BUILDING SUSTAINABLE COMPETITIVE ADVANTAGE THROUGH ORGANIZATIONAL INFORMATION SYSTEMS' CAPABILITIES. A CASE STUDY OF THE NIGERIAN E-PAYMENT INDUSTRY

Dissertation

Submitted to Unicaf University in Zambia
in partial fulfillment of the requirements
for the degree of

Doctorate of Business Administration (DBA)

Ejembi, Abah Emmanuel

February 2024

Approval of the Thesis

BUILDING SUSTAINABLE COMPETITIVE ADVANTAGE THROUGH ORGANIZATIONAL INFORMATION SYSTEMS' CAPABILITIES. A CASE STUDY OF THE NIGERIAN E-PAYMENT INDUSTRY

This Thesis by Ejembi, Abah Emmanuel has been approved by the committee members below, who recommend it be accepted by the faculty of Unicaf University in Zambia in partial fulfillment of requirements for the degree of

Doctorate of Business Administration (DBA)

Thesis Committee:

Dr Bilal Jibai, Supervisor	13th February 2024
Dr Olga Novokhatskaya, Chair	13th February 2024
Dr M. Gurusamy, External examiner	13th February 2024
Dr Douglas Akwasi Adu, Internal examiner	13th February 2024

BUILDING SUSTAINABLE COMPETITIVE ADVANTAGE THROUGH ORGANIZATIONAL INFORMATION SYSTEMS' CAPABILITIES. A CASE STUDY OF THE NIGERIAN E-PAYMENT INDUSTRY

Ejembi, Abah Emmanuel

Unicaf University in Zambia

Information Technology is a major underpinning for businesses in almost all industries today. In e-payment as it is with industry such as telecommunication, e-Commerce, and retail financial services, they owe their existence to Information Technology. There exists, however, a gap in understanding of the role of Information Technology in business in today's world of Information Technology uniquity and homogeneity. There is a mistaken assumption among industry practitioners and researchers alike, that investment in information technology assets by itself confers an advantage on one firm over the other in the same industry in today's business environment. This study has the objective to refocus the generation of rent from investment in information technology to more rare resources. The research is guided by the resource-based-view, capability-based view, and knowledge-based view of the firm.

A mixed method research approach was used for this. The mixed tool of questionnaire and interview was used based on embedded mixed method design to ensure very rounded research.

The research found that information systems produce sustainable competitive advantage for any firm that bases the generation of rent on information systems capabilities. This was established through both correlation and regression analysis of collected research data. The

research established that the relationship between sustainable competitive advantage and information systems capabilities can be enhanced when other variables such as organizational agility and organizational knowledge management are considered.

The implication of this research is that organizations that seeks a sustained competitive edge over other industry players based on information technology should shift investment to organizational capability development, organizational learning, knowledge management away from random investment in information technology physical asset as this aspect of information systems is more unique and satisfies Barney's VRIN test for sustainable competitive advantage. Based on this research, it is recommended that organizations invest in human capacity development and have a deliberate strategy to manage organizational knowledge as an answer to Schumpeterian competition.

Declaration

I declare that this thesis has been composed solely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where stated otherwise by reference or acknowledgment, the work presented is entirely my own.

Copyright Page

Dedication

This thesis is dedicated to God – my sufficiency and my family – Felicia (wife), Michelle, Annie, Charlotte (daughters) and William (son).

Acknowledgments

I wish to acknowledge the support of my family through the course of this program. The time and funding for this was taken from them. I also wish to acknowledge the support of my colleagues and the Nigeria ePayment industry for their support. My executive assistant is worthy of mention for his tireless support while I work long hours on the dissertation.

I finally also wish to recognize the contribution of my supervisor- Dr. Bilal Jibai for his incisive criticism, contributions and above all his immeasurable contributions to the richness of this research work.

Table of Contents

The foregoing ensures profit maximization, but sustainable corporate growth and profitability is made possible by Corporate Level Strategy or Grand Strategy (Pearce and Robinson, 2017). According to Dess, et. al. (2016), Grand strategy is "a strategy that focuses on gaining long-term revenue, profits, and market value through managing operations in multiple businesses". Chandler, (1962) define this as "the determination of the long-term enterprise objectives, selection of the actions, and assignment of the necessary resources to achieve these actions". The pertinent questions answered by corporate strategy according to Lynch (2006) are. 46

Community of practice as a construct is based largely on social interaction but viewed through different lenses. One such viewpoint is by Wenger-Trayner (2015) that state that

List of Abbreviations

OL	Organizational Learning
ICT	Information and Communication Technology
IT	Information Technology
IS	Information Systems
ISC	Information Systems Capacity
OA	Organizational Agility
SCA	Sustainable Competitive advantage
OKM	Organizational Knowledge Management
RBV	Resource-based view of the firm
CBV	Capability-based view of the firm
KBV	Knowledge-based view of the firm
DBA	Doctorate of Business Administration
MSc	Master of Science
MBA	Master of Business Administration
BSc	Bachelor of Science
WEF	World Economic Forum
HBR	Harvard Business Review
PSP	Payment Service Provider
ERP	Enterprise Resource Planning
IBM	International Business Machine
SPSS	Statistical Package for Social Sciences

List of Tables

List of Figures

Chapter 1

1.0 Introduction

Information is a key resource for all businesses hence Information Technology has become a major underpinning for businesses in almost all industries today. In e-payment as it is with industry such as telecommunication, e-Commerce, and retail financial services, they owe their existence to Information Technology (IT). For such businesses, IT is considered a "strategic necessity" (Peppard and Ward, 2004). It follows that information technology assets are a common factor to all industry players. In this industry and well as others, customer needs and business requirement are relentlessly changing. All businesses in the e-Payment industry are delivered through technology hence to respond to changing needs require capability to configure and re-configure technology solutions. This capacity to respond promptly to changing business need is called organizational agility (Tallon et al., 2019). In an information technology dependent organization such as e-payment, organizational agility will depend on information technology flexibility and on organizational technological knowledge – capabilities and competencies. Organizations with capabilities and competencies enough to quickly respond to business needs according to Olsen and Lucas (1994) are said to be "wired as an adaptive enterprise" and by such attribute an organization is positioned for competitive advantage with the drivers as organizational knowledge and information technology capabilities and competencies. (Penrose, 1980; Peppard and Ward, 2004). It follows therefore that companies with better knowledge of their customer needs, products, and technology and the know how to deploy quickly have an edge over competitors. According to WEF (2016), global information technology report titled "innovating in the digital economy", "Information and communication technologies (ICTs) are the backbone of

revolution. The future of countries, businesses, and individuals depends more than ever on whether they embrace digital technologies". It follows that technology adoption for all businesses is today more about business survival, but a closer look shows some congruence with the resource-based view of competitive advantage with knowledge and information technology capabilities here as the resource albeit of the dynamic kind (Hron, 2005; Barney, 2000).

There is also the growing standardization, ubiquity, and homogeneity of Information Technology (IT) in business (Chae et. al., 2014). Literature is replete with debate on the question –can Information Technology (IT) still underpin competitive advantage at all? The argument derives in part from the confusion and interchangeable use of the terms - Information Technology and Information Systems. It is important at this point to draw a clear line between these two constructs.

Information Technology is defined as "the set of non-human resources dedicated to the storage, processing and communication of information, and the way in which these resources are organized into a system capable of performing a set of tasks" (Laudon and Laudon, 2018). This therefore refers to physical assets such as the hardware (computer, network devices and storage), software, data, and the architecture of the deployment. Information Technology is used to transmit, process and store information. Information Systems on the other hand is not concerned with the "technical and computational aspect of Information Technology" (Boell and Cecez-Kecmanovic, 2015). Information System (IS) is defined as "an integrated and cooperating set of software directed information technologies supporting individual, group, organizational, or societal goals" (Watson, 2007). It is concerned with "how technology is appropriated and instantiated in order to enable the realization of Information Systems that fulfill various stakeholders such as individuals, groups or organizations" (Boell and Cecez-Kecmanovic, 2015; Alter, 2013).

Information technology has undergone significant changes since the early 1990s. Example of such changes are “as the dot-com bubble, the Y2K transition, and rapid adoption of web technologies” (Wang 2014). In recent time, we have seen the growth and adoption of cloud of the Internet and Internet based services such as computing where almost all IT services (infrastructure as a service, platform as a service, database as a service, software as a service tech) are possible off the shelf. These changes have made information technology become a more homogeneous and ubiquitous business (Chae et. al., 2014). It makes it a lot easier for “companies to imitate and even exceed their competitors’ IT capabilities. Some even suggest that IT no longer offers any competitive advantage and has become an operational commodity or even a competitive necessity “(Carr 2003). According to WEF (2016) global information technology report “there is an exponential speed of development, disruption across all major industries with corresponding impact on entire systems of production, management, and governance. This is what differentiates information technology development from previous “industrial revolutions”.

There is also the agelong investigation of the “productivity paradox”. It began with the economic question by Solow (1897)- “you can see the computer age everywhere but in the productivity statistics”. The phenomenon speaks to the observed slowdown of productivity in developed economies since the 1970s amidst growing investment in information and communication technologies (Rei, 2004). Over the decades since the 1980s, there has been significant investigations of this phenomenon at firm-level, industry-level, country-level and cross-country level by different researchers yet with the same results that productivity is not commensurate with the investment. Researchers that attempted research of these phenomena are Baily (1986); Berndt & Malone (1995); Brynjolfsson & Hitt (1995); David (1990); Dewan & Kraemer (1998); Jorgenson & Stiroh (1995); Kraemer & Dedrick (1994); Lee & Khatri (2003);

Oliner & Sichel (2000); Oliner, Sichel, & Stiroh (2007); Pilat (2004); Pohjola (2000); Rei (2004); Spithoven (2003); Vijselaar & Albers (2004). These researchers found varying reasons for the phenomenon with some dismissing it altogether. This phenomenon can be said to be foundational to Carr (2003) seminal work where he dismissed that "IT does not matter" with conclusion such as "there is no consistent correlation between IT spending levels and financial performance". Hajli and Sims (2015) sought to reinvestigate and update this phenomenon but still found mixed results. They found that while "they identified high correlation between output per capita and ICT investment growth, there is no significant correlation between investment in IT and labor or multi-factor productivity. The labor productivity indicator demonstrates highly fluctuating behavior which is not correlated to ICT investment growth." According to Kijek and Kijek (2018), while the "productivity paradox" sparked a great number of research, results of either theoretical or empirical investigations over the decades are not "convincing with regards to whether investments in information and communication technology (ICT) affect the productivity of firms, sectors, and economies".

The question now is – can the management of and competency in the appropriation and instantiation of information technology in its current state of homogeneity and standardization confer any advantage on businesses particularly in the volatile and rapidly changing business and technology environment of today? If there exists any competitive advantage, how can this be sustained. Barney (2000) opined that the basis for competitive advantage is uneven distribution of rare resources within an industry based on a process of resource accumulation by the different firms. Information Systems and management literatures is almost unanimous on the point that unlike the 1990s where proprietary information technology confers an advantage on firms that own them within any industry, the 2000s is characterized by "standardized and homogeneous

information technology that has significantly lowered entry barriers" (Chae et. al., 2014). The argument is further strengthened with the growth of the Internet leading to cloud-based solution and outsourcing models, particularly offshore outsourcing such as the growing ubiquity of different cloud offerings (platform, hardware, software and even database as service). This makes Information Technology resources almost available off the shelf to businesses once they can pay for them (Chae et. al, 2014; Masli et al. 2011). Based on this new reality, it is pretty obvious that competitive advantage cannot be earned by any organization from just acquisition and deployment of Information Technology resource (the now standard information technology assets) which immediately implies that the study of information technology contribution to firm competitive advantage cannot be based on industry factors and external market condition as the primary determinants of firm performance (market-based-view theory) (Chi and Sun, 2015). According to Carr (2003), Infrastructural technology is now a general business infrastructure and does not confer any advantage on firm within an industry. If the resource conversation is extended just slightly from information technology assets to include the management of the same, it becomes information systems and hence, different from other infrastructural technology but rather with the ability to spawn proprietary technology. Kijek and Kijek (2018) used the same approach to dispel the "productivity paradox" argument with regards to information technology investment. According to Kijek and Kijek (2018), if technological innovation moderates' information technology and productivity, the "productivity paradox" is solved. This result is consistent with Polak (2014) opined that "Productivity growth arises from innovation and development of new production methods, procedures, and technology. Therefore, information and communication technology (ICT) as a new technology was expected to boost productivity". Information technology's value should therefore be such that it creates a competitive position for an

organization otherwise it cannot contribute to organizational differentiation. Carr (2003) put this this way – "information technology by itself cannot offer any competitive differentiation, because it is only inherently strategic because of its indirect effects". According to Chaharbaghi and Lynch (1999), the concept of competitive advantage is used to "describe where an organization outpaces competitors in value creation. It refers to the degree to which the organization, under free market conditions, meets the demand of a product market while simultaneously maintaining and growing its profit levels" which according to resource-based view is predicated on enterprise resources which must be unique and rare (Barney, 2000). We can conclude based on the foregoing, that information technology and particularly the infrastructural aspect of the same do not by itself lend itself to advantage to any business today. There is obviously a lack of alignment among researchers on this subject matter as well as a gap in understanding among practitioners based on the increasing huge annual spend observed across industries. This study seeks to clarify and refocus on the aspect of information technology resources that has the potential to create a resource position for a firm and consequently led to sustained rent generation from such investment.

1.1.Statement of the problem

Among industry practitioners and researchers alike, there is the mistaken assumption that investment in information technology assets by itself confers advantage on one firm over the other in today's business environment. In the e-payment sector in Nigeria, each firm in the industry spend millions of dollars annually on information technology assets in the pursuit of competitive advantage without the desired success. This is not just a local industry problem. It is almost a problem of global dimension. According to BusinessWire (2021), Information Technology global market report, "the global information technology market is expected to grow from $7850.57

billion in 2020 to $8370.95 billion in 2021 at a compound annual growth rate (CAGR) of 6.6%. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC 2016; Laudon and Laudon, 2018). This annual growing investment is regardless of the lack of consensus by researcher on the economic benefit of such investments. The famous phenomenon called "productivity paradox" which started several decades ago following the statement by Solow (1987) that "you can see the computer age everywhere but in the productivity statistics" has enjoyed a torrent of research but the phenomenon can still not be completely dispelled. According to Kijek and Kijek (2018), while the "productivity paradox" sparked a great number of research, results of either theoretical or empirical investigations over the decades are not "convincing with regards to whether investments in information and communication technology (ICT) affect the productivity of firms, sectors, and economies". Other recent researches of the phenomenon also concluded along the same line. Hajli and Sims (2015) sought to reinvestigate and update this phenomenon but still found mixed results. They found that while "there is an identified high correlation between output per capital and ICT investment growth, there is no significant correlation between investment in IT and labor or multi-factor productivity. The labor productivity indicator demonstrates highly fluctuating behavior which is not correlated to ICT investment growth". Regardless of this conundrum, businesses still dedicate a major part of their annual budget to information technology. In most cases, businesses are hoodwinked by "IT vendors, who on the one side, are faced with the rapid development of technology and demand for their quick adaptation and implementation hence compelled to make the case for information technology introduction

while they have difficulties themselves in explaining the business value of such constant investments in the first place" (Breznik, 2012).

There is also the growing standardization, ubiquity, and homogeneity of information Technology. Researchers are divided on the conclusion of whether investment in Information Technology asset can still lead to competitive advantage in the face of the growing ubiquity and homogeneity. In some cases, researchers concluded that no link is found between firm competitive advantage and Information Technology (IT) (Tian et al.,2009; Stroumpoulis et al.,2021; Aydiner et al., 2018; Gupta et al.,2018). This agrees with positions of Carr (2003), Clemons (1986), Clemons and Row (1991) and Powell and Dent-Micallef (1997) that "as information technology's power and ubiquity have grown, its strategic importance has diminished" because like other infrastructural resources, information technology resources have become accessible to all businesses hence can no longer be a basis for differentiation. Moore's 1965 postulation, now popularly referred to as Moore's law on this subject matter provides some basis for this argument. The thrust of the law is.

(1) the power of microprocessors doubles every 18 months,

(2) computing power doubles every 18 months, and

(3) the price of computing falls by half every 18 months.

Also, according to Laudon and Laudon (2018), the "exponential growth in the number of transistors and the power of processors coupled with an exponential decline in computing costs may be reaching its limit as a transistor is barely the size of the of a human hair". There is the possibility that chip manufacturer as always will fashion chips from silicon or other technology if this is to ever become a reality (Markoff, 2016). This suggests that there may be no end in sight in making information technology's primary infrastructure- the computer more powerful, affordable,

and accessible. These suggest that the infrastructural aspect of information technology is fast becoming a commodity as first observed by Carr (2003). Along the same line, we also have the law of mass digital storage whose thrust is that "the cost of storing digital information is falling at an exponential rate of 100 percent a year". There is also the declining cost of communication and the exponential growth of the size of the Internet (Laudon and Laudon (2018).

The foundation of the growing commoditization of information technology infrastructure is its homogeneity and standardization. Chae et. al. (2014) and Masli et al. (2011) argued that unlike the 1990s where proprietary technology confers an advantage, the 2000s is characterized by "standardized and homogeneous information systems - Enterprise Resource Planning (ERP) systems, WEB technologies. The increasing power of information technology and the sharp and continual decline in the cost is due to standardization. Laudon and Laudon (2018) opined that "technology standards unleash powerful economies of scale and result in price declines as manufacturers focus on the products built to a single standard. This is foundational to the growing homogeneity of information technology. Without these economies of scale, computing of any sort would be far more expensive than is currently the case". Along the same line, the rise in enterprise technology solutions such as the Internet are made possible through standardization. This has given rise to more trends that are even still unfolding such as "mobile digital platforms, consumerization of IT, virtualization, quantum computing, cloud computing, green computing and high-performance/power-saving processors" (Laudon and Laudon, 2018).

In summary, the problem this research seeks to solve is whether investment in Information Technology assets (which is a significant portion of the annual budget of organizations) in today's world of the growing standardization and homogeneity of information technology can still underpin competitive advantage. Organization across industries invests in the same or similar

information technology assets. Pisello (2003) in his response to Carr (2003) seminal work put this this way – "information technology by itself cannot offer any competitive differentiation, because it is only inherently strategic because of its indirect effects". It follows that it is not about the amount that is spent on information technology assets but how well the investment is applied toward the improvement of business practices as two companies can invest the same amount in the same technology and yet achieve very different results. The barrier is made even lower by cloud computing model of access to information technology resources. At a ridiculously but comparatively very small cost, any firm can have access to any technological infrastructure resource like any another competitor. As a response to this problem observed both in practice and as gaps in Information Systems researches, this study seek to refocus the search for generation of rent from investment in Information Technology to rare resources such as Organizational information systems capabilities which can form an underpinnings for firm sustainable competitive advantage based on the following management research theories - resource-based-view, capability-based view, and knowledge-based view (Barney, 2000; Chaharbaghi and Lynch, 1999; Ricardo, 1817; Wang, 2014). One way that Information Systems enabled competitive advantage manifest is enhanced organizational agility (Tallon and Pinsonneault, 2011; Lu and Ramamurthy, 2011, Tallon et. al, 2019) – ability to sense opportunities and threats and respond promptly and accordingly.

1.2 Purpose of the Study, Research Aims, and Objectives

The purpose of this mixed method research is to establish that sustainable competitive advantage can be earned by firms within an industry based on Information Systems capabilities despite the growing standardization and homogeneity of Information Technology" (Chae et. al., 2014; Masli et al. 2011). The research seeks to find the aspect of organizational information

systems where information technology investments must be focused on with the specific aim of ensuring that the investing firm can earn strategic differentiation that can be sustained. To ensure a full understanding of the study, the research is based on the case study of the ePayment industry in Nigeria. The ePayment industry is an information technology dependent industry. All services are based on one information technology implementation or the other. All stakeholders within the industry possess information technology asset as a strategic necessity. The industry participants all possess information technology assets and in some cases the technologies are of the same kind. The research seeks to find if firms in such industry can build their strategy of sustainable differentiation on any aspect of information systems possessed by such firm. According to Chaharbaghi and Lynch (1999), the concept of competitive advantage is used to "describe where an organization outpaces competitors in value creation. It refers to the degree to which the organization, under free market conditions, meets the demand of a product market while simultaneously maintaining and growing its profit levels". This research seeks to establish that even in the very volatile and dynamic business environment of today, organizations can earn sustainable competitive advantage (strategic advantage) from Information Systems by identifying resources that lead to radical change (development of proprietary technology) and with capability to renews the competitive edge of an organization in a dynamic environment" (Chaharbaghi and Lynch, 1999). Such resources are obviously not standardized and homogenous information technology physical assets (infrastructural technology) but rather information technology competencies and capabilities (Peppard and Ward, 2004). The theories of Resource-Based-View, capability-based view and Knowledge-Based View of the firm will used to find the link between Information Systems and firm sustainable competitive advantage. Being organizational advantages built on information systems resources, such advantage manifest in the ability of the firms to

promptly sense opportunities and threats and respond quickly and promptly. This is particularly important in today's VUCA environment. This research seeks to find that since investment in information technology physical resources for the purpose of building sustainable competitive advantage is not guaranteed, because of the growing homogeneity and standardization of the infrastructural aspect of information technology, organizations will therefore need to have a deliberate strategy to invest in developing information systems capabilities. According to Spanos and Prastacos (2004), capabilities refer to the "dynamic, nonfinite, and path dependent processes that are not obtainable in the factor market, are difficult to copy, and are accumulated through long term, continuous learning". This is why it is important to invest in organizational capability because it creates uniqueness. "Dynamic capabilities affect how business organizations adapt and create heterogeneous resource positions in dynamic environments" (Leiblein, 2011). Heterogeneous resource position for a firm in an industry is the basis for sustainable competitive advantage according to Barney, (1991). Organizations that seek to build sustainable competitive advantage based on organizational information systems should rather consider the dynamic resource of information systems capability as opposed to the physical resources of servers, storage, network, operating systems, applications.

This research has the objective to establish that strategic management and positioning for competitive advantage should no longer be premised on tangible resources - information technology assets- infrastructural technology but more on the management of Organizational Information Technology knowledge and competencies, knowledge workers within any industry and Information Technology management itself (Dess, et al., 2016; Sanchez et al., 1996). It follows therefore that it is no longer the firms with the most investment in Information Technology assets that have an edge but those that can leverage their investment for agility as means of earning

advantage (Tallon and Pinsonneault, 2011, Tallon et. al, 2019). With globalization and growth in communication technology and the Internet, the world of business is significantly changed. There is also the changing business need of customers/clients, hyper-competition among firms, government policy changes, rising crime rate (physical and cyber) among other factors all fueling a growing volatility, uncertainty, complexity, and ambiguity (VUCA environment) of the business environment. According to Felipe et al. (2016), the business environment is more than ever "globally interconnected, more technologically complex and more politically challenged". These conditions have led to hypercompetitive markets involving major threats to the survival of companies. To respond to this environment, organizations need to be able to quickly adjust their capabilities and management processes so that they are effective over time. There is an increasing recognition that "agility is an imperative for success of contemporary firms as they face intense rivalry, globalization, and time-to-market pressures "(Brown and Eisenhardt 1997; Goldman et al. 1995; Sambamurthy et al. 2007). For any business that is information technology dependent as is the case with those in our case study, their technology should be such that enhances and does not impede agility. It must be kept in mind that information technology (IT) regardless of value it creates for the business constitutes a major cost component of a company's capital investment (Gartner, 2016; IDC 2016; Laudon and Laudon, 2018) hence it must not be made mindlessly. Information technology investment and its payoffs is a major discussion among business executives. With annual "significant investment in information technology, the infrastructure is to be managed to best achieve today's business goals as well as future demand. To ensure this, information technology infrastructure must be amenable to changes" (Chanopas, et al., 2006). It follows therefore the technology must be both flexible and the capability to ensure it can be

configured and reconfigured when required is readily available otherwise, such investment will not yield the desired expectation of rent generation and strategic differentiation.

1.3 Nature and Significance of the Study

The study of how Organizations today can earn sustainable competitive advantage through Information Systems (Information Technology and its management) will be based on the mixed method research approach. This will be using the combined instrument of Interviews and questionnaires to collect data- qualitative and quantitative. This ensures that besides more empirical data to be collected, some contextual information will also be gathered. This is to ensure more rounded research. The approach will be through a purposive sampling of the e-Payment industry of the financial services sector of Nigeria. This choice of research and sampling method is due to the specialized nature of the required sample population. The required insight for this topic can only be best provided by decision makers, leaders and influencers in the IT and business functions of the firms in this industry.

A mixed method research approach is considered for the study because of its pragmatic paradigm. Pragmatism suggests that the choice of approach is directly linked to the purpose of, and the nature of, the research questions posed (Creswell 2015). According to Armitage (2007), research is often "multi-purpose and a "what works" tactic will allow the researcher to address questions that do not sit comfortably within a wholly quantitative or qualitative approach to design and methodology". Darlington and Scott (2002) opined that the decision of quantitative or quantitative research approach are based not only on "philosophical commitment but on a belief of a design and methodology being best suited to purpose". Research triangulation besides helping with reliability and validity also helps to increase completeness of a study result when one part of the

study presents results which have not been found in other parts of the study (Johnson and Christensen, 2004; Johnson and Onwuegbuzie, 2004).

Since the sampling approach in this research is non-random, the possibility of selection bias exists, but adequate care will be taken to ensure that sample participants are selected from the identified target population (Pannucci and Wilkins, 2010; Berk, 1983). In addition to ensuring that sample is based only on target population, bias introduction at the data collection by different raters will be addressed by careful training of personnel and by clear definition of risk and outcome prior to implementation. Considering also that interview is one method for data collection with the possibility of interviewer bias, we have chosen to be open to any outcome hence are effectively blinded to the outcomes without the concerns of biases from how information is solicited, recorded, and interpreted (Pannuci and Wilkins, 2010). This choice of been blinded to the outcome will also help to avoid possible bias due to chronology as no fixed trend even exist now in literature. All of this is to ensure the particular interest of the validity of the research result hence from the design, sample selection, implementation and analysis, careful planning is adhered to, so the result or outcome is not prejudiced (create bias) (Pannuci and Wilkins, 2010).

For data collection, our sample shall be drawn from all the Central Bank of Nigeria licensed Payment Service Providers (PSP) that has commenced operation and consequently have technology footprint of any kind. In all, we have about twenty-five (25) such companies. These companies will be identified as well as their staff members from middle management upwards in both their business and technology functions. Their email and telephone contact will be obtained for the purpose of sharing questionnaires and booking face-to-face interviews. We intend to share the questionnaire with all within the selected sample population but have a face-to-face interview.

Sufficient details such as education and position for each respondent will also be obtained through either of interviews or questionnaire response in addition to responses to specific questions designed to elicit answers that will draw insights from the respondents. Being that the sampling approach is non-random, to avoid the possibility of selection bias, we intend to sufficiently define the sample population to make it easy to ensure that sample participants are selected from the identified target population (Wilkins and Pannuci, 2010; Berk, 1983). This is to guide against what Berk (1983) opined as the possibility of sample selection bias that exists whenever researcher work with non-random sample of a population because it is easy in this case to "confound the phenomenon of interest with the selection process". The qualitative data collected will be coded and combined with the quantitative dataset before data analysis will commence. Exploratory and confirmatory factor analysis will be used to test the reliability and validity of the collected data and measurement instrument. The test for hypotheses will be through correlation and regression analysis. IBM SPSS is the tool of choice for data analysis.

This research is considered very significant because Businesses and Organizations today operate in an information-based, knowledge-driven economy. According to Dess, et al. (2016), in the US, the workforce in the service sector grew from 76% in 1980 to 86% in 2012. This represents a shift toward knowledge economy with significant strategic management implications. Success in this new environment requires speed and flexibility (Bartlett and Ghoshal, 2002). This, among other factors, has made business dependence on Information Technology to be at an all-time high. Some organization such as Telecommunication, media, e-Commerce, and retail financial services, however, owe their existence to Information Technology (Peppard and Ward, 2004). WEF (2015) describes Information and Communication Technology (ICT) as a "general-purpose technology, with impact that extends well beyond productivity gains. It is described as a vector of social

development and transformation by improving access to basic services, enhancing connectivity, and creating opportunities". Information Technology has enabled "exponential speed of developments, disruption across all major industries. Management and governance are what differentiates these developments from previous "industrial revolutions". If managed well, they have the potential to give rise to innovation that will drive growth and social impact. Countries and businesses that embrace these developments, anticipate challenges, and deal with them in a strategic way are more likely to prosper as Information and communication technologies (ICTs) are the backbone of the new revolution" (WEF, 2016).

Besides the strategic importance shared above, information technology investment represents a significant part of almost all organizations annual budget. According to BusinessWire, 2021 Information Technology global market report, investment in information technology in 2021 is estimated at $8370.95 billion. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC 2016; Laudon and Laudon, 2018). Despite this massive investment that is projected to grow annually, most business cannot seem to generate rent from this resource. The reason is simple- with "standardized and homogeneous information technology that has significantly lowered entry barriers" (Chae et. al., 2014) and "ubiquity of broadband Internet, the democratization of technologies" WEF (2015). At the foundation of the growing commoditization of information technology infrastructure homogeneity and standardization. Chae et. al. (2014) and Masli et al. (2011) argued that unlike the 1990s where proprietary technology confers an advantage, the 2000s is characterized by "standardized and homogeneous information systems -

Enterprise Resource Planning (ERP) systems, WEB technologies. The increasing power of information technology and the sharp and continual decline in the cost is due to standardization. Laudon and Laudon (2018) opined that "technology standards unleash powerful economies of scale and result in price declines as manufacturers focus on the products built to a single standard. Without these economies of scale, computing of any sort would be far more expensive than is currently the case". The enterprise technology solutions we have and particularly the Internet is made possible through standardization. This has given rise to more trends that are unfolding such as "mobile digital platforms, consumerization of IT, Virtualization, Quantum computing, cloud computing, green computing and high-performance/power-saving processors" (Laudon and Laudon, 2018). Based on the foregoing, the generation of rent from information technology can only be premised on human capital development and knowledge management. It is the basis for innovation and the creation of proprietary technology that can differentiate one firm in an industry from another. Businesses should therefore be deliberate and very strategic in information technology human capital development, management of such organizational knowledge and technology as the means to earning value from any investment in information technology in today's world. Human capital development, particularly in information systems engenders the creation of a unique resource- the organizational information systems capability. According to Spanos and Prastacos (2004), capabilities refer to the "dynamic, nonfinite, and path dependent processes that are not obtainable in the factor market, are difficult to copy, and are accumulated through long term, continuous learning". This is why it is important to invest in organizational capability because it creates uniqueness. Two organizations investing in the same technology, but with different capabilities means they will have different results from their respective investments. "Dynamic capabilities affect how business organizations adapt and create heterogeneous resource

positions in dynamic environments" (Leiblein, 2011). Heterogeneous resource position for a firm in an industry is the basis for sustainable competitive advantage according to Barney, (1991). Not investing in dynamic capabilities such as organizational information systems capability blocks the possibility of building competitive advantage from any investment in information systems. This is important because according to Mark Lewis – the Chief Technology Officer (CTO) for EMC Corporation in his HBR response to Carr (2003) "IT does not matter", he posited that "IT never mattered. What matters are the people who invent technologies and those that deploy and use them. Strategic advantage based on Information Technology comes from how they are applied – the unique way information technology is combined with organization intellectual capital, business models, culture, and creativity."

Establishing the link between information systems capabilities (a dynamic information systems resource) and sustainable competitive advantage is the major contribution this research work seeks to make to information systems research and general knowledge. The research seeks to establish that firms' strategic differentiation based on information systems will manifest more in how agile such firms are in sensing, seizing, and responding to threats and opportunities (Tallon and Pinsonneault, 2011; Lu and Ramamurthy, 2011, Tallon et. al, 2019) relative to others.

1.4 Research Questions and Research Hypotheses

This research focuses on how organizations can build sustainable competitive advantage – through Organization Information Systems Capabilities. To explore this complex state of play, the following research question is used.

RQ1. What is the relationship between sustainable competitive advantage and Information Systems like in today's world of Information Technology ubiquity, standardization, and homogeneity?

Carr (2003), Clemons (1986), Clemons and Row (1991) and Powell and Dent-Micallef (1997) opined that "as information technology's power and ubiquity have grown, its strategic importance has diminished" because like other infrastructural resources, information technology resources has become accessible to all businesses hence can no longer be a basis for differentiation. Also, according to Moore's 1965 prediction "Moore's law principle states that since the number of transistors on a silicon chip roughly doubles every two years, the performance and capabilities of computers will continue to increase while the price of computers decreases." Current confirmation of that principles is that:

(1) the power of microprocessors doubles every 18 months,

(2) computing power doubles every 18 months, and

(3) the price of computing falls by half every 18 months.

According to Laudon and Laudon (2018), "exponential growth in the number of transistors and the power of processors coupled with an exponential decline in computing costs". There is the possibility that chip manufacturer as always will fashion chips from silicon or other technology if the limit of miniaturization is ever to become a reality (Markoff, 2016). This suggests that there may be no end in sight in making information technology's primary infrastructure- the computer more powerful, affordable, and accessible. These suggest that the infrastructural aspect of information technology is fast becoming a commodity as first observed by Carr (2003). The foundation of the growing commoditization of information technology infrastructure is its

homogeneity and standardization. Chae et. al. (2014) and Masli et al. (2011) argued that unlike the 1990s where proprietary technology confers an advantage, the 2000s is characterized by "standardized and homogeneous information systems - Enterprise Resource Planning (ERP) systems, WEB technologies leading to the increasing power of information technology and the sharp and continual decline in the cost is due to standardization. Laudon and Laudon (2018) opined that "technology standards unleash powerful economies of scale and result in price declines as manufacturers focus on the products built to a single standard. This is foundational to the growing homogeneity of information technology. Without these economies of scale, computing of any sort would be far more expensive than is currently the case". Along the same line, the rise in enterprise technology solutions such as the Internet are made possible through standardization. This has given rise to more trends that are even still unfolding such as "mobile digital platforms, consumerization of IT, virtualization, quantum computing, cloud computing, green computing and high-performance/power-saving processors" (Laudon and Laudon, 2018).

The research question above is very apt against the backdrop discussed above. What should the strategy of any business with desire to build sustainable competitive advantage look at in the face of this reality?

RQ2. What aspect of information systems should organizational Information technology investment be focused on to ensure differentiation and continuous generation of rent from such investment by an organization?

Another problem that is observed is that investment in information technology has been found not to yield desired results. Regardless of this conundrum, according to BusinessWire (2021), Information Technology global market report, "the global information technology market is expected to grow from $7850.57 billion in 2020 to $8370.95 billion in 2021 at a compound annual growth rate (CAGR) of 6.6%. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC 2016; Laudon and Laudon, 2018). This annual growing investment is regardless of the lack of consensus by researcher on the economic benefit of such investments. The famous phenomenon called "productivity paradox" which started several decades ago following the statement by Solow (1987) that "you can see the computer age everywhere but in the productivity statistics" has enjoyed a torrent of research but the phenomenon can still not be completely dispelled. According to Kijek and Kijek (2018), while the "productivity paradox" sparked a great number of research, results of either theoretical or empirical investigations over the decades are not "convincing with regards to whether investments in information and communication technology (ICT) affect the productivity of firms, sectors, and economies". Other recent researches of the phenomenon also concluded along the same line. Hajli and Sims (2015) sought to reinvestigate and update this phenomenon but still found mixed results. They found that while "they identified high correlation between output per capital and ICT investment growth, there is no significant correlation between investment in IT and labor or multi-factor productivity. The labor productivity indicator demonstrates highly fluctuating behavior which is not correlated to ICT investment growth".

This research question seeks to find out if current information technology is properly directed or if the focus should change.

This research focuses on how organizational information systems capability impacts organizational agility and consequently sustainable competitive advantage. To further the research, a hypothesis is generated to guide the direction of the investigation. According to Creswell (1994), "A hypothesis is a tentative generalization, the validity of which remains to be tested. In its most elementary stage, the hypothesis may be any hunch, guess, imaginative idea, which becomes the basis for action or investigation. Research questions and hypotheses become "signposts" for explaining the purpose of the study & guiding the research". In some cases, hypothesis is described as an assumption, a guess, or a suggested answer to a research problem. A hypothesis states the predictions about what the research will find. It is a tentative answer to the research question that has not yet been tested.

The following hypotheses attempts to answer the research questions based on review of literatures. This research seeks to validate these hypotheses. There are both null and alternate hypotheses captured. At the conclusion of this research work, they will either be upheld or dismissed. They were however arrived at based on rigorous literature study to find answers to the research questions.

H1a: Sustainable Competitive advantage is positively associated with Organizational Information Systems Capability in Information technology-dependent Organizations.

H1O: Sustainable Competitive advantage is not associated with Organizational Information Systems Capability in Information technology-dependent Organizations.

H2a: In an Information technology-dependent organization, the positive association between Sustainable Competitive Advantage and Organizational Information Systems Capability is greater if Organizational Agility is considered.

H2O: In an Information technology-dependent organization, the association between Sustainable Competitive Advantage and Organizational Information Systems Capability is not enhanced by Organizational Agility.

H3a: Organizational Information Systems capability predicts Organizational Agility in Information Technology-dependent Organizations.

H3O. Organizational Information Systems capability does not predict Organizational Agility in Information Technology-dependent Organizations.

H4a: Organizational Agility is positively correlated with Sustainable Competitive Advantage

H4O: Organizational Agility is not positively correlated with Sustainable Competitive Advantage

H5a: In an Information Technology-dependent organization, the positive relationship between Organizational Information Systems Capability and Sustainable Competitive Advantage is moderated by Organizational Knowledge management.

H5O. In an Information Technology-dependent organization, the relationship between Organizational Information Systems Capability and Sustainable Competitive Advantage is not moderated by Organizational Knowledge management.

Chapter 2. Literature review

2.0 Introduction

This research work studies how firms within the Nigeria e-Payment industry earn can sustainable competitive advantage through Information Systems (Organization, Information Technology, and its management). The e-payment industry is a knowledge intensive and completely information technology (IT) dependent one. In e-payment as it is with industry such as telecommunication, e-Commerce, and retail financial services, they owe their existence to Information Technology (IT). This is the same for Nigeria as it is everywhere else in the world. The problem that is observed across industry practitioners and researchers alike is the mistaken assumption that investment in Information Technology assets by itself confers any advantage on any firm over the other in today's business environment generally. In the e-payment sector in Nigeria as it is for most firm across several industries, each firm in the industry spend millions of dollars annually on information technology assets in the pursuit of competitive advantage without desired successes. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC 2016; Laudon and Laudon, 2018).

The study is based on the mixed method research approach which involves using the combined instrument of interviews and questionnaires to collect data- qualitative and quantitative data. This ensures that besides more empirical data to be collected, some contextual information is also gathered to ensure rounded research. The approach is through a purposive sampling of the e-Payment services sector of Nigeria. This choice of research and sampling method is due to the

specialized nature of the required sample population. The required insight for this topic can only be best provided by decision makers, leaders and influencers in the information technology and business functions of the firms in this industry.

A mixed method research approach is considered for the study because of its pragmatic paradigm. Darlington and Scott (2002) opined that the decision of quantitative or quantitative research approach are based not only on "philosophical commitment but on a belief of a design and methodology being best suited to purpose". Research triangulation besides helping with reliability and validity also helps to increase completeness of a study result when one part of the study presents results which have not been found in other parts of the study (Johnson and Christensen, 2004; Johnson and Onwuegbuzie, 2004).

To begin this research work, an extensive literature review was conducted on existing works on the subject matter. The review was kept to peer review literature in Information Systems and Management literatures. The reviewed literatures were published works of not more than five (5) years except in cases where key constructs have their origin in earlier literatures or our search lead to specific authorities whose insights we cannot afford to keep out.

In the search, which was mostly through Google Scholars, Unicaf e-library, peer-reviewed literatures on key constructs such as Information Systems, Sustainable Competitive Advantage, Organizational Agility (OA), Organizational Learning (OL), Organizational Information Systems Capability were searched for and rigorously reviewed. The review was to establish the level of research and findings particularly in this age of ubiquity of information technology, dynamic business/technology environment and whether businesses can glean any advantage through investment in information technology and its management. The review therefore sought to find if

there exists in literature any relationship between Organizational Information Systems Capabilities and firm's sustainable competitive advantage in the VUCA environment of today.

To understand and effectively direct this research, it was anchored on some theoretical frameworks. The world and particularly the business world is complex. It will be difficult to make sense of it if there exist no frameworks to begin this process of sense making. Theory is one such framework to academically research the world. Shubik (1987), defined theory as "an ordered set of assertions about a generic behavior or structure assumed to hold throughout a significantly broad range of specific instances". According to Bacharach (1989), theory is "a statement of relationships between units observed or approximated in the empirical world". He further expanded it "as a system of constructs and variables in which the constructs are related to each other by propositions and the variables are related to each other by hypotheses".

This research is anchored on a set of theoretical frameworks that were themselves thoroughly reviewed through peer-reviewed management literatures.

2. 1 Theoretical framework

The search for rent from Information Technology's more rare resources - Organizational knowledge and Organizational IT capabilities as the underpinnings for firm sustainable competitive advantage is based on the following management research theories - resource-based-view, capability-based view, and knowledge-based view.

2.1.1 Resource-based- view (RBV)

The foundations of the Resource-Based View (RBV) of the firm are found in the work of Penrose (1959) where the firm is thought of as an "administrative organization and a collection of productive resources, both physical and human". The resource-based theory seeks to explain the organization's internal sources of sustained competitive advantage (SCA). Resource-based-view is a response to the positioning approach that advocates that "firms' competitive advantages fundamentally depend on the applicable industrial structure. Resource-based-view in contrast contend that differences in firms' profitability depend much more on their specific internal factors than on external factors" (Nagano, 2019). While the positioning approach assumes "resources are always readily available in markets, resource-based-view proponents argue that firms are greatly limited in their ability to acquire resources" (Wernerfelt, 1984). Differentiation and economic rent accruing from resource(s) are transitory hence, organizations need to be "adept at continuously creating new resources and assembling them into competences" (Dierickx and Cool, 1989). According to Reed and DeFillippi (1990) "sustained competitive advantage is not derived from a fixed stock of competencies. Rather, it arises from a continual competency accumulation".

The central preposition of the resource-based view of the firm, is that "if a firm is to achieve a state of sustainable competitive advantage, it must acquire and control valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities and the organization (O) should be in a place that can absorb and apply them" (Barney, 1991a, 1994, 2002, Kraaijenbrink et al., 2010). These resources can be tangible and "intangible assets, such as a firm's management skills, its organizational processes and routines, and the information and knowledge under its control" (Barney, et.al, 2001). The core aim of RBV is to explicitly explain why firms in the same industry might differ in performance based on their internal sources of SCA (Kraaijenbrink, et al.,2010). It

helps to explain the “conditions under which a firm’s resources will provide it with a competitive advantage” (Barney, 1991). According to Dicksen (1996), RBV provides an “inside-out” view or firm specific view of why organization succeed or fail within industries as opposed to the market-based view that considers firms as “fairly homogenous and the driving force for market competition is branding and positioning efforts of competing firms” (Madhani, 2010). The resource-based view of the firm emphasizes the importance of enhancing “firm’s specific resources associated with path dependency”. This is reflected in Barney’s (1991) argument that if a “firm acquires rare and valuable resources due to its unique historical path, it will be able to exploit those resources to implement value-creating strategies that cannot be duplicated by other firms. This is because firms that have not proceeded along that historical path cannot acquire the resources necessary to implement the strategy” (Nagano, 2019). The resource-based theory, based on Ricardian logic explains that the “possession of scarce resources is the basis for interfirm differences in performance, building on the notion of Ricardian rents” (Collis and Montgomery, 1995). According to the Ricardian logic, heterogeneity in performance is “due to ownership of resources that have differential productivity” (Rumelt, 1987). Ricardian rents “accrue to these superior resources (also called ‘productive factors’), as they are scarce, that is, not equally available to competing firms” (Peteraf, 1993). This helps to explain that firm structure matters and is foundational to how imitation is prevented thereby helping to prevent erosion of rent. The resource-based view helps to emphasize the need to seek resources that can be uniquely controlled as the foundation is strategy is that resources must be unevenly distributed as equal availability of resources means that it cannot be used as a basis for economic rent generation or a basis for differentiation.

Based on the foregoing, the resource-based view (RBV) fits as a theory to base the investigation of intangible organizational information technology capabilities as a basis of generation of rent from Information Technology investment. Organizational Information Technology capabilities are internal resources of a firm and satisfy the VRIN test or Ricardian logic. With ubiquity, standardization, and homogeneity of information technology, it has become difficult to base a strategy of differentiation on such resources. Information systems capability however that is based of competencies acquisition and on human resources within a firm becomes a better basis for a strategy of differentiation and rent generation.

2.1.2 Capability based view (CBV)

Literature is replete with the fact that the true underpinning of competitive strategy is capability and not resources. Grant (1991), Amit and Shoemaker (1993) agree that capabilities "are the source of competitive advantage while resources are the source of capabilities". Amit and Shoemaker (1993,) defined capabilities in contrast to resources, as "a firm's capacity to deploy resources, usually in combination using organizational processes to effect a desired end". Teece et al. (1997) define organizational capabilities as, "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments". Collis (1994) and Winter (2003), view organizational capabilities as "higher order skills and resources that bears direct relationship with how a firm responds to changing environment". This agrees with Grant (1991) assertion that resources give rise to capability, but it is capability in turn that ensures competitive advantage more in the very dynamic world of information technology and information technology resources. The thrust therefore of capability-based view is that "dynamic capabilities affect how business organizations adapt and create heterogeneous resource positions in dynamic environments" (Leiblein, 2011). Heterogeneous resource position for a firm in an industry is the

basis for sustainable competitive advantage according to Barney, (1991). A key attribute of the business environment (market) today is that it is relentlessly changing. To survive and stay ahead, the resources for which economic rent is built must also be changed as often if not faster otherwise there exists the possibility of annihilation. In such markets, innovation matters. Economic rent generation in this case will have to be of the Schumpeterian kind. Schumpeterian competition refers to "firms competing by innovating in both their factors (resources) and outputs (products). These innovations entail 'creative destruction' of both resources and products" (Daneels, 2012). Dynamic capabilities or "second-order competences enable a firm to engage in Schumpeterian competition" (Daneels, 2012). For firms that wish to build sustainable differentiation and rent generation from information systems capabilities, the only approach will have to Schumpeterian as resources position created by dynamic capabilities in technology dissipates very quickly or are very easily copied. Schumpeterian competition therefore allows for constant push to create a heterogeneous resource position based on the dynamic capabilities – the information systems capabilities.

There are debates about whether this theory should stand alone or is intrinsically part of RBV with RBV resources defined broadly to cover capabilities (Hoopes and Madsen, 2008). Some researchers consider RBV and capability theory as "two branches of the same river" (Denrell et al., 2003; Helfat, 2003). What is important however is, it does contribute to resource heterogeneity which is fundamental to sustainable competitive advantage (SCA) (Barney, 1991). In the dynamic world of today's business, and with the constantly changing world of information technology itself beside the growing standardization and homogeneity, differentiation can only be based on capabilities that a firm possesses to deploy, configure, and reconfigure information technology resources. Capability-based view or rather Schumpeterian competition is most suited for today's

dynamic and relentlessly changing business environments. It will be difficult to even achieve long-term differentiation if the strategy is based on either market factors or Ricardian logic only.

2.1.3 Knowledge based view (KBV)

The firm is where "individual knowledge and intelligence converge to form a collective and creative intelligence that can be put to entrepreneurial use. From this viewpoint, companies exist because they are in the position to convert individual knowledge into collective knowledge and employ it for an entrepreneurial purpose" (North and Kumta, 2018). The Knowledge-based view is concerned with the establishment of the conditions so that "employees with specific knowledge are in a position to create collective knowledge and to implement it to ensure business success" (North and Kumta, 2018). From the viewpoint of the Resource based view of the firm, knowledge is an intangible resource that has found a lot of alignment with present day business and economic environment- information age and knowledge-based economy (Grant, 1996a; Roos, 1998; Hoskisson et al., 1999). The nature of most knowledge-based resources is "mainly intangible and dynamic, allowing for idiosyncratic development through path dependency and causal ambiguity, which are the basis of the mechanism for economic rent creation in the Knowledge-based view of the firm." (Curado and Bontis, 2006). Through the lenses of RBV, some researchers argue that knowledge is a generic resource but others such as Teece et al. (1997) argue that knowledge has unique attribute that makes it the most valuable resource hence requires to be viewed separately. Knowledge exhibits two attributes that make it particularly suitable for creating and sustaining competitive advantage. It is "imperfectly imitable due to unique historical conditions, causal ambiguity, and social complexity. It is also non-substitutable" (North and Kumta, 2018).

In modern times, particularly as we move into the information age, knowledge becomes the primary driver of firm performance and consequently as basis for competitive advantage (Evans, 2003). Another very important attribute of Knowledge is that unlike other resources, it does not depreciate but rather increases with use (Evans, 2003) and can generate increasing returns. Knowledge and particularly organizational knowledge are fundamental to business management. No progress, growth or competitive advantage is possible without organizational learning. Leaders and managers must have strategies for and must deliberately encourage organizational learning and manage organizational knowledge as the most valuable organizational resource. Knowledge resources are particularly important as a basis for sustainable competitive advantages- "sustainable differentiation" (Wiklund and Shepherd, 2003), as these resources are difficult to imitate. There is an observed difference between the book value and the market value of firms. This value difference has captured the interest of researchers in recent times. This difference has been identified as the intellectual capital of the firm and is today a major source of competitive advantage (Chen et al., 2005; Edvinsson and Malone, 1997). Maditinos et al. (2011) define Intellectual capital as "the knowledge-based equity of organizations". According to Dess, et al. (2016), it is a "measure of the value of a firm's intangible assets which include reputation, employee loyalty and commitment, customer relationships, company values, brand names, and the experience and skills of employees".

The growing popularity of Intellectual capital (firm's intangible asset) as measure of firm's competitive advantage cements the shift toward knowledge-based economy driven more by organization knowledge among another intangible attribute of the firm. Nowadays, the source of "economic value for any firm is the creation of Intellectual capital and no longer the production of material goods" (Chen et al., 2005). Schumpeterian competition is enhanced with the well

managed intellectual capital of the firm. Organization on the strength of such intellectual capital can continually change resource positions by the continual acquisition of new competencies. It follows therefore that Schumpeterian competition is enhanced by organizational intellectual capital make possible when knowledge is acknowledged either a dynamic resource or the basis for acquisition and accumulation of dynamic resources such as capabilities and competencies.

The e-payment industry, which is the industry of interest for this research, is a knowledge-intensive one. While information technology assets are ubiquitous in this industry, gaining sustainable competitive advantage is only possible through the possession of organizational information technology capabilities and competencies (Peppard and Ward, 2004). In this industry as well as others, customer needs and business requirements are relentlessly changing. Since all businesses in this industry are digitized or technology-based, responding to changing needs requires the capability to configure and re-configure technology solutions. This capacity to respond promptly to changing business needs is called organizational agility (Tallon et al., 2019). It is premised on organizational learning and technological knowledge development leading to capabilities and competencies.

2.2 Conceptual framework

Based on the synthesis of existing literature and to ensure, we answer the research questions sufficiently, below is the researcher's conceptual model of the relationship between the different constructs that will be taken as research variables. It is the researcher's attempt at taking an integrated view of the problem (Liehr and Smith, 1999). This is beside the theoretical underpinning of the research expounded on above.

The interrelationship between the variables below is the researcher's conceptual framework for investigating the research problem.

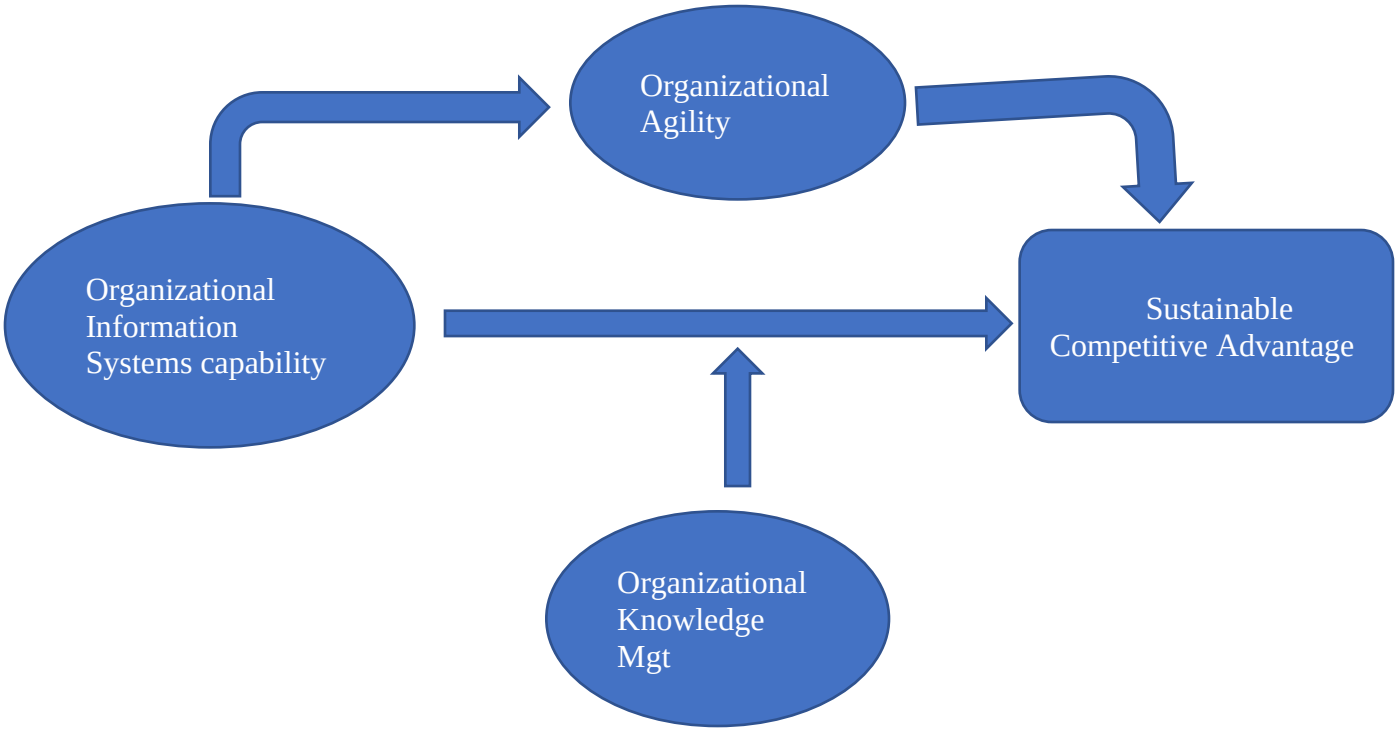


Fig. 2.1 Conceptual framework based on the researcher's review of the problem statement.

A conceptual framework is defined by Imenda (2014) as "a result of bringing together several related concepts to explain or predict a given event or give a broader understanding of the phenomenon of interest – or simply, of a research problem". According to Miles and Huberman (1994), a conceptual framework "lays out the key factors, constructs, or variables, and presumes relationships among them". Jabareen (2009) defined conceptual framework as "a network, or a plane, of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena. The concepts that constitute a conceptual framework support one another, articulate their respective phenomena, and establish a framework-specific philosophy". Conceptual framework has beside other considerations epistemological and methodical assumptions. While the epistemological assumptions "relate to "how things really are" and "how things really work" in an assumed reality", methodical assumption relates to "process of building

the conceptual framework and assessing what it can tell us about the “real” world”. (Jabareen, 2009)

From the review of literature and as represented here conceptually, the relationship between the independent variable- organizational information systems capabilities and the outcome variables are somewhat complex. Why it may be direct, other variables come into account and if taken together, the understanding of the phenomena will be richer. We have Organizational agility mediating between the independent variable – organizational information systems capabilities and the outcome variable- sustainable competitive advantage. The relationship is also moderated by the knowledge management practices of the organization. The oncology of this research as captured in the conceptual framework is of the critical realism type. This is therefore not just a construction of the researcher but rather a reality that exists, explored by different researchers in several studies and will yet be tested by this research. It follows therefore that study is of objectivist epistemology kind (Moon and Blackman, 2014).

A mediating variable is the one in the path of an effect. It is introduced to study a complex correlational relationship or a causal relationship. A mediating variable explains the way in which an independent variable impacts a dependent variable. It explains how and why the effect takes place (Bhandari, 2022). It manifests as result of the independent variable, with influence on the dependent variable and finally, when considered the correlation between the dependent and independent variable is higher (Bhandari, 2022). Organizational agility is the ability of “a firm’s ability to sense and respond to market changes” (Cai et al. ,2017). Organizational agility is the ability of organizations to “sense changes in the environment and respond quickly, efficiently, and cost-effectively to improve competitive advantages” (Amos, 1998; Chen, 2012). In an information technology dependent industry such as in ePayment, information systems capabilities significantly

enhance organizational agility. Organizational agility on the other hand is how sustainable competitive advantage is spawned in such industry. It helps with the Schumpeterian competition. In a dynamic environment, innovation matters, agile organizations can harness the value in such changing situations by aligning and realigning resources. Organizational agility as a "organizational dynamic capabilities allow firms to respond to market opportunities through radical and incremental movements" (Sambamurthy, et al., 2007). A firm with high market capitalizing agility may increase its revenue sources by entering new market segments or identify new customer needs within existing market segment (Sabherwal and Chan, 2001). With a high operational adjustment agility, a firm may "reduce its costs and ineffective business practices by continuously adjusting its business processes toward the industry best practices" (Eisenhardt and Brown, 1999; Rindova and Kotha, 2001). Either or both types of organizational agility when exhibited by a firm within an industry allows for superior financial outcomes, especially profitability, relative to their competitors.

The relationship between information systems capabilities and sustainable competitive advantage is moderated by organization knowledge management practice. A moderating variable acts on the relationship between dependent and independent variable by changing its direction or strength (Bhandari, 2022). The relationship between organizational information systems capabilities and sustainable competitive advantage is strengthened by organizational knowledge practices. Knowledge management within an organization entails a mechanism for capturing and disseminating the knowledge that exists within the organization. It starts with Organizations realizing that Knowledge is a "valuable resource and then develop a mechanism for tapping into

the collective intelligence and skills of employees to create a greater organizational knowledge base (new knowledge) and for the achievement of set group targets/objectives" (Bollinger and Smith, 2001).

2.3 Industry Description

The payment industry in Nigeria started with Smartcard's (the premier e-Payment company) introduction of ePurse (electronic wallet) for merchant transactions and some government collections. This was in 1997. The industry now has several players and even a department in the central bank of Nigeria dedicated to its regulatory frameworks and compliance. There are now over thirty (30) different companies involved in different businesses and competing for customers as services providers. The major businesses are.

1. Card program implementation with Issuing entities (commercial banks) and card schemes such VISA, Mastercard, American Express, Discover, Union Pay International, Payattitude, Verve, Afrigo etc.
2. Card data generation, cryptographic enrichment, and card personalization.
3. Payment transaction processing and switching
4. Payment transactions acquiring
5. Payment terminal service provisioning
6. Payment terminal application development
7. Payment terminal service aggregation
8. Person-to-person payments processing
9. Mobile payments processing etc.
10. eCommerce
11. Money transfer (local and international).

12. Instant payments processing

The industry is dependent completely on technology with each player possessing one technology solution or the other, but each based on the same or similar business processes. Competing based on possession of any technological asset is difficult as all players possess one technological solution or another underpinning similar business processes. For this industry, Information technology is a "strategic necessity" (Peppard and Ward, 2004). Another fundamental challenge is that the information technology industry itself changes rapidly owing to the pace of technology innovation (Yeh et al, 2012).

The electronic payment industry is a high growth sector in the Nigeria financial services industry and is currently evolving and volatile. According to USAID (2019) research of the payment system landscape, Nigeria remains a largely cash based economy with about 80% of working adults still receiving their payments with cash. The digital payment landscape is still largely undeveloped. Only 44% of Nigerian are financially included. This presents a huge opportunity for players but competitive advantage in this industry as it stands today is earned only by first movers, some based on customer intimacy as the ubiquity of technology, ease of access makes the possibility of imitation of strategy very easy leading to erosion of any possible advantages that player seems to have gained. According to Dess, et. al. (2016), an organization is environmentally aware when the leadership has a deliberate strategy to scan and monitor the environment for the purpose of recognizing and tracking trends before it becomes obvious for competitors to recognize them. This concept is what Ram Charam called "perceptual acuity" (Merino, 2013). He defines this as "the ability to sense what is coming before the fog clears". Environmentally aware organizations also engage in competitive intelligence. This involves

gathering data on competitors and interpreting the same with the aim of understanding competitor strengths and weaknesses (Dess, et. al., 2016). The organizational effort towards scanning, monitoring and competitive intelligence is to the end of forecasting to determine "plausible projections about the direction, scope, speed, and intensity of environmental change" (Dess, et. al., 2016). This is all that happens to some extent as basis to craft a strategy that will lead to building a basis for competitive advantage in this industry.

The e-payment ecosystem globally is seen as the next frontier. According to McKinsey 2021 Global Payment Report, though the global disruption of businesses in 2020 by COVID-19 pandemic did not spare global payment as it contracted by 5% ($1.9T) but is much less than expected. It is already projected to rebound with new growth drivers. Digital currency is becoming prominent with private firms entering the fray with "stablecoins" while several central banks of nations are considering or implementing digital currencies. Other drivers are the new "API economy" and open-banking initiatives allowing several third-party service providers to join the ecosystem.

Capgemini (2021) World Payment Report refers to the new reality in payment ecosystem as "payment 4.0". They define this as "experience driven payment" where customers are seeking seamless and frictionless experience. This payment is embedded within product/service offering allowing for convenient and personalized user experience. This is now made possible by the technologically heavy and software defined payment process that has now become common place. The innovation in the payment industry is due primarily to growth in Information Technology. "Changes in technology and new, innovative business models have transformed social life and business practices. Some 2.8 billion people worldwide have smartphones (50 percent of the world's population), and an estimated 1.26 billion use their smartphones for Internet access. More

than 1 billion people use tablet computers, about 15 percent of the global population. In developing and emerging countries, phones and tablets are the primary means of access to the Internet (Pew Research, 2016; eMarketer, 2015). An estimated 2.34 billion people now use social networks, with Facebook accounting for 1.7 billion people alone. Messaging services like WhatsApp, Facebook Messenger, and Twitter collectively have over 2 billion monthly users" (Laudon and Laudon, 2018).

This research is based on this industry albeit the Nigeria ePayment ecosystem. As the foregoing show, the industry is fully dependent on information technology hence a proper fit for a case study investigating how sustainable competitive advantage can be built on information systems. This research output can be of great use for any firm within this industry or similar that wants to differentiate and generate economic rent from the investment in technology that all player must make to even participate in the industry.

To properly understand the external and competitive environment of this industry, Porter 5-forces and Pestle Analysis will be used.

2.3.1 Competitive forces within the Payment Industry (Porter 5-Forces Analysis)

To better understand the payment industry task environment in Nigeria, Porter's 5-Forces is employed. This tool was developed by Michael Porter and is widely used for the understanding of changes in the task environment with capacity to impact firm's strategy.

It is important to note that Organizations (firms) exist within environment that they influence and are influenced by. According to Laudon and Laudon (2018), Organizations reside in "environments from which they draw resources and to which they supply goods and services. Organizations and environments have a reciprocal relationship in the sense that they depend on

the social and physical environment that surrounds them. They draw financial and human resources from the environment and produce goods and services that they exchange for revenue. Organizations respond to legislative and other requirements imposed by government as well as the actions of customers and competitors".

Below is the application of the Porter's 5-Forces on Nigeria Payment Industry.

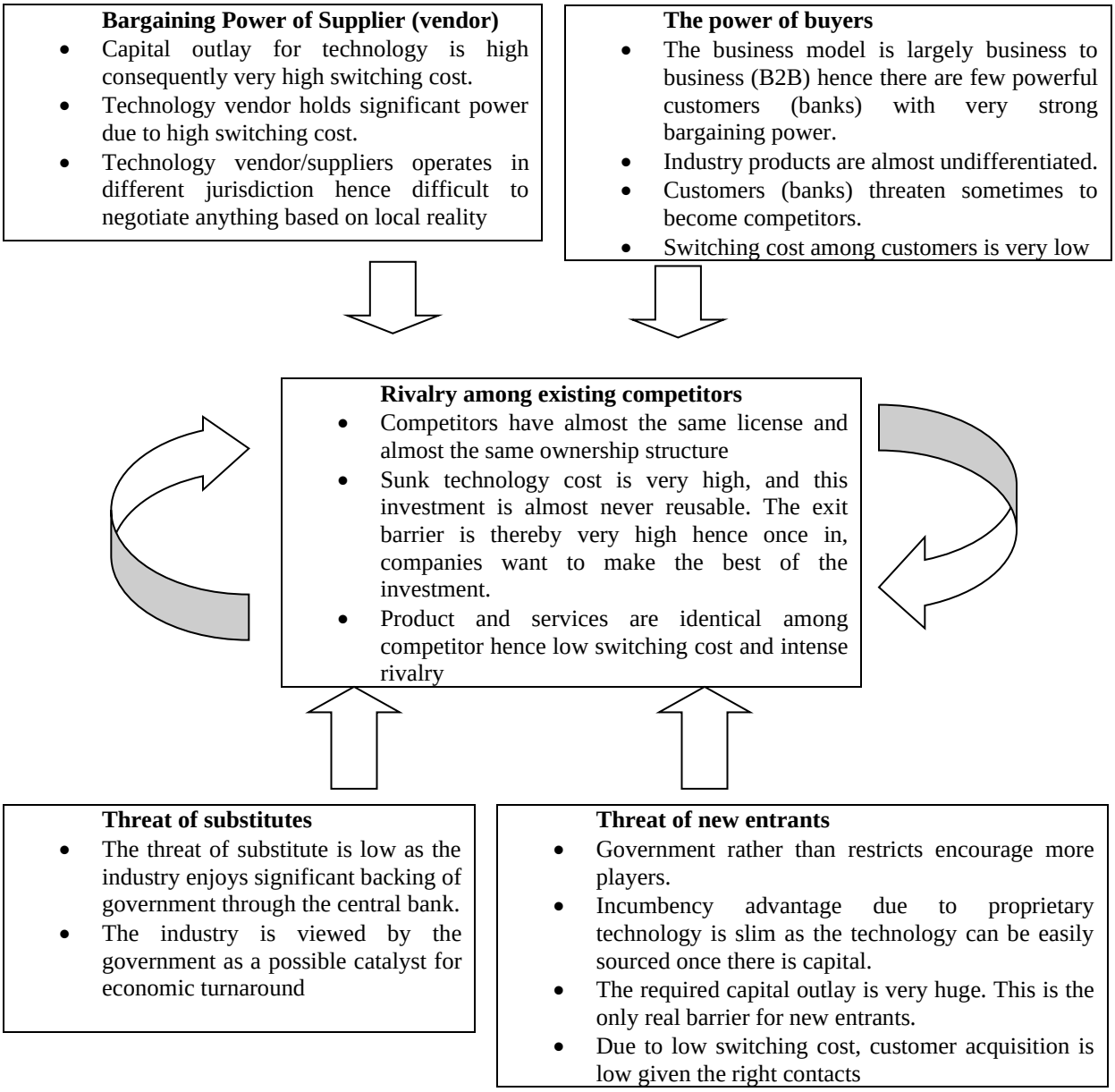


Fig 2.2 The Porter's five forces analysis of the Nigerian ePayment Industry

Source: Adapted from Porter M. E (2008). The Five Competitive Forces That Shape Strategy.

Using Porter's 5-Forces on the Nigerian Payment industry revealed the opportunity in the industry. There is a good regulatory support by the Government and a growing adoption of the services of the industry by the banked and non-banked population alike, but it does also reveal that since the services are rendered to the ultimate customers (the public) through a handful of banks, that represent a major risk. This also makes the rivalry among the competing firms in this industry to be very fierce as a change of loyalty of one customer from one service provider to another may mean a threat to survival or profitability. It also reveals that no individual company can compete based on the technological solution they possess within this industry as all firms possess the required technology as a necessity to be alive within this industry. Any competitive advantage in this regard will only be based on organizational capability with regards to recalibrating the technology with changing business needs. This will mean a competitive advantage based on organizational agility built on the information system capability.

2.3.2 External Environment (Pestle Analysis)

Pestle analysis is used to analysis and understand the external (macro) environment of the firm. According to Dess, et. al. (2016), the external environment "is composed of factors that can have dramatic effects on firm strategy". Banham (2010) opined that "challenges in organizational growth and viability arise from impact of external factors such as globalization, technological

advances etc". Using Pestle analysis, the following factors in the external of the e-payment in Nigeria is reviewed. The factors are:

1. Political
2. Economic
3. Social
4. Technological
5. Legal
6. Environmental.

Find below a Pestle analysis of Nigeria macro business environment with possible impact on the financial services sector.

Political 1. Chaotic national leadership 2. Central Bank (CBN) Cashless policy for promoting electronic payments and transactions. 3. The CBN policy on routing all payment transaction through a single payment terminal aggregator. This is hampering innovation and provides a single point of failure, 4. General insecurity impacting almost all aspects of national life	**Economic** 1. Exchange rate fluctuation leading to massive foreign exchange challenges. 2. Economic stagnancy due to lack of clear government economic policy 3. Prohibitive, unregulated, and unpaid working hours in the private sector 4. Unavailability of credit facilities (the environment is almost noncredit driven) 5. A very slowly and almost stagnant growth of the middle class (the engine of the economy) 6. The real sector of the economy is undeveloped. 7. 54% of the population is financially excluded.
Sociological 1. A National health insurance scheme is gaining national acclaim. 2. Low life expectancy (less than 60 years) 3. Employee's insensitivity towards employees' career and progression. 4. A relatively young demography	**Technological** 1. Advancement /penetration of mobile technology and devices 2. Growing awareness of the global trend of technology sourcing approaches (outsourcing, cloud computing etc) 3. Technological advances in Enterprise Resource Planning (ERP) and business systems. 4. Advancements in e-commerce technology 5. Growing awareness of cheap advertising via social media 6. Growing local capabilities in software development
Legal	**Environmental**

1. Legal implication of data sovereignty with regards to cloud computing and where business data are stored	1. Poor awareness of social responsibility by Corporates 2. No organized customer protection 3. No labor unions 4. No data on customer buying pattern. 5. Impact of globalization

Fig 2.3. A pestle analysis of the Nigeria ePayment ecosystem

Source: Adapted from CIPD, (2013) *Factsheet: PESTLE Analysis*

In alignment with the foregoing, Grant (1999) opined that "the single most significant influence on organizational policy and strategy is the environment outside and inside the organization". Kennerly & Nelly (2003) also stated that "the vagaries and the extremities of the environment affect the fortunes of organizations". The e-payment industry in Nigeria exist in the uncoordinated macro-economic condition analyzed above.

2.4 Organizational Strategy

We live in a fast and ever-changing world. These changes are occasioned by different factors which are both internal and external to every entity - individual or corporate. Humans and corporates on the other hand have set objectives (short, medium, and long term) which are impacted by the changes within and around them. To survive and make progress and or actualize set goal therefore requires an understanding of the environment and how changes in the environment impacts or have the potential to impact the goal of the entity. The construct that describes the art of sensing, planning, acting, and positioning to make the most of the changing environment is called Strategy. According to Pearce and Robinson (2009), strategy is a "set of decisions and actions that result in the formulation and implementation of plans designed to

achieve a company's objectives". Dess et. al. (2016), describe strategy as "the ideas, decisions and actions that enable a firm to succeed".

In the relentlessly changing and challenging business environment of today, firms within industry are daily seeking ways to earn and sustain an advantage over others. They do so by seeking to achieve a share of the customer's revenue or dominant market position. Some of the strategies employed to achieve this, according to Porter (1990), include Cost leadership, Differentiation and Focus. Strategies at this level are called generic or business level strategy. Dess, et. al. (2016) defines business level strategy as "a strategy designed for a firm or a division of a firm that competes within a single business". Johnson et al (2009) opined that business-level strategy "deals with the ways various businesses should compete in their particular market". With business level strategy the following questions are answered according to Lynch (2006).

- How do we compete successfully?
- What is our sustainable competitive advantage?
- How can we innovate?
- Who are our customers?
- What value do we add?

The foregoing ensures profit maximization, but sustainable corporate growth and profitability is made possible by Corporate Level Strategy or Grand Strategy (Pearce and Robinson, 2017). According to Dess, et. al. (2016), Grand strategy is "a strategy that focuses on gaining long-term revenue, profits, and market value through managing operations in multiple businesses". Chandler, (1962) define this as "the determination of the long-term enterprise

objectives, selection of the actions, and assignment of the necessary resources to achieve these actions". The pertinent questions answered by corporate strategy according to Lynch (2006) are.

• What business are we in? What business should we be in?

• What are our basic directions for the future?

• What is our culture and leadership style?

•What is our attitude to strategic change? What should it be?

According to Pearce and Robinson (2017), the corporate strategy "is the pattern of decisions in a company that determines and reveals its objectives, purposes or goals, produces the principal policies and plans for achieving those goals and defines the range of business the company pursues, the kind of economic and noneconomic contribution it intends to make for its shareholders, employees, customers and communities". Success in business should not be "a flash in the pan" but where possible should be sustained and over a long period. Effective business leadership should have at the core of its strategy the need to grow and conquer new territories. This hedges against business risk while providing opportunity for some other stakeholders -which is one of the primary purposes of enterprise.

Since the ePayment industry is a highly technology dependent one with all product development based on technology innovation, the technology base should be such that can be easily adaptable. Internal technology capabilities on the technology solutions relevant to the firm within this industry need to be developed in support of agility posture of the organizations else strategy realization will be a mirage.

2.5 The Nigerian ePayment industry and Information Systems

The Nigeria ePayment industry is considered one of the highest growth areas of the Nigeria economy and evolving and volatile. According to USAID (2019) research of the payment system landscape, Nigeria remains a largely cash based economy with about 80% of working adults still receiving their payments with cash. The digital payment landscape is still largely undeveloped. Only 44% of Nigerian are financially included. The ePayment industry represents a section of the country's payment systems. According to Central Bank of Nigeria (CBN) understanding the monitory policy series No. 6 (2021), payment system refers to an "established infrastructure (institutions, people, set of instruments, rules, procedures, standards, and computer networks) through which financial obligations are discharged by economic agents. It entails the physical and organizational structure that enables the transfer of value between parties discharging mutual obligations. In other words, a payments system refers to an arrangement in the financial system which supports the transfer of funds from suppliers/savers to users/borrowers, and from payers to payees, usually through the exchange of obligations by financial institutions. A payments system comprises three main elements or processes – payment instruments, processing, and a means of settlement for the relevant banks ECB (2010)". According to a 2021 publication by the Central Bank of Nigeria (CBN), the payments system plays a crucial role in any economy as it remains the main "channel for inter-sector, inter-industry, inter-company, and interpersonal financial resource flow, thus promoting economic growth, thus, representing the major foundation of the modern market economy". A payment system is a kind of information systems dedicated to the processing of financial transactions. The ePayment aspect of the payment system ensures the efficient processing of payment through the help of technology. The e-payment ecosystem globally is seen

as the next frontier. According to McKinsey (2021) Global Payment Report, though the global disruption of businesses in 2020 by COVID-19 pandemic did not spare global payment as it contracted by 5% ($1.9T) but is much less than expected. It is already projected to rebound with new growth drivers. Digital currency is becoming prominent with private firms entering the fray with “stablecoins” while several central banks of nations considering or implementing digital currencies. Other drivers are the new “API economy” and open-banking initiatives allowing several third-party service providers to join the ecosystem. Capgemini (2021) World Payment Report refers to the new reality in the payment ecosystem as “payment 4.0”. They define this as “experience driven payment” where customers are seeking seamless and frictionless experience. This payment is embedded within product/service offering allowing for convenient and personalized user experience. This is now made possible by the technologically heavy and software defined payment process that has now become common place.

Asaolu, et. al. (2011) noted that since “money was invented as an abstract way of representing value, a system for making payments has been in place. In the course of time, new and increasingly abstract representations of value were introduced. A corresponding progression of value transfer systems, starting from barter, through banknotes, payment orders, cheques and credit cards has finally culminated in the electronic payment system. As the transition to electronic payment systems take place, the stock of currency held outside the banking system which constitutes a potential source of unproductive economic resources because they are not available for credit expansion is integrated into it thereby expanding the deposit base of the money system”. This represents the immediate value of electronic payments. It is the fastest growing aspect of the payment system of any economy. It makes for better speed and efficiency, hence the growing popularity of the method. The growing popularity is not unconnected with the fact that it is

completed underpinned by information technology hence engenders interconnection across geographies. It becomes easy to use electronic payment instrument issued at one end of the earth at the other end within split seconds without the physical presence of cash or payer/sender bank. Due to ease and convenience, it has created an entire industry- the ePayment industry was born and thriving. The success or failure of any firm in this industry depends among many other things on information technology investment and management. To however generate rent from any investment in information systems will require much more than "throwing money (more resources)" at the problem in the hope that it will somehow underpin sustainable competitive advantage. Technology investment represents a sizable portion of the annual budget of firms in this industry because all business processes are based on information technology. We therefore find all firms in this industry investing in standard payment processing platforms from the same providers. ACI Worldwide in some cases and Compassplus in other instances. On the bases of the technology acquisitions, the firms are undifferentiated because the hardware and software are the same or very similar. To build any uniqueness will require individual companies acquire competencies and capabilities to manage the information systems by configuring and reconfiguring as required.

2.6 Competition and Competitive Advantage

Competition is as old as existence. It predates formal business and of course business strategy. This was first captured by Darwin in his powerful exposition about the struggle for existence. According to Gause (1934), a celebrated mathematical biologist, based on his research and in furtherance of Darwin theory stated that" animals and plants, remote in the scale of nature, are bound together by a web of complex relations in the process of their struggle for existence". In

Darwin's own words, this entails a "battle within battle that is continually recurring with varying success, and probably in no one case could we precisely say why one species has been victorious over another in the great battle of life". According to Henderson (1989), "for several hundred years, natural competition involved no strategy. By chance and the law of probability, competitors find the combination of resources that best distinguishes them. This is not strategy, but Darwinian natural selection based on adaptation and the survival of the fittest". In business as it is in biology, competition follows a similar evolutionary change process except where this is time compressed by strategy. By the introduction of strategy into competition, competition becomes revolutionary as opposed to evolutionary competition in nature. Through resource mobilization, strategy ensures change to "competitive relationship" at much faster pace (Henderson, 1989). With this revolutionary characteristic of strategy with regards to competition, the entity in focus either fails or is conferred an advantage.

Following from the conversation of evolutionary or revolutionary competition, and to provide better context for today's business environment based on system theory and thinking, the world is viewed as a complex web of interconnection called society. Reviewing a society, organization, or team from the point of view of this interconnection, the construct called "system" comes up readily. According to Laszlo and Krippner (1998), the term "System" connotes "a complex of interacting components together with the relationships among them that permit the identification of a boundary-maintaining entity or process". Macy (1991, p. 72) stated that a system is "a group of interacting components that conserves some identifiable set of relations with the sum of the components plus their relations (i.e., the system itself) conserving some identifiable set of relations to other entities (including other systems)".

Systems can be of different level of complexities when sorted. According to Betley et. al, (2021) Systems are sorted for the purpose of identification and study into the following.

1. Simple systems – have few components, predictable function, and stable relationship.
2. Complicated systems – have predictable function and generally definable but require expert knowledge to manage. System can either be technically or socially complicated. These systems do not adapt but have certainty of outcomes, for example, the computer system.
3. Complex adaptive system. This is unlike simple or complicated system. According to Betley et al (2021), complex adaptive systems "(non-linear means that cause and effect of a system are not in proportion to one another, sometimes referred to as tipping points)". While a complex adaptive system can be entirely human, it can also be a mix of human and non-human subsystems. An important distinction of complex adaptive system is that they "are dynamic, unpredictable, and change over time. They can also self-organize, evolve, and adapt" Betley et al (2021). Adaptive system can self-organize by the process of exhibiting emergent properties – a phenomenon of learning and forming new relationship based on the complex interaction of system components.

In any conversation on systems, boundaries – scope and scale are a most. Broadly speaking, "everything is connected but what we know and perceive has limits –boundaries" (Betley et. al. 2021). Boundaries help to identify what is within or outside, what is impacted or what is not. According to Meadows and Wright (2008), systems "rarely have universally agreed upon, legitimate boundaries and where to define a boundary around a system depends on the purpose of the discussion about that system - the questions we want to ask about the system and our value judgments". The purpose of boundary definition is that when boundaries are too broad, answers to

problems within the system are concealed or become intractable but when drawn too narrow and decisions are reached based on such scope and scale, it engenders unintended consequences as major drivers of the system may go unidentified.

One such boundaries is the Organizations. A system organized around the delivery of a particular or a set of function(s) with several internal components interacting among the self. Organizations are adaptive systems as they have "many different parts, and non-linear relationships with feedback loops across time and space" (Betley et. al., 2021). This underscores the need to manage organizations by understanding it as a whole and make decision that alter their function in a way that promote progress toward desired outcomes (Betley et. al., 2021; Wade and Arnold, 2015).

This provides a basis and context for competition within and round and the need for strategy with regards to Organizations. Organizations in their social interaction with society and the environment need to be managed to promote progress towards desired outcomes and this is what strategy is fundamentally about.". Dess et. al. (2016), describe strategy as "the ideas, decisions and actions that enables a firm (organization- system) to succeed (achieve desired outcomes)". The answer to any system surviving and achieving desired outcome as a "composite of the "interconnected whole" (Anderson et. al., 2012) is to be adaptive and that is premised on sound understanding and application of strategic management approach. According to Pearce and Robinson (2009), strategy is a "set of decisions and actions that result in the formulation and implementation of plans designed to achieve a company's objectives". This must be deliberate action always on the part of the management of any Organization in the sense and understanding

that every organization must be an adaptive system with internal and external complex connections and interactions.

Firms within an industry as an adaptive system continually seek positions that ensure "above average results for its business activities" (Cegliński, 2016a). This search is referred to as a competitive strategy. This can be defined as the search to "establish a profitable and sustainable position against the forces that determine industry competition" (Porter, 1985). According to Porter (1985), competitive advantage "grows fundamentally out of value a firm is able to create for its buyers that exceeds the firm's cost of creating it". Chaharbaghi and Lynch (1999) define competitive advantage as "the ability of an organization to outpace competitors in value creation. It is referred to as the degree to which an organization, under free market conditions, meets the demand of a product market while simultaneously maintaining and growing its profit levels". According to Wang (2014), competitive advantage is obtained when an "organization develops or acquires a set of attributes (or execution actions) that allow it to outperform its competitors". Competitive advantage is revealed, when "activities of a given organization are more profitable than those of its market competitors or when it outperforms them as regards other significant results of activities" (Huff et al., 2009).

Within the system called the industry ("interconnected whole" (Anderson et. al., 2012)) competition determines the success or failures of firms (a composite of the whole) hence the continual search for advantage of one firm over the other. This struggle between industry participants (firms within an industry) "determines the appropriateness of a firm's activities that can contribute to its performance, such as innovations, technology assets /capabilities, a cohesive culture, or good implementation" (Porter, 1985).

Barney (1991) opined that a firm is said to have competitive advantage when it can or is implementing a value creating strategy not being implemented by other firms in the same industry at the very time or even potential competition. It must be noted that competition to a firm within an industry is not limited to existing firms but even potential ones. According to Porter (1985), firms broadly can seek and secure advantage within an industry through any or a combination of the following strategies.

- Cost leadership
- Differentiation
- Focus (either cost or differentiation focus)

Pursuing the strategy of cost leadership entails being recognized as the low-cost producer in an industry. This strategy is anchored on "production scale, proprietary technology, and preferential access to raw materials, low-cost base (labor, materials, and facilities)" (Porter, 1985, Mindtools). It is very important to note that the strategic logic of "cost leadership usually requires that a firm be the cost leader, not one of several firms vying for this position" else this strategy can become disastrous for industry participants. The only way to survive when low-cost competition exist in an industry is to embrace "continuous improvement – the Japanese Kaizen philosophy" (Mindtools). Continuous improvement is underpinned by organizational agility- ability to sense and realign resources quickly to respond.

Differentiation strategy entails embracing uniqueness for your products and services. Differentiation may go beyond the product and service to include the channel of delivery, marketing and possibly any other attribute of the product or service. Since the advantage on which a premium is charged is differentiation of one or more attribute of a firm, the "logic of the

differentiation strategy therefore requires that a firm choose attributes in which to differentiate itself that are different from its rivals" (Porter, 1985).

Focus strategy entails selecting a "narrow competitive scope, a segment or a group of segments in the industry and tailors' strategy to serving them to the exclusion of other" (Porter, 1985). The focus segment may be served with either a low cost or differentiation strategy.

It is important to note that depending on the strategy chosen by any firm within any industry, seeking an advantage is premised on available resources to that firm. One of such resources in modern time is information technology – asset and capabilities.

2.6.1 Ricardian and Schumpeterian Rent

Information technology businesses (otherwise called Big Tech) and information technology dependent business such as ePayment have very fluid boundaries. To survive and remain competitive requires a new understanding of competition. Market structure, which is the static means of understanding competition, is not very relevant here. According to Petit and Teece (2021) "there is a limit to what can be achieved through a focus on market structure, and a danger that competition policy that is focused on lowering concentration levels could actually harm innovation". Petit and Teece (2021) hold the view that competition among digital firms and industries should be reviewed differently as "current market positions do not reflect entrenched monopoly power but are vulnerable to competitive pressure of disequilibrating forces arising from the use of data-driven operating models, astute resource orchestration, and the exercise of dynamic capabilities". They posit that focus should be on the "origin of rent generation in the digital economy, competitive process formulation and predictors for long-term competitive effects under

uncertainty" (Petit and Teece, 2021). This according to them is a better way to look at Big Tech and information technology dependent organizations.

Based on the fundamental principle of competitive strategy, economic profits are returns achieved more than the opportunity cost of capital. Firms capture economic profits (rents) when there are either barrier to competition or barriers to imitation. Economic profit (rent) depends on the following factors:

1. Monopoly. Monopoly speaks to economic rent generation based on industrial organizations view. A major consideration in this case is the industry structure and to ensure sustainable rent generation depends on the efficiency of creation of barrier by incumbent to new entrants.
2. Ricardian rents speak to rent generation based on resource-based view of the firm. In this case, it is not about the market structure but rather a function of internal firm's resources. Ensuring sustainable rent generation depends on how well barriers to imitation are erected.
3. Schumpeterian rent recognizes that markets are dynamic hence sustainable differentiation and rent generation depends on innovation which is a product of dynamic capabilities of the firm. This is based on the dynamic capability view of the firm.

The VUCA (volatile, uncertain, complex, and ambiguous) business environment that Big Tech and Information technology dependent organizations operate in is characterized by dynamic competition. Success is therefore not based on competition for existing rent (static competition) but rather based on dynamic competition. Dynamic competition describes a situation in which "firms compete for future rents. In dynamic competition, firms use innovation to introduce new products, processes, and services. Rivalry results in product differentiation, recombination,

integration, diversification, or platformization. It is a type of competition animated not by firms that compete head-on with similar products but by heterogeneous competitors, complementors, suppliers, and customers, using innovation to bring forth new products and processes. Such competition improves long-term factor productivity, raises consumer welfare, and supports higher wages" (Petit and Teece, 2021). In the world of ePayment, that is seen are products and solutions that are regularly act risk of replacement by new introductions. Just when one solution is being adopted, a new one seeks to replace it. In most cases this comes with better customer friendliness. This is the state of play in this industry, and this is occasioned by the base technology that consistently get changed and improved upon. Competition is therefore very dynamic and the search for competitive advantage and economic rent must be of the Schumpeterian kind.

Dynamic competition has its origin from Joseph Schumpeter's work. According to Schumpeter (1942), "it becomes a matter of comparative indifference whether competition in the ordinary sense functions more or less promptly; the powerful lever that in the long run expands output and brings down prices is in any case made of other stuff". The "other stuff" according to researcher refers to innovation which is a product of dynamic capabilities of a firm. Firms that seek to get ahead in dynamically competitive environments such as the ePayment industry must therefore consistently improve dynamic capabilities and embrace innovation as the environment is in a persistent state of flux.

It should be noted that firms are in constant competition with each other. While price is the primary vehicle through which the competition is expressed, there are other attributes such as time to market, user friendliness, product quality etc. (Mathews, 2002). All of this is to ensure the generation of rent from firms' resources. For the industry under review- the ePayment industry and similar information technology industries, market structure or monopoly-based rent generation

is almost not possible because of firm boundary fluidity. It follows therefore that the possible economic profit models are Ricardian and Schumpeterian. Mathews (2002) define Ricardian rents as "the extraction of profits from the rareness and superiority of a firm's resources, and the distinctiveness of the routines built to exploit these resources". This is consistent with the conventional perspective of the Resource-based view (RBV) of the firm. He defined Schumpeterian rents on the other hand as "the entrepreneurial profits extracted by a firm from a bundle of resources assembled from a variety of sources, through the capture of synergies between these resources". While Ricardian approach helps with appreciation of firm specific internal resources as barrier to imitation, solutions become obsolete very quickly in dynamic environments hence sustainable competitive advantage must embrace Schumpeterian approach in addition to the Ricardian to achieve the goal hence the need for the internal resource to be dynamic. Firm capabilities such as information technology/systems capabilities fit the description more than a tangible organizational resource such as information technology assets.

The nature of sustainable competitive advantage that is the focus of this study is both Ricardian and Schumpeterian rent beside other competitive differentiation that firms can embark upon.

2.6.2 Sustainable Competitive Advantage

The concept of sustainable competitive advantage according to Barney (1991) refers to when a firm is implementing a value generating strategy that is not simultaneously being implemented by another firm within the industry (current and potential competitors) but more importantly when these competitor firms are unable to duplicate the strategy or the benefit thereof. This concept does not necessarily speak of the time within which a firm continues to draw rent from the strategy. It rather speaks to a competitive advantage that continues long after effort to

duplicate its benefit has ceased. It must be noted however that sustainable competitive advantage does not suggest that economic rent will last forever. It only means that it will not just be "competed away through duplication effort" of other firms. Unexpected structural market changes, however, within an industry can easily make what used to be a source of competitive advantage for a firm to cease (Porter, 1980,1985).

The underlying assumption for the generation of sustainable competitive advantage in the classical sense is that this can be built on firm resources which are heterogeneously distributed among firms within an industry. The second assumption is that the difference in the resource accumulation among firms in an industry can be sustained over a period (Porter, 1981). The resource-based view, because it is built on firm's internal resources emphasis the same position based on the following assumptions: strategic firms' resources can be natively heterogenous even for firms within an industry and this resource may not be perfectly mobile across firms (Penrose, 1958; Wernerfelt, 1989). These therefore highlights that these firms' resources are "idiosyncratic and immobile" hence a good underpinning for sustainable competitive (Barney, 1991).

Sustainable competitive advantage when discussed within the current context of our relentlessly changing and very dynamic business environment, according to Chaharbaghi and Lynch (1999) is concerned with the "organization positively embracing change, constantly adapting to altered ways and new demands through introducing new resource configurations, while at the same time preserving the best of its past". By this position, sustainable competitive advantage involves resource management and resource development. The former is concerned with meeting the competition today while the latter is targeted toward the competitive challenges of tomorrow. Discussing the present and future in the same context, particularly with regards to organizational resources, immediately presents a major challenge but there can be no sustainability

if both the present and future are not addressed. To help organizations develop the "ability to remain competitive in the future while exploiting existing opportunities" according to Chaharbaghi and Lynch (1999) is referred to as strategic advantage. This means that organizations are not prisoners of their past through entangling themselves with resource management to the detriment of resource development. Strategic advantage is used to describe an "organization's dynamic and unique resources that determine its competitive renewal" (Chaharbaghi and Lynch,1999). This is yet another way to describe what it means to earn and sustain a competitive advantage for a firm.

Competitive advantage, particularly when conferred on firms by Information Technology (IT) dependent strategy do not necessarily make for difficulty in duplication or do not last long enough to ensure profitability (Laudon and Laudon, 2013). To ensure sustained advantage, firms do not need to just focus on technology but rather focus on identification of "differential product strategies, building or reshaping core competencies, acquiring unique technologies, and accumulation of intellectual property, all of which can be harnessed to make the company successful in a highly competitive marketplace" (Srivastava et. Al, 2013). It follows therefore that for competitive advantage to be sustainable, the basis (resource) for the advantage must be unique and protected from migration, this according to, Barney (1991) means that the resource must have the combination of the following characteristics. They must be.

- Valuable
- Rare
- Imperfectly Imitable
- Non-Substitutable

Which is what is generally referred to as “VRIN” resource-based view of the firm (Barney ,1991). Based on these, Information Technology resource alone cannot provide an enduring competitive advantage. It is not “idiosyncratic and immobile” enough. Where an advantage is conferred due to first mover advantage as in the case of eBay and Internet auction, such system originally intended to be strategic quickly becomes a tool for survival required to by every firm in such industry to stay in business. The competitive advantages that “strategic systems confer do not necessarily last long enough to ensure long-term profitability. Because competitors can retaliate and copy strategic systems, competitive advantage is not always sustainable. Markets, customer expectations, and technology change; globalization has made these changes even more rapid and unpredictable. The Internet can make competitive advantage disappear very quickly because virtually all companies can use this technology” (Laudon and Laudon, 2018).

Sustainable competitive advantage is therefore defined as “the prolonged benefit of implementing some unique value-creating strategy not simultaneously being implemented by any current or potential competitors along with the inability to duplicate the benefits of this strategy” (Hoffman, 2000). According to Day and Wensley (1988), this comes from “superior skills and superior resources”. Barney (1991) opined that such resource must satisfy the “VRIN” test. According to Prahalad and Hamel (1990), resource must be combined into “core competence” to confer sustainable competitive advantage which will require employee coordination and organizational learning facilitate growth of specific core competencies.

In summary, a competitive advantage results either from “implementing a value-creating strategy not simultaneously being employed by current or prospective competitors or through superior execution of the same strategy as competitors” (Bharadwaj, et. al, 1993). The competitive

advantage is sustained when other firms are “unable to duplicate the benefits of this strategy” (Barney 1991).

In the case of firms within the ePayment industry in Nigeria, this research seeks to establish how Organizational learning focused on Information System capabilities and competencies enables agility for firms within the industry and how particular firms can use this as launch pad for the creation and sustenance of competitive advantage that others are unable to duplicate.

2.7 Organizational resources

An organization is a “stable, formal social structure that takes resources from the environment and processes them to produce outputs. By this definition, three elements emerge- Capital, labor, and environment. The organization (the firm) transforms these inputs into products and services in a production function. The products and services are consumed by environments in return for supply inputs” (Laudon and Laudon, 2018).

Resource on the other hand is any factor relevant to the accomplishment of goals or required for carrying out an activity **(**Grantham University, 2019**).** Daft (1983) define organizational resources as “all assets, capabilities, organizational processes, firm attributes, information, knowledge etc. controlled by the firm that enables the firm to conceive of and implement strategies that improve the efficiencies and effectiveness of the firm”. Resources can be categorized into a variety of forms. Wernerfelt (1984), classify organizational resource as “physical assets, intangible assets, and organizational capabilities that the firm owns and control”. Barney (1991) classifies organizational resources as physical capital resources, human capital resources and organizational capital resources. Galbreath (2004) and Grant (2002) opine that organizational resource is “either tangible (e.g., financial, or physical) or intangible (e.g., employee’s knowledge, experiences and skills and firm’s reputation), mobilized to create a

sustainable competitive advantage". According to Grant (2002), tangible physical resource includes land and buildings, plant, equipment, machinery, and tools, whilst financial resources allude to the firm's ability to efficiently utilize its financial resource to maximize profits. Using the classification by Barney (1991), physical capital resources examples mirror those position by Grant (2002). Human capital resources however include "training, experience, judgement, intelligence, relationships for individual employees and/or managers and management insights". Organizational capital resources include structure, planning, groups (teams) and relationships between them. This extends to external groups and to those within the organizations.

With the shift in our world today towards a knowledge economy and consequently Information Technology dependence, there is a growing dependence on human and organizational capital resources to enables firms to conceive of and implement strategies that improve their efficiencies and effectiveness. Information Technology in this case is less of the physical capital resource which involves "infrastructure and applications used to create, process, store, and disseminate knowledge to organizations" (Hermawan and Suharnomo, 2020).

Organizational Information Technology resources can be categorized into the following.

- Information Technology assets (Computer hardware, Storage, Software, Telecommunication).
- Information Technology Capabilities (skills and competencies to manage Information Technology assets).

The true value of any resource is in how firms formulate and deploy their strategies around it with the intent to improve performance or gain an advantage. This they do by choices around acquisition and deployment of the resources (Othman et al., 2015). There is a growing ubiquity

and homogeneity of Information Technology (IT) in business (Chae et. al., 2014) leading to erosion of any possible advantage or very quick erosion of any advantage it confers on firms. This is however a challenge observed with Information Technology assets as an organizational resource. Information Technology (IT) asset refers to physical assets such as the hardware (computer, network devices and storage), software, data, and the architecture of the deployment. Physical Information Technology assets can be referred to as almost a common denominator to firms within any industry. According to Carr (2003), Infrastructural technology is now a general business infrastructure and does not confer any advantage on firm within an industry. If, however, the resource conversation is extended just slightly from information technology assets to include the management of the same, it becomes information systems and hence, different from other infrastructural technology but rather now with the ability to spurn proprietary technology. According to Matin & Sabagh (2015), organizational success depends on the level of focus of managers in coordinating infrastructure assets such that the organization becomes change ready in the face of the relentlessly changing relevant business environment today. “Information technology in the context of knowledge infrastructure involves the integration of technology systems and knowledge in companies in creating, continuing, storing, and securing assets of organizational knowledge resources” (Othman et al., 2015).

Based on the foregoing, it follows therefore that there exists a difference between Information Technology (IT) asset and the construct called Information Systems (IS). This is clarified as below.

2.7.1 Information Technology

Information Technology is defined as “the set of physical capital resources dedicated to the storage, processing and communication of information, and the way in which these resources are

organized into a system capable of performing a set of tasks" (Laudon and Laudon, 2018). This therefore refers to physical assets such as the hardware (computer, network devices and storage), software, data, and the architecture of the deployment. Information Technology is used to transmit, process and store information. According to Burgelman (1996, p. 91), Information Technology refers to the "resources applied by a firm in the processing and management of its data". Information Technology refers to capabilities offered by computer hardware and associated application software and telecommunications. According to Laudon and Laudon (1996), Information Technology infrastructure is composed of five major components: computer hardware, computer software, data management technology, networking, and telecommunications technology.

Computer hardware consists of technology for "computer processing, data storage, input, and output. This component includes large mainframes, servers, desktop and laptop computers, and mobile devices for accessing corporate data and the Internet. It also includes equipment for gathering and inputting data, physical media for storing the data, and devices for delivering the processed information as output" (Laudon and Laudon, 1996). This has a long evolution dependent largely on growth in electronic circuit development. The computer hardware is fifth generation and a lot more ubiquitous and less costly than earlier generations.

Computer software includes both "system software and application software. System software manages the resources and activities of the computer. Application software applies the computer to a specific task for an end user, such as processing an order" (Laudon and Laudon, 1996). The computer hardware remains a useless piece of electronic gadget without both the system and application software. While the system software ensures the hardware component work to design, the application software ensures specific task is achieved. It follows therefore that the

same kind of computer hardware with similar system software can be made to perform different tasks depending on the application software in use. This is what business value based on Information Technology is built upon.

Data Management Technology. In addition to physical media for storing the firm's data, businesses need specialized software to organize the data and make it available to business users. Data management software "organizes, manages, and processes business data concerned with inventory, customers, and vendors" (Laudon and Laudon, 1996). Business processes generate business data that need to be stored for business reference and other uses both in the present and the future hence the need for data management technologies. This remains a very critical and important component of Information Technology from the viewpoint of business and other Information Technology applications. Data is today considered one of the most valuable assets of any firm. In some parlance it is considered "the new crude oil". Being a very resource, its technology for management is also a very critical information technology asset.

Networking and telecommunications technology provides "data, voice, and video connectivity to employees, customers, and suppliers. It includes technology for running a company's internal networks, services from telecommunications/telephone services companies, and technology for running Web sites and linking to other computer systems through the Internet". A key transformational role of Information Technology in business and life generally is the speed of information sharing, communication, and collaboration that it engenders. That is made possible by Networking and telecommunication technology component of Information Technology. In business particularly, speed and accessibility make a great world of difference. Network and Networking is one aspect of information technology that has impacted life and business the most. Through its ability to bridge divides, it helps to save cost, open new markets, and opportunities.

The fact that the world is considered a global village today is due largely to the technology on Network and Networking.

The world's largest and most widely used network is the Internet. The Internet is a global "network of networks" that uses universal standards to connect millions of different networks in over 200 countries around the world. The Internet has created a new "universal" technology platform on which to build new products, services, strategies, and business models. This same technology platform has found different applications internally and externally to almost all firms. Firms today leverage the Internet to coordinate their activities with other firms for making purchases, collaborating on design, implementation, and other aspects of activities within firms. The Internet technology today has become an infrastructural technology that is a business necessity for most firms. In some cases, it is being leveraged for competitive advantage. It is from this internetwork communication that the concept of the "world as a global village" is birthed.

The interconnection between several networks around the world called the Internet will have very limited application but for the service called the "World Wide Web". It is a service provided by the Internet that uses "universally accepted standards for storing, retrieving, formatting, and displaying information in a page format on the Internet. Web pages contain text, graphics, animations, sound, and video and are linked to other Web pages. By clicking on highlighted words or buttons on a Web page, you can link to related pages to find additional information and links to other locations on the Web. The Web can serve as the foundation for new kinds of information systems "(Laudon and Laudon, 1996). There abound business uses for the world Wide Web. An example is UPS's Web-based package tracking system. The technologies provided and owned by the organization and now the Internet form the bases for Information Technology Infrastructure for business. The IT infrastructure provides the foundation, or platform,

on which the firm can build its specific information systems. The World Wide Web today is the biggest content provider globally. It has led to the demise of businesses in as fast as it has also created opportunities for new ones to be born.

The world of Information Technology is fast moving and very fluid. In most cases it is very ambidextrous – seeking always to confer obsolesce on existing technology while creating new opportunity. The future of Information Technology is predicted to be defined by the following emerging disruptive technologies that will revolutionize Information Technology for business and life. Some of the technologies have already begun to significantly impact businesses are.

- Blockchain Technology. This technology has reported challenges and a limited number of large-scale projects to date but certain "characteristics of blockchain and digital assets – such as their capacity to increase trust through transparency of transactions and the establishment of a "single source of truth" – position them for meaningful impact in the long term. Blockchain's characteristic immutability and transparency of transactions as a "single source of truth" could increase trust in the accuracy of data hence applicable use cases such as supply chain optimization, digital currency for central banks and global remittances etc. positions it for impact sooner than later" (WEF, 2021). It can find easy application in electronic Payment business as in many other businesses. In no industry is blockchain positioned for more impact than ePayment and retail banking transaction. As a distributed ledger with the famed characteristic of immutability and transparency, it has easy applicability in these industries. We expect this Information Technology to significantly disrupt existing players significantly in no time.

- Internet of Things and connected devices. This is yet another technology that holds great promise due to its possible applicability to business. It is not a single technology but rather "an architecture of several technologies. The enabling technologies that make up IoT allow information about the world to be processed digitally and then used back in the world" (WEF, 2021). There exist several possible use cases in many industries. "Everything from connected blood sugar monitors in medicine to cold chain verification in logistics to smart streetlights, mobile phone-based contact tracing, can qualify as IoT" (WEF, 2021). With the success of the Internet of information as we have it today, IoT is predicted to push the frontier even further spurning several use cases in life and business as the technology matures.
- Autonomous vehicles, shared mobility, and digitally enabled transport –There is a growing adoption of autonomous vehicles as one of the leading disruptive technologies impacting business and lives. Smart cities of the future will include "advanced network operations management and control systems that utilize field sensors to detect and respond quickly to equipment and infrastructure faults. Vital infrastructure downtimes will be caught using sensors that monitor the health of critical infrastructure, collect data on system functioning, alert operators inside an integrated urban control center to the need for predictive maintenance, and identify potential breakdowns before they occur" (Dia and Javanshour, 2017). One of its uses cases in transport is smart vehicles, trains based of digital and Information Technology foundations of smart cities. Smart vehicles sense "surrounding environments, and slow down or stop without human intervention in emergency situations"

(WEF, 2021). This use as well as IoT represent how information technology aggregation and application spurns other digital technologies and application to different use cases.

- Artificial intelligence - self-learning algorithm serves as a basis for recent AI innovations (Holdren & Smith, 2016) one of the leading disruptive technologies based on Information Technology and Digitization with a major impact in different sectors. Digitization is significantly "changing the working environment, especially in the business sector, showing that the relevance of AI is evident" (Castro & New, 2016). The McKinsey Global Institute expects that "rapid advances in automation and artificial intelligence will have a significant impact on the way we work and our productivity".

These are a few disruptive technologies based on Information Technology with the potential to impact business Information Technology Infrastructure up to the scale of the Internet. Runde and Faulkner (2019) provide some insight into why we have the massively growing field of Information Technology. They opined that at the "heart of Information/Digital technologies is symbol-based computation – bi-strings (0s and 1s) which provides a standard form of symbols to encode input, process, and generates of a wide variety of tasks (Runde and Faulkner, 2019) thereby reducing design specificity of hardware for operationalizing the objectives to be solved the symbol-based computation". It follows that core technology component (microprocessor) do not change and do not have to as a bi-strings computation converts the same component into applicability in different use cases. Technology changes and new, innovative business models have transformed social life and business practices. "Some 2.8 billion people worldwide have smartphones (50 percent of the world's population), and an estimated 1.26 billion use their smartphones for Internet access. More than 1 billion people use tablet computers, about 15 percent

of the global population. In developing and emerging countries, phones and tablets are the primary means of access to the Internet (Pew Research, 2016; eMarketer, 2015). An estimated 2.34 billion people now use social networks, with Facebook accounting for 1.7 billion people alone. Messaging services like WhatsApp, Facebook Messenger, and Twitter collectively have over 2 billion monthly users" (Laudon and Laudon, 2018).

2.7.2 Information Systems

Information System (IS) is defined as "an integrated and cooperating set of software directed information technologies supporting individual, group, organizational, or societal goals" (Watson, 2007). It is concerned with "how technology is appropriated and instantiated in order to enable the realization of Information System that fulfill various stakeholders such as individuals, groups or organizations" (Boell and Cecez-Kecmanovic, 2015; Alter, 2013). There is therefore an emphasis here on capabilities than physical assets. Laudon and Laudon, (1996) define information system (IS) as a "set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making, coordinating, and control in an organization. In addition, information systems help managers and workers analyze problems, visualize complex subjects, and create new products. Information systems contain information about significant people, places, and things within the organization or in the environment surrounding it".

Information refers to data that has been transformed and is a useable form for decision and other useful purposes such as actionable intelligence. Data, in contrast, represents a store of raw facts representing events and activities of business processes within an organization or the physical environment before they have been organized and arranged into a form that people can understand and use.

According to Laudon and Laudon (1996), three activities in an information system produce the information that organizations need to make decisions, control operations, analyze problems, and create new products or services. These activities are “input, processing, and output. Input captures or collects raw data from within the organization or from its external environment. Processing converts this raw input into a meaningful form. Output transfers the processed information to the people who will use it or to the activities for which it will be used. Information systems also require feedback, which is output that is returned to appropriate members of the organization to help them evaluate or correct the input stage” (Laudon and Laudon, 1996). Information system include the broader organization, people, and Information Technology dimensions.

The key Information System dimensions are.

Organization – Although it is generally conceived that Information Technology impact business operations and success, the organization is in fact a critical part of Information System as Information Technology and the Organization are in a two-way relationship of impact on one another. According to Laudon and Laudon (1996) a major voice in this discipline, “the history and culture of business firms affects how the technology is used and how it should be used”. Below is highlight of this bi-directional relationship between organization and Information Technology leading to the organization being considered as part of Information System of a firm. “A business firm is organized as a hierarchy, or a pyramid structure, of rising authority and responsibility. The upper levels of the hierarchy consist of managerial, professional, and technical employees, whereas the lower levels consist of operational personnel. Experts are employed and trained for different business functions, such as sales and marketing, manufacturing and production, finance and accounting, and human resources. Information systems are built by the firm to serve these different

specialties and different levels of the firm" (Laudon and Laudon, 1996). It follows that the structure of the firm defines its' information system.

The organization's specific business processes are one other way the Organization impact Information System. Most organizations' business processes include "formal rules that have been developed over a long time for accomplishing tasks. These rules guide employees in a variety of procedures, from writing an invoice to responding to customer complaints. Some of these business processes have been written down, but others are informal work practices, such as a requirement to return telephone calls from coworkers or customers, that are not formally documented. Information systems automate many business processes. From as basic as how a customer receives credit or how a customer is billed is often determined by an information system that incorporates a set of formal business processes" (Laudon and Laudon, 1996). Yet again the information system of a firm is defined by their business process. This makes for some idiosyncratic deployment of information system leading to opportunity to build competitive advantage on.

Even the culture of an organization is reflected in how its information systems are set. Organizations Information Systems set-up often reflects the Organization's ways of doing things.

People reflect another key dimension of Information Systems. From setting up Organization Information Systems, managing and making use of the output- information for decision, people represent that key variable hence adjudged as one of a key dimensions of Information Technology. Business firms require many kinds of skills and people, including managers as well as rank-and-file employees. While the managers review challenges and opportunities, they allocate people and resources to ensure result delivery under their leadership. One such daily challenge is Technology, which today is to business as oxygen is to human life and existence. People are the only ones capable of business problem solving and converting

information technology into useful business solutions hence people dimension of information systems is very central.

Technology and particularly Information Technology is often used interchangeably with Information Systems even though they are very different. Information technology is one of many tools managers use to cope with change and complexity. It refers to capabilities offered by computer hardware and associated application software and telecommunications for the achievement of business goals and objectives.

Information systems are a foundation for conducting business today. In many industries, survival and even existence is difficult without extensive use of information technology (Peppard and Ward, 2004). Businesses use information systems to achieve "six major objectives: operational excellence; new products, services, and business models; customer/supplier intimacy; improved decision making; competitive advantage; and day-to-day survival" (Laudon and Laudon, 1996).

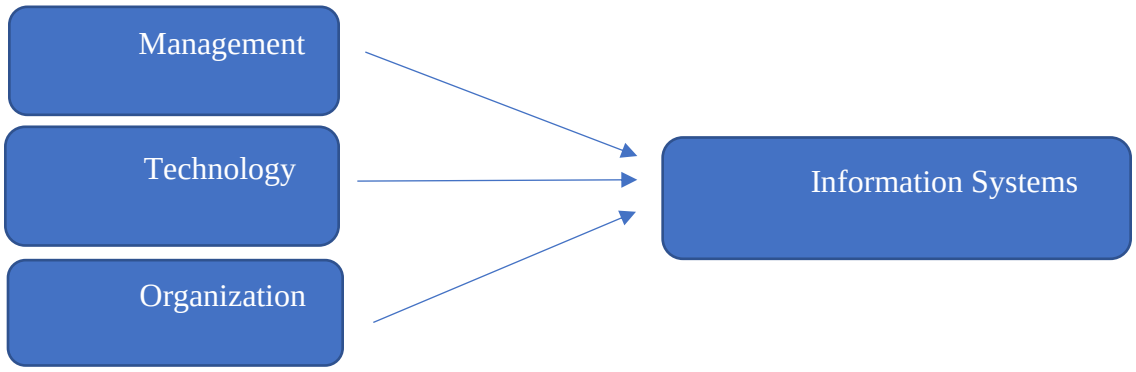


Fig 2.4 Conceptual representation of Information Systems. Adapted from Laudon and Laudon (2018)

Information systems and organizations impact one another. Management influence what Information systems are built for the interests of the business firm but at the same time must be aware of the influence of Information Systems to tap timely into the value of new technologies. The interaction between information technology and organizations is “complex and is influenced by many mediating factors, including the organization’s structure, business processes, politics, culture, surrounding environment, and management decisions” (Laudon and Laudon, 2018).

2.7.3 Organizational Capabilities

According to Spanos and Prastacos (2004), capabilities refer to the “dynamic, nonfinite, and path dependent processes that are not obtainable in the factor market, are difficult to copy, and are accumulated through long term, continuous learning”. This is opposed to other resources that are usually considered finite in supply and diminish in value with use. Some capabilities may either be “supplemental” or “enabling” and as such not sufficient to achieve advantage, but others are valuable, rare, imperfectly imitable, and non-substitutable consequently a good ground for firms that possess them to achieve sustainable competitive advantage (Leonard-Barton, 1995; Spanos and Prastacos, 2004). Grant (1991) assert that resources give rise to capability, but it is capability in turn that ensures competitive advantage more in the very dynamic world of information technology and information technology resources. The thrust of capability-based view is that “dynamic capabilities affect how business organizations adapt and create heterogeneous resource positions in dynamic environments” (Leiblein, 2011). Heterogeneous resource position for a firm in an industry is the basis for sustainable competitive advantage according to Barney, (1991).

There is a significant global shift today toward knowledge economy as opposed to what it was just a few decades ago. According to Dess, et al. (2016), in the US, the workforce in the service sector grew from 76% in 1980 to 86% in 2012. This represents a shift toward knowledge economy

with significant strategic management implications. Strategic management and positioning for competitive advantage is no longer premised on tangible resources (land, equipment, and money) but more on the management of knowledge and knowledge workers to grow organizational capabilities as the de facto organizational resource (Dess, et al., 2016; Sanchez et al., 1996). This shift toward knowledge economy has elevated the need for the understanding of the following constructs: Knowledge and knowledge management.

2.7.3.1 Knowledge

This construct is perceived as elusive by researcher (Neta and Pritchard 2009; Russell 1972). Nonaka and Takeuchi (1995) define knowledge as "justified true belief". Johnson, et al. (2011) define Knowledge as "awareness, consciousness or familiarity gained by experience or learning". Russel (1972) opines that "knowledge consists in reflection, not in impressions, and perception is not knowledge". According to Carnegie Bosch Institute [CBI] (1995), Knowledge refers to the "tacit or explicit understanding of people about relationships among phenomena. It is embodied in routines for the performance of activities, in organizational structures and processes and in embedded beliefs and behavior. Knowledge implies an ability to relate inputs to outputs, to observe regularities in information, to codify, explain and ultimately to predict". It follows therefore that knowledge comes as either tacit or explicit. Tacit Knowledge is knowledge based on experience of individuals and resides in their minds while explicit knowledge is codified knowledge written in books, printed, reprinted, and distributed (Dess, et al., 2016). Within the organization, the interaction between tacit and explicit knowledge usually leads to the development of new knowledge.

2.7.3.2 Knowledge management (KM)

King (2009) defines KM as the "planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed". O'Dell & Grayson, (1998) defined knowledge management as "getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance". Frost (2010) defines knowledge management as the "systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements". According to North and Kumta (2018), knowledge management enables "individuals, teams, and entire organizations to create, share and apply knowledge to achieve their strategic and operational objectives collectively and systematically. It contributes to increasing the efficiency and effectiveness of operations on the one hand and to change the quality of competition (innovation) on the other by developing a learning organization".

Organizations that operate in a knowledge economy must have a deliberate strategy to get the right knowledge to the right people within the organization to succeed. In the VUCA (volatile, uncertain, complex, and ambiguous) environment of today, there is a conflict between "stability" and "flexibility", on the one hand and conflict between "protection" and "exploitation" on the other hand. Knowledge management (KM) "stabilizes the organization's capabilities in a mode of protection and exploitation on the one hand and concurrently supports dynamic capabilities in a mode of exploration and sharing to enhance agility and renewal. In the digital age this is a great organizational capability to manage seeming contradictory processes and practices- being ambidextrous" (North and Kumta, 2018).

Using the knowledge-based view of the firm to anchor this, organization exist because they are able "to establish conditions so that employees with specific knowledge are in a position to create collective knowledge and to implement it to ensure business success" being that individuals have limitation in capacity with regards to acquiring, storage and to processing of knowledge. This limitation is the basis for specialization with individuals. The complexity required with solution delivery is what co-ordination of different specialist occasioned by organization engenders (Grant, 1996). It should be noted that "markets alone are incapable of taking up the role of this coordination because they cannot mobilize tacit knowledge and cannot answer the risk of theft of intellectual property (in case of explicit knowledge) by a potential knowledge buyer" (North and Kumta, 2018).

2.7.3.3 Organization learning (OL)

In the knowledge economy and particularly knowledge intensive industry such as e-payment, a major source of competitive advantage for any firm is the ability to "harness the genius of the people in the organization" (Senge, 1990).

The concept of learning organization and organizational learning (OL) while not the same, are related (Ortenblad, 2004) with organizational learning considered as part of the learning organization. This speaks to the fact that organization and not just individuals can learn, change, and succeed. Learning organization on the other hand is defined as "facilitating the learning of all its members, and continuously transforming itself" (Pedlar et al., 1990). Lessem (1991) defines it as the process of "facilitating participative and innovative development with and between people and institutions commercially, technologically and socially".

Organizational learning (OL) is “the process through which organizations change or modify their mental models, rules, processes or knowledge, maintaining or improving their performance” (Chiva, et.al., 2014). As a process of developing new viewpoints and perspectives, OL is a “source for the development of new organizational knowledge” (Cheng, et.al., 2014; Chiva et al., 2014). With the VUCA (volatile, uncertain, complex, and ambiguous) nature of the business environments today, OL has become center stage (Loermans, 2002). In summary and as put forward by North and Kumta (2018), organizational learning is “the sum of what individuals in organizations learn, or a reflection of the collective ideas, activities, processes, systems, and structures of the organization”. Nonaka (1991) opined that an “organization in a sense is a living organism with a collective sense of identity and a fundamental purpose, which in turn influences each member’s commitment to learning and sharing knowledge.”

OL is particularly critical for organizations operating in unpredictable environments to respond to unforeseen circumstances more quickly than competition (Garvin et al., 2008). With the dynamism of the business environment, the learning organization that ensures organizational members learn, grow, and contribute to organizational agility confers competitive advantage. It must be noted that knowledge acquisition and utilization define the learning organization.

In the e-payment industry in general, knowledge is intensive while information technology asset is ubiquitous and available to all firms. It follows therefore that to seek differentiation and consequently competitive advantage of any kind is only by the possession of organizational information technology capabilities and competencies (Peppard and Ward, 2004). Since all businesses in this industry are digitized, to respond to changing need require capability to configure and re-configure technology solutions. This capacity to respond promptly to changing business need is called organizational agility (Tallon et al., 2019). It is premised on organizational

technological knowledge – capabilities and competencies. Organizations with such competencies enough to quickly respond to needs according to Olsen and Lucas (1994) are said to be "wired as an adaptive enterprise". This is one source of sustainable competitive advantage- organizational knowledge as strategic resource (Penrose, 1980). Organizational learning and consequently knowledge manifest in several ways. One of such ways is technological capabilities and expertise that help with innovation and productivity. According to Drucker "If we apply knowledge to tasks we already know how to do, we call it productivity. If we apply knowledge to tasks that are new and different, we call it innovation. Only knowledge allows us to achieve these two goals." (Cited in DeTienne & Jackson, 2001).

The following processes fosters organizational learning:

2.7.3.3.1 Community of Practice

Community of practice as a construct is based largely on social interaction but viewed through different lenses. One such viewpoint is by Wenger-Trayner (2015) that state that "Communities of practice are formed by people who engage in a process of collective learning in a shared domain of human endeavor". Community practice may not necessarily be intentional. According to this body of work, it has the following attributes.

- Domain – individual members identified by a shared domain of interest within a set of competencies.
- Community -: In the pursuit of domain interest, members engage in joint activities and discussions, help each other, and share information.

- Practice - Members of a community of practice are practitioners in a shared practice (Wenger-Trayner, 2015)

This can be further described as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, et al., 2002). According to Basten and Haamann (2018), community of practice refers to a “groups of individuals who meet voluntarily—due to common interests or areas of expertise—to exchange experiences, identify or develop best practices, and establish new interindividual relations. The groups are built on mutual agreement, loosely connected, and self-managed”.

In the context of organization, it is defined as “a virtual community or informal group sponsored by an organization to facilitate knowledge sharing or learning” (Brown and Duguid, 1991). The proposition here is that organizations should recognize the value of this source of shop floor innovation and foster this informal network which works out how to get work done.

2.7.3.3.2 Action learning

This involves learning by doing and usually non-hierarchical and voluntary but organized around solving a complex problem that the individual finds difficult to solve using traditional methods (Kesby, 2008). In action learning, the “primary goal is to put knowledge instantaneously into action. Action learning differs from traditional training due to its focus on learning how to ask questions instead of finding answers to questions posed by others” (Basten and Haamann, 2018).

Other processes for fostering organizational learning include.

- Training
- Experience factory

- Cross-functional team
- Research and development

Organizational learning enhances the development of difficult-to-replicate (knowledge) assets (resources). The asset must not only be difficult-to-replicate but must be dynamic hence Teece (2009) called this "unique and difficult-to-replicate dynamic capabilities". These capabilities can be harnessed to "continuously create, extend, upgrade, protect, and keep relevant the enterprise's unique asset base". According to Teece (2009), it is the ownership of such capability that confers sustainable competitive advantage. One such capability is the organizational information technology capabilities.

2.7.4 Managing Organizational Knowledge as Strategic Asset

Knowledge has become more central to business than any time in recorded human history. There is a significant global shift today toward knowledge economy as opposed to what it was just a few decades ago. According to Dess, et al. (2016), in the US, the workforce in the service sector grew from 76% in 1980 to 86% in 2012. This represents a shift toward knowledge economy with significant strategic management implications. It is not so much as about land, machinery, and money that one business or individual has or has access to that say them apart. Strategic management and positioning for competitive advantage is no longer premised on tangible resources (land, equipment, and money) but more on the management of knowledge and knowledge workers (Dess, et al., 2016; Sanchez et al., 1996). This also now represents how businesses are valued. There is now therefore a difference between the book value and the market value of firms. This difference has been identified as the intellectual capital of the firm and is today

a major source of competitive advantage (Chen et al., 2005; Edvinsson and Malone, 1997). Maditinos et al. (2011) define Intellectual capital as "the knowledge-based equity of organizations". According to Dess, et al. (2016), it is a "measure of the value of a firm's intangible assets which include reputation, employee loyalty and commitment, customer relationships, company values, brand names, and the experience and skills of employees".

Based on literatures reviewed so far for this research works, researchers are aligned, and the papers are replete with the fact that sustainable competitive advantage is predicated on Organizational Agility (OA) which in turn is underpinned by Organizational Information Technology Capability and general Organizational Learning. It follows that knowledge as basis for learning or gaining capability is a resource that is valuable to an organization's ability to innovate and compete. Knowledge by its nature is intangible therefore exists within the "individual employees, and in a composite sense within the organization" (Bollinger and Smith, 2001). It follows therefore that organizational knowledge is a strategic asset which is a critical determinant of an organization's ability to maintain a sustainable competitive advantage hence should be managed as valuable and strategic resource. Knowledge management within an organization entails a mechanism for capturing and disseminating the knowledge that exists within the organization. It starts with Organizations realizing that Knowledge is a "valuable resource and then develop a mechanism for tapping into the collective intelligence and skills of employees in order to create a greater organizational knowledge base (new knowledge) and for the achievement of set group targets/objectives" (Bollinger and Smith, 2001). Johnson, et al. (2011) define Knowledge as "awareness, consciousness or familiarity gained by experience or learning". According to Carnegie Bosch Institute [CBI] (1995), Knowledge refers to the "tacit or explicit understanding of people about relationships among phenomena. The institute further opines that

knowledge is embodied in routines for the performance of activities, in organizational structures and processes and in embedded beliefs and behavior. Knowledge implies an ability to relate inputs to outputs, to observe regularities in information, to codify, explain and ultimately to predict". Organizational knowledge is comprised of two broad categories: knowledge that is "explicit known as codified knowledge and knowledge that is not codified but exists primarily within the minds of employees - tacit knowledge" (e.g., Fahey and Prusak, 1998; Nonaka and Konna, 1998). The distinction between the two is the difference between "know-what" and "know-how" in which "organizational "know-how" puts "know-what" into action" (Droege and Hoobler, 2003). It is therefore the interplay of explicit and tacit knowledge with other organizational resources that leads to achievement of organizational goals.

Just as junior craftsmen (apprentice) learn the tools of the trade from their masters, businesses gain from the knowledge shared within teams such as from a mentor to mentees, supervisors to co- workers, project team members, and generally from long-tenured employees. While this is a known reality within businesses, there yet exist another reality - the business world is in "the midst of an era characterized by the boundaryless career" (Arthur and Rousseau, 1996) - one where median employment tenure is just four and a half years and a lot less with roles in the specific cases of Technology businesses or Technology functions within businesses. Of all jobs lost to mobility within the labor market, new job creation accounts for only one tenth of all career moves. Most moves are across the street to competition.

Laberre (1988) captured this reality and its implications very succinctly- "I know, I cannot stop people from walking out the door – but how do I stop them from taking their knowledge with them". This remains the critical question to answer if sustainable competitive advantage is to be

built on any resource that is knowledge dependent. In our current knowledge economy, knowledge is, however, everything.

If knowledge is valuable, then it must be managed. Whatever is to be managed must be fully understood and measured (full boundary condition defined). Knowledge therefore must be sufficiently defined such that we know what it is and what it is not. The how of managing knowledge must also be known. King (2009) defines knowledge management (KM) as the "planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed". O'Dell & Grayson, (1998) defined knowledge management as "getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance". Frost (2010) defines knowledge management as the "systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements". According to North and Kumta (2018), knowledge management enables "individuals, teams, and entire organizations to create, share and apply knowledge to achieve their strategic and operational objectives collectively and systematically. It contributes to increasing the efficiency and effectiveness of operations on the one hand and to changing the quality of competition (innovation) on the other by developing learning.

It must be noted that the knowledge to be managed for organizational competitiveness is not codified knowledge. Codified knowledge is not so much impacted by labor mobility. What is at risk is in the very fluid and relentlessly changing business environment today is tacit knowledge. Zack (1999) describes tacit knowledge as "subconsciously understood and applied, difficult to articulate, developed from direct experience, and usually shared through highly interactive

conversation, storytelling, and shared experience". It follows therefore, that tacit knowledge is embedded in the psyche and intuition of individuals (Brown and Duguid, 1998; Grant, 1996) and thereby not readily articulated and hence resists codification (Baumard, 1999). The foregoing explains why tacit knowledge is more easily lost through employee turnover. According to Droege and Hoobler, (2003), Tacit knowledge is the "information about work processes and products that individuals hold above and beyond what the organization has documented. These are the "tricks of the trade" that promote smooth organizational functioning, overall know-how, and competitive advantage".

The greater the measure of organizational tacit knowledge required in the maintenance of its operation and creation of new knowledge, the greater the loss to the organization with regards to employee turnover. In technology dependent businesses like e-Payment, the spectrum is even wider as it extends from specific knowledge of business processes (underpinned by technology) to the technology know-hows itself. It is the combinations of all these that allow for agility of the organization by reconfiguration of the technology to fend of threat or take advantage of opportunity when they show up.

Reviewing tacit knowledge as an organizational resource from the lens of resource-based view as a basis for sustained competitive advantage (Barney, 1991), it is found to fit perfectly because it satisfies the VRIN test - it is difficult to imitate, it is rare and possesses value if firms can leverage it to improve competencies, capabilities processes, and products. Finally, it is difficult to find substitutes for the "knowhow" that flows out of an individual's tacit knowledge. Reviewed against the two key assumptions underlying the basis of sustainable competitive advantage-heterogeneity (idiosyncratic to the firm) of resource distribution and the "stickiness (resources cannot be easily transferred across firm boundaries without cost (Barney, 1991) of firm resources"

(Szulanski, 1996), tacit knowledge satisfies both. The assertion above is true because Tacit knowledge is a unique resource developed in the intellect, skills, and experience of a firm's human resources. Building on the framework first espoused by Wernerfelt (1984) and extended by Barney (1991), the fact that human resources and associated skills now plays a part in sustainable competitive advantage is congruent with the concept of the knowledge-based view of the firm (e.g., Grant, 1996). The knowledge-based view, as an out- growth of the resource-based view, sees "firm-specific knowledge as a unique and valuable resource that is difficult to imitate and substitute hence makes it match with meeting Barney's (1991) requirements for competitive advantage sustainability" (Droege and Hoobler, 2003). Codified knowledge on the other hand do not provide the same advantage as it can be easily copied hence does not lend itself to sustainability of competitive advantage. Tacit knowledge fits into the knowledge-based view of the firm framework by "originating from intellectual and human capital and providing the attributes necessary to be inimitable, rare, valuable, and non-substitutable" (Droege and Hoobler, 2003). The knowledge-based view positions knowledge as a firm's primary resource (Floyd and Wooldridge, 2000), but because it is stored largely in the minds of the individuals who possess them, it poses the big disadvantage that employee turnover can decrease a firm's tacit knowledge base.

2.7.4.1 Social Structure as enabler of knowledge diffusion

Social structures which refer to the "pattern of relationships within a firm" (Uzzi, 1997), plays a very central role in knowledge creation (Nonaka, 1994). The firm by itself is viewed as a social community within which factors of production are transformed into goods and services through knowledge (know-how) interplay with other resources and factors of production. One way to ensure value-creation continues is by diffusion of tacit knowledge within a company's social

structure. Tacit knowledge is thereby given a degree of protection against loss from employee turnover by virtue of organizational learning through the diffusion process.

Organizational learning is found to have a “parallel with relational linkages in social structures” (Fisher and White, 2000). A firm’s learning capacity is partially dependent on socially embedded relationships. The more socially embedded a social structure is, the more the potential for organizational learning. Capelli, (2000) identified “intrafirm social ties as a reason employees remain with a company and loyalty to the work group is often stronger than loyalty to the employer”. As relationships become “embedded in social structures, trust develops (Leana and Van Buren, 1999) leading to the promotion of norms of reciprocity” (Nahapiet and Ghoshal, 1998). Reciprocal norms, together with interpersonal trust, “create conditions that enhance knowledge sharing. Because the sharing of tacit knowledge requires high levels of individual interaction through reciprocal exchange relationships, it is advantageous that individual relationships be strongly embedded within a firm's social structure” (Droege and Hoobler, 2003). The foregoing suggests that individuals are more likely to trust and consequently open their reservoir of knowledge in any group interaction when they recognize they are within their social networks. Recognizing, promoting, or enhancing, the “relational characteristics of a firm's social structure can lessen tacit knowledge loss from employee turnover” (Droege and Hoobler, 2003). One way to promote this within firm is through creating or promoting community of practices – which is described as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, et al., 2002). According to Basten and Haamann (2018), community of practice refers to a “groups of individuals who meet voluntarily—due to common interests or areas of expertise—to exchange experiences, identify or develop best practices, and establish new interindividual

relations. The groups are built on mutual agreement, loosely connected, and self-managed". Organizational learning is a must if tacit knowledge is to be preserved. Social embeddedness is however the lubricant in that process. Encouraging ways and means to promote growth of relationship within social networks must be taken from both a deliberate and strategic standpoint by any firm that chooses to compete on knowledge and knowledge derivatives.

While it may be impracticable to preserve tacit knowledge in its entirety, it is however, a worthwhile goal to preserve as much tacit knowledge as possible during key employees' time with a firm by embedding tacit knowledge in others via social structures as a way for firms to retain valuable resources (Bierly an Chakrabarti, 1996). Social structures provide the fabric for tacit knowledge diffusion. Diffusion is "a gradual process of dissemination" (Szulanski, 1996: 28) through social interaction in a process referred to as implicit learning- knowledge becomes "embedded within the skills, abilities, and intuition of those involved" (Zack, 1999).

Tacit knowledge diffusion is made possible through the following characteristic of any social structure – collaboration, interaction, and access to tacit knowledge.

Knowledge exchange is made possible through social interaction (Tsai and Ghoshal, 1998) hence tacit knowledge is shared with others through "highly interactive conversation" (Zack, 1999: 46). Interaction among employee remains the channel for diffusion of embedded tacit knowledge. The interaction here must not just be superficial, and such do engender any knowledge transfer. This suggests the concept of density in relation to the interaction. Density in this context refers to "the ratio of the number of links to the number of possible links among employees" (Brass, 1995). Social interaction that is meaningful in this context but be both dense and substantive- about an area of common interest in relation to organizational objective.

Beyond interaction among employees, collaboration among employees has transformational effects (Powell, 1998). Collaboration brings organizational members together around common objective such as to solve a problem, work on a project, develop new or improve an existing product (Powell, 1998). Collaboration by its nature intensifies interaction thereby increasing the odds that knowledge residing in an individual's mind will be expressed to others (Zack, 1999: 46). Where collaborating employees do not verbalize their knowledge, the expression of tacit knowledge (know-how) is such that other collaborating colleagues can understand and learn. It follows therefore that collaboration provides depth and focus to employee interactions needed to diffuse tacit knowledge (Droege and Hoobler, 2003).

To properly manage organizational tacit knowledge, social interaction and collaboration should not be left to natural evolution within the firm but rather there must be a deliberate action to engender it among organizational members.

2.7.5 Organizational Information Systems Capabilities

In the words of North and Kumta (2018), the move towards an "increasingly digital world is rapidly changing the ways in which people and organization creates uses & shares data, information and knowledge". Digital transformation as defined by Bounfour (2016), is "the change associated with the application of digital technology in all aspects of human society". A key organizational capability in the digital, knowledge-based and technology dependent economy of today and particularly in e-payment, is the Information Technology (IT) capability. Ertugan and Awamleh (2021) defined IT capability as the "abilities of the organization to implement a set of common platforms (e.g., physical components, networks, database, software, and social skills) and the management of the same". This agrees with Lu & Ramamurthy (2011) that define IT capability

as implementation of IT assets (platforms) and the extent the organization is good at managing these platforms. IT capabilities involve the following three core components.

- **IT infrastructure** which represents the organization's ability to deploy hardware platforms and related software systems (Lu & Ramamurthy, 2006).
- **IT business spanning** demonstrates an organization's ability to support business goals effectively through IT resources (Lu & Ramamurthy, 2006).
- **IT proactive stance** focuses on how the organization proactively uses existing resources of IT to create new business opportunities also through redeployment and calibrations (Chu et al., 2019)

It follows therefore IT capabilities involves the capacity to align IT with business. Dynamic IT/Business alignment is the results of good organizational IT/IS capability. Organizational Capability in general and Organizational IT/IS capability specifically depends on a firm's Intellectual capital (firm's intangible asset) which is a major basis for competitive advantage in today knowledge-based economy (Chen et al., 2005; Edvinsson and Malone, 1997). Maditinos et al. (2011) define Intellectual capital as "the knowledge-based equity of organizations". According to Dess, et al. (2016), it is a "measure of the value of a firm's intangible assets which include reputation, employee loyalty and commitment, customer relationships, company values, brand names, and the experience and skills of employees".

The growing popularity of Intellectual capital (firm's intangible asset) as a measure of firm's competitive advantage cements the shift toward knowledge-based economy driven more by organization knowledge among other intangible attributes of the firm. Nowadays, the source of

"economic value for any firm is the creation of Intellectual capital and no longer the production of material goods" (Chen et al., 2005).

In a technology dependent industry such as e-payment, differentiation therefore can only be based on such intangible asset as the intellectual capital related to technology management - information technology capabilities. This is a critical organization resource in agreement with the assertion by Wernerfelt (1984), classifying "organizational capabilities" as organizational resource. This agrees with Grant (1991) assertion that resources give rise to capability, but it is capability in turn that ensures competitive advantage more in the very dynamic world of information technology and information technology resources. The thrust therefore of capability-based view is that "dynamic capabilities affect how business organizations adapt and create heterogeneous resource positions in dynamic environments" (Leiblein, 2011). Heterogeneous resource position for a firm in an industry is the basis for sustainable competitive advantage according to Barney, (1991).

2.8 Organizational agility

The global business environment has changed significantly since the turn of the 21st century. With globalization and growth in communication technology and the Internet, the world of business is significantly changed. There is also the changing business need of customers/clients, hyper-competition among firms, government policy changes, rising crime rate (physical and cyber) among other factors all fueling a growing volatility, uncertainty, complexity, and ambiguity of the business environment. According to Felipe et al. (2016), the business environment is more "globally interconnected, more technologically complex and more politically challenged". These conditions have led to hypercompetitive markets involving major threats to the survival of companies. To respond to this environment, organizations need to be able to quickly adjust their

capabilities and management processes so that they are effective over time. There is an increasing recognition that "agility is an imperative for success of contemporary firms as they face intense rivalry, globalization, and time-to-market pressures "(Brown and Eisenhardt 1997; Goldman et al. 1995; Sambamurthy et al. 2007). Giachetti (2003), Goldsby and Stank (2000) recognize that there exists a link between agility and firm competitiveness. Prahalad (2009) opine that in today's volatile business environments, firms must be "agile to be able to handle extreme changes, survive unprecedented threats, and capitalize on emerging business opportunities".

The foregoing establishes that the business environment is fluid and very challenging and survival and competitiveness of firms within industries depend on their ability to sense changes and respond as appropriate. This is what is referred to as organizational agility. Lu & Ramamurthy (2011) define organizational agility as the "firm's ability to cope with rapid, relentless, and uncertain changes and thrive in a competitive environment of continually and unpredictably changing opportunities". Cai et al. (2017) define Organizational agility as "a firm's ability to sense and respond to market changes". Organizational agility is the ability of organizations to "sense changes in the environment and respond quickly, efficiently, and cost-effectively to improve competitive advantages" (Amos 1998; Chen 2012). Organizational agility stretches the concept of organizational flexibility to include speedily sensing and responding to opportunities and threats in the business environment, solve problems, and change the firm's resource base (Mao et al., 2015; Eisenhardt & Martin, 2000; Winby & Worley, 2014). Razmi & Ghasemi (2015) opine that organizational agility is a "cultivated dynamic capability and aids the organization is making timely, efficient, rapid, and continual change when changing circumstances require it".

According to Lu & Ramamurthy (2011) organizational agility manifest in two dimensions.

- **Market capitalizing agility** which refers to "firm's ability to quickly respond to and capitalize on changes through continuously monitoring and quickly improving product/service to address customers' needs". It entails being "change-embracing, and growth-oriented entrepreneurial mind set about strategic direction, decision making, and judgment in uncertain conditions" (Sambamurthy et al., 2007).
- **Operational adjustment agility** which refers to firm's ability to quickly make changes to its internal processes to "cope with market or demand changes" (Dove 2001; Sambamurthy et al., 2007). This agility type is "primarily directed at operational activities and is reactive in nature" (Volberda, 1997).

We have established that competition determines the success or failures of firms hence the continual search for advantage of one firm over the other within an industry. This struggle between industry participants "determines the appropriateness of a firm's activities that can contribute to its performance, such as innovations, technology assets /capabilities, solution to launch etc." (Porter, 1985). Being that this search for advantage is within the context of competition, speed to sense the need and implement the required change to stay ahead is what ensures an organization stays ahead within an industry. This is what agility engenders. Organizational agility therefore is the major driver of competitive advantage. It implies that agility refers to the capacity to use the available resources in a "sustainable manner to meet the changes in a suitable time and in a flexible way that the organization can run it" (Razmi & Ghasemi, 2015). It follows therefore that agile organizations have the resources, skills and knowledge, organizational systems and architecture, and necessary experience to execute existing strategies as well as the ability to design and support potentially new ones in a timely fashion. One resources that firms turn to very easily in the pursuit

of agility is Information Technology. Firms invest in information technology to pursue "fast, innovative initiatives in response to a constantly unfolding marketplace" (Lu & Ramamurthy, 2011). Information Systems and management literatures is almost unanimous on the point that unlike the 1990s where proprietary information technology confers an advantage on firms that own them within any industry, the 2000s is characterized by "standardized and homogeneous information technology that has significantly lowered entry barriers" (Chae et. al., 2014). Information Technology assets besides being ubiquitous and homogenous could also introduce rigidity in some sense when the capability to recalibrate them is not available to a firm. According to Lu & Ramamurthy (2011), "the systems themselves do not automatically confer or enhance agility and can sometimes actually impede agility". Infrastructural technology is now a general business infrastructure and does not confer any advantage on firm within an industry (Chi and Sun, 2015; Carr, 2001). If the resource conversation is extended just slightly from information technology assets to include the management of the same, it becomes information systems and hence, different from other infrastructural technology but rather with the ability to spurn proprietary technology. It follows therefore that what ensures organizational agility from the point of view of Information Technology resources is Organizational IT knowledge and IT capabilities not the physical Information Technology assets. This is more so as organizational agility focuses on "routine maneuvering to provide fast response to changes" (Volberda 1997).

2.8.1 The Link between Information Systems Capability and Organizational Agility

Information Systems capability manifest in three dimensions.

2.8.1.1 Information Technology (IT) Infrastructure capability. This refers to "firm's ability to deploy a set of shareable platforms. It captures the extent to which the firm is good at managing data management services and architectures, network communication services, and

application portfolio and services" (Broadbent et al. (1999); Ross et al. (1996); Weill et al. (2002) and Bharadwaj, (2000)). This does not suggest just the possession of the information technology asset but rather the ability to deploy and re-deploy as required.

2.8.1.2 Information Technology business spanning capability. This refers to the "ability of management to envision and exploit Information Technology resources to support and enhance business objectives". This is a very critical capability in today world particularly in an industry such as e-Payment that rely completely on Information Technology for all its products and services (Mata et al., (1995); Ross et al., (1996); Wade and Hulland, (2004) and Bharadwaj, (2000)). This capability highlights the extent to which management understands the value of Information Technology investment -the understanding of the economics of Information Systems leading to clear Information Technology strategic vision that integrates business and Information Technology strategic planning (Lu & Ramamurthy, 2011).

2.8.1.3 Information Technology proactive stance. Information Technology (IT) opportunities in today world are business opportunities as Information Technology challenge are business challenges. Information Technology proactive stance refers to "firm's ability to proactively search for ways to embrace new Information Technology innovations or exploit existing Information Technology resources/opportunities to address and create business opportunities" (Fichman, (2004); Galliers, (2007); Weill et al., (2002); Agarwal and Sambamurthy, (2002)). Information Technology proactive stance measures the extent to which the firm strives to be "current with Information Technology innovations, continues to experiment with new Information Technology as necessary, constantly seeks new ways to enhance its effectiveness of Information Technology use, and fosters a climate that is supportive of trying out new ways of using Information Technology "(e.g., Agarwal and Sambamurthy 2002; Fichman 2004; Galliers

2007; Weill et al. 2002). This is particularly important because of the disruptive technologies that emerge constantly leading to the demise of business that have not contemplated their impact.

These three information systems capability dimensions may enable both forms of agility-market capitalizing and operational adjustment agility (Lu & Ramamurthy, 2011). Specifically speaking, and in industry such as the e-Payment industry, organizational agility (market capitalizing and operational agility) can be enabled by Information Systems Capability (ISC) through globally integrated systems that allow for organization to stay at the cutting edge of relentless change leading to disruptions in demand and supply. Timely information gathered through these systems allows for internal process adjustments. There is also the need for IT infrastructure services such as "firm-wide applications, databases, and common systems that are essential to quickly implement extensive, innovative, and radical process changes and best support demand-side initiatives" instead on silos that do not lend themselves to integrations (Weill et al. 2002). "An integrated infrastructure allows the firm to quickly implement new IT-enabled offerings or initiatives" (Lu & Ramamurthy, 2011). Beside integrated systems, management of human capital with information systems capability to intervene in effecting required changes when required is at the heart of agility as far as Information Technology Infrastructure capability is concerned.

Reviewing organizational agility from the point of view of Business Information Technology spanning capability entails "partnership and synergy between Information Technology and business managers which usually leads to effective Information Technology–business joint decision making, greater buy-in and consequently more strategic applications and better implementation" (Weill and Ross 2004). Chan and Reich (2007) opined that alignment between business and Information Technology should happen at the different levels within the

organization. Tarafdar and Qrunfleh (2009) along the same line proposed that alignment should happen at both tactical and operation levels beside the strategic level to engender proper resource allocation choices, project prioritization, technology selections etc. Henderson and Venkatraman (1993) strategic alignment model for business/Information Technology alignment, distilled strategic alignment into two broad categorizations.

- Strategic fit - Strategic fit is an "alignment decision taken with clear cognizance of external domain of both business and Information Technology and the corresponding internal domains" (Ejembi, 2017).
- Functional integration - These deals with the linkage between "organizational infrastructure and processes and Information systems infrastructure and processes hence his is concerned with internal domain of business and Information Technology" (Ejembi, 2017). It speaks also to how business strategy shapes Information Technology strategy and vice-versa.

Ross et al., (1996) opined that close interaction and collaboration between Information Technology and business engenders mutual respect and trust over time that encourages sharing and exchange of knowledge between Information Technology and line managers which consequently shapes organizational agility. The synergy between Information Technology and business activities also ensures "speedy, effective, and efficient translation of innovative responses that usually require radical changes to and reengineering of business processes and information systems" (Lu & Ramamurthy, 2011).

A proactive Information Technology stance makes for continual learning and renewal which "leads to an ability to quickly reconfigure processes in response to changes" (Haeckel,

1999). This positions Information Technology at the center stage and as a proactive partner in the innovation process which makes dynamic reconfiguring of systems/processes and resources possible on the fly. The result is a continuous metamorphosis of the organization as the business environment changes (Agarwal and Sambamurthy, 2002). The firm with a proactive Information Technology stance can "mindfully manage the adoption, assimilation, and implementation of a new Information Technology innovation and, thus, avoid falling into lock-in technology rigidity" by the timely identification of appropriate opportunities to reconfigure and reuse existing Information Technology resources to enable rapid execution of innovation and or change (Swanson and Ramiller, 2004).

It follows from the foregoing that Information Systems Capability do have a positive effect on organizational agility. The firm with the superior Information Systems capability is therefore better positioned to properly direct and leverage its "Information Technology investment to build Information Technology-based supporting, monitoring, or learning systems and the digital platform for market capitalizing agility and operational adjustment agility" (Lu & Ramamurthy, 2011).

The relationship can be conceptually represented as follows.

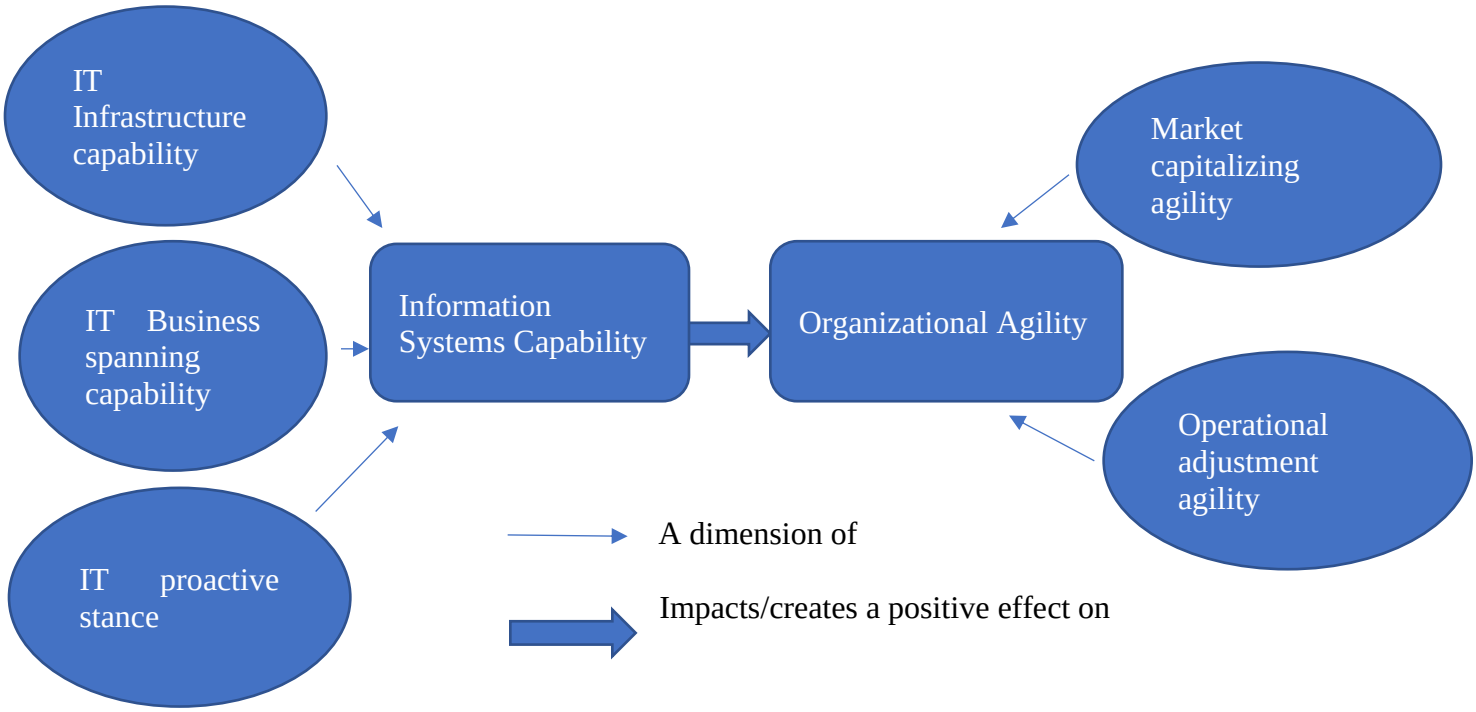


Fig 2.5. A conceptual relationship model based on Information Systems Capability and Organizational Agility based on Lu & Ramamurthy (2011).

According to Spanos and Prastacos (2004), capabilities refer to the "dynamic, nonfinite, and path dependent processes that are not obtainable in the marketplace, are difficult to copy, and are accumulated through long term, continuous learning". This is opposed to other resources that are usually considered finite in supply and diminish in value with use. Information Systems Capability is one such capability that is valuable, rare, imperfectly imitable, and non-substitutable consequently a good ground for firms that possess them to achieve sustainable competitive advantage (Leonard-Barton, 1995; Spanos and Prastacos, 2004).

2.8.2 Organizational Learning (OL) and Organizational Agility (OA)

Business and Information Systems literature is replete with the potentials of Organizational Information Technology in enhancing Organizational agility in our current VUCA environment. Enhancing agility by information Technology as organizational resource is more about dynamic Information Technology capabilities than just the Information Technology assets (artifacts).

Organizational agility is the ability of the organization to sense the environment and respond accordingly. It is not necessarily organizational change which involves leaders driving change top-down. Organizational agility (OA) is a dynamic capability that operates at an organizational wide level to enable the firm to cope in uncertain environments. It is a critical capability that allows firms to detect and seize competitive opportunities to generate innovations in addition to responding to threats (Cetindamar, et al., 2021). Organizational agility stretches the concept of organizational flexibility to include speedily sensing and responding to opportunities and threats in the business environment, solve problems, and change the firm's resource base (Mao et al., 2015; Eisenhardt & Martin, 2000; Winby & Worley, 2014). Razmi & Ghasemi (2015) opine that organizational agility is a "cultivated dynamic capability and aids the organization is making timely, efficient, rapid, and continual change when changing circumstances require it". According to Cepeda and Vera (2007), Cameron and Quinn (2011), Organizational Agility (OA) "requires a shift from managerial control mindsets to "managing by all" leading to the need for managers to care about their employees enough to empower them to build firm-level capabilities to deliver agile capacity to the organization". The required shift in mindset is not accidental. It requires deliberate action on the part of managers to embrace organizational level learning culture. According to Lin, et al. (2019), organizational learning culture refers to "a collection of organizational conventions, values, and practices that encourage employees in an organization to develop critical skills,

knowledge, and competence through continuous learning processes". It helps to shape "managerial stance and organizational response" (Cetindamar, et al., 2021).

Organizational agility being a dynamic capability has learning at its core. It is a performance-oriented process by which employee competences and capacities are changed. Firms use the process of organizational learning to create and or extend their knowledge through changes in people and thereby improve organizational competences. Learning helps in organizational problem/opportunity identification and adaptation to market conditions. Leaders/Managers therefore need to build a motivational environment where human capital "selects, acquires, transforms, and utilizes knowledge for innovative purposes. Organizational knowledge is initiated in ideas formed in individuals' minds and developed through communities of interaction. These interactions are highly influenced by embedded culture in an organization that fosters creativity and flexibility among employees" (Sims et al., 2009). It follows therefore that when a learning culture is encouraged in an organization, it promotes shared norms that in turn encourage strategic alignment that generates agility and innovation. This is fostered through sharing, acquisition, and exchange of ideas both internally and externally (Cetindamar, et al., 2021).

The more a company promotes a learning culture, the more such company is positioned to "perceive market changes and learn from experience" (March,1991). With improvement in the learning culture of a firm, it is observed that "employees are motivated to acquire, distribute, integrate, create, and transfer information and knowledge" (Swift and Hwang, 2013). It follows therefore that organizational learning culture "positively influences organizational innovation, success, and sustainability" (Lin, 2019). This is therefore an impetus for organizational leaders to ensure they are deliberate about building a learning culture in their organizations. Organizations that encourage a positive "learning culture, promotes knowledge sharing which in turn improves

productive job output" (Swift and Hwang, 2013) but more importantly "shared norms and cultures are strongly enforced among such organizational members leading to greater strategic alignment and goal attainment and generation of innovations and agility" (Zollo and Winter, 2002).

Organizational learning and consequently organizational agility in a technology dependent business or environment manifest in what is referred to as proactive Information Technology stance. It makes for continual learning and renewal which "leads to an ability to quickly reconfigure processes in response to changes" (Haeckel, 1999). This positions Information Technology (IT) at the center stage and as a proactive partner in the innovation process which makes dynamic reconfiguring of systems/processes and resources possible on the fly. The result is a continuous metamorphosis of the organization as the business environment changes (Agarwal and Sambamurthy, 2002). Organizational learning lends itself positively to organizational agility and consequently sustainable competitive advantage for the firm regardless of the type but more readily in a technology dependent one.

2.8.3 Organizational Agility and Sustainable Competitive Advantage

Sustainable competitive advantage as a measure of a firm's continuing condition of superior market advantage to other firms in its industry can be represented in the following three dimensions which are financial performance, non-financial performance (competitive position), and impediments to imitation (barrier to erosion) (Sambamurthy, et al., 2007).

A superior ability of a firm within an industry to create value for customers results in superior financial performance (Day and Wensley, 1988; Weerawardena, 2003). Organizational agility as "organizational dynamic capabilities allow firms to respond to market opportunities through radical and incremental movements" (Sambamurthy, et al., 2007). A firm with high market

capitalizing agility may increase its revenue sources by entering new market segments or identify new customer needs within existing market segment (Sabherwal and Chan 2001). With a high operational adjustment agility, a firm may "reduce its costs and ineffective business practices by continuously adjusting its business processes toward the industry best practices" (Eisenhardt and Brown 1999; Rindova and Kotha 2001). Either or both types of organizational agility when exhibited by a firm within an industry allows for superior financial outcomes, especially profitability, relative to their competitors.

Organizational agility can also spurn other valuable non-financial performance indicators leading to competitive positioning. One such non-financial performance is customer satisfaction (Chan et al. 1997), service quality (Ray et al. 2004), market share (Weerawardena, 2003) etc. which are collectively referred to as measures of competitive market position (Weerawardena, 2003). Organizational agility once again ensures these by "enriching customer value by leveraging capabilities and integrating internal processes through rapid adaptation to changes in customers' needs" (Sambamurthy, et al., 2007). This establishes that Organizational agility does contribute to competitive positioning by ensuring the creation of non-financial business value.

Competitive advantage is said to be sustainable when such "advantage resist erosion by activity of competitors" (Dehning and Stratopoulos 2003; Porter 1985; Reed and DeFillippi 1990). It follows therefore that achievement of sustainable competitive advantage involves the creation of some barriers that make the "competitors' imitation of a firm's strategy difficult" (Reed and DeFillippi 1990). Firms are required to keep seeking new strategic initiatives successive to the one that provided the initial competitive advantage to ensure it resists barrier to erosion of competitive advantage. Since organizational agility is the capability to make a firm continuously and flexibly respond to its environmental dynamics, either by being agile operationally or market capitalizing,

a firm build barrier to erosion of a competitive position and/or advantage by being continuously adaptable. The key is to remain adaptive - being wired as an adaptive enterprise. Before competition erodes an advantage, it is further changed (Sambamurthy, et al., 2007). Market capitalizing type agility fences an organization strategy from erosion more than operational adjustment agility because a "firm's innovative movements derived by its entrepreneurial agility can provide first-mover advantage to the firm. Such a first-mover advantage makes a pioneering firm enjoy an initial period of monopoly that is not available to imitator firms "(Lieberman and Montgomery 1988). A key feature of innovation is ambiguity. Innovation therefore further makes competitor imitation difficult hence market capitalizing agility that lends itself to innovation builds better barriers to erosion of competitive advantage than operational adjustment agility (Reed and DeFillippi, 1990).

The foregoing suggests that for competitive advantage for any firm to be sustainable, such firm must be very agile. Organizational agility therefore is the basis for assurance of competitive advantage for a firm

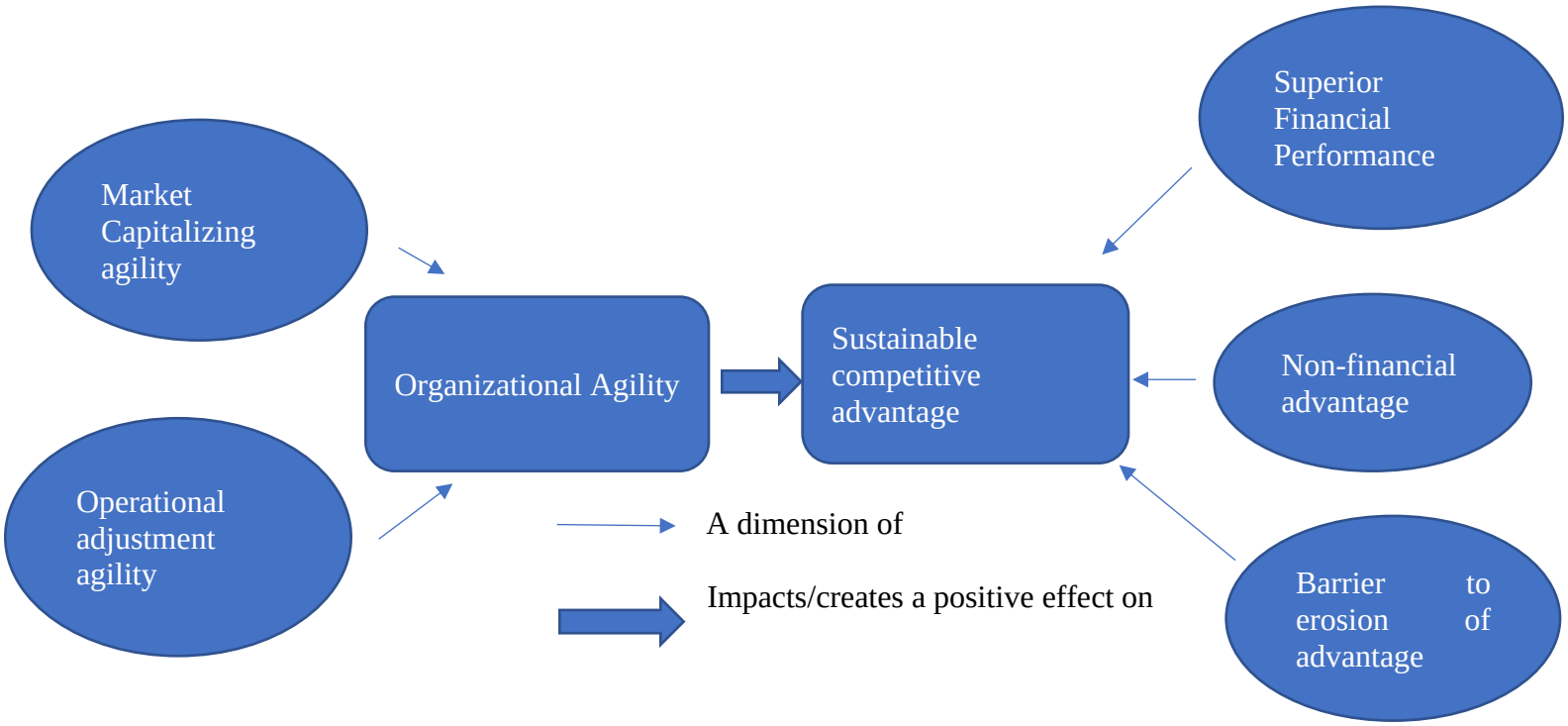


Fig 2.6 Conceptual relationship model of Organizational agility and Sustainable Competitive advantage based on Lu & Ramamurthy (2011).

2.9 Summary of important body of literatures

This research seeks to establish if there exist any link between Information Systems Capability and Sustainable Competitive advantage for firms that use and/or depend on Information Technology using the case study of the Nigeria e-payment industry. This industry is a knowledge intensive and completely information technology (IT) dependent one. In e-payment as it is with industry such as telecommunication, e-Commerce, and retail financial services, they owe their existence to Information Technology (IT). This is the same for Nigeria as it is everywhere else in the world. The problem that is observed across industry practitioners and researchers alike is the mistaken assumption that investment in Information Technology assets by itself confers any

advantage on any firm over the other in today's business environment generally. The race for such investment is on and hot. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC 2016; Laudon and Laudon, 2018).

For this research, a rigorous review of literatures in Business and Information Systems Management with focus on the impact of Information Systems Capabilities on business performance and generation of rent was undertaken. The reviews were kept to peer reviewed literatures. The reviewed literatures were published works of not more than five (5) years except in cases of authorities in the field whose insights we cannot afford to keep out. The review was to establish the level of research and findings by those available particularly in this age of ubiquity of information technology, dynamic business/technology environment and whether businesses can glean any advantage through investment in Technology and its management. Below is a summary of some of the reviewed literatures and the finding of the researchers.

References	Methodology	IS Capabilities				Finding about IS Capabilities and Sustainable competitive advantage
Hartani et al. (2021)	Survey	IT implementation success and leadership	E			IT implementation success and leadership have a direct and a significant impact on strategic alignment (business/IT alignment) (Haseeb et al., 2019). The study also discovered a significant impact of strategic alignment on the sustainable competitive advantage of firms
Gupta et al. (2018)	Theoretical	IT management			M	The study asserts that the creation of VRIN status for firms IT enabled resources or competencies needs a rethinking because the growing ubiquity/ proliferation of ground-breaking technologies (e.g., artificial intelligence, blockchain, crowdsourcing, and the Internet of Things) may erode the sustainability of existing competitive advantages held or can be spawned by firms based on Information Systems
Aydiner et al. (2019)	Survey	Infrastructure, human resource, and administrative capabilities		D		The findings of the study is that there is no empirical support for a direct relationship between Information Systems capabilities and Firm Performance under the model where decision making performance and business process performance mediates between Information Systems capabilities and sustained competitive advantage.
Piccoli and Ives (2005)	Archival	IT-dependent strategic initiative	E			Information Technology does not contribute to firm performance in isolation, but contributes as part of "an activity system that fosters the creation and appropriation of economic value" (Piccoli and Ives, 2005)
Kipyegon et al. (2018).	Conceptual and survey	IS planning, Systems Development, IS support maturity	E			The study found a significant relationship between Information Systems capabilities and firm performance – a measure of competitive advantage.

Stroumpoulis et al (2021)	conceptual theoretical model	Investment in Information systems – Information Technology assets, people and competences			M	The study found that sustainable competitive advantage was not gained, as the information systems used, and the sustainability practices developed were and are easily adopted by competitors. This is more so since the case study is of supply chain management and the technology in this case is ubiquitous and similar hence value from IT is not rare and therefore easy to imitate or copy
Zeng et al. (2020).	Systematic literature network analysis	Integrating Information Technology solution and business process - business/IT alignment	E			It was found that where the following IT capabilities are found, firm enjoy sustainable competitive advantage. They are managerial IT Competences, dynamic capabilities (e.g. vision, flexibility), Higher IT capabilities, a synergy between other Organizational resources and IT assets, IT-enabled intangibles etc.
Widodo (2015)	Survey	Business/IT alignment at all levels of the organization	E			The study found that the Organizational IT capabilities that help firms maintain competitive advantage must be dynamic. It should be such that allow organization to respond to business environment turbulence by an organizational capability that allows for quick reconfiguration of IT assets to a state that it supports the changed environment
Ditkaew et al. (2020)	Survey	Knowledge management and Information Systems implementation	E			Implementation of Information systems in functions such as accounting creates competitive advantage for the firm as it improves greatly organizational efficiencies beside data security that comes with machine-to-machine data follow.
Hemmatfar et al. (2010)	Archival	Strategic Information Systems design	E			The study found that if Information Systems design and strategic management are addressed simultaneously, the process will give rise to strategic competitive advantage premised on “information as agent of integration and the enabler of new competitiveness”

Tian et al. (2009)	Survey	IT deployment capabilities			M	The study found that direct relationship between IT capabilities and firm competitive advantage is not supported but found that there exists an indirect relationship in which the relationship is mediated by "strategic IT flexibility and business–IT partnership".

Keys:
E- Enable
D- Disable
M- Mixed

Table 2.1 Summary of literatures relevant to the study

2.9.1 Gaps in literature in relation to research

Literature is replete with the conclusion that Information Technology (IT) enables business automation, efficiency, scale economies, enhanced business performance etc. (Piccoli and Ives, 2005; Kipyegon et al., 2018). This is aligned to the more traditional role of Information Technology which is to automate processes or digitize the enterprise (Lu and Ramamurthy, 2011). According to Laudon and Laudon (2018) "the most common form of IT-enabled organizational change is automation. The first applications of information technology involved assisting employees with performing their tasks more efficiently and effectively". Literature is, however, scant on how Information Systems in this age of ubiquity/proliferation of Information Technology asset can still lead to competitive advantage. In some cases, researchers concluded that no link is found between firm competitive advantage and Information Technology (IT) (Tian et al.,2009; Stroumpoulis et al.,2021; Aydiner et al., 2018; Gupta et al.,2018). In other cases, researcher established a link between firm competitive advantage and Information Technology (IT) but mediated by Business/Information Technology alignment (Tian et al.,2009; Hartani et al., 2021).

While study abound about the link between information Technology and Organizational agility, not much exist with Organizational Agility as mediating between Information Systems capabilities and Sustainable Competitive Advantage. A lot less is found with Organizational knowledge and other dynamic capabilities of the firm as moderating variables. This study seeks to establish that Information Systems in this age of ubiquity can still spawn not just a competitive advantage but a very sustainable one. We established through review of literatures that Information Systems Capability does have a positive effect on organizational agility. The firm with the superior Information Systems capability is better positioned to properly direct and leverage its "IT investment to build IT-based supporting, monitoring, or learning systems and the digital platform for market capitalizing agility and operational adjustment agility" (Lu & Ramamurthy, 2011). Sustainable competitive advantage on the other hand is a measure of a firm's continuing condition of superior market advantage to other firms in its industry which is usually represented in the following three dimensions which are financial performance, non-financial performance (competitive position), and impediments to imitation (barrier to erosion) (Sambamurthy, et al., 2007). Organizational agility as an "organizational dynamic capabilities allow firms to respond to market opportunities through radical and incremental movements" (Sambamurthy, et al., 2007). A firm with this dynamic capability can take advantage of the opportunity to create superior financial and non-financial value. It can also use the same capability to continually innovate as a measure to build barrier around established advantages.

While Organizational Agility allows for easy business/IT alignment, they are not the same construct. Alignment between business and IT implies business and IT working towards a common goal. The original motivation for alignment arose from the need to link IT planning with strategic

business planning (Tarafdar and Qrunfleh, 2009) though alignment goes beyond IT planning. It should happen at all levels of business. It speaks to strategic fit between business and IT strategy and functional integration between Organizational structure and IT Infrastructure and processes (Henderson and Venkatraman, 1993). Organizational agility in contrast speaks to means by which organizations cope with rapid, relentless changes and unpredictable happenings within the business environment (Lu and Ramamurthy, 2011). While business/IT alignment is internally focused, organizational agility is more about the ability of the organization to be more externally orientated so that business can avoid landmines and or seize opportunity in the marketplace. It follows therefore that in the literature where Information Systems and Competitive advantage is mediated by Business/IT alignment, organizational agility construct cannot be considered to have been covered.

2.9.2 Linkage of Research to existing body of Literatures

There is a consensus among researchers that the factors that contribute to organizational success or lead to creation of competitive advantage for any firm include organizational knowledge management (building and managing the intellectual capital of the firm) and the ability to adapt promptly to changing circumstances around the business. Though organizations in different sectors are impacted differently by organizational learning and agility, there exists no disagreement about the impact as being real (Ahmad and Karim, 2019).

The construct - Organizational agility (OA) has received significant attention from researchers. There is broad consensus in the literature that Organizational Agility (OA) is "considered a dynamic capability or a set of capabilities which allow organizations to respond rapidly to change and to realize superior performance in dynamic, turbulent, and competitive

contexts" (Cetindamar, et al., 2021; Mrugalska and Ahmed, 2021; Teece, et al., 2016; Walter, 2021). Walter (2021) defined Organizational Agility as "a learned, permanently available dynamic capability that can be performed to a necessary degree in a quick and efficient fashion, and whenever needed in order to increase business performance in a volatile market environment". This definition highlights that Organizational Learning (OL) is woven into the ability of an organization to be agile and stay so. It is also well established among scholars that knowledge and Organizational Learning are critical to organizational success (Grant, 2015; Hollensbe, et al.,2014). According to Lin, et al. (2019), organizational knowledge management culture refers to "a collection of organizational conventions, values, and practices that encourage employees in an organization to develop critical skills, knowledge, and competence through continuous learning processes". It helps to shape "managerial stance and organizational response" (Cetindamar, et al., 2021).

The crux of this research is a search to establish that sustainable competitive advantage is possible in the current environment characterized by ubiquity of Information Technology with the business environment always in a state of flux (such as the e-payment industry). The research has so far unearthed two key constructs -Organizational knowledge management and Organizational Agility (OA) as both critical to and a result of Organizational Information Systems Capabilities. Consequently, Organizational Information Systems Capabilities in turn can underpin sustainable competitive advantage in the VUCA context of business defined.

Some of the reviewed literature during this research reached similar conclusions also. One such conclusion is from Gupta et al. (2018). There finding assert that the creation of VRIN status for firms' Information Technology enabled resources or competencies needs a rethinking because

the growing ubiquity/ proliferation of ground-breaking technologies (e.g., artificial intelligence, blockchain, crowdsourcing, and the Internet of Things) may erode the sustainability of existing competitive advantages held or can be spawned by firms based on Information Systems. The rethinking here is akin to premising such advantage going forward on dynamic capabilities such as Organizational Agility (OA) that can be underpinned by Information Systems Capabilities. This is also aligned with Widodo (2015) that found that the Organizational Information Technology capabilities that help firms maintain competitive advantage must be dynamic. It should allow organization to respond to business environment's turbulence by an organizational capability that allows for quick reconfiguration of Information Technology assets to a state that it supports the changed environment. These capabilities according to Zeng et al. (2020) are managerial Information Technology Competences, dynamic capabilities (e.g., vision, flexibility), Higher Information Technology capabilities, a synergy between other Organizational resources and Information Technology assets, Information Technology -enabled intangibles etc.

This research is based on finding from the e-Payment industry in Nigeria – an Information Technology dependent Industry to establish how firms within this industry create and sustain competitive advantage being that all have and continue to acquire the same or similar Information Technology solutions.

2.10 Chapter Summary

Following the establishment of the problem statement, the research question, and hypotheses in the previous chapter, in this chapter, the researcher delves in to understand and establish a theoretical and conceptual framework for the study. Three theoretical frameworks- the

resource-based view, the capability-based view and knowledge-based view of the firm were selected to help the researcher make sense of the complex state of play that the research is about. The researcher embarked on a rigorous review of peer-reviewed literature of not more than five (5) years of publication to understand the state of research in both information systems and business management with regards to the research problem to be addressed. Key constructs from the topic and problem statement were used. The researcher found that despite a torrent of research on the subject matter, there are obvious gaps in literature as is also found in practice.

This study seeks to find if sustainable competitive advantage can be built on information systems capabilities in these days of information technology ubiquity, standardization, and homogeneity. This is against the backdrops of the very dynamic and complex business environment of today. It follows that both the business and technology environments are in a state of flux yet striving to create value consistently and sustainably for clients while also ensuring rent generation from such activities. Using the theoretical frameworks, we found attributes for resources that can underpin the differentiation and sustainable rent generation that is the goal of the study. Using the resource-based view of the firm, we understand that sustainable competitive advantage cannot be based on market structure and firm's position but rather on internal resources that must first satisfy the VRIN criteria. According to Barney (2000), for any organizational resource to underpin sustainable competitive advantage for the organization, such resource must be valuable, rare, inimitable, and non-substitutable (VRIN). With these attributes defined, not all internal resources can underpin competitive advantage. Information technology physical assets will therefore not be able to spawn sustainable competitive advantage because it is very readily accessible to all industry players. It is also very standardized and homogenous. It therefore fails

the basic test of business strategy that "a resource that a business strategy can be built upon cannot be available to all industry participants".

We also found that a key attribute of the business environment of today is that it is very dynamic and complex. It is generally referred to as VUCA – volatile, uncertain, complex, and ambiguous. The information technology world is also relentlessly changing. It follows that the competition possible among industry participants is more Schumpeterian than Ricardian. The resource-based theory alone if considered in the sense of information technology physical resources is therefore insufficient for this study hence the need to also consider capability -based theory to incorporate dynamic resources that will enable innovation and organizational agility as the basis for differentiation and sustainable rent generation. Dynamic resources, particularly in the realm of information technology, were found to be about capabilities and competences that must be developed in people. With this perspective, the researcher had to incorporate knowledge-based theory into the study. Using these theoretical frameworks – resource-based, capability-based, and knowledge-based theories, it became easier to make sense of the study.

The ontology and epistemology of the study according to the researcher is critical realism and objectivism (Moon and Blackman, 2014). The researcher in this study seeks to find a reality that exists but is not sufficiently discovered. Based on the critical review of literature and experience as practitioner, the researcher found that conceptually the relationship between organizational information systems capabilities and sustainable competitive advantage is mediated by organizational agility and moderated by organizational knowledge management practices. It follows that information systems capability underpins organizational agility. Agility itself is a major attribute of organizations seeking competitive advantage that can be sustained. It follows

therefore that when considered, in the relationship between the dependent and independent variables, the relationship is significantly positively enhanced. Along the same line, embracing sound knowledge management practices enhances organizational information systems capabilities that in turns enhances organizational agility and sustainable competitive advantage. This is the very complex state of the relationship between variables that was conceptualized and will be tested by this research.

Being that the study is of a case study kind, the industry of interest- the Nigerian ePayment environment was reviewed. We found that the industry is completely information technology dependent. All industry participants possess one form of information technology solutions or the other. While the technology could be from different providers, they generally underpin the same or similar business processes. Competing on technology acquisition and possession alone is not sufficient at all for any industry participants. This situation makes the industry suitable as case study for the study on hand. The researcher found however, that practitioners are somewhat oblivious of the fact that information technology investment alone was insufficient and not a good basis for building their strategy on. The annual spend by each firm in this industry as it is also for other industry is very significant hence the significance of research such as this that seeks to refocus practitioner on the right resources to spend their budget on. The competitive forces within the ePayment industry in Nigeria was reviewed by using both Porter's five forces and Pestle analysis. The analyses highlighted the unique position of the industry, the key attributes and the competitive forces that determine firms' success in the industry.

To begin the review of the key construct, we began with finding the distinction between information technology and information systems. Information Technology is defined as "the set

of physical capital resources dedicated to the storage, processing and communication of information, and the way in which these resources are organized into a system capable of performing a set of tasks" (Laudon and Laudon, 2018). This therefore refers to physical assets such as the hardware (computer, network devices and storage), software, data, and the architecture of the deployment. Information Technology is used to transmit, process and store information. According to Burgelman (1996, p. 91), Information Technology refers to the "resources applied by a firm in the processing and management of its data". Information Technology refers to capabilities offered by computer hardware and associated application software and telecommunications. According to Laudon and Laudon (1996), Information Technology infrastructure is composed of five major components: computer hardware, computer software, data management technology, networking, and telecommunications technology. Current information technologies and emerging technologies such as the Internet, Blockchain, Cloud Computing, Artificial Intelligence, Augmented reality etc were reviewed in detail. They represent emerging technologies that are defining and will continue to define the information technology landscape in the future.

Information systems however was defined as "an integrated and cooperating set of software directed information technologies supporting individual, group, organizational, or societal goals" (Watson, 2007). It is concerned with "how technology is appropriated and instantiated in order to enable the realization of Information System that fulfill various stakeholders such as individuals, groups or organizations" (Boell and Cecez-Kecmanovic, 2015; Alter, 2013). There is therefore an emphasis here on capabilities than physical assets. Laudon and Laudon, (1996) define information system (IS) as a "set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making, coordinating, and control in an organization. In

addition, information systems help managers and workers analyze problems, visualize complex subjects, and create new products. Information systems contain information about significant people, places, and things within the organization or in the environment surrounding it". It shows that information systems are concerned more than technology. It is concerned also with organizations and people that impact the development of technology and is itself impacted by the technology.

With this base defined, the focus of the research is narrowed to information systems as it is broader and more suited to the need for Schumpeterian competition than information technology asset alone as resource. The Organizational resource of interest is information systems capabilities. This is so because business is becoming very dynamic and digitized. Digital transformation as defined by Bounfour (2016), as "the change associated with the application of digital technology in all aspects of human society". A key organizational capability in the digital, knowledge-based and technology dependent economy of today and particularly in e-payment, is the Information Technology (IT)/information systems (IS) capability. Ertugan and Awamleh (2021) defined IT/IS capability as the "abilities of the organization to implement a set of common platforms (e.g., physical components, networks, database, software, and social skills) and the management of the same". This agrees with Lu & Ramamurthy (2011) that define IT/IS capability as implementation of IT assets (platforms) and the extent the organization is good at managing these platforms. IT capabilities involve the following three core components.

- **IT infrastructure** which represents the organization's ability to deploy hardware platforms and related software systems (Lu & Ramamurthy, 2006).

- **IT business spanning** demonstrates an organization's ability to support business goals effectively through IT resources (Lu & Ramamurthy, 2006).
- **IT proactive stance** focuses on how the organization proactively uses existing resources of IT to create new business opportunities also through redeployment and calibrations (Chu et al., 2019)

It follows therefore IT capabilities involves the capacity to align IT with business.

Other constructs that were rigorously reviewed are: sustainable competitive advantage which is the dependent variable in this study, Organizational agility (the mediating variable) and Organizational knowledge management which is the moderating variable.

Sustainable competitive advantage based on reviewed literature refers to when a firm is implementing a value generating strategy that is not simultaneously being implemented by another firm within the industry (current and potential competitors) but more importantly when these competitor firms are unable to duplicate the strategy or the benefit thereof (Barney, 1991). This concept does not necessarily speak of the time within which a firm continues to draw rent from the strategy. It rather speaks to a competitive advantage that continues long after effort to duplicate its benefit has ceased. It must be noted however that sustainable competitive advantage does not suggest that economic rent will last forever. It only means that it will not just be "competed away through duplication effort" of other firms. Unexpected structural market changes, however, within an industry can easily make what used to be a source of competitive advantage for a firm to cease (Porter, 1980,1985). The underlying assumption for the generation of sustainable competitive advantage in the classical sense is that this can be built on firm resources which are heterogeneously distributed among firms within an industry. The second assumption is that the

difference in the resource accumulation among firms in an industry can be sustained over a period (Rumelt, 1984; Porter, 1981). This in a classical sense speaks to the Ricardian rent generation but in a dynamic environment it is rather Schumpeterian rent.

From the review of literatures, we can safely conclude that sustainable competitive advantage is bears a very positive correlation with organizational information systems capabilities (particularly in a Schumpeterian competition) than with investment in information technology assets against the background of changing business need and changing technology landscape.

The mediating variable (organizational agility) between the dependent and independent variables was also reviewed based on several peer-reviewed literatures. In summary, organizational agility is the "firm's ability to cope with rapid, relentless, and uncertain changes and thrive in a competitive environment of continually and unpredictably changing opportunities" (Lu & Ramamurthy, 2011). Cai et al. (2017) define Organizational agility as "a firm's ability to sense and respond to market changes". Organizational agility is the ability of organizations to "sense changes in the environment and respond quickly, efficiently, and cost-effectively to improve competitive advantages" (Amos 1998; Chen 2012). Organizational agility stretches the concept of organizational flexibility to include speedily sensing and responding to opportunities and threats in the business environment, solve problems, and change the firm's resource base (Mao et al., 2015; Eisenhardt & Martin, 2000; Winby & Worley, 2014). Razmi & Ghasemi (2015) opine that organizational agility is a "cultivated dynamic capability and aids the organization in making timely, efficient, rapid, and continual change when changing circumstances require it".

The researcher is more in agreement in terms of attributes of organizational agility with Lu & Ramamurthy (2011). The attributes are:

- **Market capitalizing agility** which refers to "firm's ability to quickly respond to and capitalize on changes through continuously monitoring and quickly improving product/service to address customers' needs". It entails being "change-embracing, and growth-oriented entrepreneurial mind set about strategic direction, decision making, and judgment in uncertain conditions" (Sambamurthy et al., 2007).
- **Operational adjustment agility** which refers to firm's ability to quickly make changes to its internal processes to "cope with market or demand changes" (Dove 2001; Sambamurthy et al., 2007). This agility type is "primarily directed at operational activities and is reactive in nature" (Volberda, 1997).

The moderating variable of Organizational knowledge management based on the reviewed literature can be summarized as the "planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed" (King, 2009). O'Dell & Grayson, (1998) defined knowledge management as "getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance". Frost (2010) defines knowledge management as the "systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements". According to North and Kumta (2018), knowledge management enables "individuals, teams, and entire organizations to create, share and apply knowledge to achieve their strategic and operational objectives collectively and systematically. It contributes to increasing the efficiency and effectiveness of operations on the one hand and to change the quality of competition (innovation) on the other by developing a learning organization".

Each of the constructs of Organizational information systems capabilities, sustainable competitive advantage, organizational agility, and organizational knowledge management were reviewed in the context of impact on or influence on one another and of other relevant constructs such as organizational learning and social embeddedness.

After the key constructs were reviewed, a review of existing literature on the topic was also conducted. We found conflicting conclusions on the relationship between information technology and sustainable competitive advantage or firm performance by the researchers. That further confirms the need for the research. The summary of the review of existing literature on the topic in this age of ubiquity/proliferation of Information Technology asset varied. In some cases, researchers concluded that no link is found between firm competitive advantage and Information Technology (IT) (Tian et al.,2009; Stroumpoulis et al.,2021; Aydiner et al., 2018; Gupta et al.,2018). In other cases, researcher established a link between firm competitive advantage and Information Technology (IT) but mediated by Business/Information Technology alignment (Tian et al.,2009; Hartani et al., 2021). This conflicting conclusion should be clarified with this research and also the famous “productivity paradox” that remains unresolved.

Chapter 3

3.0 Introduction

This research work studies how firms within the Nigeria e-Payment industry earn sustainable competitive advantage through Information Systems. Among industry practitioners and researchers alike, there is the mistaken assumption that investment in information technology assets by itself confers advantage on one firm over the other in today's business environment. In the e-payment sector in Nigeria, each firm in the industry spend millions of dollars annually on information technology assets in the pursuit of competitive advantage without the desired success. This is not just a local industry problem. It is almost a problem of global dimension. According to BusinessWire (2021), Information Technology global market report, "the global information technology market is expected to grow from $7850.57 billion in 2020 to $8370.95 billion in 2021 at a compound annual growth rate (CAGR) of 6.6%. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC 2016; Laudon and Laudon, 2018). This annual growing investment is regardless of the lack of consensus by researcher on the economic benefit of such investments. There exists a famous phenomenon called "productivity paradox". It started several decades ago following the statement by Solow (1987) that "you can see the computer age everywhere but in the productivity statistics". That phenomenon has enjoyed a torrent of research but can still not be completely dispelled. According to Kijek and Kijek (2018), while the "productivity paradox" sparked a great number of research, results of either theoretical or

empirical investigations over the decades are not "convincing with regards to whether investments in information and communication technology (ICT) affect the productivity of firms, sectors, and economies". Other recent researches of the phenomenon also concluded along the same line. Hajli and Sims (2015) sought to reinvestigate and update this phenomenon but still found mixed results. They found that while "there is an identified high correlation between output per capital and ICT investment growth, there is no significant correlation between investment in IT and labor or multi-factor productivity. The labor productivity indicator demonstrates highly fluctuating behavior which is not correlated to ICT investment growth". Regardless of this conundrum, businesses still dedicate a major part of their annual budget to information technology. In most cases, businesses are hoodwinked by "IT vendors, who on the one side, are faced with the rapid development of technology and demand for their quick adaptation and implementation hence compelled to make the case for information technology introduction while they have difficulties themselves in explaining the business value of such constant investments in the first place" (Breznik, 2012).

With growing ubiquity and homogeneity, researchers are divided on the conclusion of whether investment in Information Technology asset can still lead to competitive advantage. In some cases, researchers concluded that no link is found between firm competitive advantage and Information Technology (IT) (Tian et al.,2009; Stroumpoulis et al.,2021; Aydiner et al., 2018; Gupta et al.,2018). This agrees with positions of Carr (2003), Clemons (1986), Clemons and Row (1991) and Powell and Dent-Micallef (1997) that "as information technology's power and ubiquity have grown, its strategic importance has diminished" because like other infrastructural resources, information technology resources have become accessible to all businesses hence can no longer be a basis for differentiation.

The purpose of this mixed method research is to establish that sustainable competitive advantage can be earned by firms within an industry based on Information Systems capabilities despite the growing standardization and homogeneity of Information Technology" (Chae et. al., 2014; Masli et al. 2011). The research seeks to find the aspect of organizational information systems where information technology investments must be focused on with the specific aim of ensuring that the investing firm can earn strategic differentiation that can be sustained. To ensure a full understanding of the study, the research is based on the case study of the ePayment industry in Nigeria. The ePayment industry is an information technology dependent industry. All services are based on one information technology implementation or the other. All stakeholders within the industry possess information technology asset as a strategic necessity. The industry participants all possess information technology assets and in some cases the technologies are of the same kind. The research seeks to find if firms in such industry can build their strategy of sustainable differentiation on any aspect of information systems possessed by such firm.

According to Chaharbaghi and Lynch (1999), the concept of competitive advantage is used to "describe where an organization outpaces competitors in value creation. It refers to the degree to which the organization, under free market conditions, meets the demand of a product market while simultaneously maintaining and growing its profit levels". This research seeks to establish that even in the very volatile and dynamic business environment of today, organizations can earn sustainable competitive advantage (strategic advantage) from Information Systems by identifying resources that lead to radical change (development of proprietary technology) and with capability to renews the competitive edge of an organization in a dynamic environment" (Chaharbaghi and Lynch, 1999). Such resources are obviously not standardized and homogenous information technology physical assets (infrastructural technology) but rather information technology

competencies and capabilities (Peppard and Ward, 2004). The theories of Resource-Based-View, capability-based view and Knowledge-Based View of the firm will used to find the link between Information Systems and firm sustainable competitive advantage. Being organizational advantages built on information systems resources, such advantage manifest in the ability of the firms to promptly sense opportunities and threats and respond quickly and promptly. This is particularly important in today's VUCA environment. This research seeks to find that since investment in information technology physical resources for the purpose of building sustainable competitive advantage is not guaranteed, because of the growing homogeneity and standardization of the infrastructural aspect of information technology, organizations will therefore need to have a deliberate strategy to invest in developing information systems capabilities. According to Spanos and Prastacos (2004), capabilities refer to the "dynamic, nonfinite, and path dependent processes that are not obtainable in the factor market, are difficult to copy, and are accumulated through long term, continuous learning". This is why it is important to invest in organizational capability because it creates uniqueness. "Dynamic capabilities affect how business organizations adapt and create heterogeneous resource positions in dynamic environments" (Leiblein, 2011). Heterogeneous resource position for a firm in an industry is the basis for sustainable competitive advantage according to Barney, (1991). Organizations that seek to build sustainable competitive advantage based on organizational information systems should rather consider the dynamic resource of information systems capability as opposed to the physical resources of servers, storage, network, operating systems, applications.

Being that this research is based on a case study of the ePayment industry of Nigeria, and the study method is mixed, two instrument types – interview and questionnaires were developed. To ensure content validity as academic research, the instruments were submitted alongside the

problem statement, purpose, significance, and hypothesis of the study to the University Ethics Committee (UREC) for review and approval. To ensure quality of the research and avoid study biases, the study population and sample were also submitted. Because of the specialized nature of the study and being a case study of an industry with known participants, purposive non-probability sampling method was employed. The specialized population include leaders, influencers, project manager and technical implementation teams leaders within the Information Technology function and business relationship manager (BRM) and business team leaders within business function of Nigeria ePayment Industry. According to Laerd digssertation blog, expert elicitation is considered the "cornerstone of research design" and it is usually employed on occasions of uncertainty, when there is lack of empirical evidence in an area or dearth of knowledge among the population. The qualitative data collected through interviews during the data collection is first analyzed using a content analysis technique. The collated data is "interrogated for constructs and ideas agreed upon based on the hypothesis" (Easterby-Smith et al, 2012). This approach is employed so "that qualitative data will be coded and then imported into a quantitative dataset and analyzed together" (Easterby-Smith et al, 2012). The validity of the measurement instrument was also tested using the exploratory factor analysis. Factor analysis was used to confirm the validity or otherwise of the measurement model (the relationship between the latent variable and the observed variables (Easterby-Smith et al, 2012).

Ethical considerations in this research with regards to the relationship between the researcher and the research participants were carefully considered. For this study, besides many other such considerations the following ethical principles were strictly adhered to:

1. Informed consent
2. Privacy and confidentiality.

3. Beneficence
4. Non-maleficence
5. Research Merit and
6. Justice

3.1 Research Approach and Design

The purpose of this research is to establish that sustainable competitive advantage can be earned by firms within the e-Payment Industry in Nigeria based on Information Systems despite the growing standardization and homogeneity of Information Technology" (Chae et. al., 2014; Masli et al. 2011). Research is a deliberate and systematic process of investigation to uncover a truth or find answers to questions (Alhadeff-Jones, 2013). For an academic pursuit such as this one, research is a pure one with the need for a higher degree of originality for the purpose of contribution to knowledge. The research process follows a defined and standard process. According to Alhadeff-Jones (2013) the research process can be thought of as "system finalized in an environment" suggesting a systematic (somewhat formalized) approach but within a context. Research is by no means arbitrary. Results are not just conjured. Formalized processes are followed for truth to be uncovered. In the case of this research, we have critical realism as it's ontology, meaning that reality is "captured after a very broad and critical examination of subsisting facts" (Moon and Blackman, 2014). Critical realism is a "specific form of realism whose manifesto is to recognize the reality of the natural order and the events and discourses of the social world and holds that we will only be able to understand—and so change—the social world if we identify the structures at work that generate those events and discourses. These structures are not

spontaneously apparent in the observable pattern of events; they can only be identified through the practical and theoretical work of the social sciences" (Bryman, 2012). This is different from empirical realism that often "assumes that there is a perfect relationship between reality and the term used to describe it" (Bryman, 2012). Critical realist, however, recognize that while reality exists, their description is provisional and therefore amenable to change. This is the key difference between critical realism and empirical or naïve realism. This research from the point of view of critical realism will therefore review the work of several researcher in the bid to answer the research questions, seek to find the answers in the work of others first and subsequently also in a rigorous field study to be conducted during this research but holding constant that the conclusion of this work opens the door to further research on the subject matter.

The approach to finding the knowledge spawned by the research (epistemology) is objectivism - the results are not a creation of the imagination of the researcher. The truth exists regardless of the researcher and the process of research is to discover that truth and contribute to knowledge. The philosophical orientation of this research is therefore deductive – bothering on positivism. It means that the approach is to review and make logical deductions (Moon and Blackman, 2014). According to Bryman (2012), positivism is an "epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond. Positivism entails the following principles:

1. Only phenomena and hence knowledge confirmed by the senses can genuinely be warranted as knowledge (the principle of phenomenalism).

2. The purpose of theory is to generate hypotheses that can be tested and that will thereby allow explanations of laws to be assessed (the principle of deductivism).

3. Knowledge is arrived at through the gathering of facts that provide the basis for laws (the principle of inductivism).

4. Science must be conducted in a way that is value free (that is, objective).

5. There is a clear distinction between scientific statements and normative statements and a belief that the former is the true domain of the scientist. This last principle is implied by the first because the truth or otherwise of normative statements cannot be confirmed by the senses".

This research will be largely positivist in nature. The research hypotheses generated because of applying existing theories to answer the research questions will be tested by gathering and analyzing data with the intent to be very fiercely objective. This is important because of the significance of the study and value it brings to business that today spend large amounts of money annually without any guarantees of success. It should be noted that positivism is not another synonym for scientific investigation alone. It is also a philosophical approach used within the social sciences particularly since the 1960s (Bryman, 2012).

This research will use the combined instrument of interviews and questionnaires to collect data, implying the use of a mixed method of both qualitative and quantitative approach to study how firms in the e-Payment service sector of the Nigeria Economy can earn and sustain competitive advantage through Information Systems (which is comprised of Information technology assets, capabilities of firms, strategic management of Information technology, the people and the organization itself as they impact one on another). Mixed method refers to an approach to research in the social, behavioral, and health sciences in which the "investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates the two, and then draws interpretations based on the combined strengths of both sets of data to understand research problems" (Creswell, 2015). By this approach, it follows that the research will involve

the collection and analysis of both qualitative and quantitative data sets in response to the research questions and the integration of qualitative and quantitative data using a specific mixed method. It should be noted that the choice of this research method is not just to:

1. Simply gather both qualitative and quantitative data
2. It's not a matter of label but rather is a methodological technique associated with this research method relevant to this research.
3. Is not a mixed model approach or an evaluation technique.
4. It is not the addition of qualitative data to quantitative design but rather it "involves the collection, analysis, and integration of both quantitative and qualitative data. In this way, the value of the different approaches to research (e.g., the trends as well as the stories and personal experiences) can contribute more to understanding a research problem than one form of data collection (quantitative or qualitative) could on its own" (Creswell, 2015). It should therefore not be confused with multimethod research that involves "multiple forms of qualitative data (or multiple forms of quantitative data)"

The researcher considered that to fully understand how to build sustainable competitive advantage from information systems, the stories behind information technology is also very important not just the possession of technology alone. This informs the story population in addition to addition of qualitative approach to this positivist research. Historically, mixed methods were first proposed for seeking "convergence of findings or cross-validation" (Campbell & Fiske, 1959), along the line it became popular in social science studies for other reasons such as the "ability to leverage the strengths of varied methods, provide richer insights into phenomena of interest that cannot be fully understood using only quantitative or qualitative methods, address

research questions that call for real-life contextual understanding, multi-level perspectives, and cultural influences" (Johnson & Onwuegbuzie, 2004; Johnson, Onwuegbuzie, & Turner, 2007; Morgan, 1998). According to George (2021) mixed method involves "combining elements of quantitative and qualitative research to answer your research question. Mixed method helps to gain a more complete picture than a standalone quantitative or qualitative study, as it integrates benefits of both methods." It is for these reasons that the researcher has decided to embrace the same research approach for this study. Besides the designed questionnaire or interview questions to be answered, the researcher wishes to integrate the stories behind information systems investments, perceptions of the value of information systems from senior leaders and executives of the different businesses in the Nigerian ePayment ecosystem to be surveyed. Creswell (2015) highlighted the importance of mixed method in information systems research as it helps to provide "a holistic understanding of a phenomenon for which extant research is fragmented, inconclusive, and equivocal ". This according to him will be a needed deviation from the past which according to them involve "IS researchers publish single method papers from mixed methods programs, with the risk that they are likely to miss the opportunity to discover, develop, or extend a substantive theory in richer ways than possible with single method papers. A mixed methods approach, particularly the associated meta-inferences, offers mechanisms for discovering substantive theory by allowing researchers to not only unearth components related to a phenomenon, but also unveil interrelations among these components and boundary conditions surrounding these interrelations."

The sampling approach for this research will be of the purposive sampling type.

The purposive non-probability sampling method is to be used to select the sample population of the industry employees. This choice of sampling method is due to the specialized nature of the required sample population. The required insight and consequently research input for

this topic can be best provided by decision makers and influencer in the respective company's Information Technology function as well as managers of business units with profit and loss (P and L) responsibility. Additionally, the choice of the sampling method is because the population size is finite and can all be identified and reached directly albeit with some effort. (Easterby-Smith, et al, 2012). Purposive sampling method is premised on the researcher knowledge of the population and on the principle and assumption that the researcher's good judgement and efficient strategy can lead to the selection of a sample sufficient for the study (Kidder et. al., 1991). It is for this reason that our selected purposive sampling approach is the snowball sampling type. Though the sample population is seemingly finite, the possibility of reaching everyone directly is remote due to cost and time on the part of the researcher. The use of snowball (chain sampling) as part of this purposive sampling approach is then called upon based on the following that we define:

- A predefined criterion
- The first participant in each company is asked to refer the researcher to others within their firm that matches the criteria, and the process is repeated on and on.

The sample shall be drawn from all the Central Bank of Nigeria licensed Payment Service Providers (PSP) that has commenced operation and consequently have technology footprint of any kind. In all, we have about twenty-five (25) such companies. These companies will be identified as well as their staff members from middle management upwards in both their business and technology functions. Their email and telephone contact will be obtained for the purpose of sharing questionnaires and booking face-to-face interviews. We intend to share the questionnaire with all within the selected sample population but have a face-to-face interview with not less than a 20% of the population across at least 50% of the companies in the industry particularly the senior

executive that may not have the time to answer the questionnaire. Sufficient details such as education and position for each respondent will also be obtained through either of interviews or questionnaire response in addition to responses to specific questions designed to elicit answers that will draw insights from the respondents. Being that the sampling approach is non-random, to avoid the possibility of selection bias, we intend to sufficiently define the sample population to make it easy to ensure that sample participants are selected from the identified target population (Wilkins and Pannuci, 2010; Berk, 1983). This is to guide against what Berk (1983) opined as the possibility of sample selection bias that exists whenever researcher work with non-random sample of a population because it is easy in this case to "confound the phenomenon of interest with the selection process". The researcher considers the possibility of reaching the entire research population since it is finite enough. The approach of reaching the entire population set aside sampling as there is not need for representativeness of the population which is what sampling ensures.

It should be noted that data to be collated for this research is of the primary type. According to Easterby-Smith et. al (2012), primary data "engender confidence in the outcome and also leads to new insights". Since this research questions seek to investigate and uncover the potential benefit if any between business and Information Systems, the information solicited presents no ground for non-Maleficence for research participants. This background notwithstanding and in conformance with research ethical principles, the research participant's right to privacy and confidentiality will be respected. This will be ensured by coding questionnaires prior to administration such that the research participant cannot be identified from collected data and keeping research data secure and accessible only to researcher and those with the need for access (Stuart and Barnes, 2005). This will only be different in the case of face-to- face interviews but in each case of data collection, the

principle of informed consent will be adhered to by research participant being presented with and without coercion consent in writing or otherwise about their participation in the research process. The consent form will clearly outline details of the research, the research process, possible harm, and benefits (Dalar et. al., 2017).

3.1.1 The Research Designs

Mixed Research method focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. “Its central promise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone” (Creswell and Plano, 2015). The idea is that to best understand or develop a more complete and comprehensive understanding of the research problem, obtain different but complementary data. According to Doyle et. al. (2012), mixed method of research is viewed as the third paradigm with the “philosophical underpinning of pragmatism by allowing mixed methods researchers to use a variety of approaches to answer research questions that cannot be addressed using a singular method”. There is a raging debate about the need to situate research within a particular paradigm (world view) that is either positivist (quantitative) paradigm or naturalistic or constructivist (qualitative) and that combining the two is not possible because “it is not possible to combine the ontological and epistemological stances of both traditions” (Doyle et. al., 2012; Sandelowski, 2001), but Johnson and Onwuegbuzie (2004) believe that mixed method may be the third paradigm with the philosophy of pragmatism believing that “the consequences are more important than the process and therefore that “the end justifies the means”. It advocates eclecticism and ‘a needs-based or contingency approach to research method and concept selection”. According to Morgan (2007), the pragmatic approach to research is driven by the “belief that the practicalities of research are such that it cannot be driven by theory or data

exclusively and a process of abduction is recommended which enables one to move back and forth between induction and deduction through a process of inquiry ". There are arguments for and against the 'whatever works' position that underpins mixed method approach (Buchanan, 1992; Pawson and Tilly, 1997), but that notwithstanding, combining "quantitative and qualitative research has become unexceptional and unremarkable in recent years" but has rather become accepted by some researchers as a "distinctive research approach that warrants comparison with each of quantitative and qualitative research" (Bryman, 2012).

3.1.1.1 Embedded mixed method design

There are different kinds of mixed method research designs. The common once based on reviewed literature are convergent parallel, explanatory sequential, exploratory sequential and embedded mixed methods. For this research, the embedded mixed method. In this mixed method research designs, "the researcher collects and analyzes both types of data at the same time, but within a larger quantitative or qualitative design. One type of data is secondary to the other" (George, 2021). Embedded mixed method is described by Creswell and Clark (2010) as "the researcher combining the collection and analysis of both quantitative and qualitative data within a traditional quantitative research design or qualitative research design. The collection and analysis of the secondary data set may occur before, during, and/or after the implementation of the data collection and analysis procedures traditionally associated with the larger design". For this research, the embedded mixed method involves combining the results of the data collection before analysis. The qualitative data set is coded and converted to quantitative data then combined with quantitative data to form a single data set before the analysis. This design approach agrees with the position of Sandelowski (2001) on the subject matter. According to her "qualitative and quantitative data sets can be linked, preserving the numbers and words in each data set. Or, these data can be transformed to create one

data set, with qualitative data converted into quantitative data, or quantitative data converted into qualitative data". This is also consistent with the position of Caracelli & Greene, (1993) in earlier research.

3.1.1.2 Suitability of the research designs

This method is considered suitable for this research because the variables at play require context to be better understood hence positivist orientation alone is not suitable. Mixed methods seem to provide a realistic link between quantitative and qualitative studies and hence most suitable for this study. The study would have been possible as just quantitative if the subject matter is about Information Technology assets alone and how it underpins competitive advantage. The study rather seeks to find the link between Information Systems – which goes beyond information technology artifacts, to include the people, their capability, and the organization (how they impact or is impacted by information technology). This therefore has stretched the argument beyond what can be studied with positivist orientation alone. According to Laudon and Laudon (2018), Information systems and organizations impact one another. Management influence what Information systems are built for the interests of the business firm but at the same time must be aware of the influence of Information Systems to tap timely into the value of new technologies. The interaction between information technology and organizations is "complex and is influenced by many mediating factors, including the organization's structure, business processes, politics, culture, surrounding environment, and management decisions". This makes for why to study how information systems underpins sustainable competitive advantage is better through a mixed method than either of quantitative or qualitive methods. As Creswell and Plano (2007) pointed out "we are social, behavioral, and human sciences researchers first, and divisions between

quantitative and qualitative research only served to narrow the approaches and the opportunities for collaboration". The mixed method therefore serves to bring together the best of the two-world view and research approach together and therefore will serve the need for a comprehensive study better. The forgoing therefore is the reason for the choice of this approach for the study.

Secondly, a mixed method research approach is considered for the study because of its pragmatic paradigm. Pragmatism suggests that the choice of approach is directly linked to the purpose of, and the nature of, the research questions posed (Creswell 2015). According to Armitage (2007), research is often "multi-purpose and a "what works" tactic will allow the researcher to address questions that do not sit comfortably within a wholly quantitative or qualitative approach to design and methodology". Darlington and Scott (2002) opined that the decision of quantitative or quantitative research approach are based not only on "philosophical commitment but on a belief of a design and methodology being best suited to purpose".

3.1.1.3 Triangulation in the design

With the questions of research design and philosophical assumptions answered and the primary data is collated from the respondent, the next question is how to organize the data for proper interpretation. Once the data for the research is collected from the respondents, the qualitative data will be coded to quantitative data type so that the data can be combined. To ensure that the results from the multiple research method is brought together to give a full view, we will use research triangulation. Triangulation, besides helping with reliability and validity also helps to increase completeness of a study result as one part of the study presents results which have not been found in other parts of the study (Johnson and Christensen, 2004; Johnson and Onwuegbuzie, 2004). According to Heale and Forbes (2017), triangulation in research is the use of more than one

approach to researching a question. The objective is to "increase confidence in the findings through the confirmation of a proposition using two or more independent measures. The combination of findings from two or more rigorous approaches provides a more comprehensive picture of the results than either approach could do alone". In this research we are using the following triangulation types to aid more rounded research.

1. Method triangulation – we are using more than one method to gather data for research. In this research, qualitative method- interview is being used alongside questionnaire which represent a quantitative means. The intention is to decrease the deficiencies and biases that come from any single method.
2. Data Triangulation – We have survey and interview data to combine ensuring that possible data type that will enrich the study is captured.

We reckon that by embracing the pragmatic paradigm of embedded mixed method research design on the basis of triangulation of the research method, we will be able to produce a result that is wholistic, reliable and valid.

3.2 Population and Sample of the Research Study

Sampling is the process of selecting representative elements of a population for study purposes such that the result of such study can be fairly generalized to the population from which they were selected (Trochim, 2020). The term population in research represents members with similar characteristics and a focus of a study. Acharya et al (2013) define a sample as "subset of the population, selected so as to be representative of the larger population because studying the entire population may be difficult". Sampling techniques are classified broadly into "probability" and "non-probability" (Acharya et. al., 2013).

For this study – building sustainable competitive advantage through Information Systems capabilities, with a case study of the Nigeria ePayment Industry, the target population consist of leaders of the Information Technology and Business functions of the Central Bank of Nigeria licensed payment service providers. From the list published by the Central Bank of Nigeria for firms in that category, there are 36 such companies in Nigeria but our investigation reviews that only 25 of them are operational in the sense of using Information Systems hence the focus of this research. They are.

S/N	CENTRAL BANK OF NIGERIA LICENSED Payment Service Provider (PSP)
1	Mastercard International
2	Payattitude Global
3	VISA International
4	VERVE International
5	NIBSS
6	Palmpay Limited
7	Parkway Projects Limited
8	Opay Digital Services Limited
9	ITEX Integrated Services Limited
10	E-Settlement Limited
11	Accelerex Networks Limited
12	Etranzact International Limited

13	Arca Payments Company Limited
14	CHAMSSWITCH Limited
15	Coralpay Technology Nigeria Limited
16	Hope Payment Service Bank
17	Flutterwave Technology Solutions Limited
18	Interswitch Limited
19	Network International
20	Paystack Payment Limited
21	REMITA Payment Services Limited
22	Moniepoint Limited
23	Appzone
24	Unified Payment Services L
25	Xpress Payment Solution Limited

Table 3.1 Licensed and operating Payment service providers in Nigeria (Obtained from the Central Bank of Nigeria).

Due to the specialized nature of the research and being a case study of an industry where the participants are finite, the researcher chose a non-probability sampling approach. According to Parveen and Showkat (2017), non-probability sampling uses non-randomized methods to draw the sample. Non-probability sampling method mostly involves judgment. Instead of random selection, participants are selected based on the judgement of the researcher. It is a very convenient sampling technique, but its usefulness is limited to certain situations alone. Tansey (2007) considers non-probability sampling as an alternative sampling technique which involves researchers “drawing

samples from a larger population without the requirement of random selection. This depends a great deal on subjective judgements in the selection of the sample, as the researcher decides which element of the population will be included in the sample". Tansey (2007) argue that while this approach gives the greater control of the element selection process, it has the disadvantage of the possibility of introduction of bias very easily and findings based on such study has the difficulty of being generalized to the population. Many argue that this sampling technique is inferior to probability sampling type as the sample bears no resemblance with the population. Henry (1990) stated unequivocally that" only in the cases where probability samples cannot be used are non-probability samples viable". Tansey (2007) opined however, that seeming disadvantage of non-probability disappears when the purpose of the study is not necessarily to generalize the result of the study to a population but rather to find a causal relationship between dependent and independent variable or to obtain information about specific events and processes. The non-probability sampling method is considered suitable for this study based on the position of Tansey (2007) above. The purpose of this study is to find the link or causal relationship between Organizational Information Systems and Sustainable Competitive Advantage. If such a relationship can be established, then Information Systems can be positioned as not just another utility but rather as a means of earning sustainable competitive advantage regardless of the changing business environment.

Other reasons for the suitability of this sampling technique if sampling were to be carried out are that for effective study of this relationship the sample size needs to have similar characteristics (Easterby-Smith, et al, 2012). The study is specialized hence not just anyone can be useful as sample element but rather specific individuals within the population with the required exposure to the subject matter because real insight for this topic can be best provided by decision

makers and influencer in the company's Information Technology function and managers of business units.

The goal here is not to draw a representative sample and use interviews and questionnaires to make "generalizations about the characteristics, beliefs or actions of the full population of relevant actors" (Tansey, 2007), but rather to gather data from individuals who should know or as Tansey (2007) put it "people who are most closely involved in the process of interest" and the "sample should be representative of the wider population to the extent that it does not systematically exclude a set of actors who played an important role" (Tansey, 2007).

The non-probability sampling technique employed is the purposive type. Purposive sampling method is premised on the researcher knowledge of the population and on the principle and assumption that the researcher's good judgement and efficient strategy can lead to the selection of a sample sufficient for the study (Kidder et. al., 1991). Mohsin (2016) summarize the purposed sampling technique as below.

- Samples are selected having a prior purpose in mind.
- The criteria/characteristics of the elements of the sample are predefined.
- Not everyone available within the population is included in the sample but only those that meet the predefined criteria.
- Purposive sampling is not mutually exclusive but other non-probability sampling types are also purposive. This agrees with Trochim (2020) that broadly classified non-probability sampling types into convenient and purposive.

This is aligned with our approach of using snowball sampling as part of the purposive, non-probability sampling approach. Though the sample population is seemingly finite, the possibility

of reaching knowing everyone is remote. The use of snowball (chain sampling) as part of this purposive sampling approach is then called upon based on the following:

- Select an element that matches the predefined criteria.
- The first participant is asked to refer the researcher to others that match the criteria.
- The second participant is asked the same questions in terms of referring the researchers to other known participants that match the criteria and so on until the required sample size is achieved.

The participants are recruited from each of the 25 firms listed above through their respective Human Resource department (as gatekeepers). Once the Human Resource consents, we make request of not less than four (4) individuals that meet the requirement set for participation for this research. Contact (email and phone numbers) for such participants is then requested and they are used in contacting them to answer the questionnaire or participate in the interview. The sample population using this approach is a minimum of 120 participants to be reached using the data collection tools.

The specialized population include leaders, influencers, project manager and technical implementation teams leaders within the Information Technology function and business relationship manager (BRM) and business team leaders within business function of Nigeria ePayment Industry. According to Laerd dissertation blog, expert elicitation is considered the "cornerstone of research design" and it is usually employed on occasions of uncertainty, when there is lack of empirical evidence in an area or dearth of knowledge among the population. This was what informed our choice of strategy. In this case, not all organizational member can provide the needed details or answer the questionnaire such that we can be reasonably assured that the

provided information can be relied upon for analysis. Secondly, is not everyone within an organization that is involved in strategy formulation or execution particularly with regards to information technology or information systems generally. This informed the reason to restrict the sample population to an elite few within each organization.

The qualitative data collected through interviews during the data collection phase is first analyzed using content analysis technique. The collated data is "interrogated for constructs and ideas agreed upon based on the hypothesis" (Easterby-Smith et al, 2012). This approach is employed so "that qualitative data will be coded and then imported into a quantitative dataset and analyzed together" (Easterby-Smith et al, 2012). Content analysis has been defined as a "systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding" (Krippendorff, 1980; and Weber, 1990). "Content analysis as a research method is a systematic and objective means of describing and quantifying phenomena" (Krippendorff, 1980). Content analysis allows researchers to test theoretical issues to enhance understanding of the data. Through content analysis, it is possible to "distil words into fewer content related categories. It is assumed that when classified into the same categories, words, phrases, and the like share the same meaning" (Cavanagh, 1997). This is to ensure that the embedded mixed method design adopted is executed. It should be noted that this will happen after data collection but before data analysis. Embedded mixed method is described by Creswell and Clark (2010, p.90-93) as "the researcher combines the collection and analysis of both quantitative and qualitative data within a traditional quantitative research design or qualitative research design. The collection and analysis of the secondary data set may occur before, during, and/or after the implementation of the data collection and analysis procedures traditionally associated with the

larger design". A matrix is developed from the content analysis such that the constructs are tabulated on one axis and response frequency on another to ensure a measure of quantification of the qualitative data collated. Responses from questionnaires and coded qualitative responses are organized together to form the total dataset from which analysis for patterns and inferences is to be performed. This mixed method of data collection lends itself to wholistic, reliability and validity of research. According to Sandelowski (2001), data collection techniques vary in the degree to which they yield objective data. "Observations of behavior are generally thought to be more objective than self-reports of behavior. When a target phenomenon can be observed, observation is often the criterion measure against which self-report is judged. Accordingly, researchers in a positivist viewing position will often seek "more objective" measures to evaluate the validity of "more subjective" measures. Moreover, whenever there is a discrepancy between what participants do and say they do, what observers see participants doing is generally considered a more accurate reflection of reality than self-report". The foregoing therefore lends credence to the choice of the mix of both questionnaire and interview (qualitative and quantitative) as data collection tools for use in this research with the belief that it will make it more rounded.

3.3 Materials/Instrumentation of research tools

Primary data for this research is collected from respondents through the mixed instruments of questionnaire and semi- structure interviews. The semi-structured interview as a data collection tool is about asking questions "within a predetermined thematic framework" (Scribbr, 2022). The semi-structured interview is based on a set of predetermined questions as well as ensuring a measure of flexibility, observation and capturing of nuances of the respondents since that will be through face–to-face interactions (Kumar, 2011). The semi-structured survey is basically to gather

the qualitative aspect of the research among other data sets while questionnaires are list of questions used to gather data from respondents about their experiences and opinion of the research questions. While questionnaires can be used to gather qualitative data, this research, it is dedicated to gathering quantitative data. According to Akindele et al., (2005), “questionnaires are a good way of collecting certain types of data quickly and relatively cheaply as long as subjects are sufficiently literate, and the researcher sufficiently disciplined to abandon questions that are superfluous to the main task”. We consider this data collection strategy to be aligned with the mixed methodology employed. The approach of either only interview or survey was considered but was found that neither will be sufficient alone to capture all required data since some of the required information is neither strictly either qualitative nor quantitative.

The developed data collection instrument will be distributed, and data connected based on snowball type of purposive sampling methodology. This approach is taken yet again because though the sample population is seemingly finite, the possibility of reaching everyone directly is remote due to cost and time on the part of the researcher. The researcher cannot within the time of this doctoral study reach every respondent directly as an acquaintance hence will have to be referred through others. This is however made a lot easier through the power of the Internet for gathering and distribution as online questionnaire can now be created as form and distributed electronically once the prospective respondent’s email address is known (Kumar, 2011).

3.3.1 Instrument Development

All researches have limitations which impact the quality of conclusion arrived at from the data collected and analyzed. The quality of any research has instrument development as one of its cornerstones which imposes research limitation, determines the research quality and ultimately the research conclusion. Qualitative research design is assessed in terms of

"credibility**,** confirmability, dependability and transferability, amongst other factors" while quantitative research designs are assessed in terms of "their internal validity, external validity**,** construct validity**,** reliability and objectivity" (Laerd dissertation blog)**.** To assess the quality of measurement instrument and procedure, the following validity test must be passed. They are content validity**,** convergent and divergent validity**,** and criterion validity **(**concurrent and predictive validity**).** This is important or else the quality of such an instrument leading to research conclusion will be of very serious doubt.

Validity refers to how accurately a method measures what it is intended to measure. Validity is used to determine whether research measures what it intended to measure and to approximate the truthfulness of the results (Drost, 2011). According to Kimberlin and Winterstein (2008), validity is often defined "as the extent to which an instrument measures what it purports to measure". Validity requires that an instrument is reliable, but an instrument can be reliable without being valid. Validity evidence is built over time, with validations occurring in a variety of populations. Comprehensive literature reviews on measurement instrument development approaches are therefore critical in guiding the selection of measures and measurement instruments (Kimberlin and Winterstein, 2008). The following are types of validity in social science research.

1. **Construct validity**. This type of validity is based on the accumulation of evidence from numerous studies using a specific measuring instrument. Evaluation of construct validity requires examining the relationship of the measure being evaluated with variables known to be related or theoretically related to the construct measured by the instrument. All other validity types (content and criterion) contribute to construct validity (Crocker and Algina, (1986); Drost (2011); Kimberlin and Winterstein (2008); Campbell and Fiske (1959)).

Construct validity is primarily determined by two tests – "internal structure and relations with other established theoretical constructs" (Kalkbrenner, 2012). According to Kane & Bridgeman (2017), construct validity refers to the "extent to which an instrument accurately appraises a theoretical or hypothetical construct and is the most rigorous form of validity evidence for validating scores on newly developed tests". Our review of literature and review of adopted measurement instruments were juxtaposed to agree that the theoretical underpinning for this research is represented by the measurement instruments adopted for the study. Construct validity is tested by using factor analysis. This can be either exploratory or confirmatory factor analysis.

2. **Content validity.** This type of validity refers to how well the item that should operationalize a construct achieves the objective of representing that construct. This validity usually depends on the knowledge of the researcher as there is no empirical means of determining that a construct is adequately represented by the measure used to so represent it (Kimberlin and Winterstein, 2008). To achieve this, the researcher had to exhaustively review literatures on each of the constructs and understood the meaning of each before reviewing the measurement instruments to adopt. It also accounts for why the final instrument came from more than one study. The measurement instruments had to represent the construct sufficiently to the knowledge of the researcher for it to be adopted.
3. **Criterion-related validity.** All theoretically related construct should be related to the score taken by measuring instrument. Criterion-related validity therefore provides evidence about how well scores on the new measure correlate with other measures of the same construct or very similar underlying constructs that theoretically should be related

(Kimberlin and Winterstein, 2008). In the case of this research, the test score is the scores of the peer-reviewed researches whose instruments have been adopted and adapted to this research. In this case, the association among scores we seek is not between the scores obtained in this research and that of a test score but rather between the scores in this study and those of the other peer reviewed works. This provides higher satisfaction of higher criterion-rated validity as the comparison is with a live study as against a test study. Relying on the scores of the peer reviewed research, the researcher could predict validity of the scores of this research work or any other future research that will rely on the measurement instrument (Kalkbrenner, 2012).

In the development of the instrument for this research, the measurement scales for each of the constructs- Information Systems Capability, Organizational knowledge management, Organizational agility, Sustainable Competitive Advantage were adopted and adapted from previous peer-reviewed research work by Lu & Ramamurthy, (2011) on "the link between IT capability and Organizational Agility" and Fink and Neumann (2007) on "Gaining Agility through IT Personnel Capabilities: The Mediating Role of IT Infrastructure Capabilities" . The choice of adopting and adapting this instrument is based on ensuring that construct validity was already proven by the results obtained in that peer-reviewed work. The researcher reckons that the burden of first testing and retesting to ensure construct validity will not be needed but it was done all the same. The adapted instrument was however first reviewed with professional colleagues, co-students (doctorate level), my supervisor and then submitted to Unicaf Ethic Committee for approval before the tool developed could be deployed for use for data collection. The essence to ensure method reliability.

The following were also considered in the instrument development to ensure the quality of data collection tool. They are:

1. Every interview item is expressed as a single idea only.
2. They questions are expressed in plain English since there is a mixed respondent of both technical and business leaders (the question is free of jargons as deliberate a strategy)
3. Leading questions were avoided (Easterby-Smith et al, 2012).

Since the instrument was adapted from peer-reviewed research, it was taken to be of good quality and had only to undergo the reliability test of test- retest reliability method beside Cronbach alpha. This was achieved by administering the test first on target population to confirm that the expected data is being gathered. While the subsisting research by Lu & Ramamurthy, (2011) and Fink and Neumann (2007) can stand for that, the researcher administered the tool first on a target test population from one of the firms in the industry – a total of 15 participant to confirm that appropriate data was gathered. Drost (2011) defines test-retest reliability as referring to the temporal stability of a test from one measurement session to another. The test is important because according to Drost (2011), "reliability is the extent to which measurements are repeatable – when different persons perform the measurements, on different occasions, under different conditions, with supposedly alternative instruments which measure the same thing". Nunnally (1978) opined that reliability refers to "stability of measurement over a variety of conditions in which basically the same results should be obtained". The approach adopted for confirmation of the reliability and stability of the measurement instrument is consistent with literature such as by Kimberlin and Winterstein (2008) that opined that stability is determined by "administering a test at two different points in time to the same individuals and determining the correlation or strength of association of

the two sets of scores". The approach of adopting existing research instrument is also recommended by the school of doctoral studies for research such as this.

With validity of the measurement instrument taken care of, the test for the validity of the measurement, will be conducted using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) on the combined quantitative dataset generated from both the qualitative and quantitative instruments of interviews and questionnaires. The purpose of EFA is to "uncover the underlying dimensionality within groups of test items by detecting how the items cluster together into subscales (subscales are also known as dimensions or factors), each of which constitute an aspect of the larger construct that the researcher is seeking to measure" (Beavers et al., 2013). The essence is to isolate the latent construct that explains the correlation (covariance) among of set of observed variables. The CFA on the other hand is used for "determining the extent to which the factor solution of an existing measure maintains internal structure with a new sample of participants" (Mvududu & Sink, 2013). This is a test for convergent validity, and one-dimensionality of the constructs based on the observed variables. In this case, factor analysis is used to evaluate the psychometric quality of the measure and assessment of the dimensionality of our set of variables (Glassnap and Poggio, 1985). Test for validity in this sense refers to how accurately a method measures what it is intended to measure. Validity is used to determine whether research measures what it is intended to measure and to approximate the truthfulness of the results (Drost, 2011). According to Kimberlin and Winterstein (2008), validity is often defined "as the extent to which an instrument measures what it purports to measure". Validity requires that an instrument is reliable, but an instrument can be reliable without being valid. This is a further confirmation of the adopted and adapted measurement instruments.

3.3.1.1 Reliability of the measurement instruments

The foregoing concentrated on the validity of the measurement instruments and measures. The focus is now on the reliability of the measures or the consistency of the scores generated by the measurement instruments. Reliability can be determined by different test such as test retest, inter rater test and test of internal consistency. For this study, the reliability of the measurement is determined by internal consistency. SPSS Cronbach's coefficient alpha is the widely used tool for this test. Cronbach coefficient alpha "represents the mean value of all possible split-half combinations of the items on a measure or subscale" (Cronbach, 1951). Cronbach's coefficient alpha ranges from 0 to 1, "with values closer to 1 denoting stronger reliability evidence" (Kalkbrenner, 2012). According to George and Mallery (2003) the following is a guide on how to read and interpret result from Cronbach coefficient alpha.: "$\alpha > .9$ – Excellent, $\alpha > .8$ – Good, $\alpha > .7$ – Acceptable" (p. 231)

3.3.1.2 Instrument development steps

The detailed steps followed in the instrument adoption/adaptation (based on research on instrument development) is as follows:

1. **Clear purpose** – Having clearly established the constructs to measure and why it is important to measure them, I studied literature on the proposed construct to measure to determine if I can find existing measurement to use or adapt (Mvududu & Sink, 2013). Where I found they exist in literature, they were carefully evaluated for rigor of development by comparing the procedures that the instrument developers employed to established empirical standards and validity testing.

2. **Establish a theoretical and empirical framework.** In this context, an empirical framework refers to at least one "theory or scholarly source (e.g., peer-reviewed) that provides a series of principles or assumptions that underlie the proposed construct of measurement". The goal here is to provide an overview of the "theoretical underpinnings for the proposed construct of measurement, which is an important step for ensuring content validity or the extent to which test items adequately represent the scope of a construct of measurement" (Lambie et al., 2017). In the instrument developed peer-reviewed article were clearly referenced. The essence here is that the instrument developed is not arbitrary. There must be both a theoretical and or empirical framework underlying any instrument developed before it meets the requirements of the researcher for consideration to adopt and adapt. The researcher had to review every previous research carefully with this in mind.
3. **Synthesize Content and Scale Development**. Based on the empirical and theoretical framework established, variables that should represent the latent construct have to be carefully developed and ensuring that there is a minimum of four observable variable representing each latent construct (DeVellis, 2016). A major consideration is to avoid variables that will be redundant with regards to representing the latent construct. This was considered at this stage and was also considered when exploratory and confirmatory factor analysis was performed on the gathered data. Each observable item is written in clear unambiguous English – According to DeVellis (2016), "items should be brief, clear, and written at approximately a sixth grade reading level". This is a major consideration in this research as we have a multidisciplinary research topic leading to business teams answering questions about technology and technology teams answering questions related to business

and corporate strategy. The questions were such that anyone regardless of background but with required information can answer.

4. **Use of expert reviewer.** According to Ikart (2019 and Lambie et.al (2017), once the "raw version of the instrument (initial pool of items and scaling format) is assembled, the measure should be sent to a group of external expert reviewers who are knowledgeable in the content area". In my case, this was achieved by first reviewing with my colleagues (who are postgraduate students themselves), shared same with my supervisor (who has been very incisive all through the dissertation stage) and finally submitted the same to Unicaf Research Ethic Committee (UREC) for review and approval before the instrument could be administered even on a test population. It is also important to note that the instrument was adopted from peer-reviewed research hence this was largely already considered.
5. **Recruit participants for pilot testing**. This involves administering the instrument to a "small developmental sample that is like the target population. Pilot testing allows researchers to test their procedures and check for errors in data imputation" (Kalkbrenner, 2012). The instrument, adopted from previous research, was administered on a pilot team. The researcher confirmed used exploratory factor analysis to confirm validity of the measurement instrument. The researcher confirmed this through factor loading of the pilot observed variable to the latent construct using exploratory factor analysis. This is in addition to confirming the same from each of the peer reviewed literature from which the tool was adopted from.
6. **Evaluate Validity and Reliability**. Finally, in the instrument development phase, validity and reliability test must be seriously considered. It involves validating scores on the

developed measure (the scale is measuring what it is intended to measure) and reliability (consistency of scores) evidence of the measure and its subscales (Gregory, 2016). The exploratory and confirmatory factor analysis was employed to ensure this for this research although the instrument was adopted and adapted based on published previous research works.

The steps above were adopted because according to Kimberlin and Winterstein (2008), variables of interest in social science researches are usually abstract concepts (constructs) in nature. To ensure quality research, the measurement instruments and the measures must be both valid and reliable. Only then will results and conclusion derived from study be meaningful and useful. Considering the significance of this research, and being that the researcher is also a practitioner, the researcher is very interested in a valid research output that can immediately be put into practice.

While the steps enumerated above are used for the purpose of developing research measurement instrument, it can and is being used here to assess the rigor of existing instruments before adoption for use in this research. According to Kalkbrenner (2012), the approach popularly called the MEASURE approach "was designed to help social scientists gain a greater understanding of the instrument development process and validating scores on tests, which is consistent with the Standards for Educational and Psychological Testing (2014) and has potential to increase assessment literacy and promote methodological rigor in social sciences research". The approach is famed as a single reference article (a one-stop-shop) with an outline of instrument development and score validation process. It was developed based on the synthesis of several recommendations of expert and contemporary psychometric researchers. The aim beside being a

guide to instrument development is also to be measure of evaluation of the rigor of existing measures that can be adopted.

3.4 Operational Definition of Variables

This research will be conducted using the mixed instruments of questionnaire and semi-structure interviews. The constructs at play in this research based on the research questions and hypothesis are Organizational information systems capabilities, Organizational agility, Organizational knowledge management and Sustainable competitive advantage. They are operationally defined as follows:

As an introduction and to ensure research participants understand the requested information, the operational definition of the relevant construct is preceded by the definition of the primary and underlying concept- Organizational information systems. The researcher believes that this will lead research participants to better understand and participate more effectively. It should be noted that Organizational information systems are not one of the constructs to use for analysis in this research.

3.4.1 Organizational Information Systems

For this research, this construct is foundational. Without a clear understanding and appreciation of this construct, it is difficult to understand and appreciate Organizational information systems capability.

Information System (IS) is defined as “an integrated and cooperating set of software directed information technologies supporting individual, group, organizational, or societal goals” (Watson, 2007). It is concerned with “how technology is appropriated and instantiated in order to

enable the realization of Information System that fulfill various stakeholders such as individuals, groups or organizations" (Boell and Cecez-Kecmanovic, 2015; Alter, 2013). There is therefore an emphasis here on capabilities than physical assets. Laudon and Laudon, (1996) define information system (IS) as a "set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making, coordinating, and control in an organization. In addition, information systems help managers and workers analyze problems, visualize complex subjects, and create new products. Information systems contain information about significant people, places, and things within the organization or in the environment surrounding it".

Information systems include the organization, people, and management and how they impact one on another Laudon and Laudon, (2018).

The construct is operationally defined as in the table below.

3.4.2 Organizational Information Systems Capability.

In this research, Organizational Information Systems Capability is the independent or predictor variable. The construct is defined as "abilities of the organization to implement a set of common platforms (e.g., physical components, networks, database, software, and social skills) and the management of the same" (Lu & Ramamurthy, 2011). Ertugan and Awamleh (2021) defined IT/IS capability as the "abilities of the organization to implement a set of common platforms (e.g., physical components, networks, database, software, and social skills) and the management of the same". This agrees with Lu & Ramamurthy (2011) that define IT capability as implementation of IT assets (platforms) and the extent the organization is good at managing these platforms. IT capabilities involve the following three core components.

- **IT infrastructure** which represents the organization's ability to deploy hardware platforms and related software systems (Lu & Ramamurthy, 2006).
- **IT business spanning** demonstrates an organization's ability to support business goals effectively through IT resources (Lu & Ramamurthy, 2006).
- **IT proactive stance** focuses on how the organization proactively uses existing resources of IT to create new business opportunities also through redeployment and calibrations (Chu et al., 2019)

It follows therefore IT capabilities involves the capacity to align IT with business. Dynamic IT/Business alignment is the results of good organizational IT/IS capability. Organizational Capability in general and Organizational IT/IS capability specifically depends on a firm's Intellectual capital (firm's intangible asset) which is a major basis for competitive advantage in today knowledge-based economy (Chen et al., 2005; Edvinsson and Malone, 1997). Maditinos et al. (2011) define Intellectual capital as "the knowledge-based equity of organizations". According to Dess, et al. (2016), it is a "measure of the value of a firm's intangible assets which include reputation, employee loyalty and commitment, customer relationships, company values, brand names, and the experience and skills of employees".

For this research's instrument development, this construct is defined by the observable variables as shown in table 3 below.

3.4.3 Organizational Agility.

Organizational agility for this research is a mediating variable.

A mediating variable is the one in the path of an effect. It is introduced to study a complex correlational relationship or a causal relationship. A mediating variable explains the way in which

an independent variable impacts a dependent variable. It explains how and why the effect takes place (Bhandari, 2022). It manifests as result of the independent variable, with influence on the dependent variable and finally, when considered the correlation between the dependent and independent variable is higher (Bhandari, 2022). Organizational agility is the ability of "a firm's ability to sense and respond to market changes" (Cai et al. ,2017). Organizational agility is the ability of organizations to "sense changes in the environment and respond quickly, efficiently, and cost-effectively to improve competitive advantages" (Amos 1998; Chen 2012). In an information technology dependent industry such as in ePayment, information systems capabilities significantly enhance organizational agility. Organizational agility on the other hand is how sustainable competitive advantage is spawned in such industry. It helps with the Schumpeterian competition. In a dynamic environment, innovation matters, agile organizations can harness the value in such changing situations by aligning and realigning resources. Organizational agility as a "organizational dynamic capabilities allow firms to respond to market opportunities through radical and incremental movements" (Sambamurthy, et al., 2007). A firm with high market capitalizing agility may increase its revenue sources by entering new market segments or identify new customer needs within existing market segment (Sabherwal and Chan 2001). With a high operational adjustment agility, a firm may "reduce its costs and ineffective business practices by continuously adjusting its business processes toward the industry best practices" (Eisenhardt and Brown 1999; Rindova and Kotha 2001). Either or both types of organizational agility when exhibited by a firm within an industry allows for superior financial outcomes, especially profitability, relative to their competitors.

For this research's instrument development, Organizational Agility is defined operationally as shown in table 3 below.

3.4.4 Organizational knowledge management.

The relationship between information systems capabilities and sustainable competitive advantage is moderated by organization knowledge management practice. A moderating variable acts on the relationship between dependent and independent variable by changing its direction or strength (Bhandari, 2022). The relationship between organizational information systems capabilities and sustainable competitive advantage is strengthened by organizational knowledge practices. Knowledge management within an organization entails a mechanism for capturing and disseminating the knowledge that exists within the organization. It starts with Organizations realizing that Knowledge is a "valuable resource and then develop a mechanism for tapping into the collective intelligence and skills of employees to create a greater organizational knowledge base (new knowledge) and for the achievement of set group targets/objectives" (Bollinger and Smith, 2001).

For this research, Knowledge management is defined operationally as shown in table 3 below.

3.4.5 Sustainable Competitive Advantage.

This is the dependent variable being studied within this research.

Sustainable Competitive Advantage is defined as "the prolonged benefit of implementing some unique value-creating strategy not simultaneously being implemented by any current or potential competitors along with the inability to duplicate the benefits of this strategy" (Hoffman, 2000). According to Day and Wensley (1988), this comes from "superior skills and superior resources". Barney (1991) opined that such resource must satisfy the "VRIN" test. According to

Prahalad and Hamel (1990), resource must be combined into “core competence” to confer sustainable competitive advantage which will require employee coordination and organizational learning to facilitate growth of specific core competencies. Sustainable competitive advantage when discussed within the current context of our relentlessly changing and very dynamic business environment, according to Chaharbaghi and Lynch (1999) is concerned with the “organization positively embracing change, constantly adapting to altered ways and new demands through introducing new resource configurations, while at the same time preserving the best of its past”. By this position, sustainable competitive advantage involves resource management and resource development. The former is concerned with meeting the competition today while the latter is targeted toward the competitive challenges of tomorrow. Discussing the present and future in the same context, particularly with regards to organizational resources, immediately presents a major challenge but there can be no sustainability if both the present and future are not addressed. To help organizations develop the “ability to remain competitive in the future while exploiting existing opportunities” according to Chaharbaghi and Lynch (1999) is referred to as strategic advantage. This means that organizations are not prisoners of their past through entangling themselves with resource management to the detriment of resource development. Strategic advantage is used to describe an “organization’s dynamic and unique resources that determine its competitive renewal” (Chaharbaghi and Lynch,1999). This is yet another way to describe what it means to earn and sustain a competitive advantage for a firm.

For this research, sustainable competitive advantage is defined operationally as shown in table 3 below.

Table 3. Operational definitions of the Constructs.

Constructs	Questions	References
Organizational Information Systems	Organizational information Systems include. • The business systems within the organization that underpin the business process. • Organizational members that contribute to the development of the business systems. • Organization's business processes that are underpinned by information technology. • The feedback and continue process of the business systems to align with objective of the business. • The management of the organization and the business systems and how this impact one on the other.	Laudon and Laudon (2018)
Information System Capability	Key measures of organizational information system capability include: • Information Technology function must have a clear vision and strategy on how to create value for business. • Management and functional members within the organization must understand the business value of Information Technology to be able to take advance of it proactively. • Information Technology functional leaders must understand business realities and direction and business leaders in turn also understand Information Technology enough to contribute to its' planning. • The organization's Information Technology function must have the competence to reconfigure Information Technology assets to deliver business value and timely too	Lu and Ramamurthy (2011) Fink and Neumann (2007)
Organizational Agility	Key measures of organizational Agility include:	Tallon and Pinsonneault (2011). Mavengere (2013);

	• Business strategies are driven by IT resources (tangible and intangible) that the organization possesses. • In the face of business environment relentlessly changing, how is amenable is the organizational resources to take advantage of the changing environment which follows that Organizational resources can be easily scaled up or down in line with changing market demands. • IT resources should be such that support business is robust enough to support significant unforeseen disruption to IT services and business impact will be zero. • Market and environmental changes are seen as opportunity and the company is organized to respond swiftly and appropriately with Business success factors aligned with IT capabilities of the organization. • IT infrastructure and system are flexible, modular, and scalable such that changes in the business environment are easily responded to by recalibrating IT	Fink and Neumann (2007) Lu and Ramamurthy (2011)
Organizational Knowledge Management	Key attributes of organizational knowledge management include: • Organization recognizes intellectual capital as a strategic resource. • Organization's approach to hiring and recruiting is deliberate and comprehensive with clear goal of growing capability. • Specialized organizational member knowledge is integrated and managed as an organizational asset. • The Organization invest in training and skill development of organizational members around information technology generally and Information systems of the company	Rao and Weintraub (2013) Lai and Lin (2012)

Sustainable Competitive Advantage	Operational definition of sustainable competitive advantage. • There is a deliberate strategy within the organization to establish a profitable and sustainable position against the forces that determine industry competition. • The Organization understands itself as a value creation agent and seeks to outpace others industry participants in this. • The organizations recognizes that her objective is achieved as value is created for other stakeholders and hence predicates its value creation on resources (tangible and intangible) within its control. • The organization recognizes the importance of Information Technology as such a resource to build its competitive positioning on. The organization recognizes that Information Technology asset is readily available to all industry participants hence predicate its competitive positioning more on Information Technology capability. • The organization recognizes that for competitive position to be sustained, the basis should lend itself to adaptation, hence Knowledge and organizational capability is managed as a strategic asset particularly in the current volatile, uncertain, and complex, business environment of today.	Porter (1985), Barney (1991) Fink and Neumann (2007)

Table 3.2 Operational definitions of variables

The variables at play in this research are as defined operationally above. The relationship between these variables is complex and not direct at all. They depend one on another hence to understand the relationship between them and particularly to answer the research question, it must be viewed as one inter-relationship as was conceptually represented. If the variables are studied one after another, the value of the research will be lost. The value emanates from the inter-relationship.

The variables are however viewed based on their respective operational definitions relevant to this research.

3.5 Study Procedures and Ethical Assurances

Data was collected from mixed pair field survey of Technology and Business leaders in the ePayment industry in Nigeria. This population is considered suitable for this research being that this is an elite study and hence involves specific individuals within the relevant institutions that have the relevant knowledge and experience to participate in the study. The data collection was conducted with mixed instruments of questionnaire and face-to-face interviews. The firms within the industry that were surveyed are 25. This does not represent the total number of such companies licensed by the central bank of Nigeria as industry participant, but they are the firms (based on our study of the market) that are operational and has some information deployment in support of their businesses. A total of 130 questionnaires were administered out of which 88 participants responded representing 67.7 % response rate. This speaks only the online questionnaires. The high response rate was because of multiple follow up as individuals contacts were supplied by their respective human resource departments. Each of the respondents was recruited through their respective human resources departments by the researcher using the gatekeeper forms. The researcher, upon obtaining the approval of the company requested details (email and phone numbers) of specific individuals that meet the study criteria.

The questionnaire created after approval of Unicaf Research Ethic Committee (UREC) was distributed online using the email address of the respondents supplied by their company human resource departments. In some cases, the link of the online questionnaire was shared by WhatsApp. The draft data collection instruments (for questionnaire and interview) were submitted to the

university research and ethics committee for review. Both tools were approved without comments before the researcher proceeded to data collection. The questionnaire was then created online using Google forms. The data collection instruments (questionnaire and interview questions) were grouped into sections. A section each dedicated to demographic information of the respondents and each construct's observable variables. This grouping was done to avoid common method bias. Common method bias consideration is important to minimize method biases since the respondents respond to measurement of all variable types. Methodical separation of the measurement instrument (the constructs were individually introduced and measured separately) is therefore a way to avoid the confusion leading to common method biases. Common method bias is described as "variance that is attributable to the measurement method rather than to the constructs the measures represent" (Campbell & Fiske, 1959).

We also ensured respondents anonymity was protected to ensure reduction of evaluation apprehension (Podsakoff, et. al., 2003). Particularly for those responding to the questionnaires, the participant's name or personnel information that can be used to link any respondent to the any response set was not elicited. Although the email addresses of respondents were used to request response, the collected result did not store email addresses of the respondents. This is to further ensure anonymity of the respondent and protect privacy and confidentiality.

We also reached out to the CEOs of the 25 firms requesting face-to-face interviews if the top executives consider distracting us by responding to a questionnaire with several questions. While some chose the options of the questionnaires many opted for the interview option. The researcher succeeded with 8 for a face-to-face interview. This further improves the total response rate to 73.8 % response rate when the interview and questionnaire responses are collated together.

It should be noted that besides the consent forms filled in and signed by the interviewees, the interview document does not have the names of the respondents recorded. This is to protect their anonymity.

The interview responses were coded before they could be combined with the questionnaire responses into a single dataset since the research design is of the embedded mixed method type. For the qualitative data collected, content analysis technique was employed. The collated data was "interrogated for constructs and ideas agreed upon based on the hypothesis" so that "that qualitative data could be coded and then imported into a quantitative dataset and analyzed together" (Easterby-Smith et al, 2012).

According to Research Excellence Framework, research is "a process of investigation leading to new insights, effectively shared". This presupposes that research is a process which must be carefully and rightly followed to achieve the desired result. There is also the need for careful ethical consideration as a central piece of the research process. According to Bickman and Rog (2009) there exist "ethical concerns at every step of the research process". Haggerty (2004) stated that "Research ethics is rooted in responses to abuses of research". Ethics are moral principles, not necessarily legal ones that govern people's behavior. Research ethics are the "moral principles that govern the standards of conduct for scientific researchers" (Laerd Dissertation). Research ethics are important because they help promote research objective of generating and expanding knowledge, support for the value of collaborative work, mutual respect, and fairness. They also support the principle of "do no harm" to others (Laerd Dissertation). Research ethics ensures that the research process is not just about collecting data and or information but is also

concerned with the dignity, right and wellbeing of those involved in the process (Stuart and Barnes, 2005). Though this request presents no harm to anyone but rather seeks to uncover a truth that will ensure optimum benefit for the investment by businesses, we had to ensure still that it is conducted with the dignity and rights of the participants respected. To that end, no participant was compelled. In each data collection instrument, the first section after the introduction of the research, there exists a call for respondent consent. In fact, it is a clear disclaimer before respondents supply any information. It clearly states that respondents can withdrawal at any point without any repercussions. For the respondent that were interviewed, each of them was handed the consent form to fill before the interview sessions. The interview document does not record the name of the respondent. This is to ensure anonymity of the respondent. Once the interview document got mixed up with others after the interview, there was no way to them apart. Though each of the respondent details were obtained through their respective company's human resource departments, they were not contacted by the company personnel but rather by the researcher so that response to the research instrument is not seen as task requested of them by their company – a key performance indicator with consequences. For those recruited from the company where the researcher works, the researcher ensured that the respondents were either at the same level or higher to allow the respondent participant respond based on their free will and not based on any extraneous factor.

Researches are towards an end (new knowledge, social welfare, and individual well-being) hence research is said to have merit if it is "well-justified, meets relevant quality criteria and is conducted by persons or teams with sufficient experience and competence" (Australian Council for International Development (ACFID), 2017). Research with merit meets quality criteria by demonstrating "alignment between the aims, questions, methodology and methods that are appropriate to the research context, including its culture and values and taking into account

intercultural difference" (Australian Council for International Development (ACFID), 2017). This is made possible by a competent research team with the requisite foundational knowledge in the "culture, political situation, history and values in the relevant country and local context" (Australian Council for International Development (ACFID), 2017). Commitment of researcher to the genuine search of new knowledge through proven research principles ensures research integrity. The researcher in this case is an industry practitioner with genuine interest in leading the industry as a though leader beside the fact the research is towards a conferment of a degree. The researcher got to this stage after rigorous study of research methodology, incisive and deep review of relevant research peer-reviewed literature hence the researcher is very informed about the right process of conducting research of this kind and of acceptable quality.

Justice as research principle speaks to fairness in the process of recruitment of research participants and distribution of the benefit of participation without any undue exploitation of any participant's population. This also involves treating participants with dignity regardless of age, gender, religion, ability, culture, and ethnicity. This also covers making the research findings available to participant timely and in format that can be understood" (Australian Council for International Development (ACFID), 2017). The researcher being aware of participation in the research by any respondent is by free will and the participant will have to take the time of other important or personal task, ensure that in the introduction, it was clearly stated that respondents can withdraw from the process at any point without any penalty. In follow up to ensure participation, the researcher was mindful and did not have to constitute a nuisance only resend the questionnaire not more than thrice after weeks of interval.

During this research as research ethic principle, we are guided by the need to ensure research merit and justice.

3.5.1 Ethical Assurances

Ethical consideration in research is concerned with the relationship between the researcher and the research participants. In this study besides many other such considerations the following ethical principles are strictly adhered to:

1. Informed consent
2. Privacy and confidentiality.
3. Beneficence
4. non-Maleficence

3.5.1.1 Informed consent

Informed consent as a research principle is foundational to research ethics. It must be upheld throughout the research process from beginning through to the end. Informed Consent is a "voluntary agreement to participate in research. It is not merely a form that is signed but is a process, in which the subject understands the research and its risks" (Dalar et al, 2017). The core principle according to Australian Council for International Development (2017), is that "a participant agreeing to take part in research should do so voluntarily, without coercion and with sufficient understanding of the research procedures, potential risks and potential benefits". The fundamental ethical principle of consent is the process through which researchers respect the autonomy of research participants. Dalar et al (2017) opined that "The principle of autonomy implies that responsibility must be given to the individual to make the decision to participate". Informed Consent therefore means any individual participating in research does so willingly and with full understanding of what he/she is involved with.

To ensure this is upheld in this research, it is made plain to the research participants before they begin. It is the first section of the data collection tool. Secondly, the participants selected for this study because they work in the same industry as the researcher, they researcher ensured that they are peers or superiors so that participation cannot be by coercion. To further ensure that the research participants understand what they are getting involved in, the researcher introduces the data collection instrument of the research by stating the topic, the overarching objective, and benefits of the study at the beginning for the research participants to understand before they consent to participate. That research is an academic exercise is also made clear at the beginning of the research instrument also. The researcher ensures this by stating the name of the school, the program he is enrolled in and even the research supervisor in the research instrument (particularly in the informed consent form).

According to Dalar, et. al. (2017) the researcher must present a means with the following details to the research participant to obtain their consent.

- Purpose of the research
- Procedures involved in the research.
- Alternative to participation
- All foreseeable risks and discomforts to the subject
- Benefits of the research to society and possibly to the individual human subject
- Length of time the subject is expected to participate.
- Person to contact for answers to questions or in the event of a research-related injury or emergency.
- Statement indicating that participation is voluntary.

- Statement stating participant's right to confidentiality and possibility to withdraw at any time without repercussions.

The outline above of what the consent form/letter/ notice should capture were followed where they are applicable to this research.

3.5.1.2 Privacy and Confidentiality

Research participants' right to privacy and confidentiality will be respected hence we intend to ensure all the participants have the right to stay anonymous during the research. The right to privacy entails how much information the research participant is willing to share with the researcher, how this information is collected, analyzed, and stored (Dalar et al., 2017). The right of choice of how the research participant wants to be represented is also carefully considered.

Another consideration in the quest to preserve privacy and confidentiality is in preserving anonymity. There will be efforts invested to ensure there exists no link between the data collected which represents the response to questions by participants and the participants themselves by any means. In this case, and particularly with regards to responses collected through questionnaire, the researcher decided from the questionnaire design stage using Google forms that though emails addresses of target participants were used to reach them, the responses provided do not capture the any details of the respondents hence anonymity is fully protected. Of course, the names of the respondents are not requested. In the cases of the interviews, the researcher keeps separate result sheets different from the consent forms that the research participants fill in and sign. This is to ensure that once the interview is finalized and the result sheet is mixed with other, the researcher loses track of who is who and of course no external person can make any meaning or link any result to any single individual.

Confidentiality is another very important consideration since the study population is known (Nigeria ePayment business and technology leaders). The possibility of deductive disclosure (Tolich, 2004) where the trait of the individuals makes them identifiable in a research report is something to guide against. To guide against such confidentiality challenge, the researcher incorporates Kaiser (2009) suggestion of re-envisioning the informed consent process to guide against such ethical issues of deductive disclosure. The suggestion bothers on balancing the rich collected data with the need to protect participants confidentiality as a guide on what to make public and what the participant agreed to during the informed consent agreement. The content of the informed consent, besides sharing same with the school of doctoral studies when requested will not be shared with anyone with access to this research results.

Confidentiality speaks to how the data is handled. There is the need for assurance that research participants' information will remain for use for the purpose for which it was solicited and not for any other purpose until their permission is sought. Such that should it is only accessible by the researcher alone hence it must be securely held (Stuart and Barnes, 2005). Confidentiality therefore involves the following.

- Data handling and storage
- Usage of the data for other purposes or passing it on to other agencies
- How findings are reported

Researchers therefore must respect the principle of anonymity of the research participants except for cases where child abuse or other criminalities are uncovered. The researcher is bound by law to disclose such cases (Haggerty, 2004). As stated already, the researcher has taken deliberate steps to ensure all these.

3.5.1.3 Beneficence (do good).

Beneficence as a research concept requires that researchers have the welfare of their research participant in mind. The term *beneficence* "connotes acts or personal qualities of mercy, kindness, generosity, and charity. It is suggestive of altruism, love, humanity, and promoting the good of others. In ethical theory it effectively includes all norms, dispositions, and actions with the goal of benefiting or promoting the good of other person" (Edwards, 2019). It follows therefore that beneficence refers to a statement of a moral obligation to act for others' benefit, helping them to further their important and legitimate interests, often by preventing or removing possible harms. In research, it is more of obligatory beneficence albeit implicitly. This research largely exemplifies that. Business today invests annually in Information Technology without getting the intended benefit. This research seeks to uncover and focus decision makers on the aspect of Information Systems to focus scarce resources so that intended benefit can be generated. The research goal in its entirety is dedicated to doing good. It is therefore not only for research participant to benefit from this but rather all businesses that use or depend on information technology. The result of this research will now benefit them by stating the aspect of information systems that investment should be targeted to ensure strategic differentiation and sustained rent generation from such investments.

This principle emphasizes that "for any harm that research participants experience, it must be justified by the corresponding gain to that population" (Australian Council for International Development (ACFID), 2017), To ensure adherence to the principle of beneficence, researchers should generally be able to create value and at the most minimum level of risk and the research participant duly informed of any such risk. In this research, the pain suffered by participant to supply needed insight is balanced by the benefit to be achieved by the research output. The participants' time is viewed as the only possible pain they will suffer, and this will be

disproportionately compensated for with the insight to be gained by the result of the research. The net effect is gained on the research participants and the industry.

3.5.1.4 non-Maleficence. Closely linked with Beneficence is the concept of do-no-harm (non-maleficence). Harm in this sense refers to that done to "individual or group, short or long-term; it could be include discomfort, trauma, embarrassment, intrusion, distress, unmet expectations. Non-maleficence then refers to the fact that any such risk must be anticipated and planned for and then a basis to question the research while in progress" (Australian Council for International Development, 2017). The principle emphasizes that the possible harm should not be disproportionate to the potential benefit of the research. This is a critical ethical consideration in medical research and its significance in social science research is highlighted in several studies.

The purpose of the research is not to do any harm but to rather add value hence this principle is implicitly complied with.

3.5.1.5 Research merit and integrity.

Researches are towards an end (new knowledge, social welfare, and individual well-being) hence research is said to have merit if it is "well-justified, meets relevant quality criteria and is conducted by persons or teams with sufficient experience and competence" (Australian Council for International Development (ACFID), 2017). Research with merit meets quality criteria by demonstrating "alignment between the aims, questions, methodology and methods that are appropriate to the research context, including its culture and values and taking into account intercultural difference" (Australian Council for International Development (ACFID), 2017). This is made possible by a competent research team with the requisite foundational knowledge in the "culture, political situation, history and values in the relevant country and local context"

(Australian Council for International Development (ACFID), 2017). Commitment of researcher to the genuine search of new knowledge through proven research principles ensures research integrity. The researcher's academic journey made him well suited to conduct this research at this point as this is coming after a rigorous academic exercise. Besides, the personal education of the researcher, this is academic research hence the school of doctoral studies already defined rigid tested procedures to be followed to ensure research merit. This was diligently followed.

3.5.1.6 Justice.

Justice as research principle speaks to fairness in the process of recruitment of research participants and distribution of the benefit of participation without any undue exploitation of any participant's population. This also involves treating participants with dignity regardless of age, gender, religion, ability, culture, and ethnicity. This also covers making the research findings available to participants timely and in a format that can be understood" (Australian Council for International Development (ACFID), 2017). All aspects of research justice within the purview of the researcher will be handled but being that the research output here belongs to the university, the right to share same with the research participants remains with the school of doctoral studies. There is however the publication of the research output on the school portal. This will be done according to the procedure of the school. Research participants who so wish will at that point be able to access it.

It should be noted that this research did not seek to exploit the research participants in a way shape or form but rather to investigate and uncover some underlying facts that will contribute to knowledge. The participant selection process of the research will be careful and deliberate in

keeping with the principle of Justice. No participant will be selected or excluded based on age, gender, religion, culture, and ethnicity. The entire research process will be undertaken by a researcher, trained with the requisite foundational knowledge in context and implications of the research and with commitment to the genuine search of new knowledge through proven research principles. This is to ensure the integrity and merit of the research (Australian Council for International Development (ACFID), 2017).

3.6 Data Collection and Analysis

According to Bhandari (2022), data collection is the "systematic process of gathering observations or measurements. This is regardless of whether you are performing research for business, governmental or academic purposes. Data collection allows for first-hand knowledge and original insights into research problem". Data collection follows, after the researcher has established the aim of the study, the type of data to collect and the procedure for collection, analysis, and storage of the data to be collected. The research aim, research questions and hypotheses must be formulated because it helps to ascertain the kind of data to be collected- qualitative, quantitative or both. The kind of data collected is based on the aim of the research. If the aim is to measure statistically and precisely, then quantitative data is to be collected. If it the aim is to "explore ideas, understand experiences, or gain detailed insights into a specific context, collect qualitative data" (Bhandari, 2022). If the aim is however to measure all the above, then a mixed method approach should be used to collect both types of data.

Another important consideration is the method for data collection. Again, there are several methods, but each is based on the type of data to be collected. For qualitative data, we can use

interviews, focus groups and ethnographies. For quantitative data, we use experiments, surveys, etc. With the data collection method known, the next step is to plan how the collection will be conducted.

For this research work, the data collection was conducted with the mixed instruments of questionnaire and face-to-face interviews. The researcher used a mixed method approach so that both quantitative and qualitative data can be collected. This is based on the research problem to solve. The researcher reckons that to answer the research question, there was the need to capture some qualitative data about the details of the underpinning for the investment by firms in information technology. The nature of the research also required that the research population is both literate and experienced in corporate strategy and particularly as it involves investment for returns. The firms within the industry that were surveyed are 25. There are other firms licensed as payment service providers by the central bank of Nigeria but the list of 25 are those currently operational with some information technology investments. Based on the prospective participants collated through the human resource departments of these firms, a total of 130 questionnaires were administered out of which 88 participants responded representing 67.7% response rate. It must be noted that this high response rate came about following multiple follow-ups. The questionnaires were sent multiple times with follow-up calls to draw the attention of the respondents to them. While some executives agreed to fill out the questionnaires, many did them hence the researcher reached out and interviewed eight (8) of the CEOs. With interview response added to the questionnaire response, the total response rate grew to 73.7% success rate of the 130 respondents that were reached out to. With these results, the researcher has two data sets – the quantitative data obtained from response to the questionnaire and the qualitative data obtained from interviews. To

ensure a complete quantitative dataset for which analysis is to be based, the qualitative data collected through interview was coded (based on content analysis) and converted into a quantitative form and merged with the quantitative data collected through questionnaires. The combined quantitative dataset is then analyzed using the statistical tool called IBM SPSS and AMOS. SPSS provides computer assisted data analysis for researchers. It is one of the most widely used statistical software for researcher providing visualization and data analytical tools.

3.6.1 Coding of the Qualitative Dataset and combining into a single quantitative dataset

Face-to-face interview is one method for data collection for this mixed method research. The qualitative method was employed to take care in addition to data to be collected, other deductions that could be made from attitude, experience, values, beliefs of the people (Kumar, 2011) and to satisfy the concept of triangulation. It also took care of gathering data from the very senior Organizational leaders that did not have the time to sit and respond to questionnaires.

For this research, the researcher employed embedded mixed method research design paradigm. It follows therefore that the data collected through the qualitative method will have to be combined with the quantitative data set before data analysis can begin. It should be noted however that data collected through the qualitative method of interviews are of a different kind from the ordinal data collected through the quantitative method of questionnaire. For the data to be successfully combined, the qualitative data must be coded. The process begins with a thematic analysis of the qualitative data. Thematic analysis as used for this research involves familiarization with the collected data, generation of themes and then coding. The thematic analysis approach used here is deductive and semantic which involves “coming to the data with some preconceived

themes expected to be reflected, based on theory or existing knowledge" and analyzing the "explicit content of the data" (Caulfield, 2019). After the data has been thematically analyzed, researcher pre-assigned codes are then assigned to specific themes and phrases. Based on these, the data collected through the qualitative method are organized and combined with the quantitative data set for analysis and inferences. This is so since the data gathered through interviews are not exactly quantitative, they had to be organized -coded i.e., finding unifying idea and concepts, grouping the ideas and overarching themes. Based on scales used for the quantitative surveys, the researcher grouped and coded the responses. Certain keywords and phrases are assigned codes based on the sense the researcher got from discussion during the interview sessions. The final data set is the result of data gathered from respondent through a mixed methodology that embraces the concept of "triangulation". This is one other way to ensure validity of the study by bringing together more than one method (Yeasmin and Rahman, 2012). It follows that for this study, triangulation involves the use of multiple methods to study certain constructs and relationships between them.

The coding approach is as follows. The full interview question with responses and codes will be in the appendix.

S/N	Interview Questions	Responses	Categories/Frequency	Code
	Researcher and respondent's interaction		**For researchers use only**	
1	Are there business systems within your organization that underpin business process?	No Not sure Yes		1 2 5
2	Do your organizational members contribute to the development of the business systems?	No Not sure Not clear Yes		1 2 2 5

3	Are business systems or Information Technology deployed as they are with default settings?	No Not sure Yes		1 2 5
4	How do you view the growth in the technology world and how they impact on how your business processes evolve?	No relationship Somewhat related Directly proportional		1 3 5
5	Do you reckon that your organizational members personal efficiency is impacted by new technology deployments in the organization?	No Somewhat Yes		1 3 5

Table 3.3. Excerpt of Coding of Qualitative data

The total quantitative dataset (from the coded data from qualitative method and quantitative dataset based on responses from the online questionnaires), was imported into SPSS for analysis.

3.6.2 Test for validity and reliability of data

To test validity of the measurement instrument and reliability of the measurement, the researcher conducted both an exploratory (EFA) and confirmatory factor analysis (CFA) and the combined dataset generated after coding and combining the quantitative and qualitative data into a single quantitative data set. Besides some outlier observed variables, all the variables loaded to their respective construct thereby affirming convergent validity and one-dimensionality of the constructs. In this case, factor analysis is being used to evaluate the psychometric quality of the measure and assessment of the dimensionality of our set of variables (Glassnap and Poggio, 1985). Factor analysis is used to confirm the validity or otherwise of the measurement model (Easterby-

Smith et al, 2012). Beavers et al. (2013) define factor analysis as "construct which is a condensed statement of the relationships between a set of variables, and this is defined by it factor loading. Factor loading is defined by a correlation of a variable with a factor". The purpose of EFA is to "uncover the underlying dimensionality within groups of test items by detecting how the items cluster together into subscales (subscales are also known as dimensions or factors), each of which constitute an aspect of the larger construct that the researcher is seeking to measure" (Beavers et al., 2013). The essence is to isolate the latent construct that explains the correlation (covariance) among of set of observed variables. The CFA on the other hand is used for "determining the extent to which the factor solution of an existing measure maintains internal structure with a new sample of participants" (Mvududu & Sink, 2013). This is a test for convergent validity, and one-dimensionality of the constructs based on the observed variables.

The reliability of the measurement is also conducted. For this study, the reliability of the measurement is determined by internal consistency. SPSS Cronbach's coefficient alpha is the widely used tool for this test. Cronbach coefficient alpha "represents the mean value of all possible split-half combinations of the items on a measure or subscale "(Cronbach, 1951). Cronbach's coefficient alpha ranges from 0 to 1, "with values closer to 1 denoting stronger reliability evidence" (Kalkbrenner, 2012). According to George and Mallery (2003) the following is a guide on how to read and interpret result from Cronbach coefficient alpha.: "$\alpha > .9$ – Excellent, $\alpha > .8$ – Good, $\alpha > .7$ – Acceptable" (p. 231)

3.6. 3 Correlation and Regression Analysis for Hypotheses Testing

After confirmation of the validity of measurement instrument and reliability of the measurement, the researcher proceeds further to test the hypotheses that were generated at the beginning of the research. SPSS Correlation and Regression analysis tools are used.

Correlation is a “statistical measure that indicates the extent to which two or more variables fluctuate together. A positive correlation indicates the extent to which those variables increase or decrease in parallel; a negative correlation indicates the extent to which one variable increases as the other decreases” (Zaid, 2015). Correlation “quantifies the degree and direction to which two variables are related. When correlation coefficient r is 0.0, there is no relationship. When r is positive, it represents a trend that when one variable goes up, the second does the same. When r is negative, it represents that when one variable goes up as the other one goes down” (Zaid, 2015).

Regression analysis on the other hand “involves identifying and evaluating the relationship between a dependent variable and one or more independent variables, which are also called predictor or explanatory variables”. When there is a single continuous dependent variable and a single independent variable, the analysis is called a simple linear regression analysis. Multiple regression is used to learn about the “relationship between several independent or predictor variables and a dependent or criterion variable” (Zaid, 2015). Regression analysis explains how the independent variable is numerically related or associated to a dependent variable.

Correlation and regression analysis will be used to uphold or discard a hypothesis.

3.7 Chapter Summary

This research work seeks to investigate if sustainable competitive advantage can be built on information systems in these days of information technology standardization, homogeneity and ubiquity using a case study of the Nigerian ePayment industry. The choice of the industry is because information technology is a strategic necessity among firms in this industry as no service

can be provided without dependence on information technology. Against that backdrop, firms in the industry are therefore making significant annual investment in information technology assets albeit mindlessly. Among industry practitioners and researchers alike, there is the mistaken assumption that investment in information technology assets by itself confers advantage on one firm over the other in today's relentlessly changing business environment. This is not just a local industry problem. It is almost a problem of global dimension. According to BusinessWire (2021), Information Technology global market report, "the global information technology market is expected to grow from $7850.57 billion in 2020 to $8370.95 billion in 2021 at a compound annual growth rate (CAGR) of 6.6%. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. This annual growing investment is regardless of the lack of consensus by researcher on the economic benefit of such investments. This is captured in the famous phenomenon called "productivity paradox". This was observed and made popular several decades ago following the assertion by Solow (1987) that "you can see the computer age everywhere but in the productivity statistics". That phenomenon has enjoyed a torrent of research but can still not be completely dispelled. According to Kijek and Kijek (2018), while the "productivity paradox" sparked a great number of research, results of either theoretical or empirical investigations over the decades are not "convincing with regards to whether investments in information and communication technology (ICT) affect the productivity of firms, sectors, and economies". Other recent researches of the phenomenon also concluded along the same line. Hajli and Sims (2015) sought to reinvestigate and update this phenomenon but still found mixed results. They found that while "there is an identified high correlation between output per capital and ICT investment growth, there is no significant correlation between

investment in IT and labor or multi-factor productivity. The labor productivity indicator demonstrates highly fluctuating behavior which is not correlated to ICT investment growth".

This research seeks to find if there exist any aspect of information systems (information technology, it's management, the organization and how they impact one on another) where information technology investments must be focused on with the specific aim of ensuring that the investing firm can earn strategic differentiation that can be sustained. To ensure a full understanding of the study, the research is based on the case study of the ePayment industry in Nigeria. The ePayment industry is an information technology dependent industry. All services are based on one information technology implementation or the other. All stakeholders within the industry possess information technology asset as a strategic necessity. The industry participants all possess information technology assets and in some cases the technologies are of the same kind. The researcher seeks to find out if firms in such industry can build their strategy of sustainable differentiation on any aspect of information systems possessed by such firm.

The research design uses the combined instrument of interviews and questionnaires to collect data, implying the use of a mixed method of both qualitative and quantitative approach to study how firms in the e-Payment service sector of the Nigeria Economy can earn and sustain competitive advantage through Information Systems. Mixed method refers to an approach to research in the social, behavioral, and health sciences in which the "investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates the two, and then draws interpretations based on the combined strengths of both sets of data to understand research problems" (Creswell, 2015). By this approach, it follows that the research will involve the collection and analysis of both qualitative and quantitative data sets in response to the research questions and the integration of qualitative and quantitative data using a specific mixed method. Embedded mixed methods is the

design approach of the researcher. The embedded mixed method involves combining the results of the data collection before analysis. The qualitative data set is coded and converted to quantitative data then combined with quantitative data to form a single data set before the analysis. This design approach agrees with the position of Sandelowski (2001) on the subject matter. According to her, "qualitative and quantitative data sets can be linked, preserving the numbers and words in each data set. Or, these data can be transformed to create one data set, with qualitative data converted into quantitative data, or quantitative data converted into qualitative data". This is consistent with the position of Caracelli & Greene, (1993) in earlier research. This method is considered suitable for this research because the variables at play require context to be better understood hence positivist orientation alone is not suitable.

For this research, ontology is critical realism - meaning that reality is "captured after a very broad and critical examination of subsisting facts" (Moon and Blackman, 2014). This is different from empirical realism that often "assumes that there is a perfect relationship between reality and the term used to describe it" (Bryman, 2012). Critical realist, however, recognize that while reality exists, their description is provisional and therefore amenable to change. This is the key difference between critical realism and empirical or naïve realism. This research from the point of view of critical realism will therefore review the work of several researcher in the bid to answer the research questions, seek to find the answers in the work of others first and subsequently also in a rigorous field study to be conducted during this research but holding constant that the conclusion of this work opens the door to further research on the subject matter.

Along the same line, the approach to finding the knowledge spawned by the research (epistemology) is objectivism - the results are not a creation of the imagination of the researcher.

The truth exists regardless of the researcher and the process of research is to discover that truth and contribute to knowledge. The philosophical orientation of this research is therefore deductive – bothering on positivism. It means that the approach is to review and make logical deductions (Moon and Blackman, 2014).

Due to the specialized nature of the research and being a case study of an industry where the participants are finite, the researcher chose a non-probability sampling approach. According to Parveen and Showkat (2017), non-probability sampling uses non-randomized methods to draw the sample. Non-probability sampling method mostly involves judgment. Instead of random selection, participants are selected based on the judgement of the researcher. It is a very convenient sampling technique, but its usefulness is limited to certain situations alone. Tansey (2007) considers non-probability sampling as an alternative sampling technique which involves researchers "drawing samples from a larger population without the requirement of random selection. This depends a great deal on subjective judgements in the selection of the sample, as the researcher decides which element of the population will be included in the sample".

The research instrument development is based on adopting and adapting research instruments from extant peer-reviewed literatures in information systems and management researches. The choice of adopting and adapting this instrument is based on ensuring that construct validity was already proven by the results obtained in that peer-reviewed work. The researcher reckons that the burden of first testing and retesting to ensure construct validity will not be needed. The adapted instrument was however first reviewed with professional colleagues, co-students (doctoral level), the researcher's supervisor and then submitted to Unicaf Ethic Committee for

approval before the tool developed could be deployed for use for data collection. The essence to ensure method reliability.

The following were also considered in the instrument development to ensure the quality of data collection tool. They are:

1. Every interview item is expressed as a single idea only.
2. They questions are expressed in plain English since there is a mixed respondent of both technical and business leaders (the question is free of jargons as deliberate a strategy)
3. Leading questions were avoided (Easterby-Smith et al, 2012).

Since the instrument was adapted from peer-reviewed research, it was taken to be of good quality and do not have to undergo another round of reliability test such as test- retest reliability method beside Cronbach alpha test.

At this point in the work, the researcher revisited each of the constructs that are critical to this research such as organizational information systems capability, Organizational knowledge management, Organizational agility, and Sustainable competitive advantage. They were all operationally defined as relevant to this piece of work.

Following the operational definition of constructs, the researcher reviewed the ethical considerations and assurances required for a work of this kind and quality. The researcher considers ethics to be a cornerstone of research hence all ethical considerations were carefully noted at the data collection stage. This is to ensure that the research participants were respected and not coerced into participating in the work. According to Bickman and Rog (2009) there exist “ethical concerns at every step of the research process”. Haggerty (2004) stated that “Research ethics is rooted in responses to abuses of research”. Ethics are moral principles, not necessarily legal ones that govern people’s behavior. Research ethics are the “moral principles that govern

the standards of conduct for scientific researchers" (Laerd Dissertation). Research ethics are important because they help promote research objective of generating and expanding knowledge, support for the value of collaborative work, mutual respect, and fairness. They also support the principle of "do no harm" to others (Laerd Dissertation). Research ethics ensures that the research process is not just about collecting data and or information but is also concerned with the dignity, right and wellbeing of those involved in the process (Stuart and Barnes, 2005). Though this request presents no harm to anyone but rather seeks to uncover a truth that will ensure optimum benefit for the investment by businesses, we had to ensure still that it is conducted with the dignity and rights of the participants considered.

With ethics in mind, data is then collected through questionnaire and face-to-face interviews, meaning that the research design is of mixed method. This is based on the research problem to solve. The researcher reckons that to answer the research question, there was the need to capture some qualitative data about the details of the underpinning for the investment by firms in information technology. The nature of the research also required that the research population is both literate and experienced in corporate strategy and particularly as it involves investment for returns. The firms within the industry that were surveyed are 25. There are other firms licensed as payment service providers by the central bank of Nigeria but the list of 25 are those currently operational with some information technology investments. Based on the prospective participants collated through the human resource departments of these firms, a total of 130 questionnaires were administered out of which 88 participants responded representing 67.7% response rate. It must be noted that this high response rate came about following multiple follow-ups. The questionnaires were sent multiple times with follow-up calls to draw the attention of the respondents to them.

While some executives agreed to fill out the questionnaires, many did them hence the researcher reached out and interviewed eight (8) of the CEOs. With interview response added to the questionnaire response, the total response rate grew to 73.7% success rate of the 130 respondents that were reached out to. The qualitative data is coded and added to the quantitative data to form a single quantitative data set. The combined quantitative dataset is then analyzed using the statistical tool called IBM SPSS and AMOS. SPSS provides computer assisted data analysis for researchers. It is one of the most widely used statistical software for researcher providing visualization and data analytical tools. Correlation and regression analysis is then used to analyze the summated Likert scale of observed variables (to describe the latent variables) so that the hypotheses can be tested.

Chapter 4

4.0 Findings

The e-payment industry is a knowledge-intensive and information technology-dependent one. In e-payment, as it is with industries such as telecommunication, e-commerce, and retail financial services, they owe their existence to Information Technology. There is a mistaken assumption among industry practitioners and researchers alike, that investment in information technology assets by itself confers an advantage on one firm over the other in the same industry in today's business environment. In the e-payment sector in Nigeria, each firm in the industry spend millions of dollars annually on information technology assets in the pursuit of competitive advantage without desired successes this regardless of the growing homogeneity, ubiquity, and standardization of Information Technology. As a response to this problem observed in practice and as gaps in Information Systems researches, this study seeks to refocus the search for generation of rent from investment in information technology to more rare resources - organizational information systems capabilities as the underpinnings for firm sustainable competitive advantage. This research is based on the following management research theories - resource-based-view, capability-based view, and knowledge-based view.

A mixed method research approach was used to establish that sustainable competitive advantage can be earned by firms within an industry based on Information Systems Capabilities despite the growing standardization and homogeneity of Information Technology assets. A purposive sampling of the e-Payment industry of Nigeria was done due to the specialized nature of the required sample population.

The research established that information systems can spawn sustainable competitive advantage for any firm that base the search for generation of rent on information systems

capabilities of the firm rather than on investment in information technology assets. This was established through both correlation and regression analysis of summated scale of data collected from respondents. The constructs studied are sustainable competitive advantage, Organizational information systems capabilities, organizational agility, and organizational knowledge management. The research also established that the relationship between sustainable competitive advantage and information systems capabilities can be enhanced when other variables such as organizational agility and organizational knowledge management are considered.

By the result of this research, the focus of any organization that seeks to have a sustained competitive edge over other industry players based on information technology should shift to investment on human capability development, organizational learning, knowledge management and flexible strategic system design.

In this chapter the findings based on the analysis of data collected from respondents from the researcher's field work are presented. The chapter starts with validating the trustworthiness of the data collected. This was established through method triangulation and the consideration of the mix of Information Technology and Business leaders from the firms within the ePayment industry of Nigeria. This approach ensures the research data collected is trustworthy. For any meaningful result to be derived from the analysis of collated data, it must be established that such data is trustworthy. Triangulation is a method for ensuring the trustworthiness of data. It helps to "increase confidence in the findings through the confirmation of a proposition using two or more independent measures. The combination of findings from two or more rigorous approaches provides a more comprehensive picture of the results than either approach could do alone". As part of ensuring validity and trustworthiness of the data, the data collected were subjected to

common method bias. To minimize method biases, since respondents respond to measurement of all variable types, we ensured methodical separation of the measurement instrument (the constructs were individually introduced and measured separately). We also ensured respondents anonymity was protected to ensure reduction of evaluation apprehension (Podsakoff, et. al., 2003). This is very important because common method biases are a problem because they are one of the "main sources of measurement error. Measurement error threatens the validity of the conclusions since the relationships between measures is widely recognized to have both a random and a systematic component" (Bagozzi & Yi, 1991; Nunnally, 1978; Spector, 1987).

Once the trustworthiness of data was established, a review of the demographic information of the respondents followed. The review involves respondents by age, educational levels, levels within their respective organizations and positions they occupy within their organization. This is to establish if the participants are the right target participants for this elite research. The demographic information of the respondent was part of the collated information either through interview or questionnaire. This is to validate that the target sample has requisite training, experience, and exposure to provide the insight necessary for this research. The results are tabulated below. The information collated and tabulated is age, highest educational qualification, level, and position within the respondents' respective organizations.

The validity of the measurement instrument and measurement was further established. Validity refers to measurement the produced the result it was supposed to. Validity was established using both exploratory and confirmatory factor analysis. It was again found that the measured variables loaded significantly to the latent variable and the model fit was also found to be appropriate. This confirmed the measurement scale, and the measurement is what they should be.

This further improves the trustworthiness of the data to be analyzed. Reliability of the data was also established. Reliability refers to the internal consistency of the measured data. The Cronbach alpha coefficient was used to test the reliability of our measures. The result showed that each set of measured variables has an internal consistency of the level of good to excellent.

The data collated based on observed variables are converted to a summated Likert scale to represent the constructs of interest – Organizational Information Systems Capability, Organizational Agility, Organizational Knowledge Management and Sustainable Competitive Advantage. The validated data are then used to test the hypothesis originally generated for this research. Correlation and Regression Analysis techniques were employed for this purpose. From the results of both the correlation and regression analysis the five (5) alternate hypotheses were found to be supported and the null hypotheses were therefore rejected.

The research found that Organizational Information System Capability is positively associated with Sustainable Competitive Advantage. It follows that Organizations with investments and strategy on how to grow information system capabilities particularly in Information Technology dependent industry like the ePayment, are more likely according to Chaharbaghi and Lynch (1999) to "positively embrace change, constantly adapt to altered ways and new demands through introduction of new resource configurations, while at the same time preserving the best of its past" which is what sustainable competitive advantage is about. Sustainable Competitive Advantage involves resource management and resource development. The former is concerned with meeting the competition today while the latter is targeted toward the competitive challenges of tomorrow. This is also true in the relentlessly changing business and technology environment of today. It also established that the relationship between sustainable

competitive advantage and organizational information systems capabilities is enhanced when organizational agility and organizational knowledge management is considered alongside as mediating and moderating factors respectively.

The findings of this study confirm and bring to live the implications of both resource and capability-based views of the firms. These theories premise competitive advantage on firm resources. Resource Based View (RBV) of the form explicitly explains why different firms in the same industry might differ in performance based on their respective internal sources of Sustainable Competitive Advantage (Kraaijenbrink, et al. (2010). RBV helps to explain the "conditions under which a firm's resources will provide it with a competitive advantage" (Barney, 1991). According to Dicksen (1996), RBV therefore provides an "inside-out" view or firm specific view of why organization succeed or fail within industries.

The results of this research reconfirm and agrees with some extant business and information systems literatures on the impact of Organizational information systems capability on sustainable competitive advantage. One such research is by Khan et. al (2018). He started up by encapsulating organizational capabilities under firms' intellectual capital and defines such as firms' intangible assets – "all the valuable resources and capabilities obtained through knowledge and experience and used for further creation of wealth". They opined that "intellectual capital significantly and positively contributes to firms' value creation and sustainable competitive advantage and well managed intellectual capital assists access to the different resources and capabilities required for firms' growth, success, and positioning in dynamic market".

4.1 Trustworthiness of data

Data was collected from mixed pair field survey of Technology and Business leaders in the ePayment industry in Nigeria. The data collection was conducted with mixed instruments of questionnaire and face-to-face interviews. Besides other considerations, the choice of both business and technology leaders being involved in the survey and the use of both questionnaires and interviews is to ensure credibility and trustworthiness of the data collected. This is a form of triangulation. Researchers use triangulation which in this case is method type to ensure holistic perspective and thereby increase the validity and credibility of the study. It helps to increase completeness of a study result as one part of the study presents results which may not have been found in the other parts of the study (Johnson and Christensen, 2004; Johnson and Onwuegbuzie, 2004). According to Heale and Forbes (2017), triangulation in research is the use of more than one approach to researching a question. The objective is to "increase confidence in the findings through the confirmation of a proposition using two or more independent measures. The combination of findings from two or more rigorous approaches provides a more comprehensive picture of the results than either approach could do alone". For this this research, both quantitative and qualitative data were gathered. The is consistent with method triangulation. Face-to-face interview is one method for data collection for this mixed method research. This qualitative method was employed to take care of other deductions that could be made from attitude, experience, values, beliefs of the people besides the data to be collected (Kumar, 2011) and to satisfy the concept of triangulation. It also took care of gathering data from the very senior Organizational leaders that did not have the time to sit and respond to questionnaires. Data collected through the qualitative method were organized and combined with the quantitative data set for analysis and inferences.

For this research, the researcher employed embedded mixed method research design paradigm. It follows therefore that the data collected through the qualitative method will have to be combined with the quantitative data set before data analysis can begin. It should be noted however that data collected through the qualitative method of interviews are of the different kind from the ordinal data collected through the quantitative method of questionnaire. For the data to be successfully combined, the qualitative data must be coded. The process begins with a thematic analysis of the qualitative data. Thematic analysis as used for this research involves familiarization with the collected data, generation of themes and then coding. The thematic analysis approach used here is inductive and semantic which involves "coming to the data with some preconceived themes expected to be reflected, based on theory or existing knowledge" and analyzing the "explicit content of the data" (Caulfield, 2019). After the data has been thematically analyzed, researcher pre-assigned codes are then assigned to specific themes and phrases. Based on these, the data collected through the qualitative method are organized and combined with the quantitative data set for analysis and inferences. This is so since the data gathered through interviews are not exactly quantitative, they had to be organized -coded i.e., finding unifying idea and concepts, grouping the ideas and overarching themes. Based on scales used for the quantitative surveys, the researcher grouped and coded the responses. Certain keywords and phrases are assigned codes based on the sense the researcher got from discussion during the interview sessions. The final data set is the result of data gathered from respondent through a mixed methodology that embraces the concept of "triangulation". This is one other way to ensure validity of the study by bringing together more than one method (Yeasmin and Rahman, 2012). It follows that for this study, triangulation involves the use of multiple methods to study certain constructs and relationships between them.

It should be noted that though the research participants for the qualitative study were only eight (8) respondents, the researcher checked and ensured that "saturation" was reached before the qualitative study was closed. Additional respondents' input was no longer going to make any difference to the study. It is a point at which no new themes, insights or information is emerging. The researcher looked out for this point in the qualitative study. Saturation is however not required for the quantitative study as it is not relevant because the quantitative study approach follows a more structured and statistically driven approach. In quantitative studies, the researcher was concerned with sample size (an in this study, the entire population was used hence eliminating sampling) and representativeness (which is also not applicable to this study).

4.1.1 Common Method Bias

To minimize the threat of common method bias "(i.e., variance that is attributable to the measurement method rather than to the constructs the measures represent)" (Campbell & Fiske, 1959), both the dependent variable (Sustainable competitive advantage), independent variable (Organizational Information Systems Capability) and moderating/mediating variables (Organizational knowledge management/Organizational agility) were measured by asking business and technology executive of a number of companies the same set of questions. To minimize method biases since the respondents, respond to measurement of all variable types, we ensured methodical separation of the measurement instrument (the constructs were individually introduced and measured separately). We also ensured respondents anonymity was protected to ensure reduction of evaluation apprehension (Podsakoff, et. al., 2003). This is very important because common method biases are a problem because they are one of the "main sources of

measurement error. Measurement error threatens the validity of the conclusions since the relationships between measures is widely recognized to have both a random and a systematic component" (Bagozzi & Yi, 1991; Nunnally, 1978; Spector, 1987).

4.2 Validity and Reliability of Data

4.2.1 Exploratory Factor Analysis

To test validity of the underlying constructs that the observed variables underpin, we conducted an exploratory factor analysis (EFA). Exploratory Factor Analysis (EFA) helps to "determine what the factor structure looks like according to participant responses. It is essential in determining the underlying constructs for a set of measured variables" (Child,1990)

Running factor analysis on our data set (aggregate of data record from both qualitative and quantitative), the observed variables loaded to their respective construct thereby affirming convergent validity and one-dimensionality of the constructs. In this case, factor analysis is being used to evaluate the psychometric quality of the measure and assessment of the dimensionality of our set of variables (Glassnap and Poggio, 1985). Factor analysis is used to confirm the validity or otherwise of the measurement model (the relationship between the latent variable and the observed variables (Easterby-Smith et al, 2012). Glassnap and Poggio (1985) define factor analysis as "construct which is a condensed statement of the relationships between a set of variables, and this is defined by it factor loading. Factor loading is defined by a correlation of a variable with a factor". Using factor analysis on our dataset, the observed variables loaded to the latent variables hence confirming the validity of the measurement and measurement instrument employed for this study. There were, however, a few variables with very week factor loading that had to be skipped.

The result of factor analysis of our set of observed variables used to define the latent variables and the respect loading of the observed variables to the latent variables is as shown below.

Rotated Component Matrix[a]

	Component			
	1	2	3	4
ISC1	.119	.203	.102	**.822**
ISC2	.238	.075	.376	**.726**
ISC3	.160	.173	.133	**.805**
ISC5	.521	.158	-.062	**.594**
OA4	**.695**	.346	.227	.122
OA7	**.713**	.208	.404	.251
OA8	**.743**	.245	.310	.227
OA9	**.805**	.257	.177	.212
OKM1	.377	**.727**	.152	.252
OKM2	.158	**.894**	.233	.180
OKM3	.242	**.875**	.161	.102
OKM4	.323	**.590**	.340	.205
SCA1	.233	.269	**.733**	.052
SCA3	.177	.076	**.871**	.083
SCA6	.133	.186	**.677**	.222
SCA7	.324	.389	**.558**	.195

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Table 4.1. Factor loading

Component 1 (Factor 1) is Organizational Informational Systems Capabilities

Component 2 (Factor 2) is Organizational Agility

Component 3 (Factor 3) is Organizational Knowledge Management

Component 4 (Factor 4) is Sustainable Competitive Advantage

Factor analysis is an “orderly simplification of interrelated measures. Traditionally factor analysis has been used to explore the possible underlying structure of a set of interrelated variables without imposing any preconceived structure on the outcome” (Child, 1990). By performing exploratory factor analysis (EFA) on the data generated from our respondents, the constructs and the underlying factor structure were identified. Being that it agreed with our underlying structure (the observed variables all loaded to the respective constructs as previously hypothesized), this further strengthens the validity and reliability of the data and measurement instrument.

4.2.2 Confirmatory Factor Analysis (CFA)

To further test the convergent and discriminant validity of the measurement, we adopted structural equation modeling of the Confirmatory Factor Analysis. Confirmatory Factor Analysis allows the researcher to “test the hypothesis that a relationship between the observed variables and their underlying latent construct(s) exists. The researcher uses knowledge of the theory, empirical research, or both, postulates the relationship pattern a priori and then tests the hypothesis statistically to assess model fitness.” (Child, 1990). The “goodness of fit pertains to how well the parameter estimates of the Confirmatory factor analysis solution (i.e., factor loadings, factor correlations, error covariances) are able to reproduce the relationships that were observed in the sample data” (Child, 1990). The objective is to obtain estimates for each parameter of the measurement that “produce a predicted variance-covariance matrix that resembles the sample variance-covariance matrix as closely as possible”. By so doing confirmatory factor analysis ensures the “estimation of scale reliability” (e.g., Raykov, 2001).

Confirmatory factor analysis was performed on our dataset following the exploratory factor analysis done. Some more observed variables that loaded weakly were isolated and a final set of observed variables as shown below were used. The data loaded very strongly to the latent variable as well as other measure of model fitness as shown below were confirmed.

The statistical results of confirmatory factor analysis on the data generated from respondent for this research work are as follows.

S/N	Latent Constructs	Range of Factor Loading
1	Organizational Information Capabilities	**0.66-079**
2	Organizational Knowledge Management	**0.70-0.94**
3	Organizational Agility	**0.74-0.86**
4	Sustainable Competitive Advantage	**0.58-0.79**

Comparative Fit Index **(CFI)= 0.95**

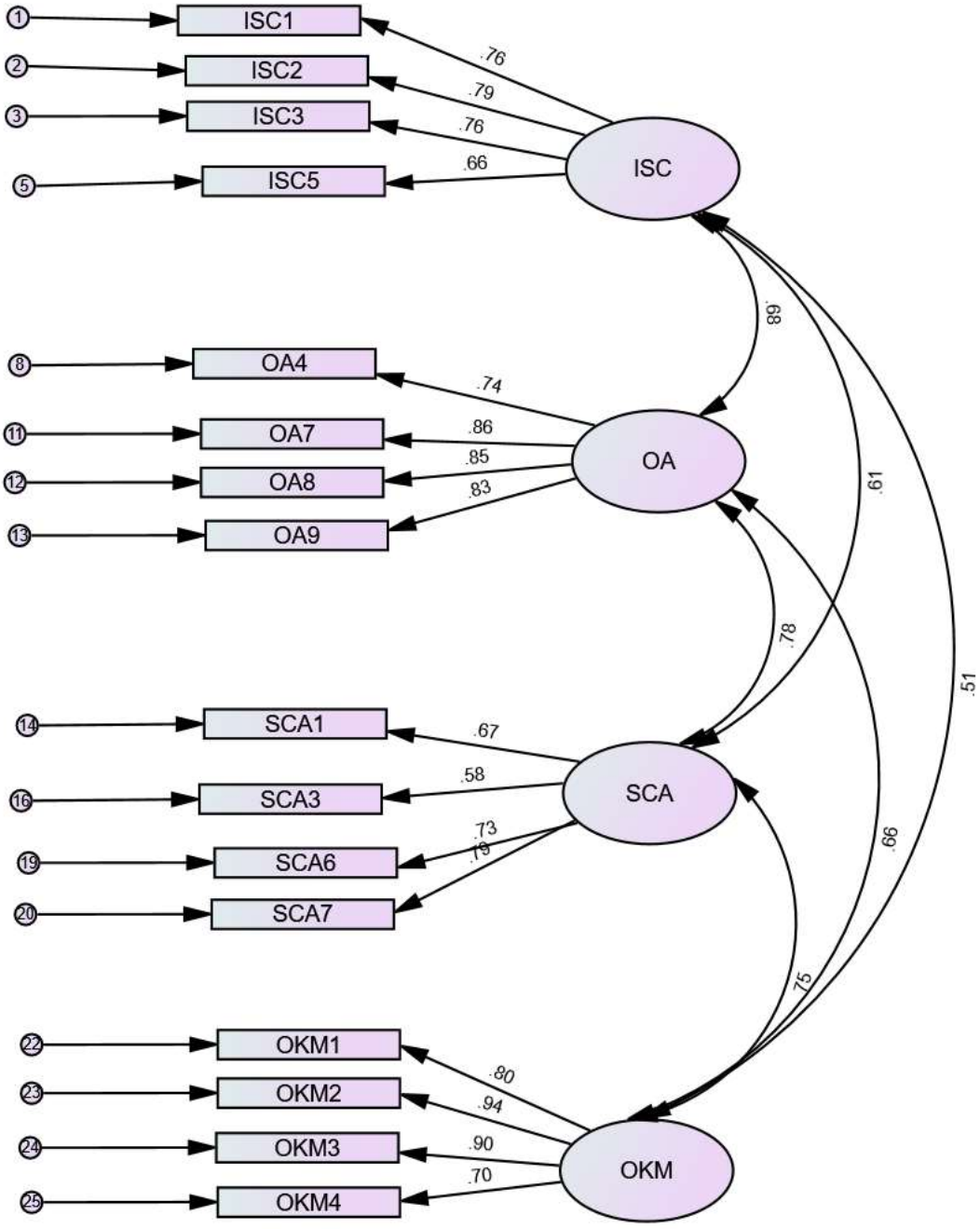
This is described as "function adjusted for sample size. CFI ranges from 0 to 1 with a larger value indicating better model fit. Acceptable model fit is indicated by a CFI value of 0.90 or greater" (Hu & Bentler, 1999).

Root Mean Square Error of Approximation **(RMSEA)= 0.07**

This is "related to residual in the model. RMSEA values range from 0 to 1 with a smaller RMSEA value indicating better model fit. The closer the value of RMSEA value is to 0.06 or less the better" (Hu & Bentler, 1999).

Table 4.2 Confirmatory factor loading range.

The result suggests significantly high loading of the observed variables to the latent variables. The fitness index is also within an acceptable model fitness range. By these, the structural relationship between the observed variables and latent variables has been confirmed. The model has also been confirmed as good enough. The validity of the data collected as well as the approach is collecting the data has therefore been validated and found reliable.



4.1 Path Diagram for Confirmatory Factor Analysis

4.2.3 Reliability of the Respondent data

The reliability of each of the observed variables used to underpin the latent variable will have to be determined. This was measured with Cronbach's alpha reliability test using SPSS. Cronbach's alpha reliability describes "the reliability of a sum (or average) of q measurements where the q measurements may represent q raters, occasions, alternative forms, or questionnaire/test items. When the measurements represent multiple questionnaire/test items, which is the most common application, Cronbach's alpha is referred to as a measure of "internal consistency" reliability" (McDonald, 1999). Cronbach's alpha reliability coefficient normally ranges between 0 and 1. George and Mallery (2003) provide the following rules of thumb: "_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable."

Checking the reliability of the observed variables for the constructs of interest (Organizational Information System Capability, Organizational Agility, Organizational Knowledge Management and Sustainable competitive Advantage) is as follow:

A. Organizational Information System Capability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.824	.826	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ISC1	12.84	3.666	.686	.481	**.761**
ISC2	12.79	3.955	.676	.464	**.770**
ISC3	13.02	3.404	.680	.470	**.766**
ISC5	13.04	3.998	.567	.322	**.814**

4.3 Cronbach's Alpha for ISC observed variables.

Based on the George and Mallery (2003) rules of thumb, with Cronbach's alpha reliability coefficient for each of the variables above 0.7, we conclude that research data for the latent variables – Organizational information systems capability have "internal consistency reliability".

B. Organizational Agility

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.888	.890	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
OA4	12.63	5.682	.689	.478	**.883**
OA7	12.55	4.761	.786	.629	**.844**
OA8	12.39	4.772	.783	.624	**.845**
OA9	12.55	4.591	.781	.609	**.848**

Table 4.4 Cronbach's Alpha for OA observed variables.

Based on the George and Mallery (2003) rules of thumb, with Cronbach's alpha reliability coefficient for each of the variables above 0.7, we conclude that research data for the latent variables – organizational agility have "internal consistency reliability".

C. Organizational Knowledge Management

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.897	.898	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
OKM1	12.51	6.082	.763	.588	**.871**
OKM2	12.54	5.634	.863	.804	**.833**
OKM3	12.67	5.924	.806	.775	**.855**
OKM4	12.46	6.294	.663	.494	**.908**

Table 4.5 Cronbach's Alpha for OKM observed variables.

Based on the George and Mallery (2003) rules of thumb, with Cronbach's alpha reliability coefficient for each of the variables above 0.7, we conclude that research data for the latent variables – organizational knowledge management have "internal consistency reliability".

D. Sustainable Competitive Advantage

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.810	.813	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SCA1	13.74	2.515	.639	.421	**.759**
SCA3	13.58	2.651	.721	.519	**.720**
SCA6	13.49	3.082	.551	.321	**.797**
SCA7	13.73	2.541	.623	.402	**.767**

Table 4.6 Cronbach's Alpha for SCA observed variables.

Based on the George and Mallery (2003) rules of thumb, with Cronbach's alpha reliability coefficient for each of the variables above 0.7, we conclude that research data for the latent variables- sustainable competitive advantage have "internal consistency reliability".

4.2.4 Demographic information about the respondents

The demographic information of the respondent was part of the collated information either through interview or questionnaire. This is to validate that the target sample has requisite training, experience, and exposure to provide the insight necessary for this research. The results are tabulated below. The information collated and tabulated is age, highest educational qualification, level, and position within the respondents' respective organizations.

4.2.4.1 Age of Respondents

There are ninety-six (96) total respondents. Three (3) did not provide their demographic information at all while five (5) did not provide information about their age. Of the information from eighty-eight (88) respondents recorded, the youngest is twenty-eight (28) while the oldest is fifty-eight (58) years old, hence the age range is Thirty (30). The mean age of respondents is 43.26.

This represents the age of adult hence information provided by such respondents can be relied upon as deliberate.

Statistics

Age

N	Valid	88
	Missing	5
Mean		43.26
Median		43.00
Std. Deviation		7.167
Variance		51.368
Range		30
Minimum		28
Maximum		58

Table 4.7 Age statistics of respondents

4.2.4.2 Educational level of respondents

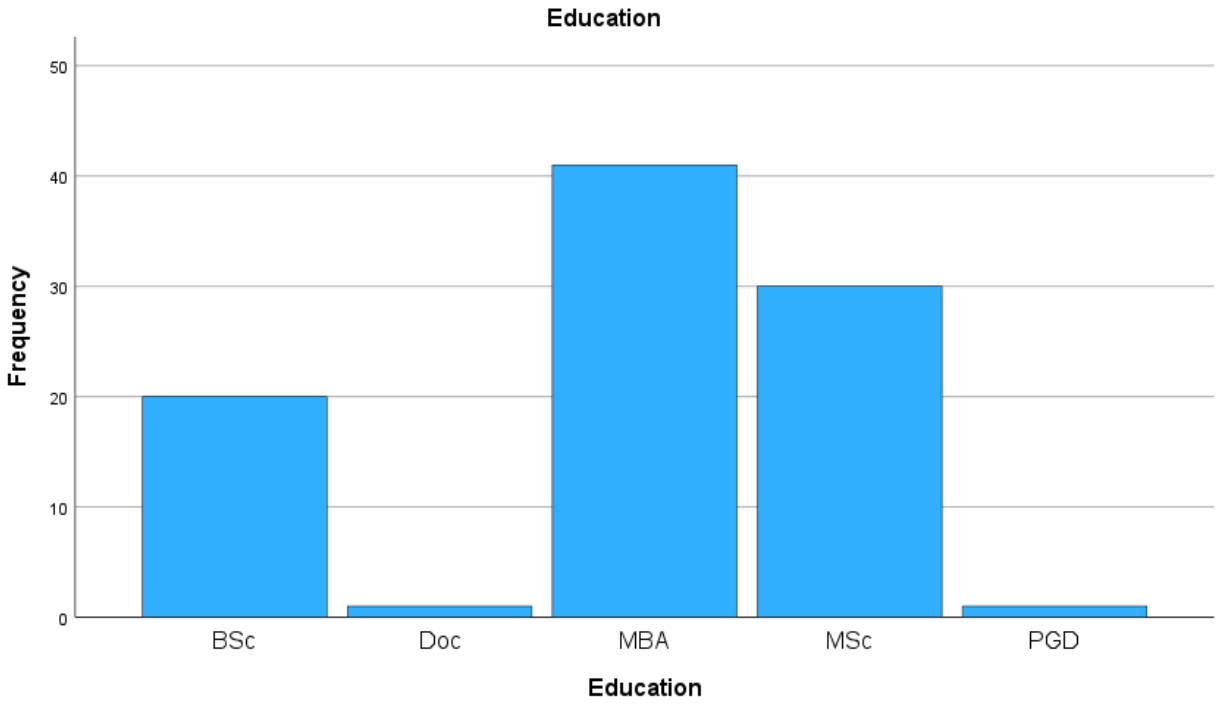
Of the ninety-six (96) total respondents, ninety-three (93) provided information about their educational level with seventy-three (73) of those with higher education beyond Bachelors' degree. One of the respondents has a doctorate while seventy-one (71) has a master's degree level education and one (1) has postgraduate diploma.

The educational level of the respondents shows that the participants belong to a very educated population. The educational level therefore proves the population has what is required to answer and provide the specialized information being elicited from them.

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BSc	20	21.5	21.5	21.5
	Doc	1	1.1	1.1	22.6
	MBA	41	44.1	44.1	66.7
	MSc	30	32.3	32.3	98.9
	PGD	1	1.1	1.1	100.0
	Total	93	100.0	100.0	

Table 4.8 Education statistic of respondents



Graph 4.1 Education distribution of respondents

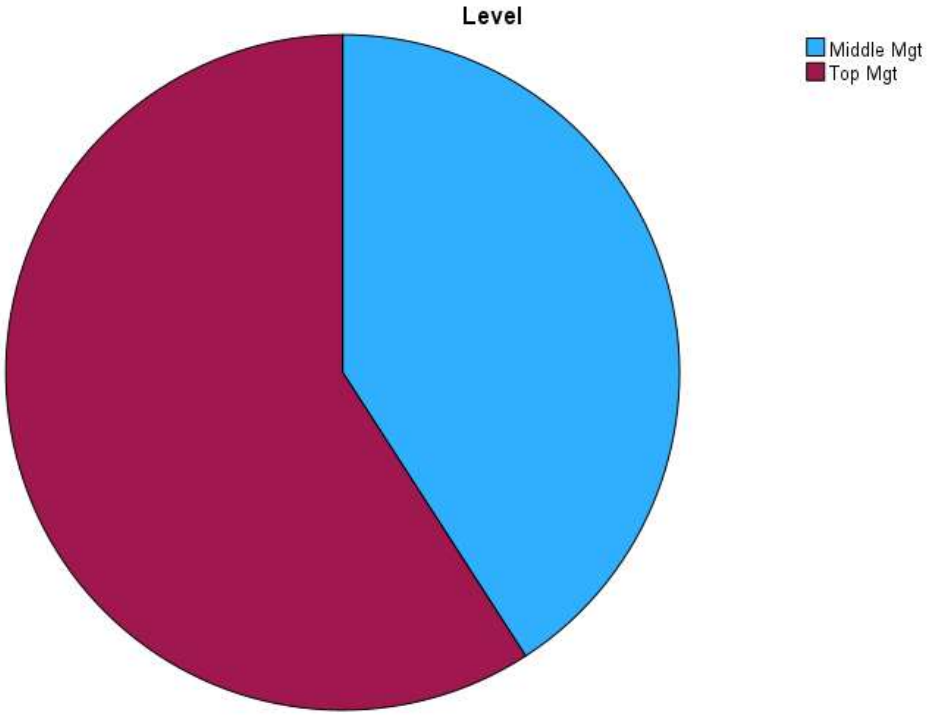
4.2.4.3 Respondents' level within their respective organizations.

Fifty-five (55) of the ninety-three (93) respondents that provided information about their respective levels within their organization belong to the top management level while thirty-eight (38) belong to middle management. This again lays credence to the information elicited and collated from this management level individuals. It shows we dealt with the right population within the different organizations.

Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Middle Mgt	38	40.9	40.9	40.9
	Top Mgt	55	59.1	59.1	100.0
	Total	93	100.0	100.0	

Table 4.9 Statistics of respondents' level within their organization



Graph 4.2 Distribution of respondents by Organizational levels

4.2.4.4 Respondent position within their respective Organizations

Below is a table showing the very different positions of responsibility (in business and technology functions) occupied by the different respondents. The position ranges from CEO (11) to Head of Department (HOD) (24) and different other positions of responsibility in between.

This information further affirms that the population have the required responsibility and therefore, should understand the issues and consequently be able to provide the required information needed for this research.

Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Account manager	1	1.1	1.1	1.1
	Asset Manager	1	1.1	1.1	2.2
	CEO	11	11.8	11.8	14.0
	Chief Growth Officer	1	1.1	1.1	15.1
	Chief Operating Officer	1	1.1	1.1	16.1
	CIO	1	1.1	1.1	17.2
	COO	1	1.1	1.1	18.3
	CTO	3	3.2	3.2	21.5
	Director	3	3.2	3.2	24.7
	Director financial institution	1	1.1	1.1	25.8
	Divisional head	1	1.1	1.1	26.9
	DVP	1	1.1	1.1	28.0
	ED	1	1.1	1.1	29.0
	Enterprise Architect	1	1.1	1.1	30.1
	Executive Director	1	1.1	1.1	31.2
	General Manager	2	2.2	2.2	33.3
	G M Telco Business	1	1.1	1.1	34.4
	GM	1	1.1	1.1	35.5
	Group Chief Strategy Officer	1	1.1	1.1	36.6
	Group head	1	1.1	1.1	37.6
	Group Head	17	18.3	18.3	55.9
	GH Audit and Compliance	1	1.1	1.1	57.0
	HOD	24	25.8	25.8	82.8
	HOO	1	1.1	1.1	83.9
	Impl. Specialist	1	1.1	1.1	84.9
	Key Account Manager	1	1.1	1.1	86.0
	Managing Partner	1	1.1	1.1	87.1

	Platform	1	1.1	1.1	88.2
	Project Manager	1	1.1	1.1	89.2
	Sales manager	1	1.1	1.1	90.3
	Senior Account Cloud Engineer	1	1.1	1.1	91.4
	Senior Management	1	1.1	1.1	92.5
	Senior Manager	1	1.1	1.1	93.5
	Senior Sales Executive	1	1.1	1.1	94.6
	Team Lead	2	2.2	2.2	96.8
	TEAM LEAD	1	1.1	1.1	97.8
	Vice President	1	1.1	1.1	98.9
	VP SRE	1	1.1	1.1	100.0
	Total	93	100.0	100.0	

Table 4.10 Respondents' levels within their respective organization

Based on the data gathered and analyzed above on level and position within the respective firms by the respondents, they respondents represent leadership and individual with requisite education and positions. This therefore confirms suitability for participation in the study. They represent those that participate in the decision on business and technology within their respective organizations.

4.3 Results

4.3.1 Hypotheses Testing

Following the test for validity of the measurement instrument and reliability of the data generated, we can now conclude that we have a set of constructs that can be used for our hypothesis testing. The hypothesis will be tested using both correlation and regression analysis. The Likert item obtained from responses by respondents that was previously tested for validity will have to be converted into a summated scale to represent each multi-variable construct. According to

(Child, 1990), “a summated scale is a good representation of the original set of items when reliability and validity of the construct have been established”. A Likert scale is composed of a “series of four or more Likert-type items that represent similar questions combined into a single composite score/variable” (Likert, 1931). Likert scale data can be analyzed as interval data, i.e., the mean is the best measure of central tendency. Parametric analysis of ordinary averages of Likert scale data is justifiable by the Central Limit Theorem” (Likert, 1931). The central limit theorem (CLT) states that “the distribution of sample means approximates a normal distribution as the sample size gets larger, regardless of the population's distribution”.

4.3.1.1 Correlation Analysis.

Hypothesis testing involves finding if the proposed relationship between variable exists or not. When comparing two different variables, two questions come to mind: “Is there a relationship between two variables?” and “How strong is that relationship?” These questions can be answered using Regression and Correlation Analysis. Regression answers whether there is a relationship and Correlation answers how strong the linear relationship is.

Correlation “quantifies the degree and direction to which two variables are related. When correlation coefficient r is 0.0, there is no relationship. When r is positive, it represents a trend that when one variable goes up, the second does the same. When r is negative, it represents that when one variable goes up as the other one goes down” (Zaid, 2015). Therefore, Correlation is a “statistical measure that indicates the extent to which two or more variables fluctuate together. A positive correlation indicates the extent to which those variables increase or decrease in parallel; a negative correlation indicates the extent to which one variable increases as the other decreases.”

Correlations

			Capability	Sus Adv	Agility	Knw Mgt
Kendall's tau_b	Capability	Correlation Coefficient	--			
		Sig. (2-tailed)	.			
		N	95			
	SusAdv	Correlation Coefficient	.332	--		
		Sig. (2-tailed)	<.001	.		
		N	95	95		
	Agility	Correlation Coefficient	.431	.495	--	
		Sig. (2-tailed)	<.001	<.001	.	
		N	95	95	95	
	KnwMgt	Correlation Coefficient	.384	.517	.555	--
		Sig. (2-tailed)	<.001	<.001	<.001	.
		N	95	95	95	95

Table 4.11 Correlations of latent variables

All the constructs are positively correlated with the least correlation coefficient at .332. Secondly, with the 2-tailed significance smaller than the significance level ($\alpha = 0.05$), we REJECT the null hypothesis in favor of the alternative. We conclude that **the correlation is statically significant**.

4.3.1.2 Regression Analysis

Linear regression finds the best line that predicts dependent variable from independent variable. The decision of which variable to call dependent and which to call independent is an important matter in regression, as a different best-fit line emerges if the two variables are swapped. Regression analysis “involves identifying and evaluating the relationship between a dependent variable and one or more independent variables, which are also called predictor or explanatory variables”. When there is a single continuous dependent variable and a single independent variable,

the analysis is called a simple linear regression analysis. Multiple regression is used to learn about the "relationship between several independent or predictor variables and a dependent or criterion variable" (Zaid, 2015). Regression analysis explains how the independent variable is numerically related or associated to a dependent variable.

Different kind of regression analysis to cover fully the relationship between the constructs based on the conceptual frameworks was performed and the results are as shown below.

A. Linear regression analysis between the dependent variables - and independent variables for this research based on the conceptual framework.

1. Sustainable Competitive Advantage (dependent) and Organizational Information System Capability (independent)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.447[a]	.200	.191	.47751

a. Predictors: (Constant), Capability

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.292	1	5.292	23.210	<.001[b]
	Residual	21.205	93	.228		
	Total	26.497	94			

a. Dependent Variable: SusAdv

b. Predictors: (Constant), Capability

Table 4.12 Regression analysis of ISC and SCA

2. Organizational Agility (dependent) and Organizational Information System Capability (independent)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.590[a]	.348	.341	.59140

a. Predictors: (Constant), Capability

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.332	1	17.332	49.554	<.001[b]
	Residual	32.527	93	.350		
	Total	49.859	94			

a. Dependent Variable: Agility

b. Predictors: (Constant), Capability

Table 4.13 Regression Analysis of OA and ISC

3. Sustainable Competitive Advantage (dependent) and Organizational Agility (independent)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.635[a]	.403	.396	.41256

a. Predictors: (Constant), Agility

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.668	1	10.668	62.678	<.001[b]
	Residual	15.829	93	.170		
	Total	26.497	94			

a. Dependent Variable: SusAdv

b. Predictors: (Constant), Agility

Table 4.14 Regression analysis of SCA and OA

B. Multiple regression analysis based on conceptual framework.

Sustainable Competitive Advantage (dependent variable), Organization Information Systems Capability (independent variable) and Organizational Agility (mediating variable)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.447[a]	.200	.191	.47751
2	.641[b]	.411	.398	.41197

a. Predictors: (Constant), Capability

b. Predictors: (Constant), Capability, Agility

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.292	1	5.292	23.210	<.001[b]
	Residual	21.205	93	.228		
	Total	26.497	94			
2	Regression	10.883	2	5.442	32.064	<.001[c]
	Residual	15.614	92	.170		
	Total	26.497	94			

a. Dependent Variable: SusAdv

b. Predictors: (Constant), Capability

c. Predictors: (Constant), Capability, Agility\

Table 4.15 Multiple regression analysis of SCA, ISC and OA

C. Hierarchical regression analysis based on the conceptual framework.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.447[a]	.200	.191	.47751
2	.619[b]	.384	.370	.42130
3	.626[c]	.392	.372	.42080

a. Predictors: (Constant), Capability

b. Predictors: (Constant), Capability, KnwMgt

c. Predictors: (Constant), Capability, KnwMgt, Cap_Know

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.292	1	5.292	23.210	<.001[b]
	Residual	21.205	93	.228		
	Total	26.497	94			
2	Regression	10.168	2	5.084	28.643	<.001[c]
	Residual	16.329	92	.177		
	Total	26.497	94			
3	Regression	10.384	3	3.461	19.548	<.001[d]
	Residual	16.113	91	.177		
	Total	26.497	94			

a. Dependent Variable: SusAdv

b. Predictors: (Constant), Capability

c. Predictors: (Constant), Capability, KnwMgt

d. Predictors: (Constant), Capability, KnwMgt, Cap_Know

Table 4.16 Hierarchical regression analysis of SCA, ISC and OKM

4.3.2 Hypotheses

4.3.2.1 H1: Sustainable Competitive advantage is positively correlated with Organizational Information Systems Capability in Information Technology dependent Organizations.

This hypothesis tests if Organizational Information Systems capabilities impact on Sustainable Competitive Advantage. The dependent variable Sustainable Competitive Advantage was regressed on the predicting variable -Organizational Information Systems Capability to test this hypothesis **H1.**

Organizational Information Systems Capability predicted Sustainable Competitive Advantage, F= 23.210, P <.001 (less than 0.05)-, which indicates that Organizational Information System Capability plays a statistically significant role in determining Sustainable Competitive Advantage. It shows that 20% of changes in Sustainable Competitive Advantage is attributable to Organizational Information System Capability. It indicates there is a positive correlation between Organizational Information Capability and Sustainable Competitive Advantage. The table below shows the details.

Hypothesis	Regression Weights	Regression Coefficient R	R Square	P- Value	Hypothesis Supported
H1	ISC → SCA	.447	.200	<.001	**Supported**

Note: P< 0.05, SCA = Sustainable Competitive Advantage, OFSC = Organizational Information System Capability. The R value indicates how strongly the independent variable predicts the dependent variable.

In the era of Schumpeterian competition, dynamic resources such as organizational information systems capabilities are strongly correlated with sustainable competitive advantage. This research result confirms that. According to Aydiner et al. (2018), information systems "capabilities and competencies enables the use of the resource-based view (RBV) to better explore the strategic value of Information System. These capabilities are composed of the infrastructure, human, and administrative kind, so that they develop an ability to exploit Information Systems resources to create a competitive advantage". The heterogeneity in its distribution, immobility of these resources and capabilities among the competing firms according to RBV is the basis for the difference in rent generation among firms in the same industry. Similarly, Information Systems' capabilities may be described as a "means of classifying and providing access to knowledge that is learned and successfully applied". Peppard and Ward (2004) describe information system capability conversation in relation to value creation for firms as a new era that builds on the previous eras of "data processing, management information systems and strategic information system (SIS)". The result confirm that organizations can build sustainable competitive advantage with strategic focus on development and growth of organizational information systems capabilities as the underpinning for rent generation from investment in information technology.

4.3.2.2 H2: In an Information Technology dependent organization, the positive correlation between Sustainable Competitive Advantage and Organizational Information Systems Capability is greater if Organizational Agility is considered.

This hypothesis tests if Organizational Information Systems capability impact on Sustainable Competitive Advantage is mediated by Organizational Agility. The dependent variable Sustainable Competitive Advantage was regressed on the predicting variable - Organizational Information Systems Capability and Organizational Agility in a multiple regression to test this hypothesis **H2.**

Organizational Information Systems Capability predicted Sustainable Competitive Advantage mediated by Organizational Agility, F= 32.064, P <.001 (less than 0.05), which indicates that Organizational Information System Capability plays a statistically significant role in determining Sustainable Competitive Advantage when mediated by Organizational Agility. With R square = .411, it follows that changes in Sustainable Competitive Advantage go up to 41% when the positive relationship with Organizational Information System Capability is mediated by Organizational Agility. The table below shows the details.

Hypothesis	Regression Weights	Regression Coefficient R	R Square	P- Value	Hypothesis Supported
H2	ISC → SCA Mediated by OA	.641	.411	<.001	**Supported**

Note: P< 0.05, SCA = Sustainable Competitive Advantage, ISC = Organizational Information System Capability, OA= Organizational Agility. The R value indicates how strongly the independent variable predicts the dependent variable.

The result here shows how the mediating impact of organizational agility on the relationship between sustainable competitive advantage and organizational information systems capabilities is so statistically significant. Razmi & Ghasemi (2015) opine that organizational agility is a "cultivated dynamic capability and aids the organization in making timely, efficient, rapid, and continual change when changing circumstances require it". It is a critical capability that allows firms to detect and seize competitive opportunities to generate innovations in addition to responding to threats (Cetindamar, et al., 2021). Organizational agility stretches the concept of organizational flexibility to include speedily sensing and responding to opportunities and threats in the business environment, solve problems, and change the firm's resource base (Mao et al., 2015; Eisenhardt & Martin, 2000; Winby & Worley, 2014). Peppard and Ward (2004) opined that for sustained competitive advantage, firms must "develop and nurture their capacities if they are to deliver value from investments made in information technology on an ongoing basis" by enabling the organization to embrace changes quickly. They termed Information system capability within organizations, the beginnings of something new - "fourth era in the evolution of the deployment and use of information technology in organizations". This is aligned with Schumpeterian competition which is the characteristic of the business environment of today. This research found a statistically significant impact of organizational agility on the relationship between the independent variable and the dependent variable.

4.3.2.3 H3: Organizational Information Systems capability predicts Organizational Agility in Information Technology dependent Organizations.

This hypothesis tests if Organizational Information Systems capabilities impact on Organizational Agility. The dependent variable -Organizational Agility was regressed on the predicting variable -Organizational Information Systems Capability to test this hypothesis **H3.**

Organizational Information Systems Capability predicted Organizational Agility, F= 49.554, P <.001 (less than 0.05), which indicates that Organizational Information System Capability plays a statistically significant role in determining Organizational Agility. With R Square = .348, it follows that 34.8 % of changes in Organizational Agility is attributable to Organizational Information System Capability. It indicates there is a positive correlation between Organizational Information Capability and Organizational Agility.

The table below shows the details.

Hypothesis	Regression Weights	Regression Coefficient R	R Square	P- Value	Hypothesis Supported
H3	ISC ⟶ OA	.590	.348	<.001	**Supported**

Note: P< 0.05, OA = Organizational Agility, ISC = Organizational Information System Capability. The R value indicates how strongly the independent variable predicts the dependent variable.

This research conceptually captured and proved that organizational agility is part of the causal pathway of the relationship between the two variables- the independent variable

(Organizational information system capability) and the dependent variable (sustainable competitive advantage). It follows therefore that organizational agility has a direct relationship with this independent variable- organizational information systems capability. Sustainable competitive advantage underpinned by this interplay of variables (information systems capability and organizational agility) manifest in superior financial position, competitive position, and barrier to erosion of the previous two attributes (Sambamurthy, et al., 2007). These attributes of sustainable competitive advantage are made possible by the dynamic capability called organizational agility by allowing "firms to respond to market opportunities through radical and incremental movements" (Sambamurthy, et al., 2007). A firm with high market capitalizing agility for instance may increase its "revenue sources by entering new market segments or identifying new customer needs within existing market segment" (Sabherwal and Chan 2001). By Operational adjustment capability, a firm may "reduce its costs and ineffective business practices by continuously adjusting its business processes toward the industry best practices" (Eisenhardt and Brown 1999; Rindova and Kotha 2001). An important attribute of sustainable competitive advantage is that such advantage should not lend itself to easy imitation by competitor. Building barrier to erosion of advantage is one of the key contributions of organizational agility. This is achieved by firms by seeking new initiative as quick replacement to existing one that create advantage before such advantage is embraced by others. Organizational agility enables a firm to respond to its environmental changes dynamically, continually, and flexibly, either by being agile operationally or by market capitalizing efforts. The barrier to erosion of value is therefore built by not being static.

4.3.2.4 H4: Organizational Agility is positively correlated with Sustainable Competitive Advantage

This hypothesis tests if Organizational Agility impact on Sustainable Competitive Advantage. The dependent variable -Sustainable Competitive Advantage was regressed on the predicting variable -Organizational Agility to test this hypothesis **H4.**

Organizational Information Systems Capability predicted Organizational Agility, F= 62.678, P <.001 (less than 0.05), which indicates that Organizational Agility plays a statistically significant role in determining Sustainable Competitive Advantage. With R Square = .403, it follows that that 40.3 % of changes in Sustainable Competitive Advantage is attributable to Organizational Agility. It indicates there is a positive correlation between Sustainable Competitive Advantage and Organizational Agility.

The table below shows the details.

Hypothesis	Regression Weights	Regression Coefficient R	R Square	P- Value	Hypothesis Supported
H4	SCA ⟶ OA	.635	.403	<.001	**Supported**

Note: P< 0.05, OA = Organizational Agility, SCA = Sustainable Competitive Advantage. The R value indicates how strongly the independent variable predicts the dependent variable.

In Schumpeterian competitive environment, competitive advantage is almost synonymous with ability to agile- ability to sense and continually change to take advantage of opportunity or avoid risks. The result of this research effort confirms this position.

4.3.2.5 H5: In an Information Technology dependent organization, the positive relationship between Organizational Information Systems Capability and Sustainable Competitive Advantage is moderated by Organizational Knowledge management.

This hypothesis tests if Organizational Information Systems capability impact on Sustainable Competitive Advantage is moderated by Organizational Knowledge Management. The dependent variable Sustainable Competitive Advantage was regressed on the predicting variable -Organizational Information Systems Capability with Organizational knowledge management in a hierarchical regression to test this hypothesis **H5.**

Organizational Information Systems Capability predicted Sustainable Competitive Advantage moderated by Organizational Knowledge Management, F= 19.548, P <.001 (less than 0.05), which indicates that Organizational Information System Capability plays a statistically significant role in determining Sustainable Competitive Advantage when moderated by Organizational Knowledge Management. With R square = .392, it follows those changes in Sustainable Competitive Advantage changes by 39.2 % when the positive relationship with Organizational Information System Capability is moderated by Organizational Knowledge Management.

The VUCA (volatile, uncertain, complex, and ambiguous) business environment that Big Tech and Information technology dependent organizations operate in is characterized by dynamic competition. In dynamic competition, firms use innovation to introduce new products, processes, and services. Rivalry results in product differentiation, recombination, integration, diversification, or platformization.

The table below shows the details.

Hypothesis	Regression Weights	Regression Coefficient R	R Square	P- Value	Hypothesis Supported
H5	ISC → SCA Moderated by OKM	. 626	.392	<.001	**Supported**

Note: P< 0.05, ISC = Organizational Information systems capability, SCA = Sustainable Competitive Advantage, OKM = Organizational knowledge management. The R value indicates how strongly the independent variable predicts the dependent variable.

Knowledge is the basis for acquiring capability- a dynamic resource that is valuable to an organization's ability to innovate and compete. Knowledge by its nature is intangible therefore exists within the "individual employees, and in a composite sense within the organization" (Bollinger and Smith, 2001). Knowledge is therefore foundational to organizational success, particularly in the knowledge economy of today. Knowledge management within an organization entails a mechanism for capturing and disseminating the knowledge that exists within the organization. It starts with Organizations realizing that Knowledge is a "valuable resource and then develop a mechanism for tapping into the collective intelligence and skills of employees in order to create a greater organizational knowledge base (new knowledge) and for the achievement of set group targets/objectives" (Bollinger and Smith, 2001). Organizational knowledge is comprised of two broad categories: knowledge that is "explicit known as codified knowledge and knowledge that is not codified but exists primarily within the minds of employees - tacit knowledge" (e.g., Fahey and Prusak, 1998; Nonaka and Konna, 1998). The distinction between

the two is the difference between "know-what" and "know-how" in which “organizational "know-how" puts "know-what" into action” (Droege and Hoobler, 2003). It is therefore the interplay of explicit and tacit knowledge with other organizational resources that leads to achievement of organizational goals. This research result found a moderating effect on the relationship sustainable competitive advantage and organizational information systems capabilities. Organizational information systems’ capabilities depend on knowledge of the individual organizational members and consequently the knowledge of the organization. The study found very statistically significant moderating impact on this relationship between the dependent variable- sustainable competitive advantage and the independent variable- organizational information systems capabilities.

4.4.6 Summary of hypotheses analysis

Based on the hypothesis test conducted above, the alternate hypotheses are all accepted with the null hypothesis rejected. Summary of the hypothesis result is as below.

Hypothesis	Details of hypothesis relationship	Sign	Result
H1	Sustainable Competitive Advantage is related to Organizational Information Systems capability	+	Supported
H2	Sustainable Competitive Advantage relationship with Organizational Information Systems capability is mediated by Organizational Agility	+	Supported
H3	Organizational Agility is correlated to Organizational Information Systems capability	+	Supported
H4	Sustainable Competitive Advantage is correlated with Organizational Agility	+	Supported
H5	Sustainable Competitive Advantage and Organizational Information Systems capability association is moderated by Organizational Knowledge Management	+	Supported

Table 4.17 Summary of findings

4.3.4 Research questions

4.3.4.1 RQ1: How can Organizations build sustainable competitive advantage from Information Systems in today's world of Information Technology ubiquity and homogeneity?

This research question has begged for answers among researchers and practitioner alike. Practitioner had to attempt to answer this question each time an investment decision is to be made. Chae et. al. (2014) and Masli et al. (2011) argued that unlike the 1990s where proprietary technology confers an advantage, the 2000s is characterized by "standardized and homogeneous information systems - Enterprise Resource Planning (ERP) systems, WEB technologies leading to the increasing power of information technology and the sharp and continual decline in the cost is due to standardization. Laudon and Laudon (2018) opined that "technology standards unleash powerful economies of scale and result in price declines as manufacturers focus on the products built to a single standard. This is foundational to the growing homogeneity of information technology. Without these economies of scale, computing of any sort would be far more expensive than is currently the case". Along the same line, the rise in enterprise technology solutions such as the Internet are made possible through standardization. This has given rise to more trends computing and even still unfolding such as "mobile digital platforms, consumerization of IT, virtualization, quantum computing, cloud computing, green computing and high-performance/power-saving processors" (Laudon and Laudon, 2018). According to Carr (2003, 2005), with growth in the power of the computer, the strategic significance has reduced. Against this background, answering this question cannot be easy. Many dismiss the notion all together while some scramble to find justifications.

The researcher through this effort however, found that, while seeking differentiation and generation of rent from infrastructural information technology asset will not make for success, sustainable competitive advantage can be successfully built on other information systems dynamic resources such as organizational information systems capabilities. As the results above show, there is a positive correlation between sustainable competitive advantage and organizational information systems capabilities. Besides the positive relationship, the research empirically established that sustainable competitive advantage is enhanced by a minimum of 20% by organizational information systems capabilities. It follows therefore that the research question was answered. Organization can build sustainable competitive advantage in this time of information technology ubiquity, standardization, and homogeneity but such strategy must be based on dynamic resources as competition today is of the Schumpeterian type.

4.3.4.2 RQ2. What aspect of information systems should organizational Information technology investment be focused on to ensure differentiation and continuous generation of rent from such investment by an organization?

According to BusinessWire (2021), Information Technology global market report, "the global information technology market is expected to grow from $7850.57 billion in 2020 to $8370.95 billion in 2021 at a compound annual growth rate (CAGR) of 6.6%. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment". This is the current state of play. A major part of the businesses' budgets annually is dedicated to and invested in information and communications technology infrastructure in the hope for value creation but often without the expected outcomes. This research seeks to answer the question of what expect of information systems should such huge investment

be directed to guarantee the needed returns- differentiation and sustained generation of rent from the investment.

This research found that information technology budget should be directed to the development of capabilities, investment in flexible infrastructure and technologies that make for organizational agility. These as underpinning for information technology strategy will position an organization for differentiation and sustainable generation of rent from investment in information technology. The result of the research emphasis that sustainable value creation and particularly competitive advantage is premised on other variables other than possession of information technology assets. The pre-requisite for value creation in general and particularly sustainable competitive advantage is what this research answered. It is based on the capabilities to plan, develop, source, deploy, support, and maintain information technology asset on the one hand and ability to use information technology to solve problems and innovate as the basis for setting one firm above the other in an industry.

The result of the research shows a very strong positive correlation between sustainable competitive advantage and organizational knowledge management. Regression analysis also showed that with knowledge management included a moderating variable, the relationship between organizational information systems capabilities and sustainable competitive advantage is significantly enhanced. The result clearly answers the research question that information technology budget dollars should be directed significantly to the management of organizational knowledge as avenue to enhance the relationship between organizational information systems capabilities and sustainable competitive advantage. This is not better at any time than at a time of relentlessly changing business environment characterized by Schumpeterian competition.

4.4 Evaluation of findings

4.4.1 Information Systems Capabilities and Sustainable Competitive Advantage

The research found that Organizational Information System Capability is positively associated with Sustainable Competitive Advantage. It follows that Organizations with investments and strategy on how to grow information system capabilities particularly in Information Technology dependent industry like the ePayment, are more likely according to Chaharbaghi and Lynch (1999) to "positively embrace change, constantly adapt to altered ways and new demands through introduction of new resource configurations, while at the same time preserving the best of its past" which is what sustainable competitive advantage is about. Sustainable Competitive Advantage involves resource management and resource development. The former is concerned with meeting the competition today while the latter is targeted toward the competitive challenges of tomorrow. This is also true in the relentlessly changing business and technology environment of today.

The findings of this study confirm and bring to live the implications of both resource and capability-based views of the firms. These theories premise competitive advantage on firm resources. Resource Based View (RBV) of the form explicitly explains why different firms in the same industry might differ in performance based on their respective internal sources of Sustainable Competitive Advantage (Kraaijenbrink, et. al, 2010). RBV helps to explain the "conditions under which a firm's resources will provide it with a competitive advantage" (Barney, 1991). According to Dicksen (1996), RBV therefore provides an "inside-out" view or firm specific view of why organization succeed or fail within industries. According RBV, Sustainable Competitive Advantage is based on "valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities that organization (O) has and can absorb and apply" (Barney, 1991a, 1994, 2002,

Kraaijenbrink et al., 2010). Capability based view stretches firms' internal resources that can confer sustainable competitive advantage such that in addition to satisfying the VRIN test they are also dynamic. Teece et al. (1997) define organizational capabilities as, "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments". Collis (1994) and Winter (2003), view organizational capabilities as "higher order skills and resources that bears direct relationship with how a firm responds to changing environment". According to Aydiner et al. (2018), information systems "capabilities with resources and competencies enables the use of the resource-based view (RBV) to better explore the strategic value of Information System. These capabilities are composed of the infrastructure, human, and administrative kind, so that they develop an ability to exploit Information Systems resources to create a competitive advantage". The heterogeneity in its distribution, immobility of these resources and capabilities among the competing firms according to RBV is the basis for the difference in rent generation among firms in the same industry. Similarly, Information Systems' capabilities may be described as a "means of classifying and providing access to knowledge that is learned and successfully applied". Peppard and Ward (2004) describe information system capability conversation in relation to value creation for firms as a new era that builds on the previous eras of "data processing, management information systems and strategic information system (SIS)". The thrust of the research by Peppard and Ward is that "technology itself has no inherent value and that Information Technology alone is unlikely to be a source of sustainable competitive advantage. The business value derived from Information Technology investments only emerges through business changes and innovations, whether they are product/service innovation, new business models, or process change, and organizations must be able to assimilate this change if value is to be ultimately realized". The changes are however only contingent on the

information technology capabilities of such firms that recognize and choose to so invest in addition to the investment in the information technology assets.

The results of this research reconfirm and agrees with some extant business and information systems literatures on the impact of Organizational information systems capability on sustainable competitive advantage. One such research is by Kraaijenbrink, et al. (2010). They started up by encapsulating organizational capabilities under firms' intellectual capital and defines such as firms' intangible assets – "all the valuable resources and capabilities obtained through knowledge and experience and used for further creation of wealth". They opined that "intellectual capital significantly and positively contributes to firms' value creation and sustainable competitive advantage and well managed intellectual capital assists access to the different resources and capabilities required for firms' growth, success, and positioning in dynamic market." In addition, Hoffman (2000) defined sustainable competitive advantage as "the prolonged benefit of implementing some unique value-creating strategy not simultaneously being implemented by any current or potential competitors along with the inability to duplicate the benefits of this strategy" According to Day and Wensley (1988), this comes from "superior skills and capabilities".

The key trust and question of this research work if and how organizations can build sustainable competitive advantage through information systems in these days of growing ubiquity, standardization, and homogeneity of information technology. Carr (2003), Chae et. al. (2014) and Masli et al. (2011) had opined that with growth in information technology standardization and homogeneity, its and strategic necessity had waned. A more disturbing anecdote is the is the "productivity paradox". According to Brynjolfsson et al. (2017), "the rapid development of information and communication technologies over the past 15 years coincided with a generalized slowdown in aggregate productivity growth" which is seems to fuel the agelong "productivity

paradox" conversation. The results of this research clarified and offer a reason for conversation. An easy way to explain it is that - access to and availability of broadband Internet and cloud computing do not immediately translate to equal value for all organizations. Organizations must have the capability to leverage such availability before it can translate to value creation or rent generation. According to Laudon and Laudon (2018), there are key drivers to leveraging the growing ubiquity of information and communication technology for value creation. They are capabilities and incentives occasioned by "differences in skill endowments, competitive pressures and market rigidities". This is the position that the results of this research unequivocally clarified.

The research further showed that the relationship between Organizational information systems capabilities and sustainable competitive advantage can be direct, it can be enhanced with other variables. The research found the interplay of other variables. It found that the relationship sustainable competitive advantage and organizational information systems capability is mediated very significantly by organizational agility and moderated by the knowledge management practices of such organizations.

4.4.2 The mediating effect of Organizational Agility on IS Capability and Sustainable Competitive Advantage relationship.

The research result show that when the relationship between organizational information systems capabilities and sustainable competitive advantage is mediated by organizational agility, the result is more positively enhanced. The finding of this research suggests that the relationship between Organizational information systems capability and sustainable competitive advantage while it can be direct could also be indirect. In the indirect relationship, organizational information systems capabilities spawn organizational agility that in turn underpins sustainable competitive

advantage for the firm. This finding is very relevant in the relentlessly changing environment of today. This is very aligned to the requirement for survival and value creation in the business world because the business environment is generally VUCA (volatile, uncertain, complex, and ambiguous). To survive requires vision, understanding and the need to adapt very quickly. Success therefore is defined by how quickly a firm makes sense of changes in the environment and adapts. Since success in this case is about positioning for advantage, agility is therefore a fundamental underpinning for sustainable advantage. Lu & Ramamurthy (2011) define organizational agility as the "firm's ability to cope with rapid, relentless, and uncertain changes and thrive in a competitive environment of continually and unpredictably changing opportunities". Cai et al. (2017) define Organizational agility as "a firm's ability to sense and respond to market changes". Organizational agility is the ability of organizations to "sense changes in the environment and respond quickly, efficiently, and cost-effectively to improve competitive advantages" (Amos 1998; Chen 2012). Organizational agility stretches the concept of organizational flexibility to include speedily sensing and responding to opportunities and threats in the business environment, solve problems, and change the firm's resource base (Mao et al., 2015; Eisenhardt & Martin, 2000; Winby & Worley, 2014). Razmi & Ghasemi (2015) opine that organizational agility is a "cultivated dynamic capability and aids the organization in making timely, efficient, rapid, and continual change when changing circumstances require it". It is a critical capability that allows firms to detect and seize competitive opportunities to generate innovations in addition to responding to threats (Cetindamar, et al., 2021). Organizational agility stretches the concept of organizational flexibility to include speedily sensing and responding to opportunities and threats in the business environment, solve problems, and change the firm's resource base (Mao et al., 2015; Eisenhardt & Martin, 2000; Winby & Worley, 2014).

The findings of this research show that Organizational Information System Capabilities ensure the ability of the organization to be agile particularly in information technology dependent organization such as ePayment, telecommunication, ecommerce etc. and the consequently created competitive position for the organization. Peppard and Ward (2004) opined that for sustained competitive advantage, firms must "develop and nurture their capacities if they are to deliver value from investments made in information technology on an ongoing basis" by enabling the organization to embrace changes quickly. They termed Information system capability within organizations, the beginnings of something new - "fourth era in the evolution of the deployment and use of information technology in organizations". According to Bharadwaj (2000), information system capability "is not so much a specific set of sophisticated technological functionalities as it is an enterprise-wide capability to leverage technology to differentiate from competition". To enable success, Information System Capability must be organizationally embedded, only then will they help to ensure that the organization is "wired as an adaptive enterprise" (Peppard and Ward, 2004). Information Systems capabilities is multifaceted and manifests in how information technology impacts business, helps in opportunity identification, in spurning innovations, driving technology enabled business models, in improving business processes, how to embrace information and turn same to tool for advantage among many others.

The dimensions of Organizational Information System Capability considered for this research is as put forward by Lu and Ramamurthy (2011). They are:

1. Infrastructure capability which deals with the ability of organization to deploy and redeploy information technology platforms.
2. Business spanning capabilities which refer to the ability of "management to envision and exploit Information Technology resources to support and enhance business objectives".

3. Proactive stance which refers to proactively seeking information technology innovation and embracing them.

These three dimensions of information system capabilities enable organization to embrace agility that manifests as.

1. Market capitalizing or
2. Operational adjustment agility.

These capabilities according to Spanos and Prastacos (2004), are “dynamic, nonfinite, and path dependent processes, accumulated over a long time of continuous learning hence not obtainable in the factor market thereby making it very difficult to copy”. This in turn underpins sustainable competitive advantage.

The result of this research show that the relationship between information system capability and sustainable advantage is significantly enhanced by the mediating effect of organizational agility. In the context of the foregoing, the reasons are clear as the impact of information system capability on the organization is not directly generation of services but rather an enablement for rent generation from the business activities of the organization through information technology resources. In this case, organizational agility is part of the causal pathway of the relationship between the two variables- the independent variable (Organizational information system capability) and the dependent variable (sustainable competitive advantage). It follows therefore that organizational agility has a direct relationship with this independent variable- organizational information systems capability. Sustainable competitive advantage underpinned by this interplay of variables (information systems capability and organizational agility) manifest in superior financial position, competitive position, and barrier to erosion of the previous two attributes

(Sambamurthy, et al., 2007). These attributes of sustainable competitive advantage are made possible by the dynamic capability called organizational agility by allowing "firms to respond to market opportunities through radical and incremental movements" (Sambamurthy, et al., 2007). A firm with high market capitalizing agility for instance may increase its "revenue sources by entering new market segments or identifying new customer needs within existing market segment" (Sabherwal and Chan 2001). By Operational adjustment capability, a firm may "reduce its costs and ineffective business practices by continuously adjusting its business processes toward the industry best practices" (Eisenhardt and Brown 1999; Rindova and Kotha 2001). An important attribute of sustainable competitive advantage is that such advantage should not lend itself to easy imitation by competitor. Building barrier to erosion of advantage is one of the key contributions of organizational agility. This is achieved by firms by seeking new initiative as quick replacement to existing one that create advantage before such advantage is embraced by others. Organizational agility enables a firm to respond to its environmental dynamics continually and flexibly, either by being agile operationally or by market capitalizing efforts. The barrier to erosion of value is therefore built by not being static.

According to the result of the research, not only is the alternate hypothesis accepted, but the conceptual framework is also validated as well as the underlying theories- resource and capability-based views of the firms. Both theories recognize that internal organizational resources are the sources of competitive advantage but more importantly in ensuring sustainability in the VUCA business environment we operate in today. In summary, this research result and literatures reviewed are aligned and the papers are replete with the fact that sustainable competitive advantage is predicated on Organizational Agility (OA) which in turn is underpinned by Organizational Information Technology Capability.

4.4.3 The moderating role of Organizational Knowledge Management on the relationship between Organizational Information Systems Capability and Sustainable Competitive Advantage.

The result of the study shows a positive moderating effect of organizational knowledge management practices on the relationship between the dependent variable (sustainable competitive advantage) and the dependent variable (Organizational information systems capability.

This result aligns with extant business and information systems literature on the subject matter. Being that information systems capability is a dynamic capability that depends on both tacit and codified knowledge of the enterprise, knowledge management practices of the organization were expected to impact the result. The result showed that the relationship between organizational information systems capability and sustainable competitive advantage is enhanced when knowledge management practices of the organization are considered. It follows therefore that any organizations that seek ways to promote knowledge management practices and consequently finds way to ensure knowledge is treated as strategic organizational asset will be better positioned in terms of sustenance of competitive advantage than others within the same industry.

Fundamentally, knowledge is the basis for acquiring capability- a dynamic resource that is valuable to an organization's ability to innovate and compete. Knowledge by its nature is intangible therefore exists within the “individual employees, and in a composite sense within the organization” (Bollinger and Smith, 2001). Knowledge is therefore foundational to organizational success, particularly in the knowledge economy of today. Knowledge management within an organization entails a mechanism for capturing and disseminating the knowledge that exists within the organization. It starts with Organizations realizing that Knowledge is a “valuable resource and

then develop a mechanism for tapping into the collective intelligence and skills of employees in order to create a greater organizational knowledge base (new knowledge) and for the achievement of set group targets/objectives" (Bollinger and Smith, 2001). According to Carnegie Bosch Institute [CBI] (1995), Knowledge refers to the "tacit or explicit understanding of people about relationships among phenomena. The institute further opines that knowledge is embodied in routines for the performance of activities, in organizational structures and processes and in embedded beliefs and behavior. Knowledge implies an ability to relate inputs to outputs, to observe regularities in information, to codify, explain and ultimately to predict". Organizational knowledge is comprised of two broad categories: knowledge that is "explicit known as codified knowledge and knowledge that is not codified but exists primarily within the minds of employees - tacit knowledge" (e.g., Fahey and Prusak, 1998; Nonaka and Konna, 1998). The distinction between the two is the difference between "know-what" and "know-how" in which "organizational "know-how" puts "know-what" into action" (Droege and Hoobler, 2003). It is therefore the interplay of explicit and tacit knowledge with other organizational resources that leads to achievement of organizational goals. This explains why the research result found a positive moderating effect on the relationship between the dependent variable (sustainable competitive advantage) and the independent variable (organizational information systems capability). This is therefore a validation that such moderating effect still exists and particularly in information technology dependent industry such as ePayment.

If knowledge is so valuable, then it must be managed. Whatever is to be managed must be fully understood and measured. Knowledge therefore must be sufficiently defined such that we know what it is and what it is not. The way of managing knowledge must also be known. King (2009) defines knowledge management (KM) as the "planning, organizing, motivating, and

controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed". O'Dell & Grayson, (1998) defined knowledge management as "getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance". Frost (2010) defines knowledge management as the "systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements". According to North and Kumta (2018), knowledge management enables "individuals, teams, and entire organizations to create, share and apply knowledge to achieve their strategic and operational objectives collectively and systematically. It contributes to increasing the efficiency and effectiveness of operations on the one hand and to changing the quality of competition (innovation) on the other.

Knowledge, because of its strategic importance, should also be protected from being lost as another way of management. It must be noted that the knowledge to be protected because of its impact on organizational competitiveness is not codified knowledge. Codified knowledge is not so much impacted by labor mobility. What is at risk in the very fluid and relentlessly changing business environment today is tacit knowledge. Zack (1999) describes tacit knowledge as "subconsciously understood and applied, difficult to articulate, developed from direct experience, and usually shared through highly interactive conversation, storytelling, and shared experience". It follows therefore, that tacit knowledge is embedded in the psyche and intuition of individuals (Brown and Duguid, 1998; Grant, 1996) and thereby not readily articulated and hence resists codification (Baumard, 1999). The foregoing explains why tacit knowledge is more easily lost through employee turnover. According to Droege and Hoobler, (2003), Tacit knowledge is the "information about work processes and products that individuals hold above and beyond what the

organization has documented. These are the "tricks of the trade" that promote smooth organizational functioning, overall know-how, and competitive advantage". To protect tacit knowledge loss is to ensure social embeddedness within the organization. Social structures which refer to the "pattern of relationships within a firm" (Uzzi, 1997), plays a very central role in knowledge creation (Nonaka, 1994). The firm by itself is viewed as a social community within which factors of production are transformed into goods and services through knowledge (know-how) interplay with other resources and factors of production. One way to ensure value-creation continues is by diffusion of tacit knowledge within a company's social structure. Tacit knowledge is thereby given a degree of protection against loss from employee turnover by virtue of organizational learning through the diffusion process. Organizational learning is found to have a "parallel with relational linkages in social structures" (Fisher and White, 2000). A firm's learning capacity is partially dependent on socially embedded relationships. The more socially embedded a social structure is, the more the potential for organizational learning. Capelli, (2000) identified "intrafirm social ties as a reason employees remain with a company and loyalty to the work group is often stronger than loyalty to the employer". As relationships become "embedded in social structures, trust develops (Leana and Van Buren, 1999) leading to the promotion of norms of reciprocity" (Nahapiet and Ghoshal, 1998). Reciprocal norms, together with interpersonal trust, "create conditions that enhance knowledge sharing. Because the sharing of tacit knowledge requires high levels of individual interaction through reciprocal exchange relationships, it is advantageous that individual relationships be strongly embedded within a firm's social structure" (Droege and Hoobler, 2003). One way to promote this within firm is through creating or promoting community of practices – which is described as "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area

by interacting on an ongoing basis" (Wenger, et al., 2002). According to Basten and Haamann (2018), community of practice refers to a "groups of individuals who meet voluntarily—due to common interests or areas of expertise—to exchange experiences, identify or develop best practices, and establish new interindividual relations. The groups are built on mutual agreement, loosely connected, and self-managed". Organizational learning is a must if tacit knowledge is to be preserved. Beyond interaction among employees, collaboration among employees has transformational effects (Powell, 1998). Collaboration brings organizational members together around common objective such as to solve a problem, work on a project, develop new or improve an existing product (Powell, 1998). Collaboration by its nature intensifies interaction thereby increasing the odds that knowledge residing in an individual's mind will be expressed to others (Zack, 1999: 46). Where collaborating employees do not verbalize their knowledge, the expression of tacit knowledge (know-how) is such that other collaborating colleagues can understand and learn. It follows therefore that collaboration provides depth and focus to employee interactions needed to diffuse tacit knowledge (Droege and Hoobler, 2003).

The foregoing, which is the result of literature reviews and extant knowledge, is what was confirmed by the research. Knowledge management practices expectedly have implications for sustainable competitive advantage. Besides, the possibility of valuable organizational knowledge leakages and losses when organizational knowledge is not treated as strategic asset, the possibility of business continuity is at risk. How will knowledge that is embodied in works routines and processes (how inputs are related to outputs) be treated. This indicates that the value of knowledge management practices is very transcendent. It impacts the very basis of getting things done beside other strategic value obtained from its immobility and uniqueness that ensure other dynamic

capabilities such as organizational information systems capability is enhanced and by extension-organizational agility and consequently sustainable competitive advantage.

The findings of the study answered the request question clearly. All null hypothesis were rejected in favor of the alternate hypothesis. It follows therefore that the research question - "how can Organizations build sustainable competitive advantage from Information Systems in today's world of Information Technology standardization and homogeneity?" was answered.

Information technology standardization and homogeneity does not translate to even diffusion of information technology among all firms within an industry. The fact that computing or broadband Internet is available to all firms to access does not immediately means value creation is based on availability and ease of access. Fundamental to creation of value from Information and communication technology is the capability to mine such value from the artifacts. The key drivers of rent generation from investment in information technology by firm is primary the firm's own firm specific capability with regards to the technology. Such capability in addition to sound organizational knowledge management practices enables the firms to be agile- able to sense changes in the business environment, innovate quickly to meet such need by recalibration of internal resources. In such response is the sustainable competitive advantage created.

4.6 Chapter Summary

In this chapter, analysis and findings from the field work are shown.

To ensure that data collected from respondents for this research is credible and trustworthy, it was reviewed against best practices. The data was collected from a mixed set of respondents of business and technology function leaders in the ePayment industry of Nigeria. The choice is to ensure that we have the input of neither of the respondent group of either business or technology functional leaders alone. This helps to provide a full view and takes care of all perspective. Along the same line, the method used for data collection was mixed – both qualitive and quantitative. This again provided triangulation of the method. Researchers use triangulation to ensure holistic perspective and thereby increase the validity and credibility of the study. It helps to increase completeness of a study result as one part of the study presents results which may not have been found in the other parts of the study (Johnson and Christensen, 2004; Johnson and Onwuegbuzie, 2004). According to Heale and Forbes (2017), triangulation in research is the use of more than one approach to researching a question. For this study, qualitative information such attitude, disposition etc. that cannot be captured by quantitative means were captured through face-to-face and telephone interviews. An important value that the interview provided was access to business leaders – MD/CEOs that could not be held down to answers the questionnaire. The interview section afforded the researcher the opportunity to incorporate their very valuable opinion into the study.

The qualitive data collected through interview was coded and added to the quantitative dataset to form a single data set. Once this was concluded, the demographic data from the collected data set was then analyzed. The result showed that we have respondents that are all adults, have a

minimum of a university degree (over 87% have a second degree at least), and are within middle and top management cadre in their respective organizations. We also found that they all have positions of responsibilities (from head of department up to Managing Director/Chief Executive Officer and almost all position in between). The demographic information showed that the respondents were elite participants suitable for the study hence data shared can be relied upon for analysis. The data collected from these respondents was scrutinized for common method biases. The data collection instrument development was such that common method variances and possible biases were considered. The demographic and observed variables were all arranged in segments to avoid confounding errors. Each segment was dedicated to a specific construct. Beyond that, due to mixed audience of technology and business leaders, technical jargons from business and technology were deliberately avoided in favor of every data English language expression. An important introduction at this stage were questions dedicated to the introduction of information systems. Though this construct was not one of the ones of interest, respondents were made to answer questions on it as an introduction to the research.

The validity of the data collected, and measurement instrument was conducted using both exploratory and confirmatory factor analysis. Besides, few observed variables, all variables loaded significantly highly (mostly above 0.5) to the latent constructs for both exploratory and confirmatory factor analysis. To ensure convergent and discriminant validity, the confirmatory factor analysis results were reviewed for model fitness. The results of the comparative fitness index (CFI) and root mean square error of approximation (RMSEA) were all within acceptable model fitness range. Reliability analysis was also performed on the observed variables before a summated

Likert scale was built from them. The Cronbach's alpha reliability coefficient for each of the variables was at the good and excellent level. This concludes the validity and reliability test for the data and the measurement instrument.

To test the hypothesis that was put forth in the research and answer the research question, a combination of correlation and regression analysis was used. The correlation analysis showed that all the constructs are positively correlated. Correlation "quantifies the degree and direction to which two variables are related. When correlation coefficient r is 0.0, there is no relationship. When r is positive, it represents a trend that when one variable goes up, the second does the same and vice versa" (Zaid, 2015). From the correlation result, the variables are all positively associated and can be said to be statically significant.

To test the relationship between the dependent variable (sustainable competitive advantage) and the independent variable (Organizational information systems capability) and the impact of the mediating variable (Organizational agility) and the moderating variable (organizational knowledge management), regression analysis was used. A combination of linear, multiple, and hierarchical regression was used in the study to sufficiently analyze the relationship between variables. In each case, the null hypothesis was rejected in favor of the alternate hypothesis. We found out from the study that:

1. Sustainable competitive advantage is positively associated with organizational information system capability.
2. The positive relationship between sustainable competitive advantage and organizational information systems capability is mediated by organizational agility.

3. The relationship between sustainable competitive advantage and organizational information systems capability is enhanced by the moderating role of organizational knowledge management practices.

It follows therefore that, the research question – "how can Organizations build sustainable competitive advantage from Information Systems in today's world of Information Technology standardization and homogeneity?" was answered.

The research found that Organizational Information System Capability is positively associated with Sustainable Competitive Advantage. It follows that Organizations with investments and strategy on how to grow information system capabilities particularly in Information Technology dependent industry like the ePayment, are more likely according to Chaharbaghi and Lynch (1999) to "positively embrace change, constantly adapt to altered ways and new demands through introduction of new resource configurations, while at the same time preserving the best of its past" which is what sustainable competitive advantage is about. Sustainable Competitive Advantage involves resource management and resource development. The former is concerned with meeting the competition today while the latter is targeted toward the competitive challenges of tomorrow. This is also true in the relentlessly changing business and technology environment of today.

The findings of this study confirm and bring to live the implications of both resource and capability-based views of the firms. These theories premise competitive advantage on firm resources. Resource Based View (RBV) of the form explicitly explains why different firms in the same industry might differ in performance based on their respective internal sources of Sustainable Competitive Advantage (Kraaijenbrink, et al. (2010). RBV helps to explain the "conditions under

which a firm's resources will provide it with a competitive advantage" (Barney, 1991). According to Dicksen (1996), RBV therefore provides an "inside-out" view or firm specific view of why organization succeed or fail within industries. According RBV, Sustainable Competitive Advantage is based on "valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities that organization (O) has and can absorb and apply" (Barney, 1991a, 1994, 2002, Kraaijenbrink et al., 2010). Capability based view stretches firms' internal resources that can confer sustainable competitive advantage such that in addition to satisfying the VRIN test they are also dynamic. Teece et al. (1997) define organizational capabilities as, "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments".

Besides development, information systems capability must be treated as strategic tool for competition and thereby given a pride of place as in so doing is organizational agility that consequently spawns sustainable competitive advantage birthed in technology dependent organization. This is regardless of the growing standardization and homogeneity of information and communication technology. The finding of this research suggests that the relationship between Organizational information systems capability and sustainable competitive advantage while it can be direct could also be indirect. In the indirect relationship, organizational information systems capabilities spawn organizational agility that in turn underpins sustainable competitive advantage for the firm. This finding is very relevant in the relentlessly changing environment of today. It is aligned to the requirement for survival and value creation in the business world because the business environment is generally VUCA (volatile, uncertain, complex, and ambiguous). To survive requires vision, understanding and the need to adapt very quickly. Success therefore is defined by how quickly a firm makes sense of changes in the environment and adapts. Since

success in this case is about positioning for advantage, agility is therefore a fundamental underpinning for sustainable advantage. Lu & Ramamurthy (2011) define organizational agility as the "firm's ability to cope with rapid, relentless, and uncertain changes and thrive in a competitive environment of continually and unpredictably changing opportunities". Cai et al. (2017) define Organizational agility as "a firm's ability to sense and respond to market changes". Organizational agility is the ability of organizations to "sense changes in the environment and respond quickly, efficiently, and cost-effectively to improve competitive advantages" (Amos 1998; Chen 2012). Organizational agility stretches the concept of organizational flexibility to include speedily sensing and responding to opportunities and threats in the business environment, solve problems, and change the firm's resource base (Mao et al., 2015; Eisenhardt & Martin, 2000; Winby & Worley, 2014). Razmi & Ghasemi (2015) opine that organizational agility is a "cultivated dynamic capability and aids the organization in making timely, efficient, rapid, and continual change when changing circumstances require it". It is a critical capability that allows firms to detect and seize competitive opportunities to generate innovations in addition to responding to threats (Cetindamar, et al., 2021).

Being that information systems capability is a dynamic capability, it depends on both tacit and codified knowledge of the enterprise. The result showed that the relationship between organizational information systems capability and sustainable competitive advantage is enhanced when knowledge management practices of the organization are considered. It follows therefore that any organizations that seek ways to promote knowledge management practices and consequently finds way to ensure knowledge is treated as strategic organizational asset will be better positioned in terms of sustenance of competitive advantage than others within the same industry.

Fundamentally, knowledge is the basis for acquiring capability- a dynamic resource that is valuable to an organization's ability to innovate and compete. Knowledge by its nature is intangible therefore exists within the “individual employees, and in a composite sense within the organization” (Bollinger and Smith, 2001). Knowledge is therefore foundational to organizational success, particularly in the knowledge economy of today. Knowledge management within an organization entails a mechanism for capturing and disseminating the knowledge that exists within the organization. It starts with Organizations realizing that Knowledge is a “valuable resource and then develop a mechanism for tapping into the collective intelligence and skills of employees in order to create a greater organizational knowledge base (new knowledge) and for the achievement of set group targets/objectives” (Bollinger and Smith, 2001). According to Carnegie Bosch Institute [CBI] (1995), Knowledge refers to the “tacit or explicit understanding of people about relationships among phenomena. The institute further opines that knowledge is embodied in routines for the performance of activities, in organizational structures and processes and in embedded beliefs and behavior. Knowledge implies an ability to relate inputs to outputs, to observe regularities in information, to codify, explain and ultimately to predict”. Organizational knowledge is comprised of two broad categories: knowledge that is “explicit known as codified knowledge and knowledge that is not codified but exists primarily within the minds of employees - tacit knowledge” (e.g., Fahey and Prusak, 1998; Nonaka and Konna, 1998). The distinction between the two is the difference between "know-what" and "know-how" in which “organizational "know-how" puts "know-what" into action” (Droege and Hoobler, 2003). It is therefore the interplay of explicit and tacit knowledge with other organizational resources that leads to achievement of organizational goals. This explains why the research result found a positive moderating effect on the relationship between the dependent variable (sustainable competitive advantage) and the

independent variable (organizational information systems capability). This is therefore a validation that such moderating effect still exists and particularly in information technology dependent industry such as ePayment.

Chapter 5

5.0 Introduction

This research work seeks to establish if businesses can still earn a sustained competitive advantage from their investment in information systems since there is a growing dependence on information technology by must businesses and investment in this resource take up a significant portion of the annual budget of organizations.

Among industry practitioners and researchers alike, there is the mistaken assumption that investment in information technology assets by itself confers advantage on one firm over the other in today's business environment. In the e-payment sector in Nigeria, each firm in the industry spend millions of dollars annually on information technology assets in the pursuit of competitive advantage without the desired success. This is not just a local industry problem. It is almost a problem of global dimension. According to BusinessWire (2021), Information Technology global market report, "the global information technology market is expected to grow from $7850.57 billion in 2020 to $8370.95 billion in 2021 at a compound annual growth rate (CAGR) of 6.6%. This annual growing investment is regardless of the lack of consensus by researcher on the economic benefit of such investments. The famous phenomenon called "productivity paradox" which started several decades ago following the statement by Solow (1987) that "you can see the computer age everywhere but in the productivity statistics" has enjoyed a torrent of research but the phenomenon can still not be completely dispelled. According to Kijek and Kijek (2018), while the "productivity paradox" sparked a great number of research, results of either theoretical or empirical investigations over the decades are not "convincing with regards to whether investments in information and communication technology (ICT) affect the productivity of firms, sectors, and economies".

There is also the twin challenge of commoditization of information technology infrastructure. The foundation of the growing commoditization of information technology infrastructure is its homogeneity and standardization. Chae et. al. (2014) and Masli et al. (2011) argued that unlike the 1990s where proprietary technology confers an advantage, the 2000s is characterized by "standardized and homogeneous information systems - Enterprise Resource Planning (ERP) systems, WEB technologies. The increasing power of information technology and the sharp and continual decline in the cost is due to standardization. Laudon and Laudon (2018) opined that "technology standards unleash powerful economies of scale and result in price declines as manufacturers focus on the products built to a single standard. This is foundational to the growing homogeneity of information technology. With growing ubiquity and homogeneity, researchers are divided on the conclusion of whether investment in Information Technology asset can still lead to competitive advantage. In some cases, researchers concluded that no link is found between firm competitive advantage and Information Technology (IT) (Tian et al.,2009; Stroumpoulis et al.,2021; Aydiner et al., 2018; Gupta et al.,2018). This agrees with positions of Carr (2003), Clemons (1986), Clemons and Row (1991) and Powell and Dent-Micallef (1997) that "as information technology's power and ubiquity have grown, its strategic importance has diminished" because like other infrastructural resources, information technology resources have become accessible to all businesses hence can no longer be a basis for differentiation since competitive advantage is earned either by building barrier to imitation or barrier to entry.

The purpose of this mixed method research is to establish that sustainable competitive advantage can be earned by firms within an industry based on Information Systems capabilities despite the growing standardization and homogeneity of Information Technology" (Chae et. al., 2014; Masli et al. 2011). The research seeks to find the aspect of organizational information

systems where information technology investments must be focused on with the specific aim of ensuring that the investing firm can earn strategic differentiation that can be sustained. To ensure that all aspects of the investigation are considered, the research design is based on embedded mixed method with result of both qualitative and quantitative studies mixed before the statistical analysis was performed.

The study is based on a case study of single industry though almost all industries today depend significantly on the use of information technology. This limits the generalization of the study to all industries. The research participants were drawn from the leaders and influencer in both the business and technology functions of all licensed Nigeria ePayment service provider companies. Though the research presents no risk, the research participants' right to privacy and confidentiality will be respected hence all the participants had to stay anonymous during the research. The right to privacy entails how much information the research participant is willing to share with the researcher, how this information is collected, analyzed, and stored (Dalar et al., 2017). The right of choice of how the research participant wants to be represented was also carefully considered.

Another consideration in the quest to preserve privacy and confidentiality is in preserving anonymity. There were efforts invested to ensure there was no link between the data collected which represents the response to questions by participants and the participants themselves by any means. In this case, and particularly with regards to responses collected through questionnaire, the researcher decided from the questionnaire design stage using Google forms that though emails addresses of target participants were used to reach them, the responses provided do not capture the any details of the respondents hence anonymity is fully protected. Of course, the names of the respondents are not requested. In the cases of the interviews, the researcher keeps separate result

sheets different from the consent forms that the research participants fill in and sign. This is to ensure that once the interview is finalized and the result sheet is mixed with other, the researcher loses track of who is who and of course no external person can make any meaning or link any result to any single individual.

Confidentiality is another very important consideration since the study population is known (Nigeria ePayment business and technology leaders). The possibility of deductive disclosure (Tolich, 2004) where the trait of the individuals makes them identifiable in a research report is something to guide against. To guide against such confidentiality challenge, the researcher incorporates Kaiser (2009) suggestion of re-envisioning the informed consent process to guide against such ethical issues of deductive disclosure. The suggestion bothers on balancing the rich collected data with the need to protect participants confidentiality as a guide on what to make public and what the participant agreed to during the informed consent agreement. The content of the informed consent, besides sharing same with the school of doctoral studies when requested will not be shared with anyone with access to this research results.

Confidentiality speaks to how the data is handled. There is the need for assurance that research participants' information will remain for use for the purpose for which it was solicited and not for any other purpose until their permission is sought. Such that should it is only accessible by the researcher alone hence it must be securely held (Stuart and Barnes, 2005). Confidentiality therefore involves the following.

- Data handling and storage
- Usage of the data for other purposes or passing it on to other agencies
- How findings are reported

Researchers therefore must respect the principle of anonymity of the research participants except for cases where child abuse or other criminalities are uncovered. The researcher is bound by law to disclose such cases (Haggerty, 2004). As stated already, the researcher has taken deliberate steps to ensure all these.

The result of the research show that the alternate hypotheses were all upheld. In this chapter, the researcher is concerned with the implications, recommendations, and conclusions. It follows therefore that organizations with a strategy differentiate and generate economic rent from their investments in Information systems but shift emphasis from infrastructural aspects of information technology to dynamic information technology/systems capabilities. The implication of the foregoing is the need for organization to refocus attention by seeking sustainable success based on human resources, organizational learning, and management of organizational knowledge. Knowledge is the basis for acquiring capability- a dynamic resource that is valuable to an organization's ability to innovate and compete. Knowledge by its nature is intangible therefore exists within the “individual employees, and in a composite sense within the organization” (Bollinger and Smith, 2001). Knowledge advantage is created by an organization when they develop the “ability to build, access, and leverage its knowledge resources” thus leading to harnessing “know-how and know-what” (Chatzkel, 2003) for the achievement of strategic outcomes. Knowledge management within an organization entails a mechanism for capturing and disseminating the knowledge that exists within the organization.

5.1 Implications.

This study posed two research questions:

- How can an organization build sustainable competitive advantage from Information Systems in today's world of Information Technology ubiquity and homogeneity?
- What aspect of Information Systems should organizational Information Technology investment be focused on today to ensure differentiation and continuous generation of rent investment?

With regards to the first research question, we found from the study that regardless of the seeming ubiquity and homogeneity of information technology, organizations can still build sustainable competitive advantage when it is not built on physical information technology asset but rather on dynamic resources such as organizational information systems capabilities. This is one of the primary confirmations of this research. On the second question, our study found that sustainable competitive advantage built on information systems capabilities can be enhanced significantly if the organization consider organizational learning and knowledge management practices as these have the capacity to enhance organizational information systems capacity. With this finding about organizational knowledge management as an important enabler, it is therefore very important to invest in ways to improve capacity development of organizational members and in addition maintain sound knowledge management practices.

This study rigorously interrogated the place of the changing business and technology environment of today in addition to the growing prevalence and seeming diffusion of information technology across every facet of business and life vis-à-vis the need for sustainable differentiation and rent generation by businesses from investment in information technology which is an aspect

of business that sees significant cost outlay annually. The research established why the current debate in strategic management and information systems literature on the place of information systems in business today with regards to sustainable competitive advantage seem to be skewed wrongly. Based on the result of the research, even in the very volatile and dynamic business environment of today, organizations can earn more than just a one off competitive advantage (usually due to first mover advantage) but sustainable competitive advantage (strategic advantage) from Information Systems by identifying resources that lead to radical change (development of proprietary technology) and with capability to renews the competitive edge of an organization in a dynamic environment" (Chaharbaghi and Lynch, 1999). That resource was found to be the dynamic organizational information systems capabilities and not the Information Technology physical assets (infrastructural technology). The implication of the conclusion reached above is that investment in traditional infrastructural technology such as datacenter, server, storages, applications, operating systems are not the basis for differentiation. This explains the "productivity paradox" at the organization level that has been a debate and basis for several strategic management and information systems researches. The conclusion by researchers investigating the phenomenon has been that "there was no correlation whatsoever between expenditures for information technologies and any known measure of profitability." (Brynjolfsson 1993; Landauer 1995; Strassmann 1990, 1997a; Weill 1992). In some cases, researchers even found slightly negative relation between firm-level spending on Information Technology assets and firm performance. A very clear explanation was found by this research for the conundrum. Investment in information technology physical assets does not spawn competitive advantage but investment in capabilities to use and manage information technology (information systems) does. Consistent with some other researches, this study found that sustainable competitive advantage in Information

Technology is from other areas of information systems other than physical infrastructure. Mata et al. (1995) argue that of the "commonly cited sources of sustainable competitive advantage from information technology, only managerial Information Technology knowledge can be the source of sustainability". This study however found that information systems capabilities in general which encompass, managerial information technology knowledge (business spanning capability) and other areas such information technology proactive stance and information technology infrastructure capabilities are the real basis for any firm that wishes to invest in information technology with a strategy for sustainable competitive advantage.

The results of this research are based on a case study of the e-payment industry in Nigeria. The ePayment industry is an information technology dependent one. All services are based on one information technology implementation or the other. Stakeholders within the industry possess information technology asset as strategic necessities. The industry participants all possess information technology assets and in some cases the technology is of the same kind. That all players in the industry possess the same or similar infrastructural technology does not guarantee homogeneity in the value creation by all industry participants. The result of the research emphasis that sustainable value creation and particularly competitive advantage is premised on other variables other than possession of information technology assets. The pre-requisite for value creation in general and particularly sustainable competitive advantage is what this research answered. It is based on the capabilities to plan, develop, source, deploy, support, and maintain information technology asset on the one hand and ability to use information technology to solve problems and innovate that set one firm above the other in an industry. According to BusinessWire, 2021 Information Technology global market report, investment in information technology in 2021

was estimated at $8370.95 billion. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC, 2016; Laudon and Laudon, 2018). Despite this massive investment that is projected to grow annually, most business cannot seem to generate rent from this resource. This massive investment was largely focused on infrastructural technology, hence the disappointment with the investment in most quarters. Congruent with some previous research, this work has established that strategic management and positioning for competitive advantage should no longer be premised on tangible resources - information technology assets- infrastructural technology but more on the management of Organizational Information Technology knowledge and competencies, knowledge workers within any industry and Information Technology management itself (Dess, et al., 2016; Sanchez et al., 1996). It follows therefore that it is no longer the firms with the most investment in Information Technology assets that have an edge but those that can leverage their investment for agility as a means of earning advantage (Tallon and Pinsonneault, 2011, Tallon et. al, 2019).

There were five (5) hypotheses put forward for this research. They are?

H1: Sustainable Competitive advantage is positively associated with Organizational Information systems Capability in Information technology-dependent Organizations.

H2: In an Information Technology-dependent organization, the positive association between Sustainable Competitive Advantage and Organizational Information systems Capability is greater if Organizational Agility is considered.

H3: Organizational Information Systems capability predicts Organizational Agility in Information Technology-dependent Organizations.

H4: Organizational Agility is positively associated with Sustainable Competitive Advantage

H5: In an Information Technology-dependent organization, the positive relationship between Organizational Information Systems Capability and Sustainable Competitive Advantage is moderated by Organizational Knowledge management.

Our research upheld all the alternate hypotheses above. It follows therefore that a major underpinning for firms' sustainable competitive advantage is Information Systems Capabilities which include but not limited to the following in specific terms:

1. Information Technology planning capabilities
2. Information Technology development capabilities
3. Information Technology deployment capabilities
4. Information Technology sourcing capabilities
5. Information Technology support capabilities
6. Information Technology management capabilities

These capabilities were previously broadly classified into information technology proactive stance, information technology infrastructure capability and information technology business spanning capability (Lu & Ramamurthy, 2011). These are all dynamic resources built around the human resources of the organizations. According to Bharadwaj (2000), information systems capability "is not so much a specific set of sophisticated technological functionalities as it is an enterprise-wide capability to leverage technology to differentiate from competition". This

resource is organizationally embedded hence able to enable the firm to be “wired as an adaptive enterprise” (Peppard and Ward, 2004). Information Systems capabilities manifests in how Information technology helps in opportunity identification, in spawning innovations, driving technology enabled business models, in improving business processes among many others.

Since this dynamic resource is valuable, it is important that strategies are developed to ensure the organization develops, grows, and maintains this dynamic resource. The implication therefore is that information technology functions should see themselves beyond the information technology assets that are maintained. The organization should focus on the attraction of the best human resource and in addition arm themselves with strategies for organizational learning and knowledge management. The organization should have strategies around dynamic resource accumulation and management. That process must detail how to encourage the diffusion of tacit knowledge among organizational members. Since differentiation and continual rent generation by firms from their investment depends on information technology capabilities such as information technology planning, development, deployment, sourcing, support and management, such decisions cannot be left to a small function within the organization but should have corporate level focus. These are now strategic decisions. It follows therefore that Information Technology leadership must be C-level.

The implication of the foregoing is the need for organization to refocus attention by seeking sustainable success based on human resources, organizational learning, and management of organizational knowledge. Knowledge is the basis for acquiring capability- a dynamic resource that is valuable to an organization's ability to innovate and compete. Knowledge by its nature is intangible therefore exists within the “individual employees, and in a composite sense within the

organization" (Bollinger and Smith, 2001). Knowledge advantage is created by an organization when they develop the "ability to build, access, and leverage its knowledge resources" thus leading to harnessing "know-how and know-what" (Chatzkel, 2003) for the achievement of strategic outcomes. Knowledge management within an organization entails a mechanism for capturing and disseminating the knowledge that exists within the organization. It starts with Organizations realizing that Knowledge is a "valuable resource and then develop a mechanism for tapping into the collective intelligence and skills of employees in order to create a greater organizational knowledge base (new knowledge) and for the achievement of set group targets/objectives" (Bollinger and Smith, 2001). Chatzkel (2003) summed it up so succinctly- "knowledge is not detached from the people, processes, or infrastructure of an organization and its network. It is part of all these things and progressively a more pivotal part. The ability to mobilize knowledge resources has become even more critical than the ability to control and amass physical and financial resources. As physical and financial resources have started to take on the character of commodities, the ability to capitalize on knowledge resources is becoming the creator of uniqueness and the differentiator of value". It is therefore not a surprise but rather a confirmation that this research found that organizational knowledge management has a major moderating effect on the relationship Organizational information systems capabilities and sustainable competitive advantage. The implication of these is that development of strategies and investment in the attraction of and training of talents is the key to sustainable differentiation particularly in information technology dependent organization such as the ePayment industry. The research confirmed that knowledge management has moderating effect on information systems capability and sustainable competitive advantage. The conceptualization and the interrelationship found by this research is that organizational learning and knowledge management practices enhances

organizational information system capabilities and in so doing promotes the relationship between the dependent variable (sustainable competitive advantage) and the independent variable (organizational information systems capabilities) since that relationship is positively linear. According to Chatzkel (2003) “as an organization remakes itself as a nurturing, leveraging, and knowledge-sharing enterprise, it starts to base its understandings, strategies, and actions on its knowledge capital and begins to be a knowledge-based enterprise. It cultivates usable knowledge resources and makes them readily accessible and actionable, putting itself and its people in the best position to create and capture value”.

In addition, the research found that information systems capabilities enable sustainable competitive advantage when the “information technology- agility contradiction is resolved”- information technology investment and deployment either “enables” or “impedes” organizational agility (Lu & Ramamurthy, 2011). For value to be derived, the contradiction must be resolved in favor of ‘enabling’ the organization. This is important as this research confirms that organizational agility mediates information systems capabilities and sustainable competitive advantage. According to Felipe et al. (2016), the business environment is more “globally interconnected, more technologically complex and more politically challenged”. These conditions have led to hypercompetitive markets involving major threats to the survival of companies. To respond to this environment, organizations need to be able to quickly adjust their capabilities and management processes so that they are effective over time. There is an increasing recognition that “agility is an imperative for success of contemporary firms as they face intense rivalry, globalization, and time-to-market pressures “(Brown and Eisenhardt, 1997; Goldman et al., 1995; Sambamurthy et al., 2007). The research lay credence to the fact that resolution of the contradiction lies in the dynamic

information systems resources such as information systems capabilities as opposed to infrastructural resources of information systems. When physical infrastructural resources of information systems alone are involved, the possibility of such investment impeding agility and consequently, impacting the organization's ability to sense and respond to changes is heightened. This research therefore helped clarify the enabling role of information system capability on organizational agility. Organizations respond to market changes by either capitalizing on market opportunity very quickly through resource deployment or adjustment of internal operations to avoid risk or take advantage of opportunities. Lu and Ramamurthy (2011) called these two extremes the dimensions of organizational agility. It follows therefore that agile organizations have the resources, skills and knowledge, organizational systems and architecture, and necessary experience to execute existing strategies as well as the ability to design and support potentially new ones in a timely fashion. One resources that firms turn to very easily in the pursuit of agility is information systems capabilities. Firms invest generally in information technology (whether rightly or wrongly) to pursue "fast, innovative initiatives in response to a constantly unfolding marketplace" (Lu & Ramamurthy, 2011). When such investment is on the information systems dynamic resources, the possibility of reaching the objective of innovation to respond to market changes is enhanced.

Based on the foregoing, it follows that organizational agility benefit from dynamic capabilities such as informational systems capabilities. The implication of this is that there is a dependency relationship between organizational information systems capability, organizational knowledge management and organization agility. Organizational knowledge management enhances organizational information system capability since both represents investment in people

and the corresponding result in the organizational abilities to sense opportunities and threat in the business environment and respond appropriately and quickly. An important implication of the study is where Information Technology spending should be directed. Since knowledge management moderates the relationship between information systems capability and sustainable competitive advantage, IT spendings that is directed at capacity development for organizational members will consequently have corresponding positive impact on organizational information systems capability thereby leading to improve ability to generate a sustainable competitive position. The implication above agrees Lu & Ramamurthy (2011) that "when IT spending is not properly channeled into information technology capability building, such IT spend has a negative effect on all dimensions of organizational agility". They suggest that information technology capability is critical in realizing greater agility. IT spending is a way to develop superior IT capability when it is correctly managed and directed into nurturing and fostering essential IT capabilities". This agrees with the view/argument that IT investment leads to capabilities, which, in turn, leads to business value. Managers of Information Technology functions should never think that in cases of low Information System Capability, that agility and consequently sustainable competitive advantage can be achieved by channeling IT spending to infrastructural technology with a view to seeking to achieve the results. It cannot be substituted one for the other. Information Technology functional manager and organizational leaders know that increased information technology spend in the short team if focused on information systems capability has the benefit of driving down total IT spend subsequently- the Information Technology budget and spendings. With growth in cloud computing with its unique economics of converting IT spend to OPEX (pay-as-you-use) for infrastructure (infrastructure as a service - IAAS), platform (platform as a service - PAAS), software (software as a service - SAAS), database (database as a service - DAAS) afford

leaders the opportunity of concentrating on development of internal information system capability as the game changer for value creation either in terms of innovation and cost reduction. Information systems capable organization give voice to the common saying that “less is more” as they concentrate information technology spending on the right things in the changing technology environment that businesses operate in today (Ferdows et al. 2004; McAfee 2004). The findings and implications thereof address the famous “productivity paradox” conversation with regards to information technology investment. The research provides an answer to Robert Solow, who wrote, “we see the computer age everywhere except in the productivity statistics”, The question now is changed from “does investment in information technology/systems provide payoffs for organizations?” to “where in information systems should investment be made to ensure payoffs?”. This is the reality since “payoffs from information technology are contingent” (Lichtenberg 1995; Stratopoulos and Dehning 2000).

5.2 Recommendations for application

This research work established that there exists a positive association between sustainable competitive advantage and Organizational information systems capabilities. With such a confirmed relationship, to build sustainable competitive advantage will therefore mean that organizations should as a deliberate strategy invest in developing information systems capabilities. According to Spanos and Prastacos (2004), capabilities refer to the "dynamic, nonfinite, and path dependent processes that are not obtainable in the factor market, are difficult to copy, and are accumulated through long term, continuous learning". This is why it is important to invest in organizational capability because it creates uniqueness. Two organizations investing in the same technology, but with different capabilities means they will have different results from their respective investments. "Dynamic capabilities affect how business organizations adapt and create heterogeneous resource positions in dynamic environments" (Leiblein, 2011). Heterogeneous resource position for a firm in an industry is the basis for sustainable competitive advantage according to Barney, (1991). Organizations that seek to build sustainable competitive advantage based on organizational information systems should rather consider the dynamic resource of Information systems capability as opposed to the physical resources of servers, storage, network, operating systems, applications. Where the physical information technology resources are "strategic necessities" (Ward and Peppard, 2004), they cannot underpin sustainable competitive advantage. The dynamic resources that can distinguish and thereby confer an advantage are capabilities such as:

1. Infrastructure capabilities – this entails "firm's ability to deploy a set of shareable platforms. It captures the extent to which the firm is good at managing data management services and architectures, servers/storage, cloud infrastructure/platforms, network

communication services, and application portfolio and services etc." (Broadbent et al. (1999). A firm's ability to design and develop an application software, ability to configure and reconfigure different applications and platforms, ability to architect major information technology solutions all fall within this category. It is recommended that any organization seeking to build sustainable competitive advantage on information systems such as firms in the ePayment industry (the case study for this research work), must develop information technology infrastructure capabilities to succeed.

2. Information technology business spanning capabilities. This refers to the "ability of management to envision and exploit information technology resources to support and enhance business objectives". This is a very critical capability in today world particularly in an industry such as e-Payment that rely completely on information technology for all its products and services (Mata et al., (1995); Ross et al., (1996); Wade and Hulland, (2004) and Bharadwaj, (2000)). This capability highlights the extent to which management understands the value of Information Technology investment -the understanding of the economics of Information Systems leading to clear Information Technology strategic vision that integrates business and information technology strategic planning (Lu & Ramamurthy, 2011). This manifest in information technology and business alignment. To ensure this is a reality, it is recommended that information technology functional managers understand business while business leader understand information technology enough to ensure it planning and exploitation. It is a major capability that any information technology dependent organization with desire to generate rent from information technology investment must have and continually seek to develop.

3. Information technology proactive stance - This refers to “firm’s ability to proactively search for ways to embrace new information technology innovations or exploit existing information technology resources/opportunities to address and create business opportunities” (Fichman, (2004); Galliers, (2007); Weill et al., (2002); Agarwal and Sambamurthy, (2002)). Information technology proactive stance measures the extent to which the firm strives to be “current with information technology innovations, continues to experiment with new information technology, constantly seeks new ways to enhance its effectiveness, and fosters a climate that is supportive of trying out new ways of using information technology “(e.g., Agarwal and Sambamurthy 2002; Fichman 2004; Galliers 2007; Weill et al. 2002). For this capability to be seem as valuable to any organization, the leadership of such organization must see information technology opportunities as business opportunities and see information technology challenges as business challenges.

Based on the result of this research, information systems capabilities such as detailed above are recommended to be embraced by organizations seeking to differentiate and ensure sustainable competitive advantage. It is a dynamic capability hence it creates uniqueness for firms and thereby sets them apart from competition.

Secondly, this research established that the positive relationship between information systems capabilities and sustainable competitive advantage is mediated by organizational agility. It is therefore recommended that in addition to information systems capabilities recommendations above, organization must invest in drivers of organizational agility. With globalization and growth in communication technology and the Internet, the world of business is significantly changed. There is also the changing business need of customers/clients, hyper-competition among firms,

government policy changes, rising crime rate (physical and cyber) among other factors all fueling a growing volatility, uncertainty, complexity, and ambiguity (VUCA environment) of the business environment. According to Felipe et al. (2016), the business environment is more than ever "globally interconnected, more technologically complex and more politically challenged". These conditions have led to hypercompetitive markets involving major threats to the survival of companies. To respond to this environment, organizations need to be able to quickly adjust their capabilities and management processes so that they are effective over time. There is an increasing recognition that "agility is an imperative for success of contemporary firms as they face intense rivalry, globalization, and time-to-market pressures "(Brown and Eisenhardt 1997; Goldman et al. 1995; Sambamurthy et al. 2007). For any business that is information technology dependent as is the case with those in our case study, their technology should be such that enhances and does not impede agility. It must be kept in mind that Information Technology (IT) regardless of value it creates for the business constitutes a major cost component of a company's capital investment hence it must not be made mindlessly. IT investment and its payoffs is a major discussion among business executives. With a "large investment in IT, the infrastructure be managed to best achieve today's business goals as well as future demand. To ensure this, IT infrastructure must be amenable to changes" (Chanopas, et al., 2006).

Based on extant literature, a major driver for agility is IT infrastructure flexibility. We recommend based on this research that investment in physical Information Technology infrastructure must be done with flexibility in mind. Byrd (2001) defined IT infrastructure flexibility as "the ability of the infrastructure to support a wide variety of hardware, software and other technologies that can be easily diffused into the overall technological platform, to distribute any type of information (data, text, voice, image, video) to anywhere inside of an organization and

beyond, and to support the design, development and implementation of a heterogeneity of business applications". Flexibility of IT infrastructure is depicted by how "shareable and reusable" IT resources are (Chanopas, et al., 2006). It usually manifests with the following attributes - connectivity, compatibility, modularity, and IT personnel competencies (Byrd and Turner, 2000). They are defined as follows:

- Connectivity is the "ability of the hardware and software to make internal and external electronic linkages" (Chanopas, et al., 2006). It facilitates "the shareability of IT resources at the platform level because technology components are able to communicate with any of the other components inside and outside of the organizational environment" (Duncan, 1995). The world wide web (WWW) is an example of connectivity. The World Wide Web, with "TCP/IP, XML, and browsers providing common protocols and interfaces, provides seamless connectivity not only within organizations but also among organizations thereby making the sharing IT resources easier, cheaper, and faster" (Chung, et al., 2003)
- Compatibility is the "ability to share any type of information (text, voice, image and video)" (Chanopas, et al., 2006). Tapscott and Caston (1993) noted that IT compatibility helps "span organizational boundaries, empower employees, and make data, information, and knowledge readily available in the organization".
- Modularity is the "ability to easily reconfigure hardware, software, and data" (Chanopas, et al., 2006). Modularity speaks to "the standardization of business processes for shareability and reusability (e.g., structured programming and component-based software architectures)" (Duncan, 1995). Schilling (2000) suggested that modularity is a

"continuum describing the degree to which a system's components can be separated and recombined."

- IT personnel competency includes both the "skills and experience required of IT personnel to perform IT activities." (Chanopas, et al., 2006).

Since organizational agility is the ability of organizations to "sense changes in the environment and respond quickly, efficiently, and cost-effectively" (Amos 1998; Chen 2012), an IT infrastructure that support such rapid change because it has inbuilt high connectivity, compatibility, modularity and handled by competent personnel is highly recommended if sustainable advantage is to be built on Information Systems.

Finally, the research found that the positive association between sustainable competitive advantage and Information Systems Capability is moderated by Organizational knowledge management practices. It follows therefore that organizational knowledge needs to be cultivated as a strategic asset. According to Chatzkel (2003), the ability of an organization to "effectively nurture, capture, leverage, and share its knowledge resources can be the key that provides an enterprise with its strategic power advantage in the world". Knowledge by its nature aids the mobilization of other resource whether dynamic or physical. While physical and financial resources have started to take on the "character of commodities, the ability to capitalize on knowledge resources is becoming the creator of uniqueness and the differentiator of value" (Chatzkel, 2003). Knowledge refers to the "tacit or explicit understanding of people about relationships among phenomena. The Carnegie Bosch Institute [CBI] (1995), opines that knowledge is embodied in routines for the performance of activities, in organizational structures and processes and in embedded beliefs and behavior. Knowledge implies an ability to relate inputs

to outputs, to observe regularities in information, to codify, explain and ultimately to predict". Organizational knowledge is comprised of two broad categories: knowledge that is "explicit known as codified knowledge and knowledge that is not codified but exists primarily within the minds of employees - tacit knowledge" (e.g., Fahey and Prusak, 1998; Nonaka and Konna, 1998). The distinction between the two is the difference between "know-what" and "know-how" in which "organizational "know-how" puts "know-what" into action" (Droege and Hoobler, 2003). It is therefore the interplay of explicit and tacit knowledge with other organizational resources that leads to achievement of organizational goals.

Based on the strategic importance of knowledge in today knowledge-based organizations and particularly in information technology dependent organizations such as ePayment, we recommend the need to have sound organizational knowledge management practices. This is important because knowledge, though very strategic to organization success can easily be lost. King (2009) defines knowledge management (KM) as the "planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed". O'Dell & Grayson, (1998) defined knowledge management as "getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance". Frost (2010) defines knowledge management as the "systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements". According to North and Kumta (2018), knowledge management enables "individuals, teams, and entire organizations to create, share and apply knowledge to achieve their strategic and operational objectives collectively and systematically. It contributes to increasing the

efficiency and effectiveness of operations on the one hand and to changing the quality of competition (innovation) on the other by developing learning.

It must be noted that the knowledge to be managed for organizational competitiveness is not codified knowledge. Codified knowledge is not so much impacted by labor mobility. What is at risk is in the very fluid and relentlessly changing business environment today is tacit knowledge. Zack (1999) describes tacit knowledge as "subconsciously understood and applied, difficult to articulate, developed from direct experience, and usually shared through highly interactive conversation, storytelling, and shared experience". It follows therefore, that tacit knowledge is embedded in the psyche and intuition of individuals (Brown and Duguid, 1998; Grant, 1996) and thereby not readily articulated and hence resists codification (Baumard, 1999). The foregoing explains why tacit knowledge is more easily lost through employee turnover. According to Droege and Hoobler, (2003), Tacit knowledge is the "information about work processes and products that individuals hold above and beyond what the organization has documented. These are the "tricks of the trade" that promote smooth organizational functioning, overall know-how, and competitive advantage".

While organizational knowledge can be grown by the training of organizational members, managing such knowledge particularly tacit knowledge is preserved and enhanced through social embeddedness. Social structures are therefore the enablers of knowledge diffusion and thereby a tool for knowledge management. Social structures which refer to the "pattern of relationships within a firm" (Uzzi, 1997), plays a very central role in knowledge creation (Nonaka, 1994). The firm by itself is viewed as a social community within which factors of production are transformed into goods and services through knowledge (know-how) interplay with other resources and factors of production. One way to ensure value-creation continues is by diffusion of tacit knowledge

within a company's social structure. Tacit knowledge is thereby given a degree of protection against loss from employee turnover by virtue of organizational learning through the diffusion process. Organizational learning is found to have a “parallel with relational linkages in social structures” (Fisher and White, 2000). A firm’s learning capacity is partially dependent on socially embedded relationships. The more socially embedded a social structure is, the more the potential for organizational learning. Capelli, (2000) identified “intrafirm social ties as a reason employees remain with a company and loyalty to the work group is often stronger than loyalty to the employer”. As relationships become “embedded in social structures, trust develops (Leana and Van Buren, 1999) leading to the promotion of norms of reciprocity” (Nahapiet and Ghoshal, 1998). Reciprocal norms, together with interpersonal trust, “create conditions that enhance knowledge sharing. Because the sharing of tacit knowledge requires high levels of individual interaction through reciprocal exchange relationships, it is advantageous that individual relationships be strongly embedded within a firm's social structure” (Droege and Hoobler, 2003). Recognizing, promoting, or enhancing, the “relational characteristics of a firm's social structure can lessen tacit knowledge loss from employee turnover” (Droege and Hoobler, 2003). One way to promote this within firm is through creating or promoting community of practices – which is described as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, et al., 2002).

It is recommended that organizations should encourage social linkages through initiative such communities of practices in the different knowledge domains that exist within the organization (engineers, accountants, business functions and even cross functionally) to diffuse and preserve organizational knowledge. In addition, and as a more wholistic approach,

organizations should have deliberate strategy and implementation of the following knowledge management practices:

- Knowledge creation entails the utilization of both internal and external resource to generate new knowledge required for the achievement of organizational goals. It could be as simple as brainstorming, investigation, research etc. (Gholami et al., 2013).
- Knowledge acquisition which encompasses "the process of acquiring and learning appropriate knowledge from various internal and external resources, such as experiences, experts. This can be achieved through observation, training, education etc." (Gholami et al., 2013).
- Knowledge sharing entails the process of passing knowledge from one person to the other. As detailed above, this is enabled through social linkages and a major way to encourage it is through social embed practices such as community of practice.
- Knowledge storage. This involves "both the soft or hard style recording and retention of both individual and organizational knowledge in a way to be easily retrieved. Knowledge storage utilizes technical systems such as modern information technology hardware and software and human processes to identify the knowledge in an organization, then to code and index the knowledge for later retrieval" (Gholami et al., 2013). It may be as simple as documentation of new knowledge and processes and as complex as having a knowledge management information system in place.
- Knowledge implementation which involves the application of existing knowledge for decision-making and for driving accomplishment of organizational goals.

It is recommended that organizations embrace the knowledge management practices above based on the value it creates for the organization, particularly information technology dependent ones as this research result confirmed.

5.3 Recommendation for future research

The generalization of this study result is limited by the sample size. A sample of 96 respondents confined to the ePayment Industry of Nigeria alone limits our ability to generalize the results to a wider population of firms particularly outside of ePayment industry. This study therefore needs to be replicated and extended to other industries and contexts. Industries such as telecommunication, eCommerce, retail banking that are completely reliant on information technology will benefit from studies such as this with their context considered. It is therefore recommended that in future research, more industries should be included beyond the ePayment space. It could even be the same study in a wider context – if sustainable competitive advantage can be built on information systems of the industry in today' ubiquitous and homogenous information technology environment.

Secondly, the methodological choices for this research were constrained by the need for contextual information as the variables at play required to be fully understood which was difficult with a positivist mindset orientation alone. The researcher had to rely on mixed method research with the accompanying challenge of combining qualitative and quantitative approach in single research. For the same reason of context and being specialized research, a non-probability research method was used to draw the sample of respondents. Non-probability sampling uses non-randomized methods to draw the sample. Non-probability sampling method mostly involves judgment. Instead of random selection, participants are selected based on the judgement of the researcher. While it is a very convenient sampling technique, its usefulness is limited to certain situations alone. Tansey (2007) considers non-probability sampling as "drawing samples from a larger population without the requirement of random selection. This depends a great deal on subjective judgements in the selection of the sample, as the researcher decides which element of

the population will be included in the sample". Tansey (2007) argue that while this approach gives the greater control of the element selection process, it has the disadvantage of the possibility of introduction of bias very easily and findings based on such study has the difficulty of being generalized to the population. For this research, the seeming disadvantage above is not relevant because the intent of the research is finding a correlation between information systems capabilities and sustainable competitive advantage. Tansey (2007) found out further that the seeming disadvantage of non-probability disappears when the purpose of the study is not necessarily to generalize the result of the study to a population but rather to find a causal or correlational relationship between dependent and independent variable or to obtain information about specific events and processes. We recommend that this study be extended to consider if the correlation between the independent variable and the dependent variable will be held in all industries and all context with the intent to generalize. For such, the non-probability sampling approach will not be suitable. The sampling approach for such study is recommended to be probability approach. A recommendation for future research is to attempt similar research with a probability sampling approach.

Thirdly, Organizational capability building and realizing sustainable competitive advantage are usually firms' medium to long-term goals with associated underpinnings that are usually work in progress (Sambamurthy et al. 2007). The current research is cross-sectional (a "type of research design in which you collect data from many different individuals at a single point in time" (Thomas, 2021)) hence, just good enough to find correlational relationships between the variables. It is desirable to have a longitudinal study (a study type that "collect data repeatedly from the same subjects over time, often focusing on a smaller group of individuals that are connected by a common trait" (Thomas, 2021)) of the variables to ensure a deeper time-tested

review of the relationship between the dependent and independent variables. It will be of value to find out that there exists a proportional relationship between information systems capabilities and organizational agility and/ or sustainable competitive advantage with the meaning that with superior information systems capabilities, greater agility and or sustainable competitive advantage can be spawned.

Fourthly, considering the importance of information systems capabilities found out by this research, future research should consider drivers and antecedents of information systems capability development. Variable such as organizational learning, social embeddedness of the organization, coevolution of business and technology etc. (Lu & Ramamurthy, 2011) are key antecedents of information systems capabilities to consider in future researches. Other drivers such business and information technology alignment, strategic planning of information systems that ensures business and technology personnels are on the same page always that helps to grow information systems capabilities of an organization are key drivers to consider. These are also variables to consider in future research as confounding/mediating or moderating variables. Embedding technology in all processes ensures that the entire organization grows in IT savviness. IT savvy organization which does not mean that technology replaces humans but rather that humans are aided by technology have been found by virtue of their higher technology capabilities to do much better in scanning the environment, understanding technology trend, and consequently helping to ensure sustainable performance for one organization over organizations (McAfee 2004). These are areas of future research around this subject matter. There is also the need to further study information systems capabilities and business performance contradiction such as the ongoing “ambidextrous phenomenon of IT exploitation and exploration in knowledge management and IT-enabled agility” (Im and Rai 2008; Lee et al. 2008).

Fifthly, this research adopted the three dimensions of information systems capabilities – information technology infrastructure capability, information technology business spanning capabilities and information technology proactive stance by Lu & Ramamurthy (2011) in the relationship with sustainable competitive advantage (studied as an organization ability to reinvent itself continuously). Future research should consider other dimensions of both information systems capabilities and sustainable competitive advantage. The study could also consider how these dimensions of information systems capabilities and sustainable competitive advantage vary from one industry to another. Obviously, information technology in manufacturing will differ from those deployed in ePayment hence the dimensions of information systems capability and how they correlate and enhance sustainable competitive advantage will differ. Future research could consider if the three dimensions of information systems used in this will be useful in all industries.

The sixth recommendation that future researchers may consider as moderating/mediating variables between information systems capabilities and sustainable competitive advantage are such variables as culture, structure, process, or people interaction with technology. Other include "customer base, brand, core competence, infrastructure, and employees' agility to change" Weill et al. (2002). Organizational information systems capability could be studied as a fusion of "people, process, structure and technology" (Garud et al., 2006; Weill et al. 2002). The fusion of people, process, structure, and technology as information system capability has it root in the work of Laudon and Laudon, (1996) that defined information systems as including the broader organization, people, and Information Technology dimensions. According to them, the organization is in fact a critical part of Information Systems as Information Technology and the Organization are in a two-way relationship of impact on one another. They stated that "the history and culture of business firms affects how the technology is used and how it should be used".

Information systems of a firm are defined by their business process. Most organizations' business processes include "formal rules that have been developed over a long time for accomplishing tasks. These rules guide employees in a variety of procedures, from writing an invoice to responding to customer complaints. Some of these business processes have been written down, but others are informal work practices. Information systems incorporates the set of formal business processes" (Laudon and Laudon, 1996). The culture of an organization is reflected in how its information systems are set. Organizations Information Systems set-up often reflects the Organization's ways of doing things.

People reflect another key dimension of Information Systems. From setting up Organization Information Systems, managing and making use of the output- information for decision, people represent that key variable hence adjudged as one of a key dimensions of Information Technology. The fusion of people, processes, structure, technology as the information systems of an organization and the capability therefore represent a major consideration for future research. A rerun of this research with people as the key information systems dimension could be key consideration for future research.

The seventh area to consider for future research is the consideration of information technology infrastructure capability alone as an aspect of information systems capability for organization in the information systems capability and sustainable competitive advantage correlation. According to McKay and Brockway (1989), Information technology infrastructure is the "enabling base of shared information systems capabilities which provide the foundation for other business systems". Information technology infrastructure capability includes both the" internal technical (equipment, software, and cabling) and managerial expertise required to provide reliable services" (McKay and Brockway 1989; Weill 1993). It is a complex set of technological

resources that develops over time that is both difficult to describe and quantify in terms of value (Duncan 1995). It should be noted that Information technology infrastructure differs from applications both in use, how it forms a base for future applications or manage uncertainties (Broadbent, et al., 1996). It also differs in how they are both financed because the value of IT infrastructure is harder to justify. The purpose of building IT infrastructure is to support the "commonality between different applications or uses and to facilitate information sharing across the enterprise, cross-functional integration" (Darnton and Giacolette 1992) and to "obtain economies of scale" (Broadbent, et al., 1996). IT infrastructure comprise of "hardware platforms, base software platforms, communications technology, client-server technology and other software (or embedded) components that provide common services to a range of applications, common handling mechanisms for different data types and methods, standards and tools" (Turnbull 1991; Darnton and Giacolette 1992). Information technology infrastructure which is usually domiciled in Information Systems functions and in some cases in external vendors are critical for business performance. IT infrastructure capability is "required where firms need to respond more rapidly to changes in the marketplace" (Quinn 1992). As has been studied, this is the basis for firm differentiation and building capabilities to ensure more timely response to changes in the marketplace could be the difference as confirmed by this research. Information technology infrastructure capability as a specific information systems capability could be studied to distill information about how this specific information systems capabilities areas contribute to sustainable competitive advantage.

Future researcher could also be more specific in terms of the competitive advantage to be sought. It could be that such research is to explore strategic differentiation such as customer intimacy, response to customer needs etc. It could also be a specific kind of economic rent to be

sought. This is important as the attribute of a Monopoly rent, Ricardian rent and Schumpeterian rent are distinct and very different one from another. Mathews (2002) define Ricardian rents as "the extraction of profits from the rareness and superiority of a firm's resources, and the distinctiveness of the routines built to exploit these resources". This is consistent with the conventional perspective of the Resource-based view (RBV) of the firm. He defined Schumpeterian rents on the other hand as "the entrepreneurial profits extracted by a firm from a bundle of resources assembled from a variety of sources, through the capture of synergies between these resources". While Ricardian approach helps with appreciation of firm specific internal resources as barrier to imitation, solutions become obsolete very quickly in dynamic environments hence sustainable competitive advantage must embrace Schumpeterian approach in addition to the Ricardian to achieve the goal hence the need for the internal resource to be dynamic. Firm capabilities such as information technology/systems capabilities fit the description more than a tangible organizational resource such as information technology assets. Schumpeterian rent recognizes that markets are dynamic hence sustainable differentiation and rent generation depends on innovation which is a product of dynamic capabilities of the firm. This is based on the dynamic capability view of the firm. Future researcher could choose to zero in on the kind of economic rent most influenced by information systems capability as dynamic capability influenced by or influencing organizational agility and organizational knowledge management.

Finally, future research should consider how information technology spendings impact information systems capability development. Such research could examine in detail the "nature of specific information technology resource spending and investments (e.g., skill building, development approaches, specific knowledge/ business intelligence applications, technology, etc.), portfolio choices, the underlying processes in making these technology choices, and whether

a plan exists to align information technology investments to the firm's information technology capability" (Lu & Ramamurthy, 2011). Such research could examine the place of such spendings in business performance and finally whether such investment translates to rent generation in a sustainable manner for the organization. Such research could be situated in the age long argument of the "productivity paradox". The "productivity paradox" of information systems (IS) is that, despite enormous improvements in the underlying technology, the benefits of Information systems spending have not been "found in aggregate output statistics". This is sometimes explained to mean that "IS spending may lead to increases in product quality, efficiency or variety which tend to be overlooked in the aggregate statistics, even if they increase output at the firm-level" (Brynjolfsson and Hitt, 1996). The research could be to reconfirm if the spending on dynamic information systems resources such as information system capability still confirms the "productivity paradox" or otherwise. The research could seek to clarify if the "productivity paradox" applies only to infrastructural information technology or it applies to dynamic information systems resources also. It could seek to explore the phenomenon in relation to firms and industries only situated in the dynamic environment of business today with only the dynamic resources of information technology/systems and reconfirm if with the narrowed playing field, the phenomenon will still hold true.

5.4 Conclusions

Information systems and management researches are replete with discussions about how to generate value from investment in information technology. Research finding seems to occupy a very wide spectrum covering from one end where information technology is still adjudged as a veritable avenue to create competitive advantage for business -directly or indirectly (e.g. Duh et al., 2006; Neirotti and Paolucci, 2007; Tallon et al., 2018; Hartani et al., 2021; Kipyegon et al., 2018, Zeng et al.,2020), in the middle we find conclusions such as "with growing power and ubiquity of information technology, its strategic importance has reduced and is more like any other infrastructural technology that is available to all" (e.g. Carr, 2003; 2005; Gupta et al.,2018; Stroumpoulis et al., 2021; Tian et al., 2009). At the other far end of the spectrum, we find those that argue that information technology impedes firm performance and consequently competitive advantage (Lu & Ramamurthy, 201, Aydiner et al., 2018). In this work, the researcher sought to better clarify this much studied but with conflicting conclusions- whether it is still strategic for businesses today to build sustainable competitive advantage on information systems. The researcher found from the study that the confusion may be due to basing the search for advantage on the infrastructural aspect of information systems – Information technology physical assets. The researcher found that with growing ubiquity, homogeneity, and standardization of the infrastructural aspect of information technology, basing the search for rent generation on such resources will not yield the desired result. It does not meet the VRIN (valuable, rare, imperfectly imitable, and non-substitutable) resource-based view requirement for competitive advantage (Barney, 1991). This is because according to basic business strategy, competitive advantage is earned when firms build barriers to imitation or barriers to entrance. The researcher rather found that dynamic information systems resources such as information systems capability can still be a

basis for building sustainable competitive advantage. The researcher conceptualized the relationship between information systems capability and sustainable competitive advantage to be mediated by organizational agility but moderated by organizational knowledge management practices. The research result show that regardless of the relentlessly changing business and technology environment, firms in information technology dependent industry such ePayment can build sustainable competitive advantage on information systems when the information systems resources underpinning the sustainable differentiation and generation of rent from information technology investment is of the dynamic type such as information systems capabilities. This is also congruent with literature and the resource-based view -VRIN requirement for sustainable competitive advantage (Barney,1991). This research also found that differentiation is significantly enhanced if organizational agility is considered as well organizational knowledge management practices. The results therefore answered the questions of whether sustainable competitive advantage can be built on information systems in today's world of information technology ubiquity and homogeneity. It also answered the question of what aspect of information systems should information technology investment be targeted to achieve the objective of differentiation and economic rent generation. The research concluded that focus should be on the development of dynamic resources such as information systems capabilities.

A major consideration for this research is the relentlessly changing business and technology environment. Competition in such an environment is of the Schumpeterian kind. The competitive advantage in this sense is how to sustainably generate Schumpeterian rent. Schumpeterian rent recognizes that markets are dynamic hence sustainable differentiation and rent generation depends on innovation which is a product of dynamic capabilities of the firm. This is based on the dynamic capability view of the firm. The conclusion of this research lends itself

clearly to how best to generate Schumpeterian rent by businesses that depend on Information Systems. Such should be based on dynamic organizational resources such as information systems capabilities. Is with such resources can an organization sense and respond to changes in the business environment through innovation. According to Mathews. (2002) Schumpeterian rent is "the entrepreneurial profits extracted by a firm from a bundle of resources assembled from a variety of sources, through the capture of synergies between these resources". For such to happen quickly, the underpinning has to be dynamic and that is what the finding of this research confirms is.

This research beside the contribution to knowledge based on the conceptualization of the relationship between information systems capabilities and sustainable competitive advantage and other variables such as organizational agility and organizational knowledge management, also helps to bring clarity to practitioners on what aspect of information systems to focus information technology budget at such a time as this. What has been found to be prevalent among practitioners is a huge annual investment by business in information technology assets in the hope that it will somehow lead to better performance. Practice such as that helps to accentuate the "productivity paradox" argument that state that "despite enormous improvements in the underlying technology, the benefits of Information technology spending have not been found in aggregate output statistics" (Brynjolfsson & Hitt, 1996). Most huge information technology investment is based on a mistaken assumption on the part of both researchers and practitioners that information technology spending is directly proportional to value creation. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new

technologies" (Gartner, 2016; IDC 2016; Laudon and Laudon, 2018). These spendings are largely based on the need to take advantage of new technologies with the intent to create advantage for respective firms but most times with very disappointing outcomes. Many firms are under pressure to "demonstrate and justify the business value of IT since it still represents one of the major investments in a firm's life" (Breznik, 2012). The annual investment in information technology infrastructure is not always for value creation as sometimes "IT vendors, who on the one side, are faced with the rapid development of technology and demand for their quick adaptation and implementation make the case for information technology introduction while they have difficulties themselves in explaining the business value of constant investments in information technology, especially to management that expects immediate results and a fast return on the investment. They end up making promises, but we know that those highly positive and short-term outcomes rarely happen since the implementation of information technology and its effects are frequently indirect" (Breznik, 2012). According to Breznik (2012), the main premise of (sustainable) competitive advantage is a "firm's unique market position that enables it to earn returns above the average for the industry (Porter, 1985). Competitive advantage grows fundamentally out of the value a firm can create; naturally, the value can only be generated if a firm possesses and exploits heterogeneous and immobile resources. Of course, not all firm resources hold the potential for a sustainable competitive advantage (Barney, 2007) but those with the potential can contribute to a superior firm performance if that potential is realized. The significance of this research is that it helps refocus leaders and manager of information technology functions on the aspect of information systems that can create value worthy of information technology investment dollars. That was clearly found not to be information technology assets. Investment in information technology asset should therefore be based on "strategic necessity" only

(Peppard and Ward, 2004) but not with the strategy of building sustainable competitive advantage and any resource that can spawn competitive advantage should not lend itself to easy imitation and possession by competitor. Information technology physical resources are available to all these days of their ubiquity and homogeneity.

The fulcrum of the study and for value creation in information technology dependent firms is information systems capability. Value creation in information technology firms and industry rotates on this very important variable and in this study – the independent variable. This capability is a key necessity in the digital, knowledge-based and technology dependent economy of today and particularly in e-payment. Ertugan and Awamleh (2021) defined IT capability as the "abilities of the organization to implement a set of common platforms (e.g., physical components, networks, database, software, and social skills) and the management of the same". This agrees with Lu & Ramamurthy (2011) that define IT capability as implementation of IT assets (platforms) and the extent the organization is good at managing these platforms. IT capabilities involve the following three core components- information technology infrastructure capability, leveraging information technology for business spanning and finally information technology proactive stance (Lu & Ramamurthy, 2011). Firm differentiation and value creation, which are both key underpinnings for sustainable competitive advantage according to this research, rely a great deal on information systems capabilities particularly in information technology dependent organizations. The findings of this research are therefore valuable for practitioners as the findings of the research is almost prescriptive – sustainable competitive advantage can be built on information systems capabilities in information technology dependent organization regardless of the growing ubiquity, homogeneity, and standardization of information technology if the focus is development of dynamic resource called information systems capability.

The study found that the relationship between information systems capabilities and sustainable competitive advantage is not exactly linear but complex with mediating and moderating variables in organizational agility and organizational knowledge management respectively. The study found that the relationship is significantly enhanced when organizational agility is considered. It follows therefore that the ability to sense changes and respond quickly with the aid of technology is a key differentiator. Organization with flexible technology infrastructure and with the know-how to configure and reconfigure when the need arises in a timely manner have the benefit of satisfying customers quicker while others in the same industry are trying to find answers. The ePayment industry in Nigeria witnessed this reality recently. Technology savvy new entrants with emphasis on flexible technology infrastructure and superior information systems capabilities took over a matured market ePayment and retail banking from agelong incumbents. It happened so quickly that the incumbent can hardly respond efficiently. In some cases, a couple of new entrants took over 90% of the market share away from over two dozen seemingly established incumbents. This further confirms the result of the research. In Schumpeterian competition, time is critical as the environment is very dynamic. The capability to sense the changes, make modifications or innovate to take advantage of changing environment is all that is required to have competitive advantage. The interplay of organizational agility based on flexible infrastructure, organizational knowledge management, the organizational information systems capabilities is what engenders the needed advantage in either Ricardian or Schumpeterian competition but particularly in Schumpeterian (VUCA) business environment of today.

In addition to the place of agility in enhancing the relationship between information systems capabilities and sustainable competitive advantage is the moderating role of organizational knowledge management practices. This study established that the promotion of means of diffusing

tacit knowledge (this is beside codifying and ensuring access as much as possible) through social embeddedness and other means of organization knowledge creation, sharing, storage and implementation have a positive moderating effect on the relationship between organizational information systems capabilities and sustainable competitive advantage. The study emphasis the place of organizational knowledge management. A major finding of this study besides the finding that organizational knowledge management is major enabler of generation of Schumpeterian rent is that it is possible to manage organizational knowledge through the promotion of social structures. Social structures are enablers of knowledge diffusion and thereby a tool for knowledge management. Social structures which refer to the "pattern of relationships within a firm" (Uzzi, 1997), plays a very central role in knowledge creation (Nonaka, 1994). The firm by itself is viewed as a social community within which factors of production are transformed into goods and services through knowledge (know-how) interplay with other resources and factors of production. One way to ensure value-creation continues is by diffusion of tacit knowledge within a company's social structure. Tacit knowledge is thereby given a degree of protection against loss from employee turnover by virtue of organizational learning through the diffusion process. Organizational learning is found to have a "parallel with relational linkages in social structures" (Fisher and White, 2000). A firm's learning capacity is partially dependent on socially embedded relationships. The more socially embedded a social structure is, the more the potential for organizational learning. Capelli, (2000) identified "intrafirm social ties as a reason employees remain with a company and loyalty to the work group is often stronger than loyalty to the employer". As relationships become "embedded in social structures, trust develops (Leana and Van Buren, 1999) leading to the promotion of norms of reciprocity" (Nahapiet and Ghoshal, 1998). Reciprocal norms, together with interpersonal trust, "create conditions that enhance knowledge sharing. Because the sharing

of tacit knowledge requires high levels of individual interaction through reciprocal exchange relationships, it is advantageous that individual relationships be strongly embedded within a firm's social structure" (Droege and Hoobler, 2003). Recognizing, promoting, or enhancing, the "relational characteristics of a firm's social structure can lessen tacit knowledge loss from employee turnover" (Droege and Hoobler, 2003). One way to promote this within firm is through creating or promoting community of practices – which is described as "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger, et al., 2002). This research work recommends that organizations should encourage social linkages through initiative such communities of practices in the different knowledge domains that exist within the organization (engineers, accountants, business functions and even cross functionally) to diffuse and preserve organizational knowledge. This will help protect organizational knowledge which is a major challenge in most organizations. This cannot be overemphasized for knowledge-based organizations.

The results from this study confirm the theories of resource-based, capability and knowledge-based views of the firm as well as some extant literature. Based on these theories and empirical examination, this research has tried to further clarify the position put forward by the seminal work by Carr (2003) that "IT doesn't matter". While theoretical debate of whether information technology is now generally a commodity with diminished strategic importance will rage on, this research has provided some much-needed clarifications and context that can immediately be used by practitioners. Organizations can build a strategy for differentiation and the generation of economic rent on the information systems based on the result of this research work. Investment in information technology must only be based on infrastructure only to the extent that

it is necessary but must not be the basis of competitive advantage. The strategy for sustainable competitive advantage must be targeted at how to increase organizational agility, on organizational knowledge management and on dynamic information systems resources such as organizational information systems capabilities.

The researcher hopes that this work opens a new perspective to pursue in the understanding of the place of information systems in business. A focus on the dynamic information systems resources as against the infrastructural information technology assets as basis for strategic review of information technology's place in business. The researcher also hopes that information systems should always be considered in its full dimensions of people, the organization and information technology and not the prevalent view of information technology assets as the only dimension. The wholistic view ensures help clarify and resolves the phenomenon called the "productivity paradox". This agrees with Aydiner et al. (2018) that opined that information systems "capabilities and competencies enable the use of the resource-based view (RBV) to better explore the strategic value of Information Systems. These capabilities are composed of the infrastructure, human, and administrative kind, so that they develop an ability to exploit Information Systems resources to create a competitive advantage". The heterogeneity in its distribution, immobility of these resources and capabilities among the competing firms according to RBV is the basis for the difference in rent generation among firms in the same industry. This is what the research work confirmed and should be the one of the new frontiers of information systems researches.

References

Acharya, A. S., Prakash, A., Saxena, P and Nigam, A. (2013). Sampling: Why and How of it? INDIAN JOURNAL OF MEDICAL SPECIALITIES. 4(2):330-333.

Agarwal, R., and Sambamurthy, V. (2002). Principles and Models for Organizing the IT Function. MIS Quarterly Executive (1:1). Pp. 1-16.

Ahmad, F. and Karim, M. (1989). Impacts of Knowledge Sharing: A Review and Directions for Future Research. J. Workplace Learn. 31, 207–230.

Akindele, R. T (2005). Essentials of Research Methodology. Obafemi Awolowo University Press

Alhadeff-Jones, M. (2013). Complexity, methodology and method: Crafting a critical process of research. Complicity, 10(1/2), 19-44.

Alter, S. (2013). Work System Theory: Overview of Core Concepts, Extensions, and Challenges for the Future Work. Journal of the Association for Information Systems 14, 2. 72–121.

Amit, R. and Schoemaker, P. (1993). Strategic Assets and Organizational Rent. Strategic Management Journal, 14, 33-46.

Amos, J. (1998). Transformation to Agility: Manufacturing in the Market Place of Unanticipated Change. London, UK: Routledge.

Anderson, A. R., Drakopoulou, D. S. and Jack, S. L (2012). Entrepreneurship as connecting: Some implications for theorizing and practice. Management Decision. 50:958-971.

Andrews, K.R. (1997). The concept of corporate strategy. Oxford University Press.

Armitage, A. (2007). Mutual Research Designs: Redefining Mixed Methods Research Design. The British Educational Research Association Annual Conference. Institute of Education, University of London.

Arthor, A. and Hancook, B. (2009). Introduction to the Research Process. The NIHR Research Design Service for Yorkshire & the Humber.

Arthur, M.B. and Rousseau, D.M. (1996). The Boundaryless Career: A New Employment Principle for a New Organizational Era. New York, NY: Oxford University Press.

Asaolu, T.O., Ayoola, T.J. & Akinkoye, E.Y. (2011). Electronic Payment System in Nigeria: Implication, Constraints and Solutions, Journal of Management and Society, 1 (2), 16 – 21.

Australian Council for International Development, (2017). Principles and Guidelines for ethical research and evaluation in development. Research for development impact network.

Awamleh, F. and Ertugan, A. (2021). The Relationship Between Information Technology Capabilities, Organizational Intelligence, and Competitive Advantage. Sage

Aydiner, A.S., Tatoglu, E., Bayraktar, E. and Zaim, S. (2018). Information system capabilities and firm performance: Opening the black box through decision-making performance and business-process performance. International Journal of Information Management 47.168–182.

Bacharach, S.B. (1989). Organizational theories: some criteria for evaluation. Acad. Manage. Rev. 14 4, 496–515.

Bagozzi, R. P., & Yi, Y. (1991). Multitrait–multimethod matrices in consumer research. Journal of Consumer Research, 17, 426–439.

Barney, J. (2000). Firm Resources and Sustained Competitive Advantage. *Journal of Management.*17 (1) pp.99-120.

Bartlett, C.A. and Ghoshal, S. (2002). Building Competitive Advantage through People. MIT Sloan Management Review. Vol. 43. No.2.

Bakopoulous, J.Y. (1985). Toward a More Precise Concept of Information Technology. Proceedings of the 6th International Conference on Information Systems. pp. 17-24.

Banham, H. (2010). External Environmental Analysis for Small and Medium Enterprises .*Journal of Business & Economics Research*. 8 (10) pp.19-26.

Berndt, E. R., & Malone, T. W. (1995). Information Technology and The Productivity Paradox: Getting the Questions Right. Economics of Innovation and New Technology, 3(3&4): 177-182.

Barney, J. (1986a). Strategic factor markets: expectations, luck, and business strategy. Management Science, 32 (10), 1231-1241.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management. 17: 99-120.

Barney, J. B. (1994). Bringing Managers Back In: A Resource-Based Analysis of the Role of Managers in Creating and Sustaining Competitive Advantages for Firms, does management? On competencies and competitive advantage. The 1994 Crafoord lectures: 1-36. Lund, Sweden: Institute of Economic Research, Lund University.

Barney, J. B. (2002). Gaining and Sustaining Competitive Advantage: Prentice Hall.

Barney, J. B., Wright, M., & Ketchen Jr., D. J. (2001). The Resource-Based View of the Firm: Ten Years after 1991. Journal of Management, 27: 625-641.

Basten, D. and Haamann, T. (2018). Approaches for Organizational Learning: A Literature Review. SAGE Open. DOI: 10.1177/2158244018794224

Baumard, P. (1999). Tacit Knowledge in Organizations. Thousand Oaks, CA: Sage Publications Ltd.

Berk, R. A. (1983). An introduction to sample selection bias in sociological data. American Sociological Review, 386-398.

Betley, E., Sterling, E.J., Akabas, S.; Paxton, A. and Frost, L. (2021). Introduction to Systems and Systems Thinking. Network of Conservation Educators and Practitioners, Center for Biodiversity and Conservation, American Museum of Natural History. Vol. 11, Issue 1, pp. 9-25.

Beavers, A. A., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. Practical Assessment, Research & Evaluation, 18(5/6), 1-13.

Baily, M. N. (1986). What has happened to productivity growth? Science, 234(4775): 443451.

Bharadwaj, A., (2000). A resource-based perspective on information technology and firm performance: an empirical investigation. MIS Quarterly, Vol. 24 No. 1, pp. 169-96.

Bharadwaj, S.G., Varadarajan, P. R. and Fahy, R. (1993). Sustainable Competitive Advantage in Service Industries: A Conceptual Model and Research Propositions. Journal of Marketing. 57: 83-99.

Bhandari, P. (2022). Data Collection | Definition, Methods & Examples. Scribbr

Bierly, P. and Chakrabarti, A. (1996). Generic Knowledge Strategies in the U.S Pharmaceutical Industry. Strategic Management Journal. 17:123-135.

Bickman, L., and Rog, D. (2009). Applied research design: A practical approach. Thousand Oaks, CA: Sage

Boell, S.K. and Cecez-Kecmanovic, D. (2015). What is an Information System? 48th Hawaii International Conference on System Sciences. 1530-1605/15. DOI 10.1109/HICSS.2015.587.

Bollinger, A.S. and Smith, R.D. (2001). Managing organizational knowledge as a strategic asset. Journal of Knowledge Management. Volume 5. Number 1. 8 -18

Bounfour, A. (2016). Digital futures, digital transformation. Heidelberg: Springer

Burgelman, J. (1996). How social dynamics Influence Information Society Technology: Lessons for innovation policy. Pp. 215-224 in OECD, Social Sciences

BusinessWire, (2021). Information Technology Global Market Report 2021: IT Services; Computer Hardware; Telecom; Software Products - Forecast to 2025 & 2030 - ResearchAndMarkets.com

Brass, D. J. (Ed.). (1995). A Social Network Perspective on Human Resource Management." Research in Personnel and Human Resource Management.13: 39-79

Breznik, L. (2012). Can information technology be a source of competitive advantage? Economic and Business Re view, 14 (3). https://doi.org/10.15458/2335-4216.1232

Brown, J. S. and Duguid. P (1998). Organizing Knowledge. California Management Review .40: 90-1 1 1

Brown, J. S. and Duguid, P. (1991). Organizational learning and communities of practice: toward a unified view of working, learning and innovation. Organizational science. 2, 1, 40-57.

Brown, S. L. and Eisenhardt, K. M. (1997). The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. Administrative Science Quarterly, Vol. 42, No. 1, pp. 1-34.

Broadbent, M., Weill, P., and Neo, B. S. (1999). Strategic Context and Patterns of IT Infrastructure Capability. Journal of Strategic Information Systems. (8:2), pp. 157-187.

Broadbent, M., Weill, P., Brein, T. and Neo, B. (1996). Firm Context and Patterns of IT Infrastructure Capability. ICIS Proceedings. 13. http://aisel.aisnet.org/icis1996/13

Bryman, A. (2012). Integrating quantitative and qualitative research: how is it done? Qualitative research, 6(1), 97-113.

Brynjolfsson, E. (1993). The productivity paradox of information technology: Review and assessment. Communications of the ACM (36/12): 67–77.

Brynjolfsson, E., & Hitt, L. M. (1995). Information Technology as A Factor Of Production: The Role Of Differences Among Firms. Economics of Innovation and New Technology, 3(3&4): 183-200.

Brynjolfsson, E., & Hitt, L. M. (1996). Paradox Lost? Firm-Level Evidence on the Returns to Information Systems Spending. Management Science, 42 (4), 541-558. http://dx.doi.org/10.1287/mnsc.42.4.541

Bryd, T. A. and Turner, D.E. (2000). Measuring the Flexibility of Information Technology Infrastructure: Exploratory Analysis of a Construct. Journal of Management Information Systems. Vol. 17, No. 1. pp. 167–208

Byrd, T.A. and Turner, E.D. (2001). An Exploratory Analysis of the Value of the Skills of IT Personnel: Their Relationship to IS Infrastructure and Competitive Advantage. Decision Sciences, 32(1), 21-54.

Buchanan, D.R. (1992). An Uneasy Alliance: Combining Qualitative and Quantitative Research. Health Education Quarterly 19(1): 117–35.

Cai, Z., Liu, H., Huang, Q. and Liang, L. (2017). Developing organizational agility in product innovation: the roles of IT capability, KM capability, and innovative climate. R&D Management. RADMA and John Wiley & Sons Ltd.

Campbell, D. T., & Fiske, D. (1959). Convergent and discriminant validation by the multitrait–multimethod matrix. Psychological Bulletin, 56, 81–105.

Cameron, K.S. and Quinn, R.E. (2011). Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework. 3rd ed. Jossey-Bass: San Fransisco, CA, USA.

Capelli, P. (2000). A Market-Driven Approach to Retaining Talent. Harvard Business Review. 78: 103-113.

Capgemini Research Institute (2021). World Payment Report

Caulfield, J. (2019). How to Do Thematic Analysis | Step-by-Step Guide & Examples. Scribbr

Cavanagh, S. (1997). Content Analysis: Concepts, Methods and Application. Nurse Researcher. 4. 5-13. http://dx.doi.org/10.7748/nr1997.04.4.3.5.c5869

Carr, N.G. (2003). IT Doesn't Matter. Harvard Business Review. 81, 41-49.

Carr, N. (2005). The end of corporate computing. Sloan Management Review, 46 (3), 67-73.

Castro, D. and New, J. (2016). The Promise of Artificial Intelligence.

CBI (Carnegie Bosch Institute). (1995). Knowledge in international corporations – Outline of research area. Pittsburg: CBI.

Cegliński, P. (2016a). The use of strategic marketing management tools in contemporary enterprises. Marketing Zarządzanie. No. 5 (46), pp. 9–16.

Cepeda, G. and Vera, D. (2007). Dynamic capabilities and operational capabilities. J. Bus. Res. 60, 426–437.

Cetindamar, D.; Katic. M.; Burdon, S. and Gunsel, A. (2021). The Interplay among Organizational Learning Culture, Agility, Growth, and Big Data Capabilities. Sustainability. 13, 13024. https://doi.org/10.3390/su132313024.

Caracelli, V.J., & Greene, J.C. (1993). Data analysis strategies for mixed-method evaluation designs. Educational Evaluation and Policy Analysis, 15, 195–207.

Chae, H., Koh, C.E, and Prybutok, V.R. (2014). INFORMATION TECHNOLOGY CAPABILITY AND FIRM PERFORMANCE: CONTRADICTORY FINDINGS AND THEIR POSSIBLE CAUSES. MIS Quarterly Vol. 38 No. 1 pp. 305-326

Chan, Y. E., & Reich, B. H. (2007). **IT Alignment: What Have We Learned?** ***Journal of Information Technology***. 22(4) Pp.297-315.

Chan, Y.E., Huff, S.L., W., B.D., and Copeland, D.G. (1997). Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment. Information Systems Research (8:2). Pp. 125-150.

Chanopas, A., Krairit, D. and Khang, D. B. (2006). Managing information technology infrastructure: a new flexibility framework. Management Research News. Vol. 29 No. 10. pp. 632-651.

Chandler, A.D. (1962). Strategy and structure. Harvard University Press.

Chaharbaghi, K. and Lynch, R. (1999). Sustainable competitive advantage: towards a dynamic resource-based strategy. Management Decision 37/1. 45–50.

Chatzkel, J. L. (2003). Knowledge Capital: How Knowledge-Based Enterprises Really Get Built.

Chen, X. (2012). Impact of Business Intelligence and IT Infrastructure Flexibility on Competitive Advantage: An Organizational Agility Perspective. Nebraska, USA: The University of Nebraska - Lincoln.

Chen, M.C., Cheng, S.J. and Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. Journal of Intellectual Capital. Vol. 6 No. 2, pp. 159-76.

Chi, J. and Sun, L. (2015). IT and Competitive Advantage: A Study from Micro Perspective. Modern Economy. 6, 404-410.

Chiva, R., Ghauri, P., & Alegre, J. (2014). Organizational learning, innovation, and internationalization: A complex system model. British Journal of Management, 25, 687-705.

Child, D. (1990). The essentials of factor analysis, second edition. London: Cassel Educational Limited.

Chung, S.H., Rainer Jr, R.K. and Lewis, B.R. (2003). The Impact of Information Technology Infrastructure Flexibility on Strategic Alignment and Application Implementations. Communications of the Association for Information Systems: Vol. 11, Article 11.

Chu, Y., Chi, M., Wang, W., & Luo, B. (2019). The impact of information technology capabilities of manufacturing enterprises on innovation performance: Evidence from SEM and fsQCA. Sustainability, 11(21), 5946. https://doi.org/10.3390/ su11215946.

CIPD, (2013). *Factsheet: PESTLE Analysis*. Available at: http://www.cipd.co.uk/hr-resources/factsheets/pestle-analysis.aspx

Clemons, E. K. (1986). Information Systems for Sustainable Competitive Advantage. Information & Management (11:3). pp. 131-136.

Clemons, E. K. (1991). Evaluation of Strategic Investments in Information Technology. Communications of the ACM (34:1). pp. 22-36.

Clemons, E. K. and Row, M. C. (1991). Sustaining IT Advantage: The Role of Structural Differences. MIS Quarterly (15:3). Pp. 275-292.

Creswell, J. W., Plano, C. V. L. (2007). Designing and Conducting Mixed Methods Research. Thousand Oaks, CA. Sage Publications.

Creswell, J. W. (1994). *Research design: Qualitative & quantitative approaches.* Sage Publications, Inc.

Creswell, J.W. (2015). Research Design: Qualitative, Quantitative and Mixed Methods Approaches . Sage. London

Creswell, J.W. and Clark, V.L.P. (2010). Best Practices for Mixed Methods Research in the Health Sciences. Office of Behavioral and Social Sciences Research (OBSSR).

Crocker, L. and Algina, J. (1986). Introduction to classical and modern test theory. Orlando, FL: Harcourt Brace Jovanovich :1-527.

Cronbach, L, J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika* **volume 16**, pages297–334

Collis, D. J. (1994). How valuable are organizational capabilities? Strategic Management Journal. 15(8), 143–152.

Collis, D. J. and Montgomery, C.A. (1995). Competing on Resources: Strategy in the 1990s**.** HBR.

Curado, C. and Bontis, N. (2006). The knowledge-based view of the firm and its theoretical precursor. Int. J. Learning and Intellectual Capital. Vol. 3, No. 4.

Dalar, S., Hagemann, J., Aburto, M and Rose, S., (2017). Informed Consent in Human Subjects Research. Office for the Protection of Research Subjects (OPRS)

Daneels, E. (2012). Second-order competences and Schumpeterian rents. Strategic Entrepreneurship Journal. https://doi.org/10.1002/sej.1127

Darnton, G., and Giacoletto, S. (1992). Information and IT Infrastructures. In Information in the Enterprise: It's More Than Technology. Salem, Massachusetts: Digital Press. pp. 273-294.

Darlington, Y. and Scott, D. (2002). Qualitative Research in Practice: Stories from the field. Allen and Unwin. Australia

David, P. A. (1990). The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox. The American Economic Review, 80(2): 355-361.

Day, G. S. and Wensley, R. (1988). Assessing Advantage: A Framework for Diagnosing Competitive Superiority. Journal of Marketing. 52 (April): 1-20.

Denrell, J., Fang, C. and Winter, S. (2003). The economics of strategic opportunity. Strategic Management Journal. 24(10). 977–990.

Dess, G.G., McNamara, G., and Eisner, A.E. (2016). Strategic Management: Creating Competitive Advantage' (8th Edition). New York, McGraw-Hill Irwin.

Dehning, B., and Stratopoulos, T. (2003). Determinants of a Sustainable Competitive Advantage due to an IT-Enabled Strategy. Strategic Information Systems (12). Pp. 7-28.

Dewan, S., & Kraemer, K. L. (1998). International Dimensions of the Productivity Paradox. Communications of the ACM, 41(8): 56-62.

DeVellis, R. F. (2016). Scale development (4th ed.). Sage

Dia, H. and Javanshour, F. (2016). Autonomous Shared Mobility-On-Demand: Melbourne Pilot Simulation Study. 19th EURO Working Group on Transportation Meeting (EWGT). Transportation Research Procedia 22. 285–296.

Dicksen, P. R. (1996). The static and dynamic mechanics of competitive theory. Journal of Marketing. Pp. 102-106.

Dierickx, I. and Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. Management Science. Vol. 35 No. 12. Pp. 1504-1511.

Ditkaew, K., Pitchayatheeranart, L. and Jermsittipasert, K. (2020). The Causal Structural Relationships between Accounting Information System Quality, Supply Chain Management Capability, and Sustainable Competitive Advantages of Maize. Int. Journal of Supply Chain. Mgt. Vol. 9. No. 1.

Dove, R. (2001). Response Ability: The Language, Structure, and Culture of the Agile Enterprise. New York: John Wiley & Sons

Doyle, L., Brady, A. and Byrne, G. (2012). An overview of mixed methods research. Journal of Rsearch in Nursing. Sage Pulications.

Droege, S.B. and Hoobler,J.M. (2003). Employee Turnover and Tacit Knowledge Diffusion: A Network Perspective. JOURNAL OF MANAGERIAL ISSUES Vol. XV Number 1: 50-64.

Drucker, P. in DeTienne, Kristen Bell, Lisa Ann Jackson, (2001) Knowledge Management: Understanding Theory and Developing Strategy‟, Competitiveness Review: An International Business Journal, Vol. 11 Issue: 1:1-11

Drost, E. A. (2011). Validity and reliability in social science research. Education Research and Perspectives, 38(1), 105.

Duncan, N.B. (1995). Capturing Flexibility of Information Technology Infrastructure: A Study of Resource Characteristics and their Measure. Journal of Management Information Systems, 12(2), 37-57.

Duh, R.R., Chow, C.W. & Chen, H. (2006). Strategy, IT applications for planning and control, and firm performance: The impact of impediments to IT implementation. Information & Management, 43 (8), 939-949.

Easterby-Smith, Thorpe, M., R. and Jackson, P. (2012). *Management Research* (4th Ed.). SAGE Publications. London.

Edvinsson, L. and Malone, M.S. (1997). Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower. Harper Business. New York, NY.

Edwards, N. (2019). The Principle of Beneficence in Applied Ethics. Stanford Encyclopedia of Phylosophy

Evans, C. (2003). Managing for Knowledge: HR's Strategic Role. Butterworth-Heinemann. Amsterdam.

Ejembi, A.E. (2017). Management Research Project. MSc. Information Systems Management. Roehampton University. London.

Eisenhardt, K.M., and Brown, S.L. (1999). Patching: Restitching Business Portfolios in Dynamic Markets. Harvard Business Review. (77:3). Pp. 72-82.

Eisenhardt, M., & Martin, J. (2000). Dynamic Capabilities: What Are They? Strategic Management Journal. 21, 1105-1121. http://dx.doi.org/10.1002/1097-0266(200010/11)21:10/113.0.CO;2-E

eMarketer. (2015). Tablet Users to Surpass 1 Billion Worldwide in 2015.

Fahey, L. and Prusak, L. (1998). The Eleven Deadliest Sins of Knowledge Management. California Management Review 40: 265-27.

Felipe, C.M., Roldán, J.L and Leal-Rodríguez, A. L. (2016). An explanatory and predictive model for organizational agility. Journal of Business Research 69. 4624–4631.

Fichman, R. G. (2004). Real Options and IT Platform Adoption: Implications for Theory and Practice. Information Systems Research (15:2). Pp. 132-154.

Fisher, S.R. and White, M.A. (2000). Downsizing in a Learning Organization: Are There Hidden Costs?" Academy of Management Review. 25: 244-25

Fink, L. and Neumann, S. (2007). Gaining Agility through IT Personnel Capabilities: The Mediating Role of IT Infrastructure Capabilities. Journal of Association of Information Systems. Volume 8, Issue 8, Article 2, pp. 440-462.

Floyd, S. W. and Wooldridge, B. (2000). Building Strategy from the Middle: Reconceptualizing Strategy Process. Thousand Oaks, CA: Sage Public

Frost, A. (2010). Knowledge Management Definition. Retrieved from Knowledge Management Tools website: http://www.knowledge-management-tools.net/knowledge-managementdefinition.html.

Ferdows, K., Lewis, M. A., and Machuca, J. A. D. (2004). RapidFire Fulfillment. Harvard Business Review (82:11), pp. 104-110

Galliers, R. (2007). Strategizing for Agility: Confronting Information Systems Inflexibility in Dynamic Environments. In Agile Information Systems, K. DeSouza (ed.), Burlington, MA: Butterworth-Heinemann. Elsevier Inc. Pp. 1-15.

Galbreath, J. T. (2004). Determinants of Firm Success: A Resource-based Analysis. Curtin University of Technology.

George, T. (2021). Mixed Methods Research | Definition, Guide & Examples. Scribbr blog. Retrieved from https://www.scribbr.com/methodology/mixed-methods-research/#:~:text=Mixed%20methods%20research%20combines%20elements,integrates%20benefits%20of%20both%20methods

Glassnapp. D. R., & Poggio, J. (1985). Essentials of Statistical Analysis for the Behavioral Sciences. Columbus, OH: Charles E. Merril Publishing.

Garud, R., Kumaraswamy, A., and Sambamurthy, V. (2006). Emergent by Design: Performance and Transformation at Infosys Technologies. Organization Science (17:2), pp. 277-286.

Garvin, D. A., Edmondson, A. C., & Gino, F. (2008). Is yours a learning organization? Harvard Business Review, 86, 109-116.

Gartner, Inc. (2016). Gartner Says Worldwide IT Spending Is Forecast to Decline 0.5 Percent in 2016. Business Wire.

Gause, G.F (1934). The Struggle for Existence. A Classic in Mathematical Biology and Ecology. Zoological Institute, Malaia Bronnaia.

Gartner, Inc. (2016). Gartner Says Worldwide IT Spending Is Forecast to Decline 0.5 Percent in 2016. Business Wire

Gupta, G., Tan, K.T.L., Ee, Y.S. and Phang, S.C.S. (2018). Resource-Based View of Information Systems: Sustainable and Transient Competitive Advantage Perspectives. Australasian Journal of Information Systems. Vol 22. Research Note.

Gholami, M., Asli, M. N., NazariShirkouhi, S. and Noruzy, A. (2013). Investigating the Influence of Knowledge Management Practices on Organizational Performance: An Empirical Study. Acta Polytechnica Hungarica. Vol. 10, No. 2.

Giachetti, R. E. (2003). Analysis of the structural measures of flexibility and agility using a measurement theoretical framework. Production Economics, Vol. 86, No. 1, pp. 47-62.

Goldman, S. L., Nagel, R. N., and Preiss, K. (1995). Agile competitors and virtual organizations. (Van Nostrand Reinhold New York, NY).

Goldsby, T. J. and Stank, T. P. (2000). World class logistics performance and environmentally responsible logistics practices. Journal of Business Logistics. Vol. 21, No. 2, pp. 187–208.

Gregory, R. J. (2016). Psychological testing: History, principles, and applications (Updated 7th edition). Pearson.

Grant, R. (1991). A resource-based perspective of competitive advantage. California Management Review, 33, 114-135.

Grant, R.M. (1996). Toward a Knowledge-Based Theory of the Firm: Knowledge-Based Theory of the Firm. Strateg. Manag. J. .17, 109–122.

Grant R.M. (2002). Contemporary strategy analysis; concept, technique, applications. (4th ED). Mssachusetts: Blackwell

Grantham (2019). A Guide to Organizational Resources and How to Manage Them. Blog. University of Arkansas. Retrieved from https://www.uagrantham.edu/blog/a-guide-to-organizational-resources-and-how-to-manage-them/.

George, D., & Mallery, P. (2003). SPSS for Windows step by step: A simple guide and reference. 11.0 update (4th ed.). Boston: Allyn & Bacon.

Hajli, M. and Sims, J. M. (2015). Information technology (IT) productivity paradox in the 21st century. International Journal of Productivity and Performance Management Vol. 64 No. 4.

Haeckel, S. H. (1999). Adaptive Enterprise: Creating and Leading Sense-and-Respond Organizations. Harvard Business School Press. Boston.

Haggerty, K. D. (2004). Ethics creep: Governing social science research in the name of ethics. Qualitative sociology, 27(4), 391-414.

Hartani, N.H., Haron, N. and Tajuddin, N.I.I. (2021). THE IMPACT OF STRATEGIC ALIGNMENT ON THE SUSTAINABLE COMPETITIVE ADVANTAGES: MEDIATING ROLE OF IT IMPLEMENTATION SUCCESS AND IT MANAGERIAL RESOURCE. INTERNATIONAL JOURNAL OF eBUSINESS and eGOVERNMENT STUDIES. Vol: 13 No: 1. ISSN: 2146-0744 (Online) (pp. 78-96) Doi: 10.34111/ijebeg.202113104.

Heale, R. and Forbes, D. (2017). Understanding triangulation in research. Evid Based Nurs. Volume 16. Number 4.

Helfat, C. E. (2003). The SMS Blackwell Handbook of Organizational Capabilities: Emergence, Development and Change. Blackwell Publishing: MA.

Hemmatfar, M., Salehi, M. and Bayat, M. (2010). Competitive Advantages and Strategic Information Systems. International Journal of Business and Management .Vol. 5 . No. 7.

Henderson, B.D. (1989). The Origin of Strategy. What Business owe Darwin and other reflections on Competitive Dynamics. Harvard Business Review.

Henderson, J. C., & Venkatraman, N. (1993). Strategic Alignment: Leveraging Information Technology for Transforming Organizations. *IBM Systems Journal*. 32(1) pp.4-16.

Henry, G. T. (1990). Practical Sampling. Newbury Park, CA: Sage Publications.

Hermawan, I., & Suharnomo. (2020). Information Technology as a Strategic Resource in Encouraging Organizational Change Readiness through the Role of Human Capital Effectiveness. Jurnal Dinamika Manajemen. 11(2), 242-254.

Hoffman, N. P. (2000). An Examination of the "Sustainable Competitive Advantage" Concept: Past, Present, and Future. The University of Alabama

Hollensbe, E., Wookey, C., Hickey, L., George, G. and Nichols, C.V. (2014). Organizations with Purpose. Acad. Manag. J. 57, 1227–1234.

Holdren, J.P. and Smith, M. (2016). Preparing for the future of Artificial Intelligence. Executive Office of the President National Science and Technology Council Committee on Technology.

Hoopes, D.G. and Madsen, T.L. (2008). A capability-based view of competitive heterogeneity. Industrial and Corporate Change. Pp. 1 of 34 doi:10.1093/icc/dtn008

Hoskisson, R., Hitt, M., Wan, W. and Yiu, D. (1999). Theory and research in strategic management: swings of a pendulum. Journal of Management.Vol. 25, No. 3. Pp.417–456.

Hron J. (2005). Knowledge management. Conference on Firm Management, Brno.

Huff, A. S., Floyd, S. W., Sherman, H. D., and Terjesen, S. (2009). Strategic Management. Logic and Action. John Wiley & Sons, New York.

Hu, L. & Bentler, P. M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling, 6(1), 1-55.

International Data Corporation. (2016). Worldwide Public Cloud Services Spending Forecast to Double by 2019, According to IDC.

Ikart, E. (2019). Survey questionnaire survey pretesting method: An evaluation of survey questionnaire via expert reviews technique. Asian Journal of Social Science Studies, 4(2). https://doi.org/10.20849/ajsss.v4i2.565

Im, G., and Rai, A. (2008). Knowledge Sharing Ambidexterity in Long-Term Interorganizational Relationships. Management Science (54:7), pp. 1281-1296.

Imenda, S. (2014). Is There a Conceptual Difference between Theoretical and Conceptual Frameworks? Journal of Social Sciences. 38(2): 185-195.

Jabareen, Y. (2009). Building a Conceptual Framework: Philosophy, Definitions, and Procedure. International Journal of Qualitative Methods. 8(4)

Johnson, R. B., & Christensen, L. B. (2004). Educational research: Quantitative, qualitative, and mixed approaches. Allyn and Bacon. Boston, MA.

Jorgenson, D. W., & Stiroh, K. J. (1995). Computers and Growth. Economics of Innovation and New Technology, 3(3 & 4): 295-316.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. Educational researcher. 33(7), 14-26.

Johnson, G., Whittington, R., Scholes, K., Angwin, D and Regnér, P. (2011). Exploring Strategy. (9th Edition). Pearson.

Kaiser, K. (2009). Protecting Respondents Confidentiality in Qualitative Research. Qual Health Res. 19(11):1632-1641.

Kane, M. and Bridgeman, B. (2017). Research on Validity Theory and Practice at ETS.

Kalkbrenner, M. T. (2012). A Practical Guide to Instrument Development and and Score Validation in the Social Sciences: The MEASURE Approach. Vol. 206

Kennerley, M. and Nelly, A. (2003). Measuring performance in a changing business environment. International Journal of Operations and Production, 23(2), 213-229

Kidder, L. H., Charles M. J., and Eliot R. S. (1991). Research Methods in Social Relations. Fort Worth, TX: Brace Jovanovich College Publishers, 132.

Kijek, T. and Kijek, A. (2018). Is innovation the key to solving the productivity paradox? Journal of Innovation and Knowledge. 219-225

Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. Am J Health Syst Pharm, 65(23), 2276-2284.

Krippendorff, K. (1980). Content Analysis: An Introduction to Its Methodology. Newbury Park, CA: Sage.

Kraemer, K. L., & Dedrick, J. (1994). Payoffs from Investment in Information Technology: Lessons from the Asia-Pacific Region. World Development, 22(12): 1921-1931

Kumar, R. (2011). Research Methodology. A step-by-step guide for beginners. SAGE Publications Ltd

Kennerley, M. and Nelly, N. (2003). Measuring performance in a changing business environment. *International Journal of Operations and Production*. 23(2), 213-229.

Kesby, D. (2008). Exploring the power of action learning. KM Review, 11(5), 26-29.

King, W. R. (2009). Knowledge Management and Organizational Learning. 3 Annals of Information Systems. 4, DOI 10.1007/978-1-4419-0011-1_1

Kipyegon, B.A., Obura, J. and Oginda, M. (2018). Analysis of Information Systems Capabilities and Performance of Firms in Telecommunications Industry, Kenya. International Journal of Scientific Research and Management. Volume 06|. Issue 04. Pages 219-327.

Kraaijenbrink, J., Spender, J. C. and Groen, A.J. (2010). The resource-based view: A review and assessment of its critiques. MPRA Paper No. 21442

Labarre, P. (1998). People Go, Knowledge Stays. Fast Company September:48

Laudon, K.C., and Laudon, J.P., (2013). *Essentials of Management Information Systems*. 10th edition. Harlow: Pearson

Laudon, k.C. and Laudon, J.P. (1996). Management Information Systems: Managing the Digital Firm. (11th Ed). New York University

Laudon, k.C. and Laudon, J.P. (2018). Management Information Systems: Managing the Digital Firm. (15th Ed) New York University

Laerd Dissertation Blog retrieved from https://dissertation.laerd.com/

Leana, C.R. and Van Buren III, H. J. (1999). Organizational Social Capital and Employment Practices. Academy of Management Review. 24:538-555.

Lambie, G., Blount, A., & Mullen, P. (2017). Establishing content-oriented evidence for psychological assessments. Measurement and Evaluation in Counseling and Development. 50(4), 210– 216. https://doi.org/10.1080/07481756.2017.1336930

Landauer, T. K. (1995). The Trouble with Computers. Cambridge, MA: MIT Press.

Lai, C. & Lin, S. (2017). Systems theory.

Laszlo, A. and Krippner, S. (1998). Systems Theories: Their Origin, Foundations and Developments. Systems Theories and A Priori Aspects of Perception. Advances in Pschology.

Lee O., Sambamurthy, V., Lim, K., and Wei, K. K. (2008). IT Enabled Organizational Agility and Sustainable Competitive Advantage. Working Paper, Social Science Research Network (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1249301

Lee, I. H., & Khatri, Y. (2003). Information Technology and Productivity Growth in Asia, IMF Working Paper. WP/03/15.

Leiblein, M.J. (2011). What Do Resource- and Capability Based Theories Propose? Journal of Management. Vol. 37 No. 4. 909-932

Lessem, R. (1991). Total Quality Learning: Building a Learning Organisation. Blackwell, Oxford.

Leonard-Barton, D. (1995). Wellsprings of Knowledge:Building and Sustaining the sources of Innovation. Harvard Business School Press, Boston. MA

Lieberman, M.B., and Montgomery, D.B. (1988). First-Mover Advantages. Strategic Management Journal (9: Special Issue). Pp. 41-58.

Liehr, P. and Smith. M.J. (1999). Middle range theory: Spinning research and practice to create knowledge for the new millennium. Advances in Nursing Science, 21(4): 81-91.

Lin, C.Y.,Huang, C.K. and Zhang, H. (2019). Enhancing employee job satisfaction via e-learning. Int. J. Hum. Comput. Interact. 35, 584–595.

Loermans, J. (2002). Synergizing the learning organization and knowledge management. Journal of Knowledge Management, 6, 285-294.

Lucas, H. and Olsen, M. (1994). The impact of information technology on organizational flexibility. Journal of Organizational Computing. Volume 4, Issue 2.

Lu, Y., & Ramamurthy, K. R. (2011). The link between IT capability & organizational agility. Introduction. MIS Quarterly, 35(4), 931–954.

Lu, Y., & Ramamurthy, K. R. (2006). IT capability, uncertainty, and organizational performance: Development of measures and empirical examination (3222385). https://search.proquest. com/docview/304973960/previewPDF/D76F9D8A5D36404DPQ/1?accountid=15309

Liang, T., You, J. and Liu, C. (2010). A resource-based perspective on information technology and firm performance: a meta-analysis. Industrial Management & Data Systems .Vol. 110 No. 8.pp. 1138-11.

Lu, Y.and Ramamurthy, K. (2011). Understanding the link between information technology capability and Organizational agility: An empirical examination. *MIS Quarterly Vol. 35 No. 4 pp. 931-954.*

Likert, R. (1931). A technique for the measurement of attitudes. Archives of Psychology. New York: Columbia University Press.

Lichtenberg, F. R. (1995). The output contribution of computer equipment and personnel: A firm level analysis. Journal of Economic Innovation and New Technologies (3): 201–217

Lynch, R. (2006). Corporate strategy. London: Financial Times/Prentice Hall.

Macy, J. (1991). Mutual causality in Buddhism & general system theory. USA: SUNY Press.

McKinsey and Company. (2021). The 2021 McKinsey Global Payment Report.

McKay, D. T., and Brockway, D. W. (1989). Building IT Infrastructure for the 1990s. Stage by Stage (Nolan Norton and Company). Volume 9, Number 3. pp. 1-11.

McDonald, R. P. (1999). Test theory: A unified treatment. Mahwah, NJ: LEA

McAfee, A. (2004). Do You Have Too Much IT?, MIT Sloan Management Review (45:3), pp. 18-22.

Maditinos, D., Chatzoudes, D., Tsairidis, C. and Theriou, G. (2011). The impact of intellectual capital on firms' market value and financial performance. Journal of Intellectual Capital Vol. 12 No. 1, 2011 pp. 132-151. Emerald Group Publishing Limited 1469-1930. DOI 10.1108/14691931111097944

Madhani, P.M. (2010). Resource Based View (RBV) of Competitive Advantage. An Overview. The Icfai University Press.

Masli, A., Richardson, V. J., Sanchez, J. M. and Smith, R. E. (2011).Returns to IT Excellence: Evidence from Financial Performance around Information Technology Excellence Awards. International Journal of Accounting Information Systems (12:3). Pp. 189-205.

Mao, H., Liu, S., and Zhang, J. (2015). How the effects of IT and knowledge capability on organizational agility are contingent on environmental uncertainty and information intensity. Information Development. 31, 358–382.

March, J.G. (1991). Exploration and exploitation in organizational learning. Organ. Sci. 2, 71–87.

Markoff, J. (2016). Moore's Law Running Out of Room, Tech Looks for a Successor. New York Times (May 4).

Matin, E. K., & Sabagh, P. (2015). Effects of Knowledge Management Capabilities on Organizational Performance in Iranian Export Companies. Mediterranean Journal of Social Sciences. 6(2), 240-240.

Mata, F. J., Fuerst, W. L., and Barney, J. B. (1995). Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis. MIS Quarterly (19:4). Pp. 487-505.

Mathews, J.A. (2002). SCHUMPETERIAN COMPETITIVE DYNAMICS AND ECONOMIC LEARNING: AN ECONOMY-WIDE RESOURCE-BASED VIEW. DRUID

Summer Conference on "Industrial Dynamics of the New and Old Economy - who is embracing whom?". Copenhagen/Elsinore 6-8.

Mavengere, N. S. (2013). Role of Information Systems for Strategic Agility in Supply Chain.

Meadows, D., and Wright, D. (2008). Thinking in Systems: A Primer. Chelsea Green Publishing, White River Junction, VT, USA.

Merino, M. (2013). You can't be a wimp: Making the tough calls. Harvard Business Review. 91(11): 73–78.

Mindtools retrieved from https://www.mindtools.com/pages/article/newSTR_82.htm.

Miles, M. B., & Huberman, A. M. (1994). Qualitative data analysis: An expanded source book (2nd ed.). Newbury Park, CA: Sage.

Mrugalska, B. and Ahmed, J. (2021). Organizational Agility in Industry 4.0: A Systematic Literature Review. Sustainability. 13, 8272.

Morgan, D. L. (2007). Paradigms lost and pragmatism regained: methodological implications of combining qualitative and quantitative methods. J Mixed Methods Res 1: 48–76.

Mohsin, A. (2016). A Manual for Selecting Sampling Techniques in Research. MPRA. 70218. University of Karachi

Moon, K., and Blackman, D. (2014). A Guide to Understanding Social Science Research for Natural Scientists. *Conservation Biology*, **28**: 1167-1177. Online: http://onlinelibrary.wiley.com/doi/10.1111/cobi.12326/full

Mvududu, N. H., & Sink, C. A. (2013). Factor analysis in counseling research and practice. Counseling Outcome Research and Evaluation, 4(2), 75-98. https://doi.org/10.1177/2150137813494766

Maths and Statistics Support. University of St. Andrews. Retrieved from https://www.st-andrews.ac.uk/ceed/study-skills/mathsandstatisticssupport/mathematicssupport/

Nagano, H. (2019). The growth of knowledge through the resource-based view. Faculty of Business Administration. Rissho University, Tokyo, Japan.

Neirotti, P. & Paolucci, E. (2007). Assessing the strategic value of information technology: An analysis of the insurance sector. Information & Management, 44 (6), 568-582.

Neta, R. and Pritchard, D. (2009). Arguing about knowledge. Routledge, London

Nunnally, J. C. (1978). Psychometric Theory. McGraw-Hill Book Company, pp. 86-113, 190-255.

Nunnally, J. C. (1978). Psychometric theory (2nd ed.). New York: McGraw-Hill.

Nahapiet, J. and Ghoshal, S. (1998). Social Capital, Intellectual Capital, and Organizational Advantage. Academy of Management Review 23:242-267

Nonaka, I. (1994). A Dynamic Theory of Organizational Knowledge Creation. Organizational Science. 5: 14

Nonaka, I. and Konna, N. (1998). The Concept of 'Ba': Building a Foundation for Knowledge Creation. California Management Review 40: 40.

North, K. and Kumta, G. (2018). Knowledge Management: Value Creation Through Organizational Learning. Second Edition. Springer

O'Dell, C., and Grayson, C.J. (1998). If only we knew what we know: identification and transfer of internal best practices. California Management Review 40(3): 154–174.

Oliner, S. D., & Sichel, D. E. (2000). The Resurgence of Growth in the Late 1990s: Is Information Technology the Story? Journal of Economic Perspectives, 14(4): 322.

Oliner, S. D., Sichel, D. E., & Stiroh, K. J. (2007). Explaining a Productive Decade. Brookings Papers on Economic Activity, 1: 81-137.

Ortenblad, A. (2004). The learning organization: towards an integrated model. The Learning Organization, Vol. 11 No. 2, pp. 129-44.

Othman, R., Arshada , R., Arisb , N.A. and Arif, S.M.M. (2015). Organizational Resources and Sustained Competitive Advantage of Cooperative Organizations in Malaysia. Social and Behavioral Sciences. 170. 120 – 127

Pannucci, C.J. and Wilkins, E.G. (2010). Identifying and avoiding bias in research. Plast Reconstr Surg. 126(2): 619–62

Pearce, J. and Robinson, R. (2009; 2017). Strategic Management: Formulation, Implementation, and Control. (11th/ 13th Edition). New York, McGraw-Hill Irwin.

Penrose E.T. (1980). The Theory of the Growth of the Firm (U.S. edition). M.E. Sharpe, Inc. White Plains, NY: 76–80.

Petit, N. and Teece, D.J. (2021). Innovating Big Tech firms and competition policy: favoring dynamic over static competition. Industrial and Corporate Change. 30, 1168–1198 DOI: https://doi.org/10.1093/icc/dtab049.

Pew Research Center. (2016). The State of Privacy in America.

Pedlar, M., Burgoyne, J., Boydell, T. and Welshman, G. (1990). Self-Development in Organisations. McGraw-Hill, Maidenhead.

Peppard, J. and Ward, J. (2004). Beyond strategic information systems: towards an IS capability. Journal of Strategic Information Systems.

Penrose E.T. (1980). The Theory of the Growth of the Firm. U.S. edition. M.E. Sharpe, Inc. White Plains, NY: 76–80.

Piccoli, G. and Ives, B. (2005). IT-DEPENDENT STRATEGIC INITIATIVES AND SUSTAINED COMPETITIVE ADVANTAGE: A REVIEW AND SYNTHESIS OF THE LITERATURE. MIS Quarterly. Vol. 29 No. 4. Pp. 747-776.

Pisello, T. (2003). IT Value Chain Management—Maximizing the ROI from IT Investments. *Digital Publications from The Information Economics Press*, vol. D10. The Information Economics Press, New Canaan, Connecticut. USA. [accessed 08.09.2005]

Pilat, D. (2004). The ICT Productivity Paradox: Insights from Micro Data. OECD Economic Studies, 38: 37-65.

Pohjola, M. (2000). Information Technology and Economic Growth: A Cross-Country Analysis, Working Papers No. 173. The United Nations University, World Institute for Development Economics Research.

Polak, P. (2014). The productivity paradox: A meta-analysis. IES Working Paper, No. 28. Charles University in Prague. Institute of Economic Studies (IES). Prague

Porter, M.E. (1990). Competitive Strategy. Techniques for analyzing industries and competitors. The free press

Porter, M.E. (1985). Competitive Advantage: Creating and Sustaining Superior Performance. New York: Free Press.

Porter, M. E. (2008). The Five Competitive Forces That Shape Strategy. *Harvard Business Review.* pp.24-40.

Powell, W.W. (1998). Learning from Collaboration: Knowledge and Networks in the Biotechnology Industries. California Management Review 40:228-240.

Powell, T. C. and Dent-Micallef, A. (1997). Information Technology as Competitive Advantage: The Role of Human, Business, and Technology Resources. Strategic Management Journal (18:5). Pp. 375-405.

Prahalad, C.K. and Hamel, G. (1990). The Core Competence of the Corporation. Harvard Business Review. 68: 79-91.

Prahalad, C. K. (2009). In Volatile Times, Agility Rules. Business Week. September 21, p. 80.

Pawson, R. and Tilly, N. (1997). Realistic Evaluation. London: Sage.

Parveen, H. and Showkat N. (2017). Non-Probability and Probability Sampling. Communications Research.

Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. Strategic Management Journal, 14, pp. 179-191.

Podsakoff, P.M., MacKenzie, S.B., Jeong-Yeon, L. and Podsakoff, N.P. (2003). Common Method Biases in Behavioral Research: A Critical Review of Literature and Recommended Remedies. Journal of Applied Psychology. Vol. 88, No. 5, 879–903.

Quinn, J. B. (1992). Intelligent Enterprise: A Knowledge and Service Based Paradigm for Industry. New York: The Free Pres

Rao, J. & Weintraub, J. (2013). How Innovative Is Your Company's Culture? MIT Sloan Management Review. 54. 29-+.

Ray, G., Barney, J.B., and Muhanna, W.A. (2004). Capabilities, Business Processes, and Competitive Advantage: Choosing the Dependent Variable in Empirical Tests of the Resource-Based View. Strategic Management Journal. (25:1), 37. Pp. 23.

Razmi, B. & Ghasemi, H. M (2015). Designing a model of organizational agility: A case study of Ardabil Gas Company. International Journal of Organizational Leadership 4.

Reed, R., and DeFillippi, R.J. (1990). Casual Ambiguity, Barriers to Imitation, and Sustainable Competitive Advantage. The Academy of Management Review. (15:1). Pp. 88-103.

Rei, C. M. (2004). Causal evidence on the “productivity paradox” and implications for managers. International Journal of Productivity and Performance Management, 53(2): 129-142.

Rindova, V.P., and Kotha, S. (2001). Continuous "Morphing": Competing Through Dynamic Capabilities, Form, and Function. Academy of Management Journal. (44:6). Pp. 1263-1280.

Ricardo, D. (1817). Principles of Political Economy and Taxation. J. Murray. London.

Russell, B. (1972). A history of western philosophy. Simon and Schuster, New York.

Rumelt, R. P. (1987). Theory, strategy, and entrepreneurship. In D. J. Teece (Ed.). The Competitive Challenge (pp. 137-158). New York: Harper & Row.

Runde, J. & Faulkner, P. (2019). Theorizing the digital object. MIS Quarterly. 43. 10.25300/MISQ/2019/13136.

Roos, J. (1998). Exploring the concept of Intellectual Capital (IC). Long Range Planning.Vol. 31. Pp.150–153.

Ross, J. W., Beath, C. M., and Goodhue, D. L. (1996). Develop Long-Term Competitiveness through IT Resources. Sloan Management Review (38:1), pp. 31-42.

Sanchez, R., Heene, A. and Thomas, H. (1996). Towards the Theory and Practice of Competence-based Competition. Forthcoming.

Sabherwal, R., and Chan, Y.E. (2001). Alignment between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders. Information Systems Research. (12:1). Pp. 11-33.

Sandelowski, M. (2001). Combining qualitative and quantitative sampling, data collection and analysis techniques in mixed method studies research. Nurs Health 23: 246–255.

Sambamurthy, V., Bharadwaj, A., and Grover, V. (2007). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. MIS Quarterly. Vol. 27, No. 2, pp. 237-63.

Schumpeter, J. (1942). Capitalism, Socialism, and Democracy. The process of creative destruction.

Scribbr, (2022). Semi-Structured Interview: Definition, Guide & Examples. Available at https://www.scribbr.com/

Senge, P. M. (1990). The leader's new work: Building learning organizations. Sloan Management Review, 32(1): 7–23.

Shubik, M. (1987). What is an application and when is theory a waste of time? Manage. Sci. 33 12, 1511–1522.

Sims, H.P., Faraj, S. and Yun, S. (2009). When should a leader be directive or empowering? Bus. Horiz. 52, 149–158.

Stroumpoulis, A., Kopanaki, E. and Karaganis, G. (2021). Examining the Relationship between Information Systems, Sustainable SCM, and Competitive Advantage. Sustainability. 13, 11715. https://doi.org/10.3390/su132111715

Spanos, Y.E. and Prastacos, G. (2004). Understanding Organizational Capabilities: towards a conceptual framework. Journal of Knowledge Management. Vol 8. No. 4. Pp 31-43.

Swanson, E. B., and Ramiller, N. C. (2004). Innovating Mindfully with Information Technology. MIS Quarterly (28:4). Pp. 553-583.

Spithoven, A. H. G. M. (2003). The productivity paradox and the business cycle. International Journal of Social Economics, 30(6): 679-699.

Swift,P.E. and Hwang, A. (2013). The impact of affective and cognitive trust on knowledge sharing and organizational learning. Learn. Organ. 20, 20–37

Srivastava, M., Franklin, A. and Martinette, L. (2013). Building a Sustainable Competitive Advantage. Journal of Technology Management and Innovation. Volume 8, Issue 2.

Szulanski, G. (1996). Exploring Internal Stickiness: Impediment to the transfer of Best Practice Within the Firm. Strategic Management Journal.17:17-43.

Solow, R. (1987). We'd better watch out. The New York Times Book Review, 12: 36.

Stuart, J. and Barnes, J. (2005). CONDUCTING ETHICAL RESEARCH. NATIONAL EVALUATION OF SURE START (NESS).

Spector, P. E. (1987). Method variance as an artifact in self-reported affect and perceptions at work: Myth or significant problem. Journal of Applied Psychology, 72, 438–443.

Schilling, M.A. (2000). Toward a General Modular Systems Theory and its Application to Interfirm Product Modularity. Academy of Management, 25(2), 312-334.

Strassmann, P. (1990). The Business Value of Computers: An Executive's Guide. New Canaan, CT: The Information Economic Press.

Stratopoulos, T., and Dehning, B., (2000). Does successful investment in information technology solve the productivity paradox? Information and Management 38 (2): 103–117.

Tallon, P.P., Queiroz, M., Coltman, T. and Sharma, R. (2018). Information Technology and the Search for Organizational Agility: A Systematic Review with Future Research

Possibilities. Journal of Strategic Information Systems. Available online at https://doi.org/10.1016/j.jsis.2018.12.002

Tansey, O. (2007). Process Tracing and Elite Interviewing: A Case for Non-probability Sampling. University of Reading.

Tapscott, D. and Caston, A. (1993). Paradigm Shift: The New Promise of Information Technology. McGraw-Hill. New York, NY.

Tolich, M. (2004). Internal Confidentiality: When Confidentiality Assurance Fail Relational Informants. Qualitative Sociology. 27: 101-106

Trochim, W.M.K. (2020). Research Method Knowledge base. Retrieved from https://socialresearchmethods.net/kb/sampling-in-research/

Tallon, P. & Pinsonneault, A. (2011). Competing Perspectives on the Link between Strategic Information Technology Alignment and Organizational Agility: Insights from a Mediation Model. *MIS Quarterly*, 35 (2) pp.463-486.

Tallon, P., Queiroz, M., Coltman, T., and Sharma, T. (2019). Information technology and the search for organizational agility: A systematic review with future research possibilities. Journal of Strategic Information Systems. 28. 218-237.

Tanwar, R. (2013). Porter's Generic Competitive Strategies. Journal of Business and Management. 2278-487X, p-ISSN: 2319-7668. Volume 15, Issue 1.

Tarafdar, M., and Qrunfleh, S. (2009). **IT-Business Alignment: A Two-Level Analysis**. ***Information Systems Management***. 26 (4) pp. 338-349.

Teece, D. (2009). Dynamic capabilities & strategic management. Oxford: Oxford University Press

Teece, D., Peteraf, M. and Leih, S. (2016). Dynamic Capabilities and Organizational Agility: Risk, Uncertainty, and Strategy in the Innovation Economy. Calif. Manag. Rev. 58, 13–35.

Teece, D. J., Pisano, G. and Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18, 509–533.

Tian, J., Wang, K. and Chen, Y. (2009). From IT deployment capabilities to competitive advantage: An exploratory study in China. Inf Syst Front. 12:239–255

Thomas, L. (2021). Cross-Sectional Study. Definition, Uses & Examples. Scribbr. Retrieved from https://www.scribbr.com/methodology/cross-sectional-study/

Turnbull, P. D. (1991). Effective Investments in Information Infrastructures. Information and Software Technology, Volume 33, Number 3, pp. 191-199.

Tsai, W. and Ghoshal, S. (1998). Social Capital and Value Creation: The role of Intrafirm Networks." Academy of Management Journal. 41:464-477.

USAID, (2019). Nigerian Payment Landscape. Power Africa, A US government led partnership.

Uzzi, B. (1997). Social Structure and Competition in Interfirm Network. The Paradox of Embeddedness. Administrative Science Quarterly. 42:35-67.

U.S. General Accounting Office (1996). Content Analysis: A Methodology for Structuring and Analyzing Written Material. GAO/PEMD-10.3.1. Washington, D.C. (This book can be ordered free from the GAO).

Vijselaar, F., & Albers, R. (2004). New technologies and productivity growth in the euro area. Empirical Economics, 29(3): 621-646.

Volberda, H. W. (1997). Building Flexible Organizations for Fast Moving Markets. Long Range Planning. (30:2), pp. 169-183.

Wang, H. (2014). Theories for competitive advantage. Faculty of Business - Papers (Archive). 408.

WEF, (2015). ICTs for Inclusive Growth. The Global Information Technology Report

WEF, (2016). Innovating in the Digital Economy. The Global Information Technology Report

Wade, J.P. and Arnold, R.D. (2015). A definition of systems thinking: a systems approach. Procedia Computer Science 44:669–678.

Wade, M., and Hulland, J. (2004). Review: The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research. MIS Quarterly (28:1). Pp. 107-142.

Walter, A.T. (2021). Organizational Agility: Ill-Defined and Somewhat Confusing? A Systematic Literature Review and Conceptualization. Manag. Rev. 71, 343–391.

Watson, S.T. (2007). Information Systems. University of Georgia. Global Text Project.

Weerawardena, J. (2003). Exploring the Role of Market Learning Capability in Competitive Strategy. European Journal of Marketing. (37:3/4) .Pp. 407-429.

Weill, P., Subramani, M., and Broadbent, M. (2002). Building IT Infrastructure for Strategic Agility. Sloan Management Review (44:1), pp. 57-65.

Weill, P. (1992). The relationship between investment in information technology and firm performance: A study of the valve manufacturing sector. Information Systems Research 3 (4): 307–333.

Weill, P. (1993). The Role and Value of Information Technology Infrastructure: Some Empirical Observations. In R. Banker, R. Kauffman and M. A. Mahmood, Strategic Information Technology Management: Perspectives on Organizational Growth and Competitive Advantage. Middleton, Pennsylvania: Idea Group Publishing.

Weill, P., and Ross, J. (2004). IT Governance: How Top Performers Manage IT Decision Rights for Superior Results, Boston: Harvard Business School Press.

Wenger- Trayner, E. and Wenger-Trayner, B. (2015). Communities of practice a brief introduction. Wenger-Trayner

Wenger, E., McDermott, R., & Snyder, W. (2002). Cultivating communities of practice: A guide to managing knowledge. Cambridge, MA: Harvard University Press.

Wernerfelt, B. (1984). A Resource-Based View of the Firm. Strategic Management Journal. 5:171-180.

Widodo, T. (2015). The Effect of Transformative IT Capability on Sustainable Competitive Advantage. School of Applied Science, Telkom University.

Winter, S. G. (2003). Understanding dynamic capabilities. Strategic Management Journal. 24(10), 991–996.

Winby, S., & Worley, C. G. (2014). Management processes for agility, speed, and innovation. Organizational Dynamics, 43, 225–234.

Wiklund, J. and Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. Strategic Management Journal. Vol. 24. Pp.1307–1314.

World Economic Forum. (2021). Global Technology Governance Report 2021: Harnessing Fourth Industrial Revolution Technologies in a COVID-19 World. In Collaboration with Delloitte.

Weber, R. P. (1990). Basic Content Analysis, 2nd ed. Newbury Park, CA.

Yeasmin, S. and Rahman, K. F. (2012). Triangulation' Research Method as the Tool of Social Science Research. BUP JOURNAL. Volume 1. Issue 1, ISSN: 2219-4851.

Yeh, C., Lee, G. and Pai, J. (2012). How information system capability affects e-business information technology strategy implementation: An empirical study in Taiwan. Business Process Management Journal. Vol. 18 Iss: 2 pp. 197 – 218.

Zaid, M.A. (2015). Correlation and Regression Analysis. The Statistical, Economic and Social Research and Training Centre for Islamic Countries

Zack, M. H. (1999). Managing Codified Knowledge. Sloan Management Review. 40: 45-58.

Zeng. F., Lee, S.H.N. and Lo. C.K.Y. (2020). The Role of Information Systems in the Sustainable Development of Enterprises: A Systematic Literature Network Analysis. Sustainability. 12, 3337. doi:10.3390/su12083337.

Zollo, M. and Winter, S.G. (2002). Deliberate learning and the evolution of dynamic capabilities. Organ. Sci. 13, 339–351.

Appendix A – UREC PROVISIONAL APPROVAL

REAF_DSPA - Version 1.0 AP

UNICAF UNIVERSITY
RESEARCH ETHICS APPLICATION FORM
DOCTORAL STUDIES PROVISIONAL APPROVAL

The Provisional Approval - Research Ethics Application Form (REAF) should be completed by Doctoral level candidates enrolled on Dissertation stage 1.

This form is a **provisional approval** which means that the UREC committee has accepted the initial description of the project but this is conditional as changes may have to be implemented following Dissertation Stage 2 and piloting in Dissertation Stage 3.

This is a conditional offer and acceptance of the project needs to be verified and confirmed upon completion of the Research Ethics Application Form in Dissertation Stage 3.

Important Notes:

- An electronic version of the completed form should be uploaded by the student to the relevant submission link in the VLE. Student's supervisor will then review the form and provide feedback commentary. Once supervisor's initial approval is given then the supervisor will forward this to doctoral.studies-aa@unicaf.org, for provisional approval by the Unicaf University Research Ethics Committee (UREC).

- Please type your answers and **do not** submit paper copy scans. Only *PDF* format documents should be submitted to the committee. It is recommended to use free version of Adobe Acrobat Reader available online: https://get.adobe.com/reader/

- If you need to supply any supplementary material, not specifically requested by the application form, please do so in a separate file. Any additional document(s) should be clearly labelled and uploaded in the relevant VLE link.

- If you have any queries about the form, please address them to your dissertation or project supervisor.

REAF_DSPA - Version 1.0

UNICAF UNIVERSITY
RESEARCH ETHICS APPLICATION FORM
DOCTORAL STUDIES PROVISIONAL APPROVAL

UREC USE ONLY:
Application No:
Date Received:

Student's Name: Ejembi, Abah Emmanuel

Student's E-mail Address: emmanuel.ejembi@up-ng.com

Student's ID #: R1809D6138630

Supervisor's Name: Bilal Jibai

University Campus: Unicaf University Zambia (UUZ)

Program of Study: UUZ: DBA Doctoral of Business Administration

Research Project Title: Building Sustainable Competitive Advantage through Information Systems: A case study of the Nigeria e-Payment Industry

1. **Please state the timelines involved in the proposed research project:**

Estimated Start Date: October, 2021 Estimated End Date: August, 2023

2. **The research project**

2a.Project Summary:

In this section please fully describe the purpose and underlying rationale for the proposed research project. Ensure that you pose the research questions to be examined, state the hypotheses, and discuss the expected results of your research and their potential.
It is important in your description to use plain language so it can be understood by all members of the UREC, especially those who are not necessarily experts in the particular discipline. To that effect please ensure that you fully explain / define any technical terms or discipline-specific terminology (maximum 300 words +/- 10%).

Businesses are increasingly turning to IT to enable its ability to respond to the relentlessly changing business environment-unexpected business threats and opportunities (Tallon et. al., 2019). Researchers such Olsen and Lucas (1994) support the agility argument of information technology implication for business by saying that it ensures that Organizations are "wired as an adaptive enterprise". This is beside the more traditional role of IT in businesses - automate processes (Lu and Ramamurthy, 2011). To some organization, however, such as Telecommunication, media, e-Commerce and financial services, they owe their existence to Information Technology. For such businesses, IT is considered a "strategic necessity" (Peppard and Ward, 2004).

Literature is however scant on how information Technology can still be leveraged in this days of its ubiquity and seeming homogeneity for sustainable competitive advantage. In fact in the replicative study by Koh and Prybutok (2014) based on the original study in the 1990s by Bharadwaj (2000), the conclusion is that the causal relationship between IT leadership capability and firm performance can no longer be established based on today's reality. The forgoing and even from the traditional use of IT in business - studies of IT's contribution to firm competitive advantage is based on Industry factor and external market condition as the primary determinants of firm performance (market-based-view theory) (Chi and Sun, 2015), there still exist gaps as the studies focus less on rare resources such as Organizational knowledge and consequently Organizational IT capabilities as underpinnings of firm sustainable competitive advantage.

Research questions;

1. What are the implications of Information systems (IS) in business today? In the future?
2. What is the relationship between Organizational IS capability and competitive advantage?
3. How is sustained competitive advantage engendered for a firm by information systems?

Research hypotheses;

1. Information technology have positive implication for business today.
2. Information technology capacity development positively impact organizational competitiveness.
3. Organizational Information technology capability is a rare resource to build competitive advantage for a firm on.

2b. Significance of the Proposed Research Study and Potential Benefits:

Outline the potential significance and/or benefits of the research (maximum 200 words).

Based on this research, IT assets and IT/IS capability are treated as distinct organizational resources (Peppard and Ward, 2004), and according to the resource based view (RBV) of the firm, "resources that as rare, inimitable, non-substitutable and firm-specific enables firms to implement a value-creating strategy to generate rents" (Barney, 2000). Organizational IS capability therefore are non-tradable, organization-specific competencies to acquire, assemble, deploy, and utilize other resources within the firm. In this sense, Information technology assets are the inputs of the processes, while capability refers to the capacity to deploy this resources (Wang et al, 2012). This suggests that organizational capability has the "attribute of been organizationally embedded and cannot easily be bought from the factor market" (Barney, 2000).

This research is to point organizational leaders to the need to not only invest (as has been the case) in the acquisition of information technology assets but equally and strategically acquire organizational capability and competencies in the management of the same. This has then the benefit of creating the not just competitive advantage but a sustainable one.

3. **Project execution:**

3a. Type of project. The following study is an:

- [x] experimental study (primary research)
- [ ] desktop study (secondary research)
- [ ] desktop study using existing databases involving information of human/animal subjects
- [ ] Other

If you have chosen 'Other' please Explain:

3b. Methods. The following study will involve the use of:

Method	Materials / Tools
☑ Qualitative	☑ Face to Face Interviews
	☑ Phone Interviews
	☐ Face to Face Focus Groups
	☐ Online Focus Groups
	☐ Other*
☑ Quantitative	☐ Self-administered Questionnaires
	☑ Online Questionnaires
	☐ Experiments
	☐ Tests
	☐ Other *

*If you have chosen 'Other' please Explain:

4. Participants

4a. Does the Project involve the recruitment of participants?

☑ YES **If YES, please complete all following sections.**

☐ NO **If NO, please directly proceed to Question 5.**

Note: The definition of "participation" includes active participation, such as when participants knowingly take part in an interview or complete a questionnaire.

4b. Relevant Participant Details of the Proposed Research

Please state the number of participants you plan to recruit, and describe important characteristics such as: demographics (e.g. age, gender, location, affiliation, level of fitness, intellectual ability etc). It is also important that you specify any inclusion and exclusion criteria that will be applied (e.g. eligibility criteria for participants).

Number of participants: 80

Age range: From 30 To 55

Gender: ☑ Female ☑ Male

Eligibility Criteria:

- Inclusion criteria: In Technology and Business leadership in the e-payment sector of the Financial Services Sector of the Nigerian Economy.
- Exclusion criteria: If not in leadership and makes no input into strategy or decisions of the firm you work in whether or not you work in the industry of choice.

Disabilities: Participants with mental disabilities will not be included as all participant involvement in the research will be based on informed consent

Other relevant information (maximum 100 words):

This choice of research and sampling method is due to the specialized nature of the required sample population. The required insight for this topic can only be best provided by decision makers, leaders and influencers in the IT and business functions of the firms in this industry.

4c. Recruitment Process for Human Research Participants:

Please clearly describe how the potential participants will be identified, approached and recruited (maximum 200 words).

This choice of sampling method is based on the fact that sample units that could provide real insight for this topic are known decision makers and influencer in the company's IT function and managers of business units. The same units are finite enough.
There are about 15 firms in this industry. I will start by identifying all the business and technology leaders and influencers' in each firm by their names, email addresses and phone numbers. The email addresses will be used to share online questionnaires while I will use phone numbers to schedule face-to-face interviews. In some cases the interview may be by telephone.

4d. Relationship between the principal investigator and participants:

Is there any relationship between the principal investigator (student), co-investigators(s), (supervisor) and participant(s)? For example, if you are conducting research in a school environment on students in your classroom (e.g. instructor-student).

☑ YES ☐ NO

If YES, please specify (maximum 100 words).

The researcher is just a fellow industry participant. I work in one of the firms in the same industry as the research participant.

Participants in the research will have to hierarchical relationship with the researcher

5. **Further Approvals**

Are there any other approvals required (in addition to ethics clearance from UREC) in order to carry out the proposed research study?

☐ YES ☑ NO

If YES, please specify (maximum 100 words).

6. **Potential Risks of the Proposed Research Study**

Are there any potential risks, psychological harm and/or ethical issues associated with the proposed research study, other than risks pertaining to everyday life events (such as the risk of an accident when travelling to a remote location for data collection)?

☐ YES ☑ NO

If YES, please specify (maximum 150 words):

7. **Application Checklist**

Please mark √ if the study involves any of the following:

☐ Children and young people under 18 years of age, vulnerable population such as children with special educational needs (SEN), racial or ethnic minorities, socioeconomically disadvantaged, pregnant women, elderly, malnourished people, and ill people.

☐ Research that foresees risks and disadvantages that would affect any participant of the study such as anxiety, stress, pain or physical discomfort, harm risk (which is more than is expected from everyday life) or any other act that participants might believe is detrimental to their wellbeing and / or has the potential to / will infringe on their human rights / fundamental rights.

☐ Risk to the well-being and personal safety of the researcher.

☐ Administration of any substance (food / drink / chemicals / pharmaceuticals / supplements / chemical agent or vaccines or other substances (including vitamins or food substances) to human participants.

☐ Results that may have an adverse impact on the natural or built environment.

8. **Final Declaration by Applicants:**

(a) I declare that this application is submitted on the basis that the information it contains is confidential and will only be used by Unicaf University and Unicaf University Research Ethics Committee (UREC) for the explicit purpose of ethical review and monitoring of the conduct of the research proposed project as described in the preceding pages.

(b) I understand that this information will not be used for any other purpose without my prior consent, excluding use intended to satisfy reporting requirements to relevant regulatory bodies.

(c) The information in this form, together with any accompanying information, is complete and correct to the best of my knowledge and belief and I take full responsibility for it.

(d) I undertake to abide by the highest possible international ethical standards governing the Code of Practice for Research Involving Human Participants, as published by the UN WHO Research Ethics Review Committee (ERC) on http://www.who.int/ethics/research/en/ and to which Unicaf University aspires to.

(e) In addition to respect any and all relevant professional bodies' codes of conduct and/or ethical guidelines, where applicable, while in pursuit of this research project.

(f) I understand it is my responsibility to submit a full REAF application during Dissertation Stage 3 to UREC. If a REAF application is not submitted my project is not approved by UREC.

(g) I fully acknowledge that this form does not constitute approval of the proposed project but it is only a provisional approval.

☑ **I agree with all points listed under Question 8**

Student's Name: Ejembi, Abah Emmanuel

Supervisor's Name: Bilal Jibai

Date of Application: 3/10/2021

Important Note:
Please now save your completed form (we suggest you also print a copy for your records) and then submit it to your UU Dissertation/project supervisor (tutor). **In the case of student projects, the responsibility lies with the Faculty Dissertation/Project Supervisor.** If this is a student application, then it should be submitted via the relevant link in the VLE. Please submit only electronically filled in copies; **do not** hand fill and submit scanned paper copies of this application.

☑ **Before submitting your application, please tick this box to confirm that all relevant sections have been filled in and the information contained is accurate to the best of your knowledge.**

Appendix B – UREC FINAL APPLICATION

REAF_DS - Version 3.1 AP ☐

UNICAF UNIVERSITY
RESEARCH ETHICS APPLICATION FORM
DOCTORAL STUDIES

UREC USE ONLY:
Application No:
Date Received:

Student's Name: Ejembi, Abah Emmanuel

Student's E-mail Address: emmanuel.ejembi@up-ng.com

Student's ID #: R1809D6138630

Supervisor's Name: Bilal Jibai

University Campus: Unicaf University Zambia (UUZ)

Program of Study: UUZ: DBA Doctorate of Business Administration

Research Project Title: Building Sustainable Competitive Advantage through Information Systems: A case study of the Nigeria e-Payment Industry

1. **Please state the timelines involved in the proposed research project:**

Estimated Start Date: 05-Oct-2022 Estimated End Date: 30-Aug-2023

2. **External Research Funding (if applicable):**

2.a. Do you have any external funding for your research?

☐ YES ☑ NO

If YES, please answer questions **2b** and **2c**.

2.b. List any external (third party) sources of funding you plan to utilise for your project. You need to include full details on the source of funds (e.g. state, private or individual sponsor), any prior / existing or future relationships between the funding body / sponsor and any of the principal investigator(s) or co-investigator(s) or student researcher(s), status and timeline of the application and any conditions attached.

2.c. If there are any perceived ethical issues or potential conflicts of interest arising from applying or and receiving external funding for the proposed research then these need to be fully disclosed below and also further elaborated on, in the relevant sections on ethical considerations later on in this form.

3. The research project

3.a. Project Summary:

In this section fully describe the purpose and underlying rationale for the proposed research project. Ensure that you pose the research questions to be examined, state the hypotheses, and discuss the expected results of your research and their potential.

It is important in your description to use plain language so it can be understood by all members of the UREC, especially those who are not necessarily experts in the particular discipline. To that effect ensure that you fully explain / define any technical terms or discipline-specific terminology (use the space provided in the box).

The purpose of this research is to establish that sustainable competitive advantage can be earned by firms within an industry based on Information Systems despite the growing standardization and homogeneity of Information Technology" (Chae et. al., 2014; Masli et al. 2011).
According to Chaharbaghi and Lynch (1999), the concept of competitive advantage is used to "describe where an organization outpaces competitors in value creation. It refers to the degree to which the organization, under free market conditions, meets the demand of a product market while simultaneously maintaining and growing its profit levels". This research seeks to establish that even in the very volatile and dynamic business environment of today, organizations can earn sustainable competitive advantage (strategic advantage) from Information Systems by identifying resources that lead to radical change (development of proprietary technology) and with capability to renews the competitive edge of an organization in a dynamic environment" (Chaharbaghi and Lynch, 1999). Such resources are obviously not the Information Technology physical assets (infrastructural technology) but rather Information Technology competencies and capabilities (Peppard and Ward, 2004). The rationale for this research is the mistaken assumption among industry practitioners and researchers alike, that investment in Information Technology assets by itself confers any advantage on any one firm over the other in today business environment
The research has the objective to establish that strategic management and positioning for sustainable competitive advantage is no longer premised on tangible resources - information technology assets- infrastructural technology but more on the management of Organizational Information Technology knowledge and competencies, knowledge workers within any industry and Information Technology management itself (Dess, et al., 2016; Sanchez et al., 1996). It also no longer means which firms has the most investment in IT but rather those that can leverage their investment for agility as means of earning advantage (Tallon and Pinsonneault, 2011, Tallon et. al, 2019).
The study is based on the following research questions.
1. How does organizational knowledge management lead to the development of Organizational Information systems' capability?
2. How does Organizational Information Systems' capability enable organizational agility?
3. How does organizational agility engender sustained competitive advantage for a firm?
The following hypothesis will be tested during this study.
1. H1: Organizational learning leads to Organizational Information Systems capability.
2. H2: Organizational agility depends on Organizational Information Systems capability
3. H3: Organizational learning engenders Organizational agility
4. H4: Organizational agility enables sustainable competitive advantage for Organizations

3.b. Significance of the Proposed Research Study and Potential Benefits:

Outline the potential significance and/or benefits of the research (use the space provided in the box).

This research is considered very significant because Businesses and Organizations today operate in an information-based, knowledge-driven economy. According to Dess, et al. (2016), in the US, the workforce in the service sector grew from 76% in 1980 to 86% in 2012. This represents a shift toward knowledge economy with significant strategic management implications. Success in this new environment requires speed and flexibility (Bartlett and Ghoshal, 2002). This among other factors have made business dependence on Information Technology to be at an all-time high. Some organization such as Telecommunication, media, e-Commerce, and retail financial services, however, owe their existence to Information Technology (Peppard and Ward, 2004). WEF (2015) describe Information and Communication Technology (ICT) as a "general-purpose technology, with impact that extends well beyond productivity gains. It is described as a vector of social development and transformation by improving access to basic services, enhancing connectivity, and creating opportunities". Information Technology has enabled "exponential speed of developments, disruption across all major industries. Management and governance are what differentiates these developments from previous "industrial revolutions". If managed well, they have the potential to give rise to innovation that will drive growth and social impact. Countries and businesses that embrace these developments, anticipate challenges, and deal with them in a strategic way are more likely to prosper as Information and communication technologies (ICTs) are the backbone of the new revolution" (WEF, 2016).
According to BusinessWire, 2021 Information Technology global market report, investment in information technology in 2021 is estimated at $8370.95 billion. In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC 2016; Shumsky, 2016; Laudon and Laudon, 2018). Despite this massive investment that is projected to grow annually, most business cannot seem to generate rent from this resource. The reason is simple- with "standardized and homogeneous information technology that has significantly lowered entry barriers" (Chae et. al., 2014) and "ubiquity of broadband Internet, the democratization of technologies" WEF (2015), generation of rent from information technology can only be premised on human capital development and knowledge management. It is the basis for innovation and creation of proprietary technology that can differentiate one firm in an industry from another. Businesses should therefore be deliberate and very strategic in information technology human capital development, management of such

4. Project execution:

4.a. The following study is an:

- [x] experimental study (primary research)
- [ ] desktop study (secondary research)
- [ ] desktop study using existing databases involving information of human/animal subjects
- [ ] Other

If you have chosen 'Other' please Explain:

4.b. Methods. The following study will involve the use of:

Method	Materials / Tools
Qualitative:	☑ Face to Face Interviews
	☐ Phone Interviews
	☐ Face to Face Focus Groups
	☐ Online Focus Groups
	☐ Other *
Quantitative:	☑ Face to Face Questionnaires
	☑ Online Questionnaires
	☐ Experiments
	☐ Tests
	☐ Other *

*If you have chosen 'Other' please Explain:

5. **Participants:**

5 a. Does the Project involve the recruitment and participation of additional persons other than the researcher(s) themselves?

☑ YES **If YES, please complete all following sections.**

☐ NO **If NO, please directly proceed to Question 7.**

UNICAF UNIVERSITY

5 b. Relevant Details of the Participants of the Proposed Research

State the number of participants you plan to recruit, and explain in the box below how the total number was calculated.

Number of participants: 80

The firms within the e-payment industry in Nigeria licensed by the Central Bank and currently in Operations are about 20. I expect to recruit at least 4 persons from each institution

Describe important characteristics such as: demographics (e.g. age, gender, location, affiliation, level of fitness, intellectual ability etc). It is also important that you specify any inclusion and exclusion criteria that will be applied (e.g. eligibility criteria for participants).

Age range From: 30 To: 55

Gender
- [x] Female
- [x] Male

Eligibility Criteria:

- Inclusion criteria: In Technology and Business leadership in the e-payment sector of the Financial Services Sector of the Nigerian Economy
- Exclusion criteria: If not in leadership and makes no input into strategy or Information Systems decisions of the firm whether or not you work in the industry of choice.

Disabilities: Participants with mental disabilities will not be included as all participant involvement in the research will be based on informed consent

Other relevant information (use the space provided in the box):

5 c. Participation & Research setting:

Clearly describe which group of participants is completing/participating in the material(s)/ tool(s) described in 5b above (use the space provided in the box).

Due to the specialized nature of this research, the required insight for this topic can only be best provided by decision makers, leaders and influencers in the IT and business functions of the firms in this industry.

The decision makers and leader (senior executives) will be reached for face-to-face interviews while influencers (middle management) will be administered questionaires (either face-to-face or online).

To ensure I reach every one, I will be using snowball type of purpose sampling method

5 d. Recruitment Process for Human Research Participants:

Clearly describe how the potential participants will be identified, approached and recruited (use the space provided in the box).

This choice of sampling method is based on the fact that sample units that could provide real insight for this topic are known decision makers and influencer in the company's IT function and managers of business units. There are about 20 firms in this industry. I will start by identifying all the business and technology leaders and influencers' in each firm by their names, email addresses and phone numbers. The email addresses will be used to share online questionnaires while I will use phone numbers to schedule face-to-face interviews. In some cases the interview may be by telephone.

The 20 firms in this industry with be reached with gatekeeper forms and same used to request for contact (phone numbers and emails) of the target participants.

5 e. Research Participants Informed Consent.

Select below which categories of participants will participate in the study. Complete the relevant Informed Consent form and submit it along with the REAF form.

Yes	No	Categories of participants	Form to be completed
☑	☐	Typically Developing population(s) above the maturity age *	Informed Consent Form
☐	☑	Typically Developing population(s) under the maturity age *	Guardian Informed Consent Form

* Maturity age is defined by national regulations in laws of the country in which the research is being conducted.

5 f. Relationship between the principal investigator and participants.

Is there any relationship between the principal investigator (student), co-investigators(s), (supervisor) and participant(s)? For example, if you are conducting research in a school environment on students in your classroom (e.g. instructor-student).

☑ YES ☐ NO

If YES, specify (use the space provided in the box).

The researcher is a fellow industry participant. I work in one of the firms in the same industry as the research participants. That I am a fellow industry participant notwithstanding all potential participants are at the same level or superior to the me (the researcher). The researcher therefore exercises no direct or indirect control or influence on potential participants.

6. **Potential Risks of the Proposed Research Study.**

6 a. i. Are there any potential risks, psychological harm and/or ethical issues associated with the proposed research study, other than risks pertaining to everyday life events (such as the risk of an accident when travelling to a remote location for data collection)?

☐ YES ☑ NO

If YES, specify below and answer the question 6 a.ii.

6 a.ii Provide information on what measures will be taken in order to exclude or minimise risks described in 6.a.i.

6 b. Choose the appropriate option

		Yes	No
i.	Will you obtain written informed consent form from all participants?	☑	☐
ii.	Does the research involve as participants, people whose ability to give free and informed consent is in question?	☐	☑
iii.	Does this research involve participants who are children under maturity age? **If you answered YES to question iii, complete all following questions.** **If you answered NO to question iii, do not answer Questions iv, v, vi and proceed to Questions vii, viii, ix and x.**	☐	☑
iv.	Will the research tools be implemented in a professional educational setting in the presence of other adults (i.e. classroom in the presence of a teacher)?	☐	☑
v.	Will informed consent be obtained from the legal guardians (i.e. parents) of children?	☐	☑
vi.	Will verbal assent be obtained from children?	☐	☑
vii.	Will all data be treated as confidential? If NO, explain why confidentiality of the collected data is not appropriate for this proposed research project, providing details of how all participants will be informed of the fact that any data which they will provide will not be confidential.	☑	☐
viii.	Will all participants /data collected be anonymous? If NO, explain why and describe the procedures to be used to ensure the anonymity of participants and/or confidentiality of the collected data both during the conduct of the research and in the subsequent release of its findings.	☑	☐

		Yes	No
ix.	Have you ensured that personal data and research data collected from participants will be securely stored for five years?	☑	☐
x.	Does this research involve the deception of participants? If YES, describe the nature and extent of the deception involved. Explain how and when the deception will be revealed, and who will administer this debrief to the participants:	☐	☑

6 c. i. Are there any other ethical issues associated with the proposed research study that are not already adequately covered in the preceding sections?

☐ Yes ☑ No

If YES, specify (maximum 150 words).

6.c.ii Provide information on what measures will be taken in order to exclude or minimise ethical issues described in 6.c.i.

6 d. Indicate the Risk Rating.

☐ High ☑ Low

7. **Further Approvals**

Are there any other approvals required (in addition to ethics clearance from UREC) in order to carry out the proposed research study?

☐ YES ☑ NO

If YES, specify (maximum 100 words).

8. **Application Checklist**

Mark √ if the study involves any of the following:

☐ Children and young people under 18 years of age, vulnerable population such as children with special educational needs (SEN), racial or ethnic minorities, socioeconomically disadvantaged, pregnant women, elderly, malnourished people, and ill people.

☐ Research that foresees risks and disadvantages that would affect any participant of the study such as anxiety, stress, pain or physical discomfort, harm risk (which is more than is expected from everyday life) or any other act that participants might believe is detrimental to their wellbeing and / or has the potential to / will infringe on their human rights / fundamental rights.

☐ Risk to the well-being and personal safety of the researcher.

☐ Administration of any substance (food / drink / chemicals / pharmaceuticals / supplements / chemical agent or vaccines or other substances (including vitamins or food substances) to human participants.

☐ Results that may have an adverse impact on the natural or built environment.

9. **Further documents**

Check that the following documents are attached to your application:

		ATTACHED	NOT APPLICABLE
1	Recruitment advertisement (if any)	☐	☑
2	Informed Consent Form / Guardian Informed Consent Form	☑	☐
3	Research Tool(s)	☑	☐
4	Gatekeeper Letter	☑	☐
5	Any other approvals required in order to carry out the proposed research study, e.g., institutional permission (e.g. school principal or company director) or approval from a local ethics or professional regulatory body.	☐	☑

10. Final Declaration by Applicants:

(a) I declare that this application is submitted on the basis that the information it contains is confidential and will only be used by Unicaf University for the explicit purpose of ethical review and monitoring of the conduct of the research proposed project as described in the preceding pages.

(b) I understand that this information will not be used for any other purpose without my prior consent, excluding use intended to satisfy reporting requirements to relevant regulatory bodies.

(c) The information in this form, together with any accompanying information, is complete and correct to the best of my knowledge and belief and I take full responsibility for it.

(d) I undertake to abide by the highest possible international ethical standards governing the Code of Practice for Research Involving Human Participants, as published by the UN WHO Research Ethics Review Committee (ERC) on http://www.who.int/ethics/research/en/ and to which Unicaf University aspires to.

(e) In addition to respect any and all relevant professional bodies' codes of conduct and/or ethical guidelines, where applicable, while in pursuit of this research project.

☑ **I agree with all points listed under Question 10**

Student's Name: Ejembi, Abah Emmanuel

Supervisor's Name: Bilal Jibai

Date of Application: 05-Oct-2022

Important Note:
Save your completed form (we suggest you also print a copy for your records) and then submit it to your UU Dissertation/project supervisor (tutor). **In the case of student projects, the responsibility lies with the Faculty Dissertation/Project Supervisor.** If this is a student application, then it should be submitted via the relevant link in the VLE. Please submit only electronically filled in copies; **do not** hand fill and submit scanned paper copies of this application.

Appendix C – UREC FINAL DECISION

UNICAF UNIVERSITY

UREC Decision, Version 2.0

Unicaf University Research Ethics Committee Decision

Student's Name: Emmanuel Abah Ejembi

Student's ID #: R1809D6138630

Supervisor's Name: Dr Bilal Jibai

Program of Study:

Offer ID /Group ID: O45821G47260

Dissertation Stage:

Research Project Title: Building Sustainable Competitive Advantage through Information Systems: A case study of the Nigeria e-Payment Industry

Comments: No comments

Decision*: A. Approved without revision or comments

Date: 28-Nov-22

*Provisional approval provided at the Dissertation Stage 1, whereas the final approval is provided at the Dissertation stage 3. The student is allowed to proceed to data collection following the final approval.

Appendix D – Informed Consent Form

UNICAF UNIVERSITY

UU_IC - Version 2.1

Informed Consent Form

Part 1: Debriefing of Participants

Student's Name: Ejembi, Abah Emmanuel

Student's E-mail Address: emmanuel.ejembi@up-ng.com

Student ID #: R1809D6138630

Supervisor's Name: Dr. Bilal Jibai

University Campus: Unicaf University Zambia (UUZ)

Program of Study: UUZ: DBA - Doctorate of Business Administration

Research Project Title: Building Sustainable Competitive Advantage through Information Systems: A case study of the Nigeria e-Payment Industry

Date: 14-Oct-2022

Provide a short description (purpose, aim and significance) of the research project, and explain why and how you have chosen this person to participate in this research (maximum 150 words).

In 2015, "global firms and governments spent about €3.4 trillion on information systems hardware, software, and telecommunications equipment. In addition, they spent another €544 billion on business and management consulting and services—much of which involves redesigning firms' business operations to take advantage of these new technologies" (Gartner, 2016; IDC 2016; Shumsky, 2016; Laudon and Laudon, 2018). Despite this massive investment that is projected to grow annually, most business cannot seem to generate rent from this resource due to "standardized and homogeneous information technology" (Chae et. al., 2014). It follows therefore that generation of rent from information technology can only be premised on human capital development and knowledge management. Businesses should therefore be deliberate and very strategic in human capital development, management of organizational knowledge and technology as the means to earning value from any investment in information technology in today's world.
This participant works in Technology in a leading E-payment company hence can provide insight.

The above named Student is committed in ensuring participant's voluntarily participation in the research project and guaranteeing there are no potential risks and/or harms to the participants.

Participants have the right to withdraw at any stage (prior or post the completion) of the research without any consequences and without providing any explanation. In these cases, data collected will be deleted.

All data and information collected will be coded and will not be accessible to anyone outside this research. Data described and included in dissemination activities will only refer to coded information ensuring beyond the bounds of possibility participant identification.

I, Ejembi, Abah Emmanuel **, ensure that all information stated above is true and that all conditions have been met.**

Student's Signature: _____

UU_IC - Version 2.1

Informed Consent Form

Part 2: Certificate of Consent

This section is mandatory and should to be signed by the participant(s)

Student's Name: Ejembi, Abah Emmanuel

Student's E-mail Address: emmanuel.ejembi@up-ng.com

Student ID #: R1809D6138630

Supervisor's Name: Dr. Bilal Jibai

University Campus: Unicaf University Zambia (UUZ)

Program of Study: UUZ: DBA - Doctorate of Business Administration

Research Project Title: Building Sustainable Competitive Advantage through Information Systems: A case study of the Nigeria e-Payment Industry

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that I am free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of my participation to this study. I understand that my data will remain anonymous and confidential, unless stated otherwise. I consent voluntarily to be a participant in this study.

Participant's Print name:

Participant's Signature: _____

Date:

If the Participant is illiterate:

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had an opportunity to ask questions. I confirm that the aforementioned individual has given consent freely.

Witness's Print name:

Witness's Signature: _____

Date:

Appendix E- Gatekeeper form

UNICAF UNIVERSITY

UU_GL - Version 2.0

Gatekeeper letter

Address: Unified Payment Services Ltd

Date: 14-oct-22

Subject: Request to recruit research participants

Dear Head of Human Resources, Unified Payments,

I am a doctoral student at Unicaf University Zambia.

As part of my degree I am carrying out a study on Building Sustainable Competitive Advantage through Information Systems: A case study of the Nigeria e-Payment Industry.

I am writing to enquire whether you would be interested in/willing to allow me recruit some of your staff members as participants in this research.

Subject to approval by Unicaf Research Ethics Committee (UREC) this study will be using questionnaires and interviews.

The research seeks to establish the link between information systems and sustainable competitive advantage in the volatile business and ubiquitous technology world of today using the Nigeria E-payment industry as a case study

Participants are to answer questions based on shared online questionnaire or in some cases be involved a face-to-face or telephone interviews. While participation is open for period of 3 weeks from XXX to XXX, answering the questions takes just a couple of minutes.

Thank you in advance for your time and for your consideration of this project. Kindly please let me know if you require any further information or need any further clarifications.

Yours Sincerely,

Student's Name: Ejembi, Abah Emmanuel
Student's E-mail: emmanuelejembi@up-ng.com
Student's Address and Telephone: +2348025618198
Supervisor's Title and Name: Dr. Bilal Jibai
Supervisor's Position: Faculty at Unicaf University
Supervisor's E-mail: b.jibai@unicaf.org

Appendix F- Tool1 – Interview questions

Dear Respondent

I am a doctoral student at Unicaf University in Zambia.

As part of my degree, I am carrying out a study on Building Sustainable Competitive Advantage through Information Systems: A case study of the Nigeria e-Payment Industry.

This is to request you to participate as respondent by answering the questionnaire below.

The research seeks to establish the link between information systems and sustainable competitive advantage in the volatile business and ubiquitous technology world of today using the Nigeria E-payment industry as a case study.

Respondent should understand that they are free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. By going ahead respondent consents to participation in the study voluntarily.

The data will remain anonymous and confidential, unless stated otherwise.

Respondent's characteristics and classification

1. **Respondent's Age----------**
2. **Respondent's highest education qualification (Diploma/B.Sc/MBA/MSc/Doc) ---------**
3. **Respondent's level in the organization (Middle Mgt/Top Mgt) ----------**
4. **Respondent's position in the organization ----------**

Interview questions

Discuss how you view your company against key management construct using the following questions.

S/N	Interview Questions	Responses	Categories/Frequency	Code
	Researcher and respondent's interaction		**For researchers use only**	
1	Are there business systems within your organization that underpin business process?			
2	Do your organizational members contribute to the development of the business systems?			
3	Are business systems or Information Technology deployed as they are with default settings?			

4	How do you view the growth in the technology world and how they impact on how your business processes evolve?			
5	Do you reckon that your organizational members personal efficiency is impacted by new technology deployments in the organization?			
6	In your own view, is your organization Information Technology planning and deployment			

	mindful and always a function of strategic business planning?			
7	Do you think your organization's Information Technology function has a clear vision and strategy on how to create value for business?			
8	Do you reckon that the management and functional members within the organization understand the business value of Information Technology?			
9	In your reckoning do Information			

	Technology functional leaders understand business realities and direction and business leaders in turns also understand Information Technology enough to contribute to its' planning?			
10	Do your organization's Information Technology function have capability to reconfigure Information Technology assets to deliver business value?			
11	Do you reckon that your organization			

	will be more competitive in the industry if IT leaders understand business and business leaders in turn understand IT enough to aid its planning?			
12	Do your organization IT managers have C-level positions in the organization as their business counterparts?			
13	Is your organization's business strategies driven by IT resources (tangible and intangible) that the organization possesses?			

14	Can your Organizational IT resources be easily scaled up or down in line with changing market demands?			
15	Do you reckon that IT support for the business is robust enough to support significant unforeseen disruption to IT services and business impact will be zero?			
16	Do you customers have confidence that even in the event of urgent and emergency request, our service offerings and quality will			

	not be impacted?			
17	Is market and environmental changes are seen as opportunity and the company is organized to respond swiftly and appropriately?			
18	Do your company consistently scans the environment and consequently strategically reinvent itself hence continuously remains relevant?			
19	Do you reckon that there exist a match			

	business strategy and IT resources portfolio			
20	Is your organization IT infrastructure and system are flexible, modular, and scalable such that changes in the business environment are easily responded to by recalibrating IT?			
21	Is your organization's approach to hiring and recruiting is deliberate and comprehensive with clear goal of growing capability?			

22	Is Knowledge is considered a strategic asset within your organization hence there exist clear strategies for skill retention?			
23	Does your organization have a strategy for the identification of specialized organizational member knowledge for integrated and management?			
24	Does your Organization invest in training and skill development of organizational			

	members around information technology generally and Information systems of the company?			
25	Does your organization have a deliberate strategy to establish a profitable and sustainable position against the forces that determine industry competition?			
26	Does your organization understand itself as a value creation agent and seeks to outpace others			

	industry participants on this?			
27	Does your organization recognize that her objective is achieved as value is created for other stakeholders?			
28	Does your organization predicate her value creation effort on organization resources (tangible and intangible)?			
29	Is Information Technology recognized as such resource for your organization to			

	build her competitive positioning on?			
30	Is it clear to your organization that Information Technology asset is readily available to all industry participants hence predicate her competitive positioning more on Information Technology capability?			
31	Does your organization recognize that for competitive position to be sustained, the basis should lend itself to adaptation,			

	hence Knowledge and organizational capability is managed as a strategic asset?			
32	Does your organization recognize that in the current volatile, uncertain, and complex, business environment, my organization is still able to generate rent from her Information systems sustainably?			

Appendix G- Tool2 – Questionnaire

Dear Respondent

I am a doctoral student at Unicaf University in Zambia.

As part of my degree, I am carrying out a study on Building Sustainable Competitive Advantage through Information Systems: A case study of the Nigeria e-Payment Industry.

This is to request you to participate as respondent by answering the questionnaire below.
The research seeks to establish the link between information systems and sustainable competitive advantage in the volatile business and ubiquitous technology world of today using the Nigeria E-payment industry as a case study.

Respondent should understand that they are free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. By going ahead respondent consents to participation in the study voluntarily.
The data will remain anonymous and confidential, unless stated otherwise.
(Online questionnaire will be based on Google form)

Respondent's characteristics and classification

5. **Please provide your Age----------**
6. **Please provide your highest education qualification (Diploma/B.Sc/MBA/MSc/Doc) ---------**
7. **Provide your level in your organization (Middle Mgt/Top Mgt) ----------**
8. **Provide your position in your organization ----------**

Questionnaire questions

Constructs	Questions	References
Organizational Information Systems (OFS)	On a scale of 1-5 (with 1=poorest and 5=most superior), evaluate your organization's Information Systems (the information technology within your organization and how they evolve). **OFS1**. There are business systems within your organization that underpin the business process. **OFS2**. Organizational members contribute to the development of the business systems. **OFS3.** The business systems or Information Technology and deployed as they are with default settings. **OFS4**. The growth in the technology world has some impact on how your business processes evolve. **OFS5**. Your organizational members' personal efficiency is impacted by new technology deployments in organizations. **OFS6.** Organization Information Technology planning and deployment is mindful and always a function of strategic business planning.	Laudon and Laudon (2018)
Information System Capability (ISC)	On a scale of 1-5 (with 1=poorest and 5=most superior), evaluate your organization's Information Systems capability	Peppard and Ward (2004);

	ISC1. Information Technology function has a clear vision and strategy on how to create value for business. **ISC2.** Management and functional members within the organization understand the business value of Information Technology **ISC3.** Information Technology functional leaders understand business realities and direction and business leaders in turns also understand Information Technology enough to contribute to its' planning. **ISC4.** The organization's Information Technology function has capability to reconfigure Information Technology assets to deliver business value. **ISC5.** Information Technology function has capability to reconfigure IT assets to align with business objective very timely. **ISC6.** Your organization is competitive in the industry becuase IT leaders understand business and business leaders in turn understand IT enough to aid its planning? **ISC7**. IT managers have C-level positions in the organization as their business counterparts.	Bharadwaj (2000); Barney (2000); Lu and Ramamurthy (2011)
Organizational Agility (OA)	On a scale of 1-5 (with 1=poorest and 5=most superior), evaluate your organizations agility based on her information systems	Tallon and Pinsonneault (2011). Mavengere (2013);

	OA1. Business strategies are driven by IT resources (tangible and intangible) that the organization possesses. **OA2.** Organizational IT resources can be easily scaled up or down in line with changing market demands. **OA3.** IT support for the business is robust enough to support significant unforeseen disruption to IT services and business impact will be zero. **OA4.** Our customers have confidence in us that even in the event of urgent and emergency request, our service offerings and quality will not be impacted. **OA5.** Market and environmental changes are seen as opportunity and the company is organized to respond swiftly and appropriately. **OA6.** The company consistently scans the environment and consequently strategically reinvent itself hence continuously remains relevant. **OA7.** There exists a match business strategy and IT resources portfolio. **OA8**. Business success factors are aligned with IT capabilities of the organization. **OA9.** IT infrastructure and system are flexible, modular, and scalable such that changes in the business environment are easily responded to by recalibrating IT	

Organizational Knowledge Management (OKM)	On a scale of 1-5 (with 1=poorest and 5=most superior), evaluate your organizational knowledge management practices with regards to Organizational agility. **OKM1**. Organization's approach to hiring and recruiting is deliberate and comprehensive with clear goal of growing capability **OKM2**. Knowledge is considered a strategic organizational asset hence there exist clear strategies for skill retention **OKM3.** Specialized organizational member knowledge are integrated and managed as an organizational asset **OKM4**. The Organization invest in training and skill development of organizational members around information technology generally and Information systems of the company	Rao and Weintraub (2013) Lai and Lin (2012)
Sustainable Competitive Advantage (SCA)	On a scale of 1-5 (with 1=poorest and 5=most superior), evaluate your organization's competitive positioning relative to other competitors in the industry by responding to the following question. **SCA1.** There is a deliberate strategy within the organization to establish a profitable and sustainable position against the forces that determine industry competition.	Porter (1985), Barney (1991)

	SCA2. The Organization understand itself as a value creation agent and seeks to outpace others industry participants on this. **SCA3**. The organizations recognizes that her objective is achieved as value is created for other stakeholders **SCA4**. The organization predicates its value creation on resources (tangible and intangible) within its control. **SCA5**. The organization recognizes the importance of Information Technology as such resource to build its competitive positioning on. **SCA6**. The organization recognizes that Information Technology asset is readily available to all industry participants hence predicate its competitive positioning more on Information Technology capability. **SCA7**. The organization recognizes that for competitive position to be sustained, the basis should lend itself to adaptation, hence Knowledge and organizational capability is managed as a strategic asset. **SCA8**. In the current volatile, uncertain, and complex, business environment, my organization is still able to generate rent from her Information systems sustainably.	