

Digital Transformation and Business Sustainability of Telecommunication Firms in Lagos State, Nigeria

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Abstract

Digital transformation is a key driver of extensive change in the world around us which has the potential to expressively improve consumer lives and create broader societal good, and at the time, providing businesses with new opportunities to create and capture value. The study examines the effect of digital transformation on business sustainability of telecommunication firms. Descriptive design was employed; structured questionnaire was used to gather information. The formulated hypotheses were tested using Pearson product moment correlation coefficient and the result revealed that digital technology has a significant positive effect on operational efficiency in telecommunication industry in Lagos state also digital infrastructure has a significant positive relationship on service delivery. It was concluded that Digital Transformation is impacting the organizations profitability goals, in an increasingly competitive environment, and also impacting the Sustainability aspects of business, therefore organization should increasingly deployed digital technologies to improve business sustainability.

Keywords: Digital transformation, digital technology, business sustainability

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I. Background Of The Study

Information communication technology (ICT) has provided the means for global logistics and communication to work with humungous amounts of data moving at ever-faster speeds, enabling large organizations to be agile. The most significant change in the industry started in early 2000's with the advent of Digital Transformation. In the early 2000's, most regions of the world were spending between 5% and 7% of the GDP on various forms of Information Technology (IT). By 2011, of the global economy valued at \$65.6 trillion, a significant \$3.9 trillion was being spent on IT. In the same year, more than 60% of the global population had access to a digital technology in the form of mobile cell phones (Cortada, 2012). Digital Transformation is thus, not only impacting the organizations profitability goals, in an increasingly competitive environment, but is also impacting the Sustainability aspects of business such as the increasing concern on global warming and pollution impacts of business. Digital Transformation, results in business benefits by taking an integrated approach towards IT, Supply chain, Operations and other functions of an organization, leading to delivery of sustained value, reductions in costs, improvement in operational efficiencies, and creating a sense of urgency. The role that Digital Transformation in ensuring Sustainability of business in areas such as Supply Chain, Operations, and the Demand side, are not recognized by organizations. Sustainability resulting from Digital Transformation are typically in the form of stand-alone projects or as a by-product of initiatives for cost reduction (Shin, 2014, Lee, 2014).

Organizations across the board are using Digital to improve Efficiency and Customer Experience, but higher maturity organizations differentiate by using Digital to transform business and moving ahead of competition. Digitally maturing organizations are more comfortable taking risks than the less digitally mature peer organizations. Digital transformation has gained strategic significance as a critical agenda for top management (Bharadwaj, Sawy, Pavlou, Venkatraman, 2013 and Singh, Hess, 2017). Various definitions describe the digital transformation in the literature Fitzgerald, Kruschwitz, Bonnet, Welch, (2014), Piccinini, Hanelt, Gregory, Kolbe, (2015), Andriole, (2017), Nwankpa, Datta, (2017). The extant literature provides a good understanding of digital transformation and how it disrupts various aspects of our lives. Although IT plays an important role in driving digital transformation strategy, the burden of implementing and adapting to the massive changes that go along with digital transformation falls on human resources. For this reason, digital transformation is a people issue. It is not about

technology, but about how businesses harness new technologies for business improvement and sustainability, and about enabling innovation. Digital transformation is developing as a key driver of extensive change in the world around us. Undoubtedly, digital transformation has the potential to expressively improve consumer lives and create broader societal good, and at the time, providing businesses with new opportunities to create and capture value. Digital disruption today is characterized by declining technology costs, rapid innovation models and a fail-fast culture. Digital has dramatically reduced entry costs at almost every point of the value chain, making it increasingly difficult to predict the emergence of new competition encumbered by large and clunky legacy infrastructure stacks, an ageing workforce, lack of an innovation culture and in some cases regulation, operators are finding it difficult to compete.

Telecommunication companies are at the forefront of digital transformation, the telecommunications industry is a key driver of worldwide digitization, as the industry supports the digitization of other sectors that directly depend on the essential infrastructure, applications and productivity improvements delivered by the telecom industry. For the telecom companies, digital transformation is a series of initiatives aimed at modernizing telecom companies and making them more efficient, more agile and more customer-centric. Digital transformation addresses a telco's network, its IT systems, its people and processes. Telcos operators started off as voice centric business, offering voice as a service. Then with the start of the internet and internet related technologies, the telcos moved to data centric business. As traffic increase, the cost of building infrastructure increases, while revenues and profits began to stagnate, but customers still expect operators to invest heavily in their network and systems to deliver higher speeds, better coverage and exciting customer experience.

1.1 Objectives of the Study

The study explores the effect of digital transformation on business sustainability of telecommunication firms in Lagos state, Nigeria but specifically seeks to

- 1) Ascertain the effect of digital technology on operational efficiency
- 2) Investigate the nature of relationship between of digital infrastructure on service delivery

1.2 Research questions

- 1) What is the effect of digital technology on operational efficiency
- 2) What is the nature of relationship between digital infrastructure and service delivery

1.3 Hypotheses

- 1) Digital technology has a positive effect on operational efficiency
- 2) There is significant relationship between digital infrastructure and service delivery

II. Review of Related Literature

2.2 Conceptual Review

Digital Transformation as an environment where everything for an organization is connected, creating digital imperatives for companies to create transformation through technology impacting Customer Experience, Operational Improvement and Business Model Change thus covering an organization's Supply side, Demand side and Operations (Fitzgerald, 2013). Digital Transformation is helping in optimization of Supply Chains, and Operations, faster processing of information and knowledge, optimization of raw materials usage, and reducing energy (Massachusetts, 2015). Digital transformation refers to the unprecedented disruptions in society, industry, and organizations stimulated by advances in digital technologies such as artificial intelligence, big data analytics, cloud computing, and the Internet of Things (Abdul, Hangjung, and Ananth, 2021). Digital transformation is the use of new digital technologies to enable major business improvements in operations and markets such as enhancing customer experience, streamlining operations or creating new business models" (Paavola, Hallikainen, Elbanna, 2017). Digital transformation as a process of evolution where digital technologies and digital capabilities create value by stimulating business models, customer experiences, and operational processes (Morakanyane, Grace, 2017). Digital transformation is a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies. In the course of this research digital transformation will be proxies with digital technology, and digital infrastructure.

Digital technology: The first phase of the Digital Technology journey started about mid of the 20th century and lasted till the early 1990's, just about the time when Internet became a major digital driver (Cortada, 2012). The second phase started with the advent of the Internet Age. Though Internet existed in the 1970's, wide spread adoption of this technology started in the 1990's. Three events in the 1980's triggered this, introduction of networking by Cisco, arrival of Personal Computers by IBM and introduction of Desktop Computing Operating System by Microsoft. These events transformed the world by linking computing and network and the evolution of new forms of computing (Chandola, 2015). Froese (2010) referred to digital

technologies as paradigm shift in the use of emerging IT, such as computer aided design (CAD), email, building information modelling (BIM), and web based project management (WBPM) applications. Whyte & Lobo (2010) identified role of digital technologies to facilitate social interactions, knowledge sharing, and coordination practices among stakeholders. Digital technologies are advanced information and communication technologies that enable capturing, storing, processing, communicating, displaying, integrating and collaborating information (Hamelink, 1997).

Digital infrastructure: Digital infrastructure is the key to enabling the benefits of the digital economy and society. Digital infrastructure is the physical hardware and associated software that enables end-to-end information and communications system to operate. Digital infrastructure includes: - Internet backbone including national and trans-oceanic fibre cables; Fixed broadband infrastructure such as analogue coaxial and optic fibre cable networks; Mobile communications infrastructure and networks including FWA, transmission towers, radio and optic fiber backhaul networks; - Broadband communications satellites; Data and cloud computing facilities; End user equipment such as mobile handsets, PCs, modems and local Wi-Fi and Bluetooth networks, Software platforms including computer and mobile device operating systems as well as application programming interfaces; and - Network edge devices such as sensors, robots, autonomous and semiautonomous vehicles, and other Internet of things facilitating devices and software. Digital infrastructure refers to the digital technologies that provide the foundation for an organization's information technology and operations.

Business sustainability: Sustainability, is an approach to creating true and real value to the systems and resources upon which that value depends on. Business Sustainability can be said to be a process of analysis and decision making across business functions, obtained through a committed and clear understanding of transitions that may occur in the present or the future (Anekwe, Ndubusi-okolo and Uzoezie, 2019). Sustainability is a business approach to creating long-term value by taking into consideration how a given organization operates in the ecological, social and economic environment (Kunt, 2016). Elkington (1997) states that for a business to become sustainable, it is necessary to consider the three pillars of sustainability (e.g., economic, environmental and social pillars), placing them with the same degree of importance. Business sustainability isn't good for the society or environment at large but it's also benefit the business itself through business cost reduction, provides competitive advantage and improve business reputation,

2.3 Theoretical Framework

Disruptive innovation theory was hypothesized by Christensen in 1997. He suggested that in a quickly changing and uncertain world, innovation is the key to competitive advantage. Yet innovation also increases uncertainty and market pressure (Lettice, 2006). The more radical the innovation, the more difficult it is to estimate its market acceptance and potential. The increasing complexity and market dynamics create a substantial knowledge gap between theory and practice. Many companies are not organized to give new ideas a chance, to recognize trend breaking points in the market, to adapt quickly to changing market circumstances, or to cause market changes in the first place (Markides, 2009). Disruptive innovations change the game. It attacks an existing business, and offer great opportunities for new profit growth. Only radical innovations lead to growth (Hamel, 2009). A radical innovation is a product, process or service with either unprecedented performance features or familiar features that offer significant improvements in performance or cost that transform existing markets or create new ones. The process of disruptive innovation is a rhythm of searching and selecting, exploring and experimenting, of learning and unlearning, and cycles of divergent and convergent thinking. The disruptive innovation development process is an interdependent system, based on the concepts of system thinking and of dynamic strategic thinking with learning as a central aspect (Brown, 2009).

2.4 Literature Review

Digital transformation affects all sectors of society, in particular economies. Companies now are given an opportunity to radically change their business models by new digital technologies like social networks, mobile, big data, Internet of things, other innovations like blockchain. This mostly involves changes of the core business operations and modifies products and processes, as well as organizational structures, as companies ought to set up management practices to conduct these complex transformations [13]. The firms succeed in embracing transformation through digital technology to enable major business improvements such as enhancing customer experience and engagement, streamlining operations and creating new business models or they will face destruction at the hands of their competitors that do (Fitzgerald et al., 2014). Fitzgerald et al (2013) view digital transformation as the adoption of current digital technologies such as social media, analytics or embedded devices that will enhance major business improvement such as customer experience, streamlining operations or developing new business models. In a similar development, BMWI (2015) posits that digital transformation relates to complete integration of all parts of the economy and society and also the ability to gather relevant data and to analyze and interpret those data into actions. In their study, Ernst and Young (2011) assert that digital transformation (DT) or digitalization is the conversion from analogue information to digital or computer readable information.

ICT has provided the means for global logistics and communication to work with humungous amounts of data moving at ever-faster speeds, enabling large organizations to be agile. The most significant change in the industry started in early 2000's with the advent of Digital Transformation. In the early 2000's, most regions of the world were spending between 5% and 7% of the GDP on various forms of Information Technology (IT). By 2011, of the global economy valued at \$65.6 trillion, a significant \$3.9 trillion was being spent on IT. In the same year, more than 60% of the global population had access to a digital technology in the form of mobile cell phones (Cortada, 2012). Digital Transformation is a recent paradigm enabled by the proliferation of Digital Technologies such as Analytics, Mobile Computing (mobility), Social Computing, and Cloud Computing. These technologies are enabling shifts that are resulting in reductions in total cost of ownership of IT due to shared infrastructures and broadband communications. Much like electrical utilities, Cloud Computing is helping deliver computing power over cloud technology, making it available, as a utility. Digital Transformation is helping in optimization of Supply Chains, and Operations, faster processing of information and knowledge, optimization of raw materials usage, and reducing energy consumption (Chandola, 2015). Digital Transformation is thus, not only impacting the organizations profitability goals, in an increasingly competitive environment, but is also impacting the Sustainability aspects of business such as the increasing concern on global warming and pollution impacts of business.

Digital Transformation, on the other hand, results in business benefits by taking an integrated approach towards IT, Supply chain, Operations and other functions of an organization, leading to delivery of sustained value, reductions in costs, improvement in operational efficiencies, and creating a sense of urgency (Chandola, 2015). The role that Digital Transformation is playing in improving Sustainability aspects of business in areas such as Supply Chain, Operations, and the Demand side, are not necessarily recognized by organizations. Sustainability resulting from Digital Transformation are typically in the form of stand-alone projects or as a by-product of initiatives for cost reduction (Shin, 2014, Lee, 2014). Chandola (2015) assert that Digital Transformation impacts the Sustainability aspects of doing business. This is important for organizations since consumers, share-holders and other stakeholders have visibility to business impacts on Brand Value, Revenues and Company Valuation.

Digital technologies are not only transforming markets and creating new paradigms of doing business, the technologies are also providing solutions to organizations for addressing Sustainability challenges (Chandola, 2015). Technology improvements have been seen as a way of improving processes to deliver quality, cost-effective buildings needed to meet NZ housing and infrastructure needs (Clark-Reynold and Pelosi (2016). This research posits that digital technologies are a viable solution that can transform the construction sector to improve its overall efficiency. Goodman (2021) assert that Digital technology can be more compact, faster, lighter, and more versatile. Huge amounts of information can be stored locally or remotely and moved around virtually instantaneously. The large upside opportunity that Digital Transformation provides to organization's in efforts towards greater Sustainability is still nascent and supported by limited recent research.

III. Methodology

The descriptive survey design was employed whose main aim according to Ezeani (1998) is to gather detailed and factual information that describes an existing phenomenon. Data for the study were generated from primary source. The target population of the study comprises both senior and junior staff of four selected telecommunication companies in Nigeria which include MTN, Globacom, Etisalat and Airtel. The population status is two hundred and eighty six (286). Taro Yamane formula for determining sample size was used to arrive at the sample of one hundred and forty-three (143). Structure questionnaire was used to gather information from the respondent and was structured using five point Likert scale: the response scoring rates are: 5 for strongly agree, 4 for Agree, 3 for undecided, 2 for Disagree and 1 for strongly Disagree. Content and construct validity were used to test for the reliability of the instrument. Pearson Product Moment Correlation Coefficient was used to test for the hypotheses and the decision rule states that Statistical Correlation is significant if the coefficient is more than 0.5. Moreover, if P- value is low (under 0.01), it implies that the correlation actually exists.

IV. Results and Discussion

Hypothesis one

Ho: Digital technology has a positive effect on operational efficiency.

H1: Digital technology has a no positive effect on operational efficiency

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.895 ^a	.871	.967	1.158

a. Predictors: (Constant), digital technology

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	356.564	1	347.564	263.902	.000 ^b
	Residual	10.536	8	1.317		
	Total	348.100	9			

a. Dependent Variable: operational efficiency

b. Predictors: (Constant), digital technology

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.746	1.464		-3.924	.004
	DT	.856	.082	.985	16.245	.000

a. Dependent Variable: operational efficiency

The regression sum of squares (356.564) is greater than the residual sum of square (10.536), which indicates that more of the variation in the dependent variable is explained by the model.

R, the correlation coefficient which has a value of 0.895, indicates that there is a positive relationship between digital technology and operational efficiency. The R square, coefficient of determination shows that 87.1% of the variation in the productivity is explained by the model. With the linear model, the error of estimate is high, with a value of about 1.158. digital technology coefficient of .856 which indicates a positive significance effect between digital technology and operational efficiency, which is statistically significant (16.245). therefore, the null hypothesis was rejected and the alternate hypothesis accepted. Thus digital technology has a positive effect on operational efficiency in telecommunication industry in Lagos state.

Hypothesis two

H0: There is a significant relationship between digital infrastructure and service delivery

H1: There is no significant relationship between digital infrastructure and service delivery

Correlations

		DIGITAL INFRASTRUCTURE	SERVICE DELIVERY
DIGITAL INFRASTRUCTURE	Pearson Correlation	1	.846**
	Sig. (2-tailed)		.000
	N		143
SERVICE DELIVERY	Pearson Correlation	.846**	1
	Sig. (2-tailed)	.000	
	N	143	63

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

The correlation coefficient shows 846. This value indicates for that correlation is significant at 0.05 level (2tailed) and this implies that there is a significant positive relationship between digital infrastructure and service delivery (r = .846). However, the computed r = 846, is greater than 195 we reject the null hypothesis and concluded that digital infrastructure has a significant positive relationship on service delivery (r = .846, P<.05)

V. Discussion of findings

Digital technology has transformed nearly every aspect of modern life. Travel, work, shopping, entertainment, and communications are just some of the areas that have been revolutionized in recent decades. Digital technologies are not only transforming markets and creating new paradigms of doing business, the technologies are also providing solutions to organizations for addressing Sustainability challenges. The study shows that digital technologies has a significant positive relationship with operational efficiency. Whyte &

Lobo (2010) argued that digital technologies facilitate social interactions, knowledge sharing, and coordination practices among stakeholders while Clark-Reynold and Pelosi (2016) assert that digital technology have been seen as a way of improving processes to deliver quality, cost-effective buildings needed to meet NZ housing and infrastructure needs.

VI. Conclusion and Recommendations

Digital Transformation, has resulted in business benefits by taking an integrated approach towards IT, Supply chain, Operations and other functions of an organization, leading to delivery of sustained value, reductions in costs, improvement in operational efficiencies, and creating a sense of urgency. Manufacturing and service organizations are now introducing new products and platforms based on digital technologies used to achieve business sustainability. Organizations should therefore, seek for lasting partnerships with ICT companies in Digital Technology areas. This will ensure long term Sustainability results linked to Digital Transformation. Digital Transformation and Sustainability should, together, be recognized as strategic imperatives by organizational leadership. Digital technologies should be increasingly deployed in different sectors of the organization to ensure operational efficiency which will improve business sustainability.

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