brilliance (sensing and exploiting opportunities)			
		3.54	0.984	260

The attributes were then aggregated to develop the leader as an auctioneer index. The auctioneer index has a mean = 3.576 with a standard deviation =0.76554, N=280.

Test of Normality

A histogram for the auctioneer index was plotted to give an indication of the shape of the distribution (Samuels & Marshall, 2017). The resultant histogram is shown in Figure 4.7.
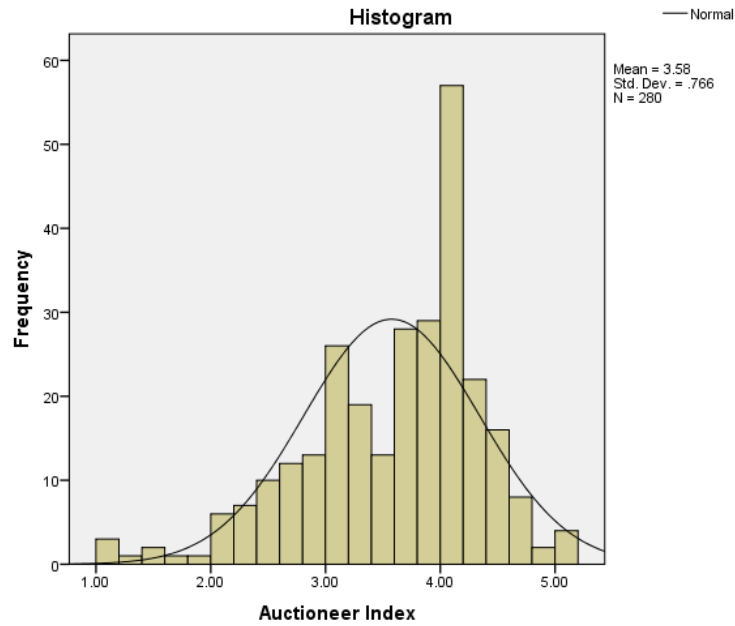
Figure 4.7: Histogram of Test of Normality of the Auctioneer Index

The data is approximately normally distributed given the curve approximately peaks in the middle and is fairly symmetrical, and therefore, the assumption of normality has been met.

The normal Q-Q plot for the data, as seen in the Figure 4.8, also shows that the scatter lies close to the line and thus asserts the assumption of normal distribution.
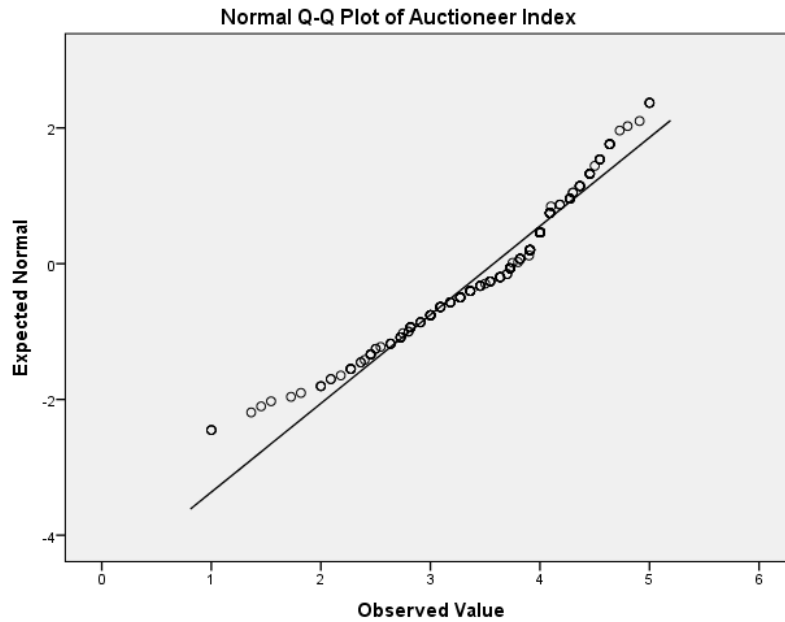
Figure 4.8: Q-Q Plot for Auctioneer Index

Correlation between Leader as an Auctioneer and E-Readiness Accession

The auctioneer index and e-readiness accession index are correlated as shown in Table 4.13. This indicates a moderately significant positive correlation, r=0.479 (p<0.001) with 261 complete observations (Kent State University Libraries, 2017).

Table 4.13: Correlation between Leader as an Auctioneer and E-Readiness Accession

<div align="center">Correlations</div>

		Auctioneer Index	E-Readiness Accession Index
Auctioneer Index	Pearson Correlation	1	.479**
	Sig. (2-tailed)		.000
	N	280	261
E-Readiness Accession Index	Pearson Correlation	.479**	1
	Sig. (2-tailed)	.000	
	N	261	267

**. Correlation is significant at the 0.01 level (2-tailed).

Linear Regression between Leader as an Auctioneer and E-Readiness Accession

The test hypothesis was that the leader as auctioneer has no significant influence on e-readiness accession in higher education institutions in Kenya. The relationship was tested using a simple regression model of the form $Y=\beta_0+\beta_3X_3+\varepsilon$. The test of hypothesis proceeded as follows.

At a significance level, $\alpha = 0.05$ we test the hypotheses, H_{03}: $\beta_0=\beta_3=0$ (the leader as an auctioneer is not a significant predictor of e-readiness accession). The model was found to be statistically significant (F (1, 259) = 77.263, p-value < 0.001). Since p-value < 0.001, we reject the null hypothesis and conclude that, at $\alpha = 0.05$ level of significance, the leader as an auctioneer is a significant predictor of e-readiness accession.

The adjusted R^2 value indicates that 22.7% of the total variation in the dependent variable, e-readiness accession, can be explained by the independent variable, leader as an auctioneer. The adjusted R^2 value = 0.227 lies between 0.2 and 0.4 and therefore considered moderate (SSRL, 2010). The results of the linear regression of e-readiness on the auctioneer index are shown in Table 4.14.

Table 4.14: Results of Regression of E-Readiness on the Auctioneer Index

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.479[a]	.230	.227	.48066

a. Predictors: (Constant), Auctioneer Index

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.850	1	17.850	77.263	.000[b]
	Residual	59.837	259	.231		
	Total	77.687	260			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), Auctioneer Index

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.573	.152		16.944	.000
	Auctioneer Index	.362	.041	.479	8.790	.000

a. Dependent Variable: E-Readiness Accession Index

Using the standardized coefficients, the resultant regression equation $Y=\beta_0+\beta_3 X_3 +\varepsilon$ yields $Y= 0.479 X_3$, where Y is E-Readiness Accession Index and X_3 is Auctioneer Index. The variable is significant with $\beta_0 = 0.479$, $t = 8.79$, p-value < 0.001 indicating that for a unit increase in the leader as a conductor, e-readiness accedes by 0.479. The leader as an auctioneer is good at sensing the needs of the market and customers, setting up appropriate systems, exciting and governing the market, sensing interest and exciting interest in the products and keeping the environment active. As higher education institutions improve in the dimension of a leader as an auctioneer they improve in the level of e-readiness and their ability to operate effectively in the digital age.

The focus group discussion and interviews revealed an attempt to emulate the capabilities of leaders as auctioneers. As auctioneers, the leaders were evidenced by the ability to watch/spot actors but with the challenge of carrying these exceptional actors along. There are efforts at identifying champions and enthusiasts in the systems to drive specific institutional agendas such as assimilation of new teaching and learning methods, adoption of technologies for better management students, staff and administrative affairs of the universities. It was observed that some leaders were more hands-off, just expecting everyone to perform their roles along.

4.6.4   Output of the Leader as a Promoter

Digital age leaders are expected to have charisma, endowed in managing projects and institutionalization (leader as a promoter). The specific objective was to examine the influence of the leader as a promoter on e-readiness accession in higher education institutions in Kenya.

For the purpose of this research 9 items were used to estimate the leader as a promoter dimension. Test of reliability of scale using the Cronbach's Alpha Coefficient yielded the value of $\alpha=.873$ with 10 items as shown on Table 4.4. The 10th item is the control question. The value $\alpha=.873$ goes to $\alpha=.911$ on deletion of the control question: "senior management are poor at stimulating/creating enthusiasm."

The mean and standard deviation of each attribute used to measure the leader as a promoter are presented in Table 4.15.

Table 4.15: Results of Digital Age Promoter Leadership Dimensions

Item		Mean	Std. Dev.	N
a)	Senior management are good in building a "together we will make it" spirit	3.79	0.976	247
b)	Senior management are good in generating personal motivation	3.5	0.983	247
c)	Senior management are good in stimulating dreams and aspirations	3.55	0.99	247
d)	Senior management are good in managing projects effectively	3.46	1.011	247
e)	Senior management are good in initiating ideas and solutions	3.57	0.925	247
f)	Senior management are good in mobilizing people to get tasks done	3.75	0.928	247
g)	Senior management are poor at stimulating/creating enthusiasm	3.16	1.219	247
h)	Senior management are good in institutionalizing new ideas (making them part of our culture)	3.59	0.932	247
i)	Senior management are good in leading without leading	3.31	0.965	247
j)	Senior management are good in setting up policies/procedures/processes	3.83	0.935	247

The attributes were then aggregated to develop the leader as a promoter index. The promoter index has a mean = 3.5998 with a standard deviation =0.68418, N=260.

Test of Normality

A histogram for the promoter index was plotted to give an indication an indication of the shape of the distribution (Samuels & Marshall, 2017). The resultant histogram is shown in Figure 4.9.
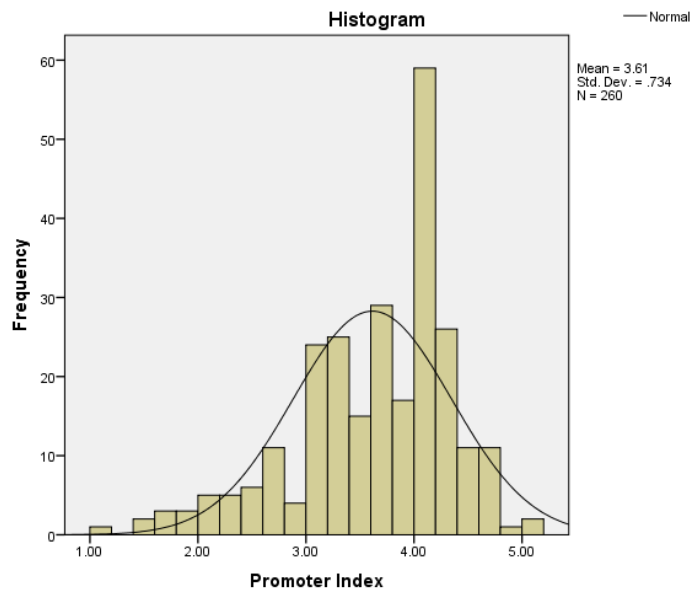
Figure 4.9: Histogram of Test of Normality of the Promoter Index

The data is approximately normally distributed given the curve approximately peaks in the middle and is fairly symmetrical, and therefore, the assumption of normality has been met. The normal Q-Q plot for the data, as seen in the Figure 4.10, also shows that the scatter lies close to the line and thus asserts the assumption of normal distribution.
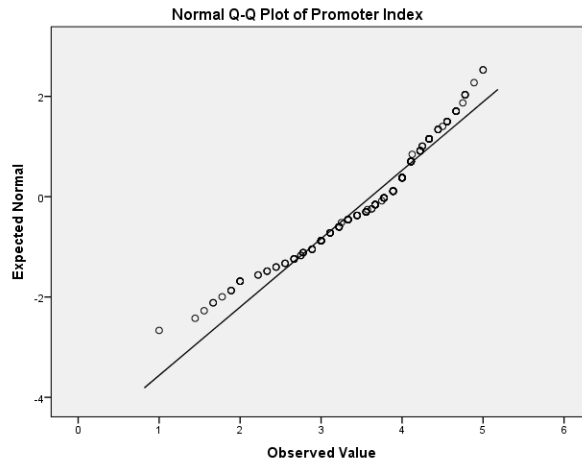
Figure 4.10: Q-Q Plot for Promoter Index

Correlation between Leader as a Promoter and E-Readiness Accession

The promoter index and e-readiness accession index are correlated as shown in Table 4.16. This indicates a moderately significant positive correlation, r=0.464 (p<0.001) with 253 complete observations (Kent State University Libraries, 2017).

Table 4.16: Correlation between Leader as a Promoter and E-Readiness Accession

Correlations			
		Promoter Index	E-Readiness Accession Index
Promoter Index	Pearson Correlation	1	.464[**]
	Sig. (2-tailed)		.000
	N	268	253
E-Readiness Accession Index	Pearson Correlation	.464[**]	1
	Sig. (2-tailed)	.000	
	N	253	267

**. Correlation is significant at the 0.01 level (2-tailed).

Linear Regression between Leader as a Promoter and E-Readiness Accession

The hypothesis was that the leader as a promoter has no significant influence on e-readiness accession in higher education institutions in Kenya. The relationship was tested on the basis of the regression model, $Y=\beta_0+\beta_4X_4+\varepsilon$.

At a significance level, $\alpha = 0.05$ we test the hypotheses, H_0: $\beta_0=\beta_4=0$ (the leader as promoter is not a significant predictor of e-readiness accession). The model was found to be statistically significant (F $(1, 251) = 68.836$, p-value < 0.001). Since p-value < 0.001, we reject the null hypothesis and conclude that, at $\alpha = 0.05$ level of significance, the leader as a promoter significantly predicts e-readiness accession.

The adjusted R^2 value indicates that 21.2% of the total variation in the dependent variable, e-readiness accession, can be explained by the independent variable, leader as a promoter. The adjusted R^2 value $= 0.212$ lies between 0.2 and 0.4 and therefore considered moderate (SSRL, 2010). The results of the linear regression of e-readiness on the promoter index are shown in Table 4.17.

Table 4.17: Results of Regression of E-Readiness on the Promoter Index

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.464[a]	.215	.212	.47995

a. Predictors: (Constant), Promoter Index

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.856	1	15.856	68.836	.000[b]
	Residual	57.818	251	.230		
	Total	73.675	252			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), Promoter Index

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.551	.164		15.562	.000
	Promoter Index	.366	.044	.464	8.297	.000

a. Dependent Variable: E-Readiness Accession Index

Using the standardized coefficients, the resultant regression equation $Y=\beta_0+\beta_4X_4+\varepsilon$ yields $Y= 0.464X_4$, where Y is E-Readiness Accession Index and X_4 is Promoter Index. The variable is significant with $\beta_0 = 0.464$, $t = 8.297$, *p*-value < 0.001 indicating that for a unit increase in the leader as a conductor, e-readiness accedes by 0.464. The leader as a promoter is able influence people to do things because the want to do them, not because the leader wanted the things done. They make people have fun in doing the things they do. As higher education institutions improve in the dimension of a leader as a promoter they improve in the level of e-readiness and their ability to operate effectively in the digital age.

The focus group discussion and interviews revealed an attempt to emulate the capabilities of leaders as promoters. As promoters, leaders motivated staff to do better influenced by the personalities (risk averse versus risk appetite). Some were exceptional in motivating and encouraging other actors to pursue particular goals.

4.6.5 Output of the Leader as a Developer

Digital age leaders are expected to be good at creating ownership of the agenda, developing leaders and nurturing leadership culture (leader as a developer). The specific objective was to examine the influence of the leader as a developer on e-readiness accession in higher education institutions in Kenya.

For the purpose of this research 18 items were used to estimate the leader as a developer dimension. Test of reliability of scale using the Cronbach's Alpha Coefficient yielded the value of α=.947 with 20 items as shown on Table 4.4. The 19th and 20th item are the control questions. The value α=.947 goes to α=.955 and α=.956 on deletion of the control questions: "senior management does not care about nurturing successors" and "senior management are poor at building experts/professionals," respectively.

The mean and standard deviation of each attribute used to measure the leader as a developer are presented in Table 4.18.

Table 4.18: Results of Digital Age Developer Leadership Dimensions

Item		Mean	Std. Dev.	N
a)	Senior management are good in enabling people to take ownership of development agenda	3.72	1.027	224
b)	Senior management are good in retaining and attracting highly skilled employees	3.6	1.088	224
c)	Senior management are good in being engaged as both an enabler and participant	3.61	0.987	224
d)	Senior management are good in turning skeptics and nonbelievers into people willing to take more responsibility	3.44	1.04	224
e)	Senior management are good in helping staff to work fast and effectively beyond directives from above	3.56	1.009	224
f)	Senior management are good in allowing a sense of autonomy in the workforce	3.56	0.921	224

Item		Mean	Std. Dev.	N
g)	Senior management does not care about nurturing successors	2.98	1.202	224
h)	Senior management are good in enhancing leadership capacity of individual members	3.64	0.974	224
i)	Senior management are good in enhancing leadership capacity of teams	3.59	0.919	224
j)	Senior management are good in providing employees with needed skills	3.59	0.938	224
k)	Senior management are good in appreciating leadership development as a means of building organizational capability	3.64	0.95	224
l)	Senior management are good in motivating people to move from one level in leadership competency	3.54	0.974	224
m)	Senior management are good in transforming leader's mind-set from one level to the next (developing of bigger minds)	3.59	0.928	224
n)	Senior management are poor at building experts/professionals	2.89	1.232	224
o)	Senior management are good in seeing change in leadership culture as the missing link	3.49	0.97	224
p)	Senior management are good in articulating the value of digital technologies to the organization's future	3.69	0.937	224
q)	Senior management are good in taking risks	3.49	1.042	224
r)	Senior management are good in building skills to realize the strategy	3.64	0.965	224
s)	Senior management are good in developing digital strategies with an eye on transforming the business	3.66	0.924	224
t)	Senior management are good in fostering a culture to change and invent the new	3.57	1.031	224

The attributes were then aggregated to develop the leader as a developer index. The developer index has a mean = 3.6118 with a standard deviation =0.74356, N=266.

Test of Normality

The histogram for the developer index was plotted to give an indication an indication of the shape of the distribution (Samuels & Marshall, 2017). The resultant histogram is shown in Figure 4.11.
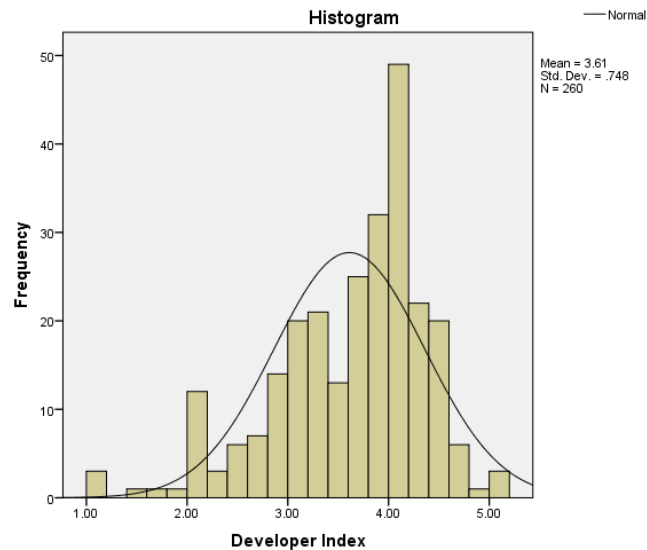
Figure 4.11: Histogram of Test of Normality of the Developer Index

The data is approximately normally distributed given the curve approximately peaks in the middle and is fairly symmetrical, and therefore, the assumption of normality has been met. The normal Q-Q plot for the data, as seen in Figure 4.12, also shows that the scatter lies close to the line and thus asserts the assumption of normal distribution.
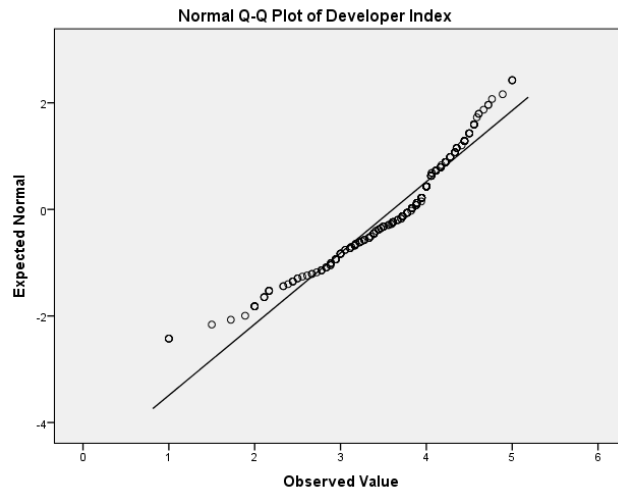
Figure 4.12: Q-Q Plot for Developer Index

Correlation between Leader as a Developer and E-Readiness Accession

The developer index and e-readiness accession are correlated as shown in Table 4.19. This indicates a moderately significant positive correlation, r=0.489 (p<0.001) with 267 complete observations (Kent State University Libraries, 2017).

Table 4.19: Correlation between Leader as a Developer and E-Readiness Accession

<table>
<tr><td colspan="4" align="center">Correlations</td></tr>
<tr><td></td><td></td><td>Developer Index</td><td>E-Readiness Accession Index</td></tr>
<tr><td>Developer Index</td><td>Pearson Correlation</td><td>1</td><td>.489[**]</td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td></td><td>.000</td></tr>
<tr><td></td><td>N</td><td>266</td><td>257</td></tr>
<tr><td>E-Readiness Accession Index</td><td>Pearson Correlation</td><td>.489[**]</td><td>1</td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td>.000</td><td></td></tr>
<tr><td></td><td>N</td><td>257</td><td>267</td></tr>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Linear Regression between Leader as a Developer and E-Readiness Accession

The null hypothesis was that the leader as a developer has no significant influence on the e-readiness accession in higher education institutions in Kenya. The relationship was tested using a simple regression in the form of $Y=\beta_0+\beta_5X_5 +\varepsilon$.

At a significance level, $\alpha = 0.05$ we test the hypotheses, H_{05}: $\beta_0=\beta_5=0$ (the leader as a developer is not a significant predictor of e-readiness accession). The model was found to be statistically significant (F (1, 255) = 80.023, p-value < 0.001). Since p-value < 0.001, we reject the null hypothesis and conclude that, at $\alpha = 0.05$ level of significance, the leader as a developer is a significant predictor of e-readiness accession.

The adjusted R^2 value indicates that 23.6% of the total variation in the dependent variable, e-readiness accession, can be explained by the independent variable, leader as a developer.   The adjusted R^2 value = 0.201 lies between 0.2 and 0.4 and therefore considered moderate (SSRL, 2010). The results of the linear regression of e-readiness on the developer index are shown in Table 4.20.

Table 4.20: Results of Regression of E-Readiness on the Developer Index

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.489[a]	.239	.236	.47746

a. Predictors: (Constant), Developer Index

ANOVA[a]					
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.243	1	18.243	80.023	.000[b]
	Residual	58.132	255	.228		
	Total	76.374	256			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), Developer Index

	Coefficients[a]				
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	2.505	.158		15.882	.000
Developer Index	.379	.042	.489	8.946	.000

a. Dependent Variable: E-Readiness Accession Index

Using the standardized coefficients, the resultant regression equation $Y=\beta_0+\beta_5X_5+\varepsilon$ yields $Y= 0.489X_5$, where Y is E-Readiness Accession Index and X_5 is Developer Index. The variable is significant with $\beta_0 = 0.489$, t = 8.946, *p*-value < 0.001 indicating that for a unit increase in the leader as a conductor, e-readiness accedes by 0.489. The leader as a developer is able to grower leaders vertically (self-drive) and horizontally (with expert support). The developer leader is able to make others own the agenda, to develop and nurture leaders and develop a leadership culture. As higher education institutions improve in the dimension of a leader as a developer they improve in the level of e-readiness and their ability to operate effectively in the digital age. According to Abraham Maslow's Hierarchy of Needs model, a leader as a developer would be considered one who is able to help others to actualize (Businessballs, 2017).

The focus group discussion and interviews revealed an attempt to emulate the capabilities of leaders as developers. This was demonstrated through giving challenging assignments, making people feel they can handle more challenging roles, and engendering some form of succession planning such as associate deans and deputy directors. However, it was felt by a majority that leadership development was curtailed by budgetary constraints, slow acceptance/adoption of avenues such as hand-holding, listening, observation and doing (allowing mentees seat with professionals and experts

to "listen", "observe" and "emulate" in a structured environment). The focus group discussion posited that leaders as developers would have to transcend their own self-actualization needs to help others to achieve self-actualization (Businessballs, 2017) when viewed through the prism of Abraham Maslow's Hierarchy of Needs model. The discussion also identified potential for overlaps between the variables, especially the leaders as a developer and the leader as a promoter although not confirmed by the results of data analysis (through variable inflation factor (VIF) results).

4.7   Results of E-Readiness Accession

4.7.1   Outputs of E-Readiness Accession

In the context of the higher education sector e-readiness is a measure of the sectors (and individual higher education institutions) readiness, willingness or preparedness to tap the benefits and opportunities arising from ICTs. For the purpose of this study e-readiness accession was based on 40 items. Test of reliability of scale using the Cronbach's Alpha Coefficient yielded the value of $\alpha=.960$ with 45 items as shown on Table 4.4. The 5 items h, s, aa, hh and ss are control questions and are marked by a spurious means and standard deviations as seen in Table 4.21.

The mean and standard deviation of each attribute used to measure the e-readiness accession are presented in Table 4.21.

Table 4.21: Results of E-Readiness Attributes

Item		Mean	Std. Dev.	N
	People			
a)	We are excited with automation (new ICT solutions)	4.13	0.896	190
b)	We are empowered to serve in our roles	3.91	0.877	190
c)	We adapt change easily	3.73	1.018	190

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Item		Mean	Std. Dev.	N
d)	Our systems (ERPs, HRMISs, LMISs) give timely response	3.63	1.009	190
e)	Our systems (ERPs, HRMISs, LMISs) are up and running when we need	3.67	1.013	190
f)	We are involved in decision-making on technology acquisitions	3.32	1.12	190
g)	We are well updated	3.67	1.088	190
h)	Our skills rarely match the business technology needs	3.11	1.179	190
i)	We have technology skills	4.05	0.799	190
j)	We have business skills	3.93	0.804	190
k)	We have analytical skills	3.96	0.762	190
	Processes			
l)	Our processes are well defined	3.79	0.906	190
m)	We understand our processes	3.85	0.893	190
n)	We easily share data across departments and teams	3.62	1.101	190
o)	We have adopted best practices	3.66	0.988	190
p)	We continually improve our processes	3.83	0.961	190
q)	We make decisions based on data	3.62	0.9	190
r)	We monitor the performance of our processes	3.75	0.896	190
s)	Our processes are not aligned with our technology solutions	3.15	1.138	190
	Technology			
t)	Our technology solutions are user-friendly	3.82	0.854	190

Item	Mean	Std. Dev.	N
u) Our technology solutions are useful for our work	3.91	0.821	190
v) Our systems offer optimal performance	3.8	0.91	190
w) Our systems are optimal uptime	3.69	0.928	190
x) We have business continuity/failsafe mechanisms	3.56	0.851	190
y) We get timely upgrades for hardware and software	3.48	1.022	190
z) We apply best practices/standards in ICT management	3.72	1.024	190
aa) Our people, process and technology environment is not conducive for innovation, performance and development	3.01	1.299	190
Service Quality			
bb) Our ICT service staff are willing to help users	4.26	0.759	190
cc) Our ICT service staff are ready to respond to users requests	4.21	0.709	190
dd) Our ICT service staff provide services as promised	3.97	0.908	190
ee) Our ICT service staff are dependable in handling user's service problems	4.03	0.884	190
ff) Our ICT service staff perform services right the first time	3.86	0.923	190
gg) Our ICT service staff maintain reliable technology and system	3.83	0.933	190
hh) We would be better off without the ICT service staff	2.43	1.456	190
ii) Our ICT service staff make users feel safer in computer transactions	3.91	0.837	190
jj) Our ICT service staff are consistently courteous	3.88	0.84	190
kk) Our ICT service staff have the knowledge to answer	4.07	0.784	190

Item		Mean	Std. Dev.	N
	user's questions			
ll)	Our ICT service staff give users individual attention	3.99	0.813	190
mm)	Our ICT service staff deal with users in a caring fashion	3.86	0.818	190
nn)	Our ICT service staff have the user's interest at heart	3.93	0.845	190
oo)	Our ICT service staff understand the needs of users	3.98	0.8	190
pp)	Our ICT service staff have visually appealing facilities	3.71	0.936	190
qq)	Our ICT service staff appear professional	4.03	0.826	190
rr)	Our ICT service staff provide useful support materials (e.g. documentation, training, videos…)	3.8	0.977	190
ss)	Our ICT service quality is not conducive for innovation, performance and development	2.89	1.345	190

The attributes were then aggregated to develop the e-readiness accession index. The e-readiness accession index has a mean = 3.8792 with a standard deviation =0.54965, N=267.

Test of Normality

A histogram for the e-readiness accession index was plotted to give an indication an indication of the shape of the distribution (Samuels & Marshall, 2017). The resultant histogram is shown in Figure 4.13.
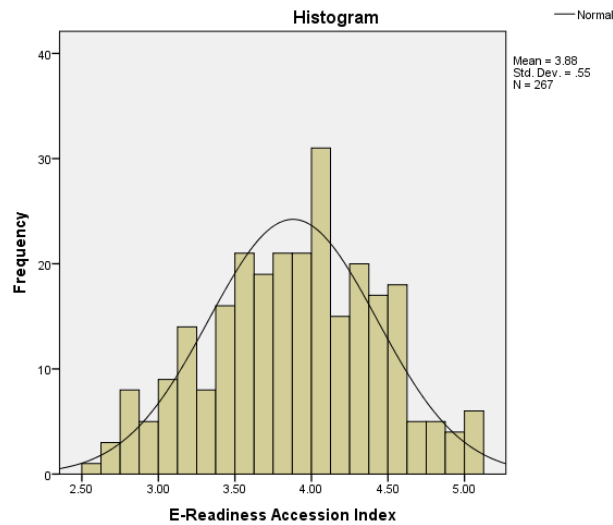
Figure 4.13: Histogram of Test of Normality of the E-readiness Accession Index

The data is approximately normally distributed given the curve approximately peaks in the middle and is fairly symmetrical, and therefore, the assumption of normality has been met. The normal Q-Q plot for the data, as seen in Figure 4.14, also shows that the scatter lies close to the line and thus asserts the assumption of normal distribution.
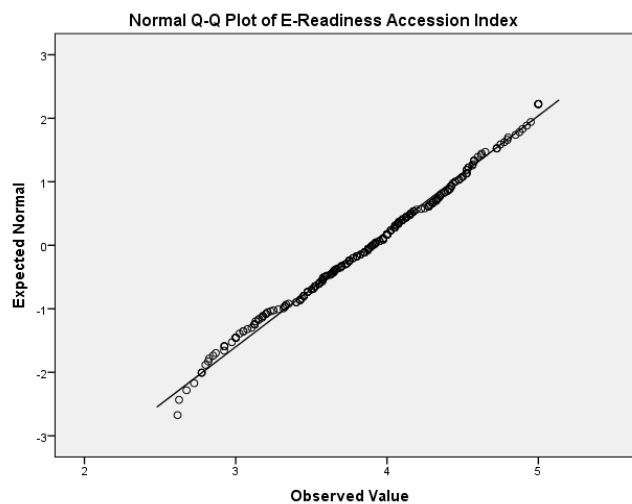
Figure 4.14: Q-Q Plot for E-Readiness Accession Index

Correlation between Aggregate Leader Dimension and E-Readiness Accession

Correlation and linear regression between the individual leader dimensions, leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer with e-readiness accession has been demonstrated with moderately significant positive correlation. Correlation and linear regression is herein also tested with the aggregate leader index and e-readiness accession. The leader index is obtained by aggregating the five leadership dimensions.

The leader index and e-readiness accession are correlated as shown in Table 4.22. This indicates a moderately significant positive correlation, r=0.515 (p<0.001) with 267 complete observations (Kent State University Libraries, 2017).

Table 4.22: Correlation between the Leader and E-Readiness Accession

Correlations		Leader Index	E-Readiness Accession Index
Leader Index	Pearson Correlation	1	.515**
	Sig. (2-tailed)		.000
	N	313	266
E-Readiness Accession Index	Pearson Correlation	.515**	1
	Sig. (2-tailed)	.000	
	N	266	267

**. Correlation is significant at the 0.01 level (2-tailed).

Linear Regression between Aggregate Leader Dimension and E-Readiness Accession

The overall hypothesis was that leadership orchestration has no significant influence on the e-readiness accession in higher education institutions in Kenya. This relationship was tested using a simple regression model in the form $Y=\beta_0+\beta_n X_n +\varepsilon$.

At a significance level, $\alpha = 0.05$ we test the hypotheses, H_0: $\beta_0 = \beta_{GO} = 0$ (leadership is not a significant predictor of e-readiness accession). The model was found to be statistically significant ($F(1, 264) = 95.381$, p-value < 0.001). Since p-value < 0.001, we reject the null hypothesis and conclude that, at $\alpha = 0.05$ level of significance, leadership is a significant predictor of e-readiness accession.

The results of the linear regression analysis on the leader index are shown in Table 4.23. The R value represents the simple correlation which is 0.489 and indicates a moderate degree of correlation. The adjusted R^2 value indicates that 26.3% of the total variation in the dependent variable, e-readiness accession, can be explained by the independent variable, leader index. The adjusted R^2 value $= 0.263$ lies between 0.2 and 0.4 and therefore considered moderate (SSRL, 2010). The results of the linear regression of e-readiness on the aggregated leader index are shown in Table 4.23.

Table 4.23: Results of Regression of E-Readiness Accession on the Leader Index

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.515[a]	.265	.263	.46986

a. Predictors: (Constant), Leader Index

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.057	1	21.057	95.381	.000[b]
	Residual	58.282	264	.221		
	Total	79.339	265			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), Leader Index

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.291	.166		13.836	.000
	Leader Index	.438	.045	.515	9.766	.000

a. Dependent Variable: E-Readiness Accession Index

Using the standardized coefficients, the resultant regression equation $Y=\beta_0+ \beta_cX_c+\varepsilon$ yields $Y= 0.515X_n$, where Y is E-Readiness Accession Index and X_n is Leader Index. The variable is significant with $\beta_0 = 0.515$, $t = 9.766$, *p*-value < 0.001 indicating that for a unit increase in the leader index, e-readiness accedes by 0.515.

Universities are operating in an ever-changing and increasingly complex environment in the face a changing policy agenda, economic uncertainty, rapid changes in technology and new demands from students, hence the need to find new ways of working – harness the new opportunities and also mitigate the new risks (Looker, 2016). The digital age environment requires leaders who can orchestrate the ability of the higher education institutions to either become digital leaders or simply stay relevant in the digital age (McCusker & Babington, 2015). Broadly, orchestration (Abbott, Genschel, Snidal, & Zangl, 2010), (Hewlett-Packard, 2013), (Wallin, 2006) is the facilitation and coordination of intermediary actors by providing them with material and ideational support in order to achieve governance goals with respect to target actors (Abbott, Genschel, Snidal, & Zangl, 2010). As higher education institutions improve in leader orchestration they improve in the level of e-readiness and their ability to operate effectively in the digital age.

The focus group discussion and interviews indicate that higher education institutions were implementing specific measures to demonstrate leadership orchestration. In consideration of how the leadership of the institutions of higher education faired in the leadership orchestration for better performance and sustainability, the institutions were implementing performance evaluation on the basis of performance contracting, rewards and sanctions, restructuring and focus on the institutional visions and missions. The institutions were however challenged by concerns of slow decision-making, limited funding of performance improvement reforms.

McCusker and Babington (2015) argue that today's digital age where the voice of the customer is more prevalent than ever, turning your customers into advocates for your university is one of the most powerful marketing tools available. On the review of the institutions on the focus on better customer experience, value generation from investments and business continuity, there was indication that all the institutions had put in place structures and processes geared towards better customer experience. The institutions were increasingly very caring, better listening, reaching out to customers (staff, students, parents/guardians, sponsors and partners/suppliers). It was observed that the institutions lacked clear focus on value generation from investments and business continuity. Whereas there are attempts to implement leadership orchestration, there are challenges to be overcome.

Multiple Linear Regression between Individual Leader Dimensions and E-Readiness Accession

Multiple linear regression analysis was carried out to predict the values of e-readiness accession index, Y, given the leader dimensions, leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer variables $(X_1, X_2, X_3, X_4, X_5)$ (Tranmer & Elliot, 2008). Table 4.24 indicates that the leadership dimensions have a highly significant and positive correlation with one another and a moderately significant positive correlation with the e-readiness accession. Correlation value $r>0.783$ $(p<0.001)$ was observed for the respective complete observations (Kent State University Libraries, 2017).

Table 4.24: Correlation of E-readiness Accession and the Multiple Predictors

		Conductor Index	Architect Index	Auctioneer Index	Promoter Index	Developer Index	ERA Index
Conductor Index	Pearson Correlation	1	.826**	.794**	.783**	.816**	.478**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	309	288	277	266	263	262
Architect Index	Pearson Correlation	.826**	1	.810**	.824**	.822**	.452**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	288	290	279	267	264	262
Auctioneer Index	Pearson Correlation	.794**	.810**	1	.853**	.827**	.479**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	277	279	280	268	264	261
Promoter Index	Pearson Correlation	.783**	.824**	.853**	1	.847**	.464**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	266	267	268	268	262	253
Developer Index	Pearson Correlation	.816**	.822**	.827**	.847**	1	.489**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	263	264	264	262	266	257
ERA Index	Pearson Correlation	.478**	.452**	.479**	.464**	.489**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	262	262	261	253	257	267

**. Correlation is significant at the 0.01 level (2-tailed).

The R value represents the simple correlation which is 0.526 and indicates a high degree of correlation. The adjusted R^2 value indicates that 26.2% of the total variation in the dependent variable, e-readiness accession, can be explained by the independent

variables, leader dimensions. The adjusted R^2 value = 0.262 lies between 0.2 and 0.4 and therefore considered moderate (SSRL, 2010).

The results of the multiple linear regression of e-readiness on the leader indices (leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer) index are shown in Table 4.25.

Table 4.25: E-Readiness Accession Multiple Regression on the Leader Indices

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.526[a]	.276	.262	.46625

a. Predictors: (Constant), Developer Index, Conductor Index, Promoter Index, Auctioneer Index, Architect Index

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.355	5	4.071	18.726	.000[b]
	Residual	53.261	245	.217		
	Total	73.616	250			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), Developer Index, Conductor Index, Promoter Index, Auctioneer Index, Architect Index

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.250	.175		12.819	.000
	Conductor Index	.182	.089	.219	2.038	.043
	Architect Index	.005	.089	.007	.059	.953
	Auctioneer Index	.046	.089	.060	.518	.605
	Promoter Index	.058	.090	.074	.648	.518
	Developer Index	.159	.089	.207	1.783	.076

a. Dependent Variable: E-Readiness Accession Index

Whereas individually and aggregated the leadership dimensions (leader index) have been indicated to be significant predictors of e-readiness accession, the multiple regression paints a different picture. At p-value ≤ 0.05 only the leader as a conductor at $p = 0.043$ and t=2.038 has a significant contribution to e-readiness accession.

The regression equation, $Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\epsilon$, and using the standardized co-efficients, yields $Y= 0.219X_1+0.007X_2+0.06X_3+0.074X_4+0.207X_5$, where Y is E-Readiness Accession Index and $X_{i,\ i=1,\ 2,\ 3,\ 4,\ 5}$ are the leader dimensions, leader as a conductor, as an architect, as an auctioneer, as a promoter, and, as a developer respectively.

Factor Analysis and Step-Wise Regression

Having noted that only the leader as conductor was seen to have a significant influence on the e-readiness accession in the multiple regression equation, factor analysis and step-wise regression was carried out. This was intended to identify what would be considered to be the most significant combination of variables in the multiple regression model. The variables would not be separable using factor analysis (extraction method used was principal component analysis (PCA) with varimax rotation method). The computation of the step-wise multiple regression yielded Table 4.26.

Table 4.26: Results of Step-Wise Multiple Regression

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.497[a]	.247	.244	.47177
2	.522[b]	.273	.267	.46469

a. Predictors: (Constant), Developer Index
b. Predictors: (Constant), Developer Index, Conductor Index

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.196	1	18.196	81.753	.000[b]
	Residual	55.420	249	.223		
	Total	73.616	250			
2	Regression	20.063	2	10.032	46.455	.000[c]
	Residual	53.553	248	.216		
	Total	73.616	250			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), Developer Index
c. Predictors: (Constant), Developer Index, Conductor Index

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.498	.157		15.926	.000
	Developer Index	.381	.042	.497	9.042	.000
2	(Constant)	2.288	.170		13.454	.000
	Developer Index	.219	.069	.286	3.189	.002
	Conductor Index	.219	.075	.264	2.941	.004

a. Dependent Variable: E-Readiness Accession Index

The leader as a developer and the leader as a conductor emerge as the two significant predictors of e-readiness (t>2, p-value < 0.001). Given that each leader dimension individually was found to be a significant predictor of e-readiness, and although the step-wise multiple regression identifies only the leader as a developer and the leader as a conductor we may utilize the analogy: that we may tell the quality and cost of one's home by a look at the class and cost of a car one owns! It is possible that the possession of one leader dimension, say leader as a conductor, fulfills the need for any other dimension, especially the leader as an architect (solution co-creator), auctioneer

(unlocking the "market" environment, the demand and the buyer), promoter (the motivator) and the developer (actualizing others).

Johan Wallin, the author of the Business Orchestration: Strategic Leadership in the Era of Digital Convergence, upon which this study is based, stated that olympism is inseparable from culture, and leadership is about instigating the right culture for success to follow (Wallin, 2006). This picture is also painted by Capability Maturity Model Integration (CMMI) which defines the functions of business development organizations as understanding customer needs, responding to RFPs, preparing proposals, pricing, managing sales organizations and campaigns, positioning products, preparing advertising and collateral material, defining product value propositions, managing market risks, managing the negotiation, closing the deal, establishing and maintaining customer relationships, and executing successfully in a cost effective and acceptable manner (Beynon, 2007). The CMMI business development organization is strikingly similar with the Wallin's proposals on leadership. CMMI in fact posits that when things go wrong, the business development organization and its leadership must exhibit adaptability. Adaptability is (a) the ability to see a change in the market, the environment, the customer, or the sales campaign and (b) the ability to determine and take the appropriate corrective action.

These two authorities point to the view of leadership as a continuum of the leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer and, perhaps, lends credence to the conclusion that the dimensions are inseparable – possession of one dimension automatically qualifies the possession of the others.

The focus group discussion and interview strike a familiar line on import of leadership to the e-readiness of the higher education institutions. On the few things that, if addressed, would help in the improvement of e-readiness in "your institution" the respondents indicated that improved communication, faster decision-making, capacity building of staff, adoption of "electronic" operations, provisions of budgetary resources

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were a priority. On the question of which technology solutions (hardware, software, services, technology skills, business skills) would have made your work/experience you're your institution better a majority homed on implementation of integrated students' management systems, e-learning systems, anti-plagiarism solution, internet bandwidth, automation of management of research funds and grants were a priority.

Posed with the question on how the institutional leadership had contributed to the current state of e-readiness the respondents indicated that the leadership had contributed in one of two ways. On the one hand the level of e-readiness of the institutions had benefited through ownership, championship and enforcement of the e-readiness agenda or, one the flipside, through "foot dragging" and limitation of resources. This view of leadership contribution to or against e-readiness accession tallies well with the results of the data collected which indicate that a unit improvement in the aggregate leadership index makes a 0.515 improvement in e-readiness of the institutions surveyed.

4.7.2 PPT Nexus with SQ Nutshell

An e-ready higher education institution would be said to have an equilibrium at the people, process and technology (PPT) nexus encapsulated by an environment of the service quality (SQ) nutshell. The nexus of people, process and technology is further visualized in the transformation of the health care sector through connected care (information and infrastructure), empowering people (clients and service providers) as well as effective and efficient systems (seamless sharing of data and information, integrated processes) (Wiggins, 2015). This reinforces the need for interoperability of data, processes, software systems and networks as well as the transformation of mindsets – emphasizing the people, policy and technology nexus. The building blocks of Enterprise 2.0 or better, an entity that is able to leverage business and IT strategy to increase effectiveness and efficiency of technology initiatives, are the people, processes and technology that make up the organization (Husby, 2012), (Williams & Leask, 2011). The enterprise, in this case, would suitably be considered an e-ready organization able to

leverage ICT to advance its vision and societal advancement. Another study posits that operational efficiency requires an approach that optimizes the relationships between people, process and technology (Emerson Network Power, 2013).

The model is significant with $F_{(4, 253)} = 332328.727$, p-value < 0.001. The adjusted R Square 1.0 means the PPT nexus and the SQ nutshell can explain 100% of the level of e-readiness accession. Given the standardized coefficients of 0.286, 0.222, 0.212 and 0.419 for the people, process, technology and service quality respectively with t>2, p-value < 0.001 the variables are significant. ICT service quality highly explains e-readiness with a unit increase of service quality translating into a 42.9% in e-readiness accession.

The results shown in Table 4.27 indicate that the nexus-nutshell model does not suffer multi-collinearity with tolerance being within the range > 0.1 (or VIF < 10) for the people, process, technology and service quality (Statistics Solutions, 2017).

Table 4.27: Results of Regression of E-Readiness Accession on the PPT and SQ

Descriptive Statistics			
	Mean	Std. Deviation	N
E-Readiness Accession Index	3.8848	.55334	258
ERA People	3.8570	.62327	258
ERA Process	3.7716	.71478	258
ERA Technology	3.7748	.66674	258
ERA SQ Nutshell	3.9996	.57984	258

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1.000[a]	1.000	1.000	.00769

a. Predictors: (Constant), ERA SQ Nutshell, ERA Process, ERA People, ERA Technology

b. Dependent Variable: E-Readiness Accession Index

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.675	4	19.669	332328.727	.000^b
	Residual	.015	253	.000		
	Total	78.690	257			

a. Dependent Variable: E-Readiness Accession Index
b. Predictors: (Constant), ERA SQ Nutshell, ERA Process, ERA People, ERA Technology

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.008	.004		-2.261	.025		
	ERA People	.254	.001	.286	200.551	.000	.369	2.707
	ERA Process	.172	.001	.222	144.402	.000	.318	3.144
	ERA Technology	.176	.001	.212	133.186	.000	.297	3.369
	ERA SQ Nutshell	.400	.001	.419	337.219	.000	.487	2.055

a. Dependent Variable: E-Readiness Accession Index

At $\alpha = 0.05$ the people, process, technology and service quality we note that each e-readiness dimension were all significant predictors of e-readiness accession (p-value < 0.001) and $2 < |t| > 2$. The constant is also significant (p-value < 0.001, t = -2.261). The four dimensions of e-readiness model do not suffer multi-collinearity with tolerance being within the range > 0.1 (or VIF < 10) for all variables (Statistics Solutions, 2017).

The use of people, process and technology (Emerson Network Power, 2013) and service quality (Tarvid, 2008) as a contributor to the level of e-readiness accession is herein postulated. A unit increase in service quality improves e-readiness by a greater magnitude 0.419 as compared to the people (0.286), process (0.222) and technology (0.212). In ranking of magnitude from the larger to the smaller the service quality, people, process and technology follow in order. While emphasis has been on technology, investment in service quality, people and process re-engineering is due.

The results of the focus group discussion and interviews revealed the outcomes of the lag in the careful consideration of the fullness of the PPT Nexus and service quality. On the question of the level of institutions e-readiness with respect to people, processes, technology and service quality it was observed that people and process e-readiness were lagging in the people, process and technology nexus. Service quality with respect to the ICT service providers (ICT directorate, departments, sections or centers) in the respective institutions were considered reasonable given the circumstances and constraints of attracting, developing and retaining or maintaining high-end human resources, process re-engineering and acquisition of appropriate technology capabilities. Hiring, structured skills development and retention as well as ineffective communication and slow decision-making were prevalent constraints on the people segment of the nexus.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1   Introduction

This chapter presents a summary of the major findings of the study with respect to the specific objectives of the research, conclusions, recommendations and proposals on areas for further research.

5.2   Summary of Findings

5.2.1   Influence of the Leader as a Conductor on E-Readiness Accession

The first specific objective was to examine the influence of the leader as a conductor on e-readiness accession in higher education institutions in Kenya. The results indicate that the leader as a conductor significantly predicts e-readiness accession. The leader as a conductor is able to mobilize other actors into a joint value-creating activity. As higher education institutions improve in the dimension of a leader as a conductor they improve in the level of e-readiness and their ability to operate effectively in the digital age.

5.2.2   Influence of the Leader as an Architect on E-Readiness Accession

The second specific objective was to examine the influence of the leader as an architect on e-readiness accession in higher education institutions in Kenya. The results indicate that the leader as an architect significantly predicts e-readiness accession. The leader as an architect is a problem solver, solution designer or implementer of customer wishes. As higher education institutions improve in the dimension of a leader as an architect they improve in the level of e-readiness and their ability to operate effectively in the digital age.

5.2.3 Influence of the Leader as an Auctioneer on E-Readiness Accession

The third specific objective was to examine the influence of the leader as an auctioneer on e-readiness accession in higher education institutions in Kenya. The results indicate that the leader as an auctioneer is a significant predictor of e-readiness accession. The leader as an auctioneer is good at sensing the needs of the market and customers, setting up appropriate systems, exciting and governing the market, sensing interest and exciting interest in the products and keeping the environment active. As higher education institutions improve in the dimension of a leader as an auctioneer they improve in the level of e-readiness and their ability to operate effectively in the digital age.

5.2.4 Influence of the Leader as a Promoter on E-Readiness Accession

The forth specific objective was to examine the influence of the leader as a promoter on e-readiness accession in higher education institutions in Kenya. The results indicate that the leader as a promoter significantly predicts e-readiness accession. The leader as a promoter is able influence people to do things because the want to do them, not because the leader wanted the things done. They make people have fun in doing the things they do. As higher education institutions improve in the dimension of a leader as a promoter they improve in the level of e-readiness and their ability to operate effectively in the digital age.

5.2.5 Influence of the Leader as a Developer on E-Readiness Accession

The fifth specific objective was to examine the influence of the leader as a developer on e-readiness accession in higher education institutions in Kenya. The results indicate that the leader as a developer is a significant predictor of e-readiness accession. The leader as a developer is able to grower leaders vertically (self-drive) and horizontally (with expert support). The developer leader is able to make others own the agenda, to develop and nurture leaders and develop a leadership culture. As higher education institutions

improve in the dimension of a leader as a developer they improve in the level of e-readiness and their ability to operate effectively in the digital age.

5.2.6   Overall Leadership as a Predictors of E-Readiness Accession

The general objective of the study was to investigate the influence of leadership orchestration on the e-readiness accession in higher education institutions in Kenya. The results of this indicate that, overall, leadership (leadership index) is a significant predictor of e-readiness accession. The digital age environment requires leaders who can orchestrate the ability of the higher education institutions to either become digital leaders or simply stay relevant in the digital age and developer other leaders across and along the ladder. This tallies well with the finding that as the higher education institutions improve in leader orchestration they improve in the level of e-readiness and, consequently, their ability to operate effectively in the digital age.

The results and findings herein demonstrate that the leader dimensions, leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer as predictor variables for e-readiness accession have a positive and significant correlation. The individual independent variables each are significant predictors of e-readiness. However, in multiple linear regression, only the leader as a conductor is seen to have a significant correlation. Step-wise multiple regression analysis indicates that the leader as a conductor and the leader as a developer are the two predictors which jointly and significantly predicts e-readiness accession.

Variable inflation analysis shows that the variables do not suffer multi-collinearity while a plot of standardized residuals against the standardized predicted values indicate that the model does suffer hetero-skedasticity. Factor analysis was not able to separate the attributes in the leadership dimensions into any difference sets from the those gleaned from Johan Wallin's Business Orchestration: Strategic Leadership in the Era of Digital Convergence.

As higher education institutions improve in the dimension of a leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer they improve in the level of e-readiness and their ability to operate effectively in the digital age. The digital age leadership characteristics point at the ability to perform in the present, follow responses from the market, recognize new opportunities in the environment, inspire and encourage the value-creating knowledge professionals (Wallin, 2006) in the higher education institution. In this case, the leadership must be able to assess the value of the education institution's offering to customers, manage the process of co-producing offerings (co-creation) in a mutually-beneficial partnership with the interested parties, and gel together the respective actors (value constellation) to ensure a sustainable blending of capabilities.

Focus group discussion and interviews indicate that leadership exerts influence over the e-readiness accession and may work for or against. Digital age readiness is necessary for higher education institutions to provide quality education and make impact in the society. This calls for a transformation of leadership and leadership development. The study of leadership orchestration is, therefore, both essential and necessary in the advancement of digital age readiness accession in the higher education institutions in Kenya.

5.2.7 PPT Nexus and SQ Nutshell Estimation of E-Readiness Accession

The people, process and technology (PPT) nexus and the service quality (SQ) nutshell are confirmed by the results of the data analysis, the interviews and the focus group discussion as useful dimensions in the estimation of e-readiness accession. While emphasis has been on technology, investment in service quality, people and process re-engineering is due. This is due in both management, governance and leadership of institutions of higher education as well as the assessment of e-readiness access of the respective institutions.

5.3   Conclusions

The study concludes that there is a strong, significant and positive correlation between e-readiness accession and the individual leader dimensions, the leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer. The study also concludes that the aggregated predictors, leader index, has a positive and significant correlation with the dependent variable. Developing leader capabilities in the mold of the leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer is expected to improve e-readiness accession in HEIs in Kenya.

In multiple regression, it is concluded that that only the leader as a conductor has a significant correlation with the e-readiness accession while, in step-wise multiple regression analysis, the leader as a developer and conductor are the two joint significant predictors of e-readiness accession.

The study also concludes that the people, process and technology (PPT) nexus and the service quality (SQ) nutshell, as confirmed by the interviews and the focus group discussion as useful dimensions in the estimation of e-readiness accession. Studies on e-readiness accession should be based on the people, process and technology (PPT) nexus and service quality (SQ) nutshell in HEIs, and in general, to ascertain the e-readiness accession for targeted intervention especially as relates to tapping of digital age opportunities for quality education as well as other sectors.

5.4   Recommendations

The following recommendations are herein in the leadership and managerial sphere, policy sphere and into the body of knowledge.

5.4.1 Leadership and Managerial Sphere

Higher education institutions need to invest in leadership orchestration (leader as a conductor, as an architect, as an auctioneer, as a promoter and/or as a developer) in order to effectively tap into the existing and emerging digital age technologies for the improvement of e-readiness accession of the institutions of higher education in Kenya.

In ranking of magnitude from the larger to the smaller the service quality, people, process and technology follow in order in the contribution to the observed and perceived level of e-readiness. While emphasis has been on technology, investment is due in service quality, people and process re-engineering in institutions of higher education and e-readiness surveys in Kenya.

Leadership orientation for digital age leadership is recommended especially noting the lag as revealed in KENET e-readiness studies of 2006, 2008 and 2013 and the consensus of the analysis of the data collected, interviews conducted and the focus group discussion that leadership has the potential to work for or against e-readiness accession in higher education institutions.

5.4.2 Policy Sphere

Confirmatory studies on e-readiness accession based on the people, process and technology (PPT) nexus and service quality (SQ) nutshell in higher education to confirm the status of e-readiness accession in higher education as a basis for targeted intervention especially as relates to tapping of digital age opportunities for quality education. Longitudinal studies on e-readiness accession should be done based on the people, process and technology (PPT) nexus and service quality (SQ) nutshell should be carried out in HEIs to ascertain the e-readiness accession over time and the capability to dynamically adapt to the digital age.

5.4.3 Body of Knowledge

Into the body of knowledge is the addition and refinement of the digital age leadership dimensions (leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer) and the measurement of e-readiness is the PPT nexus and SQ nutshell. The PPT nexus and the SQ nutshell model is advanced as a new model for e-readiness assessment – uniform for institutions and geo-political jurisdictions (counties, countries and regions).

5.4.4 Theoretical Impression

The impression is created that the way to e-readiness is through effective leadership orchestration in the mold of the leader as a conductor, an architect, an auctioneer, a promoter or a developer. The impression is also created that e-readiness is not just a function of technology but much more of people, process and service quality. In the theories and practices of leadership, leadership orchestration is reinforced as a new theory. In the e-readiness accession and related studies the people, process and technology nexus and the service quality nutshell is posited. It is also proposed that accession into the digital age is both essential and necessary to ensure that higher education in Kenya and beyond does not lag the rest of the world in harnessing digital age capabilities and that leadership orchestration is central to this accession.

5.5 Areas for Further Research

The results and findings herein demonstrate that the leader dimensions, leader as a conductor, as an architect, as an auctioneer, as a promoter and as a developer as predictor variables for e-readiness accession have a positive and significant correlation. The individual independent variables each are significant predictors of e-readiness. However, in multiple linear regression, only the leader as a conductor was seen to have a significant correlation. Step-wise multiple regression analysis indicated that the leader as

a conductor and the leader as a developer are the two predictors which jointly and significantly predicts e-readiness accession. Further studies will deconstruct and re-construct a new set of variables and, perhaps, form a different combination(s) of predictors of e-readiness accession.

Further research on the leadership orchestration model and the novel e-readiness accession tool employed herein is needed in order to refine the tool for wide application in leadership for the digital age. The effect of moderating, mediating and intervening variables unforeseen in this study will be an interesting area of further research endeavor.

Cross-sectional research design was used for this study used primary data. Further research may be done using longitudinal research design with snapshots of primary data annually or biannually, as well as, using secondary data collected by KENET on e-readiness in higher education institutions in Kenya in the years 2006, 2008 and 2013 into the future.

The Venn Diagram posed in Figure 2.4 would also be an interesting area for further research especially using Venn Diagram visualization.

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APPENDICES

Appendix 1: Letter of Introduction

June 20th, 2016
Chairperson,
Department of Entrepreneurship, Technology, Leadership and Management
School of Entrepreneurship, Procurement and Management
College of Human Resource Development
Jomo Kenyatta University of Agriculture and Technology
P.O. Box 62000-00200
Nairobi

Dear Madam

RE: REQUEST FOR A LETTER OF INTRODUCTION FOR DATA COLLECTION

I am a postgraduate student in the Department of Entrepreneurship, Technology, Leadership and Management (ETLM), School of Entrepreneurship, Procurement and Management (SEPM) in the College of Human Resource Development (COHRED), Reg. No. HD419-4128/2013.

I am undertaking research titled **"Influence of Leadership Orchestration on E-Readiness Accession in Higher Education Institutions in Kenya"** under the **supervision of Dr. Esther Waiganjo and Prof. John Kihoro**. The research proposal and the supervisors have been approved by the Board of Postgraduate Studies.

This is therefore to request for a letter of introduction for data collection to progress with the research and thesis writing.

Yours faithfully,

Mwirigi Kiula

HD419-4128/2013

Appendix 2: Questionnaire

Introduction

This is a study on "Influence of Leadership Orchestration on E-Readiness Accession in Higher Education Institutions in Kenya" aimed at investigating the influence of the leader as a conductor, architect, auctioneer, promoter and developer on the improvement of the level of e-readiness in higher education institutions in Kenya. The research is approved by the National Commission for Science, Technology and Innovation (NACOSTI) - Permit No. NACOSTI/P/16/50450/14305.

I am a student of Jomo Kenyatta University of Agriculture and Technology (JKUAT) pursuing a Doctorate Degree in Leadership and Governance. I am undertaking a research titled "Influence of Leadership Orchestration on E-Readiness Accession in Higher Education Institutions in Kenya" which is aimed at investigating the influence of the leader as a conductor, architect, auctioneer, promoter and developer on the improvement of the level of e-readiness in higher education institutions in Kenya. The data gathered through the attached questionnaire is solely meant to be used for academic purposes and will be treated with confidentiality. The data gathered will be aggregated and be used to enrich the ability, skill and knowledge in the practice of leadership in the information/digital age. The data will be utilized under the Open Data Framework for the advancement of research and development. Your participation and provision of honest responses will be highly appreciated. The questionnaire is available at the web address: http://elearn.jkuat.ac.ke/limesurvey/index.php?sid=52616

1) What is the name of your institution? (Drop-down list)

2) What is your level in the institutions (select one)?

Student	
Staff	
Operational Manager (COD, Section Head…)	
Middle Level Manager (Registrar, Dean, Director, Manager, Finance Manager, Procurement Manager, Estates Manager, Deputy Director)	
Senior Manager (VC, DVC, Principal)	

3) What is your highest level of education (select one)?

Primary School Certificate	
Secondary School Certificate	
Diploma Certificate	
Bachelors Degree (B.Sc., BA, B.Com., B.Ed., B.Arch., LLB…)	
Masters Degree (M.Sc., MA, M.Ed., LLM…)	
Doctorate Degree (Ph.D.)	
Other	

4) How do you rate the quality of leadership of your institution (tick one)?

Excellent	Good	Satisfactory	Fair	Poor

5) How do you rate the level of e-readiness of your institution (tick one)?

Excellent	Good	Satisfactory	Fair	Poor

A. **Leader as Conductor:** able to ensure ongoing activities of the organization are timed correctly and performed in the proper sequence to achieve the desired results.

6) Senior management are good in.

Rating ((1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)	1	2	3	4	5
Nurturing creativity					
Building up new ideas					
Facilitating situational awareness					
Bringing up new ideas timely					
Reconciling alternative opinions					
Recognizing innovation					
Rewarding innovation					
Building trust					
Inspiring feedback					
Leading by doing					
Learning from partners					
Engaging sponsors and guardians					
Relationship on basis of mutual respect					
Delegating responsibility					
Inspiration					
Inspiring professionals					
Building up the performance capacity of staff					
Keeping staff enthusiastic					
Keeping customers thrilled					
Convincing others to perform according to game plan					
Coherent performance					
Seeking coherence in performance					
Integrating and synchronizing efforts and actions					
Mobilizing teams to perform					
Subordination (loosing oneself for the benefit of the team)					

B. **Leader as Architect:** able to analyze situations, problem scenarios and specifications and design appropriate solutions.

7) Senior management are good in.

Rating ((1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)	1	2	3	4	5
Customer focus					
Sensing customer expectations					
Transforming customer expectations into tangible solutions					
Implementing the wishes of customers					
New knowledge					
Assimilating new information					
Unlearning existing ways and applying new knowledge					
Blending diverse capabilities at different project stages					
Problem solving					
Emphasizing problems solving skills					
Engaging experts to play a role in solution development					
Creating solutions beyond customer expectations					
Teams and Partnerships					
Building up successful teams					
Working with stakeholders to develop solutions					
Building an environment that says "this is the place to be"					

C. **Leader as Auctioneer:** able to remain watchful, engaging and confident and maintain right pace, poise, preparation, panache (mood) and brilliance (catch opportunities).

8) Senior management are good in.

Rating ((1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)	1	2	3	4	5
Sensing the market					
Listening to customers					
Sensing the needs of the market					
Seducing customers to our products and services					
Setting up systems					
Setting up systems to manage our customers					
Exploiting new solutions (tapping disruptive technologies)					
Pushing the limits to higher performance					
Governing the market					
Achieving the right pace (right speed)					
Achieving the right poise (keeping steady)					
Achieving the right preparation (knowing our products and services)					
Achieving the right panache (achieving the right mood)					
Achieving the right brilliance (sensing and exploiting opportunities)					

D. **Leader as Promoter:** able to motivate anti-status quo sentiment, sustain political and technical trust, stimulate thoughts and dreams, mobilize interest, influence

peoples' creativity and willingness, exhibit charisma and a together-we-will-make-it-approach.

9) Senior management are good in.

Rating ((1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)	1	2	3	4	5
Charisma					
Building a "together we will make it" spirit					
Generating personal motivation					
Stimulating dreams and aspirations					
Managing projects					
Managing projects effectively					
Initiating ideas and solutions					
Mobilizing people to get tasks done					
Institutionalization					
Institutionalizing new ideas (making them part of our culture)					
Leading without leading					
Setting up policies/procedures/processes					

E. **Leader as Developer:** able to help people to identify the right course of action, commit to the achievement of that cause effectively and efficiently, advance into unknown territories, attain skills to transform, nurture ability to take responsibility and make decisions.

10) Senior management are good at.

Rating (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)	1	2	3	4	5
Ownership of agenda					
Enabling people to take ownership of development agenda					
Retaining and attracting highly skilled employees					
Being engaged as both an enabler and participant					
Turning skeptics and nonbelievers into people willing to take more responsibility					
Helping staff to work fast and effectively beyond directives from above					
Allowing a sense of autonomy in the workforce					
Developing leaders					
Enhancing leadership capacity of individual members					
Enhancing leadership capacity of teams					
Providing employees with needed skills					
Appreciating leadership development as a means of building organizational capability					
Motivating people to move from one level in leadership competency					
Transforming leader's mind-set from one level to the next (developing of bigger minds)					
Leadership culture					
Seeing change in leadership culture as the missing link					
Articulating the value of digital technologies to the organization's future					
Taking risks					
Building skills to realize the strategy					
Developing digital strategies with an eye on transforming the business					
Fostering a culture to change and invent the new					

F. E-Readiness Accession – People, Process and Technology Nexus

11) Rate your agreement with the following statements about your organization.

Rating (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)	1	2	3	4	5
People					
We are excited with automation (new ICT solutions)					
We are empowered to serve in our roles					
We adapt change easily					
Our systems (ERPs, HRMISs, LMISs) give timely response					
Our systems (ERPs, HRMISs, LMISs) are up and running when we need					
We are involved in decision-making on technology acquisitions					
We are well updated					
We have technology skills					
We have business skills					
We have analytical skills					
Process					
Our processes are well defined					
We understand our processes					
We easily share data across departments and teams					
We have adopted best practices					
We continually improve our processes					
We make decisions based on data					
We monitor the performance of our processes					
Technology					
Our technology solutions are user-friendly					
Our technology solutions are useful for our work					
Our systems offer optimal performance					
Our systems are optimal uptime					

Rating (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)	1	2	3	4	5
We have business continuity/failsafe mechanisms					
We get timely upgrades for hardware and software					
We apply best practices/standards in ICT management					

G. E-readiness Accession – Service Quality Nutshell

12) Rate your agreement with the following statements about your organization.

Rating (SA – Strongly Agree, A-Agree, N-Neutral, D-Disagree, SD-Strongly Disagree)	SA	A	N	D	SD
Responsiveness					
They are willing to help users					
They are ready to respond to users requests					
Reliability					
They provide services as promised					
They are dependable in handling user's service problems					
They perform services right the first time					
They maintain reliable technology and system					
Rapport					
They make users feel safer in computer transactions					
They are consistently courteous					
They have the knowledge to answer user's questions					
They give users individual attention					
They deal with users in a caring fashion					

Rating (SA – Strongly Agree, A-Agree, N-Neutral, D-Disagree, SD-Strongly Disagree)	SA	A	N	D	SD
They have the user's interest at heart					
They understand the needs of users					
Tangibles					
They have visually appealing facilities					
They appear professional					
They provide useful support materials (e.g. documentation, training, videos…)					

H. Access to Technology Resources

13) Do you have access to the following?

Do you access to the following	Yes	No	Uncertain
University WiFi (wireless internet access)			
Smart Staff/Student ID Card (access at the gates, accessing library and other buildings, buying meals in the cafeteria,...)			
Power (charging of laptops/smartphones in board rooms, lecturer rooms, open study/relaxing spaces,...)			
Scanning, copying and printing facilities in the university			
Video/tele-conferencing facilities			
E-learning facilities			
Presentation facilities (projectors, whiteboards...in board rooms, lecturer rooms...)			

I. Gender

14) Kindly indicate your gender: M   F

Thank you for your participation this research. The data collected will enhance our understanding leadership orchestration on e-readiness in higher education institutions. The data will be handled analyzed together with data collected from other respondents and used solely for academic studies without prejudice to the respondents. Permit No. NACOSTI/P/16/50450/14305.

Appendix 3: Focus Group Discussion Guide

1) Leadership Orchestration

    a) Conductor Operational Attributes

Digital age leaders are expected to stand out in nurturing creativity, building trust, inspiration and facilitating coherent performance (leader as a conductor). The leader as a conductor is expected to be able to ensure ongoing activities of the organization are timed correctly and performed in the proper sequence to achieve the desired results. These are demonstrated by specific attributes as highlighted in the Table 3.4. How does the leader as a conductor reflect in your institution? How do their attributes relate to the attributes provided? Which additional attributes are not captured in Table 3.4. Which attributes are superfluous?

    b) Architect Operational Attributes

Digital age leaders are expected to be able to build the spirit of customer focus, new knowledge, problem solving, teams and partnerships (leader as an architect). This dimension of leadership orchestration is demonstrated by the attributes shown in Table 3.5. How does the leader as an architect reflect in your institution? How do their attributes relate to the attributes provided? Which additional attributes are not captured in Table 3.5. Which attributes are superfluous?

    c) Auctioneer Operational Attributes

Digital age leaders are expected to be good at sensing the market, setting up systems, governing the market (leader as an auctioneer). This is demonstrated by the attributes shown on Table 3.6. How does the leader as an auctioneer reflect in your institution? How do their attributes relate to the attributes provided? Which additional attributes are not captured in Table 3.6. Which attributes are superfluous?

d) Promoter Operational Attributes

Digital age leaders are expected to have charisma, endowed in managing projects and institutionalization (leader as a promoter). This leadership dimension is demonstrated by the attributes shown in Table 3.7. How does the leader as a promoter reflect in your institution? How do their attributes relate to the attributes provided? Which additional attributes are not captured in Table 3.7. Which attributes are superfluous?

e) Developer Operational Attributes

Digital age leaders are expected to be good at creating ownership of the agenda, developing leaders and nurturing leadership culture (leader as a developer). They are able to help others to achieve their self-actualization. This dimension is demonstrated by the attributes shown in the Table 3.8. How does the leader as a developer reflect in your institution? How do their attributes relate to the attributes provided? Which additional attributes are not captured in Table 3.8. Which attributes are superfluous?

2) **E-Readiness**
   a) E-Readiness Accession Operational Attributes

In the context of the higher education sector e-readiness is a measure of the sectors (and individual higher education institutions) readiness, willingness or preparedness to tap the benefits and opportunities arising from ICTs (Kashorda & Waema, The E-Readiness Survey on Kenyan Universities 2013 Report, 2013). The indicators of e-readiness in this study are people, process and technology (PPT) nexus and service quality (SQ) nutshell as shown in Table 3.9. How do people and process affect the adoption of digital age in the institutions? What attributes would be worthy to consider about people, process and technology in relation to e-readiness? How does leadership affect the state of e-readiness

in your institution? Which additional attributes are not captured in Table 3.9. Which attributes are superfluous?

Appendix 4: Interview Guide

1. How does your senior management fair in the leadership orchestration for better:
    a. Performance?
    b. Sustainability?
2. How would you rate your institutions focus on better:
    a. Customer experience?
    b. Value generation from investments?
    c. Business continuity?
3. How does your top leadership fair as:
    a. Conductors: ability to mobilize all other actors (staff, students, partners) to perform towards achieving the vision and mission
    b. Architects: ability to solve customer problems and creating better solutions
    c. Auctioneers: ability to be watchful and keen on the operating environment (staff, students, partners, interests, …) and able to maintain excitement and momentum among the actors to continue getting things done
    d. Promoters: ability to motivate people to do great things because they want it (not just because the leaders want)
    e. Developers: ability to facilitate the actors to improve themselves (from trainers and experts and by self-initiative) to have better skills for improving the institution
4. How would you describe your institutions level of e-readiness with respect to:
    a. People
    b. Processes
    c. Technology
    d. Service quality

5. How well suited is your ICT Section/Department/Center/Directorate in ensuring service quality?

6. What do you consider your greatest challenge to e-readiness between people, process, technology and service quality?

7. Mention a few things that, if addressed, would help in the improvement of e-readiness in your institution.

8. Which technology solutions (hardware, software, services, technology skills, business skills) would have made your work/experience you're your institution better? How has the institutional leadership contributed to the current state?

Appendix 5: List of Participating Institutions

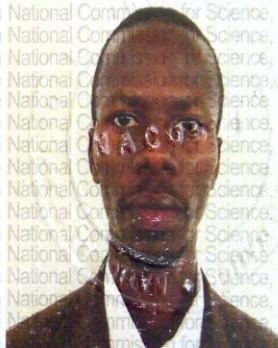| Name of Institution	County	Participation
Maasai Mara University	Narok	Online Questionnaire
Jomo Kenyatta University of Agriculture and Technology	Kiambu	Online Questionnaire
Kenya Methodist University	Nairobi	Online Questionnaire & Interview
Meru University of Science and Technology	Meru	Online Questionnaire
Daystar University	Nairobi	Online Questionnaire & Focus Group
The Co-operative University of Kenya	Nairobi	Online Questionnaire
Dedan Kimathi University of Technology	Nyeri	Online Questionnaire
St. Paul's University	Kiambu	Online Questionnaire
Pan Africa Christian University	Nairobi	Online Questionnaire
Others (Machakos University, Technical University of Mombasa, Scott Christian University, Chuka University, Africa Nazarene University, Karatina University, Kenyatta University, Pwani University, University of Eastern Africa, Baraton, Laikipia University, Egerton University, United States International University, Moi University, University of Nairobi, Kenya Education Network and CGAIR)		Online Questionnaire, Focus Group & Interview

Appendix 6: Certificate of Research Authorization by NACOSTI

THIS IS TO CERTIFY THAT:
MR. BONIFACE MWIRIGI KIULA
of JKUAT, 4625-1002
Madaraka-Thika, has been permitted to
conduct research in *All Counties County*

on the topic: *INFLUENCE OF
LEADERSHIP ORCHESTRATION ON
E-READINESS ACCESSION IN HIGHER
EDUCATION INSTITUTIONS IN KENYA*

for the period ending:
16th November, 2017

Permit No : NACOSTI/P/16/50450/14305
Date Of Issue : 16th November, 2016
Fee Recieved : Ksh 2000

....
Applicant's
Signature

....
Director General
National Commission for Science,
Technology & Innovation

Appendix 7: Generic Letter of Clearance for Data Collection in Universities

Mwirigi Kiula
Jomo Kenyatta University of Agriculture and Technology
P.O. Box 62000-00200
NAIROBI
January 7th, 2016

Vice Chancellor

Dear Sir/Madam

RE: REQUEST FOR APPROVAL FOR RESEARCH DATA COLLECTION IN JKUAT

I am a postgraduate student in the Department of Entrepreneurship, Technology, Leadership and Management (ETLM), School of Entrepreneurship, Procurement and Management (SEPM) in the College of Human Resource Development (COHRED), Reg. No. HD419-4128/2013.

I am undertaking research titled **"Influence of Leadership Orchestration on E-Readiness Accession in Higher Education Institutions in Kenya"** under the supervision of Dr. Esther Waiganjo and Prof. John Kihoro. The research proposal and the supervisors have been approved by the Board of Postgraduate Studies. The research has also been approved by the National Council for Science, Technology and Innovation (NACOSTI) - Permit No. NACOSTI/P/16/50450/14305.

The research involves data collection in chartered public and private universities in Kenya. Data collection will be done through an online questionnaire. The results, findings and recommendations will be shared with the University and NACOSTI.

This is therefore to request for your approval for data collection from JKUAT staff and students.

Yours faithfully,

Mwirigi Kiula

HD419-4128/2013