



Supportive Information Technology And Organizational Resilience In The Telecommunication Service Sector

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ABSTRACT

No organization is immune to changes, thus, organization must have capabilities to adapting to changes when they occur. The organization's capacity to anticipate disturbance, adapt to events, and create lasting value and thrive in a changing world is very important. Hence, in order to survive and beat the competition in today's competitive business environment, organizations have to manage the future. Managing the future means managing information which is a major aim of information technology. Thus, this paper investigates the role of supportive information technology in providing organizational resilience in the telecommunication service sector in Rivers State, Nigeria. In order to achieve its aim, secondary information was used. It was found that information technology plays important role in providing organization resilience. In order to deliver quality information to the decision-maker at the right time and in order to automate the process of data collection, collation and refinement, organizations have to make information technology an ally, harness its full potential and use it in the best possible way so as to achieve organizational resilience.

Keywords: Information, Information Technology, Organizational Resilience

INTRODUCTION

No organization today, whether large or small, local or global, profit or nonprofit, governmental agency or non-governmental organization (NGO), is immune to change (Grote, 2009). In fact, the amount of significant, even traumatic change in organizations has grown tremendously during the last two decades (Hoopes and Kelley, 2004). Charles Darwin (1809 – 1882) said it is not the strongest or most intelligent that survive, it is the most adaptable to change (Coutu, 2002). Therefore, organizations does not just need to survive constant change, but need to grow and evolve in their own right to become stronger, fitter and more capable of adaptation to any kind of challenges.

Looking at today's world there are increasing economic, social and environmental challenges, turbulences and uncertainties which cause disturbances and discontinuities for organizations (Burnard and Bhamra, 2011). Organizations struggle and continuously adapt in order to flourish despite these disturbances, be it man-made or natural (Stephenson, Seville, Vargo and Roger, 2010). Those organizations which are capable of surviving over time in the face of current and future challenges are referred to as resilient organizations. The concept of resilience within organizations may offer a potential framework to overcome breakdowns, disturbances and discontinuities and allow for organizational development.

If organizational resilience is the ability to bounce back, or to recover from challenges in a manner that leaves the organisation more flexible and better able to adapt to future challenges, then organizational resilience is a quality that leaders and managers in all organizations should seek to foster at all times (Denhardt and Denhardt, 2010). As organizational decision-makers were forced to consider how to respond to different kinds of uncertainties, turbulence and frequent changes in the business environment,

the concept of resilience began to gain ground in business management (Meyer, 1982). Grote (2009) saw it as a potential panacea to move beyond survival and even prosper in face of challenging conditions.

Organizational resilience is characterized as the ability to bounce back from negative emotional experiences and by flexible adaptation to the changing demands of stressful experiences (Holling, 1973). Brand and Jax (2007) observed that organization's resilience is the ability of an organization to sustain competitive advantage over time through its capability to do two things simultaneously; deliver excellent performance against current goals, and effectively innovate and adapt to rapid, turbulent changes in markets and technologies. The challenge for organizations in today's business environment is to develop a new organizational form; one with the capability for continuously responding to change (Deevy, 1995). To attain this, we think, organizations must of necessity engage more the application of supportive information technology.

Information technology is revolutionizing the way, in which we live and work. It is changing all aspects of our life style. The digital revolution has given mankind the ability to treat information with mathematical precision, to transmit it with high accuracy and to manipulate it (Himanshu, Murty, Senapati, and Khuntia, 2008). These capabilities are bringing into being, a whole world within and around the physical world. The amount of calculation power that is available to mankind is increasing at an exceptional rate and computers and communication is becoming integral parts.

Organizations are facing growing propensity of vulnerability to new and future threats such as terrorism, pandemic potential, energy volatility, climate changes, globalization, and increase competition which result to failure for some organizations (World Economic Forum, 2012). While such failures and breakdowns have proven relatively rare, the consequences of failures within an interconnected world can cause serious problems beyond geographical and functional borders on the organization which requires the immediate application of supportive information technology (Boin and McConnell, 2007). An information technology has an ambivalent effect on the performance of the organization due to the fact it has become a platform of innovation and economic growth by means of efficient coordination and distribution of information (Hollnagel, Woods, and Leveson, 2006).

Information technology from word processing, to the internet, to e-business has been increasingly recognized as a strategic tool to manage information for today's competitive business environments. Particularly, in this era when information has become an invisible asset, helping firms to attune to changes in the environment (Barney, Wright and Ketchen, 2001). Also, by enabling them make decisions fast, change direction nimbly, and figure out when to enter and exit markets (Meyer, 2001). Information technology ensures smooth flow of information across the organization guide organization to adopt the most viable business practices even in times of changes. In order words, information technology ensures seamless flow of information across the different departments of the organization and develops and maintains an enterprise wide database (Himanshu et al., 2008). This database eliminates the need of the isolated data islands that may exist in the organization and makes the organization's data accessible across the departmental boundaries. This enterprise wide sharing has many benefits likes automation of procedures, availability of high quality information for better decision-making and faster response times during the period of challenges.

Furthermore, from extant literature studies on the concept of organizational resilience has not looked in the direction of supportive information technology but have explored other constructs such as Sheffi (2005) who linked the application of existing ideas about vulnerability to problems of increased organizational uncertainty in supply chains with organizational resilience. Also other predictor variables used on organizational resilience are: disruptive innovation (Dewald and Bowen, 2010); natural disasters (Baker, 2009) and pandemics (Nohria, 2006); resilience and competitive advantage (Hamel and Valikangas, 2003); business intelligence (Sawka, 1996), industry analysis (Mullich, 2009). From the above, no study has looked at supportive information technology and organizational resilience, therefore, the study looks forward to bridging this gap by studying the relationship between supportive information technology and organizational resilience.

Problem of the Study

The business and social environment is complex, dynamic and turbulent which means that today's success formula can become tomorrow's liability nearly overnight. One thing has become clear: the world is becoming more turbulent at a faster pace than organizations are becoming resilient enough to handle that change. Robb (2000) argues that large organizations are failing more frequently, profit levels dwindling, and overall corporate performance threatened as well. As a result of this fact, resiliency at the individual and organizational levels has taken on urgent importance.

Countries, communities, organization and individual are all subject to diverse and ever changing environment. The threats that turbulent business environment pose can vary in both severity and frequency and may originate internally or externally to an organization. An event in one area can often have disastrous effects in another. Natural disasters, pandemic disease, economic recession, equipment failure and human error can all pose both a potentially unpredictable and severe threat to the continuity of an organization operation. Organizations must strive and continually adapt in order to sustain competitiveness and remain viable within uncertain environment. Through turbulent economic, social, and environmental periods, organizations will experience disruptions and discontinuities. These disruptions can pose several threats to the incumbency of an organization. Understanding the features that allow for successful adaptation is essential within the volatile business ecosystem in which modern organization operates (Brand and Jax, 2007).

Furthermore, in turbulent environments, where organizations face too many and too frequent unanticipated shocks, resilience further address the survival and persistence of organizations itself. Recent studies show that the survival rate of businesses remain low, as 50-70 percent of all start-ups disband within five years and more than 80 percent of corporate enterprises do not survive more than a decade (Hollnagel, 2011; Zook and Allen, 2010). This can be as a result of customers' lamentation over the perennial issues of poor quality of services in the telephone service sector in Nigeria; this has led to increased drop calls, depletions of credits, unsolicited short text messages (SMS), among others have necessitated that service providers (the telecommunication industry) develop approaches, practices and methodologies to proffer a lasting solution to the identified drawbacks. It is evident that firms who are able to speedily attend to these perceived needs will have competitive advantage over others and consequently become more resilient.

Research Questions

The following research questions were considered very germane to the study and therefore they were raised to guide the study.

- i) How significant is the relationship between supportive information technology and organizational resilience?
- ii) What are the contribution of information and internet to organizational resilience?

Research Hypotheses

The following null hypotheses were formulated to guide the study:

- i) There is no significant relationship between supportive information technology and organizational resilience.
- ii) There is no significant relationship between information and internet and organizational resilience.

Literature Review

Supportive Information Technology

Information Technology (IT) as a technical support for human thinking and communication has been evolving over thousands of years. New developments have been rapid over the last few decades. It is only recently that the term has been used as a collection term for the whole spectrum of technologies providing the ways and means to acquire, store, transmit, retrieve and process information (Singh, 2000). Information technology enables us to do things, that we have been doing, but to do them better, cheaper and faster; provides new capabilities and enables us to do things that we had not been able to do previously and it has become an integral part of our activities; it affects the way we do things and changes our life style. Thus, many organizations now have IT departments for managing the computers, networks,

and other technical areas of their businesses. IT jobs include computer programming, network administration, computer engineering, Web development, technical support, and many other related occupations. Since we live in the information age, information technology has become a part of our everyday lives.

IT is a generic term that covers the acquisition, processing, storage and dissemination of information; it involves the application of computers and communication technology in the task of information handling from the generation to the utilization levels (Zorkoczy, 1999). It is restricted to systems dependent on microelectronics based combination of computers and telecommunication technologies. The IT is the boon for mankind. It gives accessibility to information at fingertips. The promising and diversified possibilities of IT have reduced the space and time between people, countries, and continents and ultimately have led to the emerging concepts of global society and global village.

Information technology has been defined differently by different people. The British Department of Industry considers IT as science of information handling, particularly by computers, used to support the communication of knowledge in technical, economical and social fields. It defines IT as the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by microelectronics based combination of computing and telecommunication. In the same vein, Boar (1997) defines information technology as those technologies engaged in the operation, collection, transport, retrieving, storage, access presentation, and transformation of information in all its forms. Also, Information Technology Association of America (ITAA) defined it as the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware. It deals with the use of electronic computers and computer software to convert, store, protect, process, transmit and retrieve information, securely.

Furthermore, Thong and Yap (1995) defined information technology as computer software and hardware solutions that provide support of management, operations, and strategists in organizations. Also, Sarosa and Zowghi (2003) explained that IT entails all the technology that is used by an organization to collect, process, and disseminate information in all its form. Therefore, the component of information technology will include hardware (**scanner, printer, computer**, etc), software (**operating systems, application development language, office application**, etc.). Based on this review the term information technology will cover wide range of information processing and computer application in organizations. It will cover systems of information, Internet, information and communication related technologies, and their infrastructure including computer software, networks and hardware, which processes or transmit information to enhance the effectiveness of individuals and organizations. More so, the term information technology also includes any computer application and required packages of hardware, Computer Aided Manufacturing, Computer Aided Design, Electronic Data Interchange and Enterprise Resource planning that positively affect the productivity of cooperation.

Thong and Yap (1995) observed that the goal of having information technology with all computer applications like MRP/EDI, CAM/CAD is to increase productivity of an organization. The objectives of IT is to provide better means of information of data messages in the form of written or printed records, electric, audio or video signals by using wires, cables and telecommunication techniques. IT plays a vital role in information handling due to developments such as reduction in computing time, capabilities of files on video discs, use of T.V as readymade information screen, telecommunication and satellite communication facilities etc. More so, the development in computer and communication technology has brought a new dimension to the program of information handling. The introduction of microprocessor and microcomputers has made things easier. All these developments facilitate better and quicker services to the user (Sooryanarayana and Mudhol, 2000).

Organizational Resilience

Resilience is basically an emergent property associated with an organization's capacity to pursue its goals despite disruption through mindfulness, resourceful agility, elastic infrastructures and recoverability (Weick and Sutcliffe, 2007). Hence, resilience is a combination of technical design features, such as fault-tolerance and dependability with organizational features, such as mindfulness, training and decentralized decision making (Antunes and Mourao, 2011). Organizational resilience is defined as the capacity of an

organisation to adapt in times of difficulty in order to sustain superior performance and rebound more quickly to superior levels of performance following performance loss (Deevy, 1995). This definition suggests that organizations develop an adaptive capacity to mitigate the impact of negative environmental events as well as a second element of resilience, namely, the ability of a firm to bounce back, or rebound, to earlier levels of performance following a period of inferior performance or performance decline.

Organizational resilience is an important if not critical element in the success of any change initiative. It is imperative that leaders develop their organizations' levels of resilience to not only help adapt to change with a minimum of disruption, but to embrace change as a natural means of achieving their primary objectives, whatever they are. The impact of new technologies, turbulent economic conditions and rapidly changing social environments make it increasingly difficult for any organization to do business as usual. Frequently old methods of operation ways become obsolete and rapidly deplete the organization's effectiveness and productive capacities. If an organization has not done those things required to withstand these intense changes and rebound in new and creative ways, then it will not matter what the previous productive capacity was or could have become (Hoopes and Kelley, 2004).

Resilience as a psychological and organizational strength is receiving increased attention by both organizational behavior scholars and professional managers. Both have indicated there may be a resilience gap. That is, as the world around us changes more quickly than ever before, employees, leaders, and overall organizations are struggling to keep up and maintain their resilience. Deevy (1995) argues that this unstable environment requires a deep understanding of the inner dynamics of organizations. The old view that organizations are simply mechanical entities that can be fixed when broken is no longer adequate. The challenge for organizations today is to develop a new organizational form; one with the capability for continuously responding to change. According to Robb (2000), a resilient organization is able to sustain competitive advantage over time through its capability to do two things simultaneously; deliver excellent performance against current goals, and effectively innovate and adapt to rapid, turbulent changes in markets and technologies. It also exhibits certain broad characteristics, and is able to create structure and dissolve it when necessary, provide safety (though not necessarily security or stability) during times of change, manage the emotional consequences of continuous transformation and change, and learn, develop and grow.

It includes situation awareness, keystone vulnerabilities and adaptive capacity. Endsle, Bolte and Jones (2003) define situation awareness as the ability of an organization of being aware of what is happening around it and to have understanding of what that information means to it now and in the future. Robb (2000) argues that situation awareness should be regarded as an essential requirement for competent performance in dynamic environments, with inaccurate and incomplete situation awareness often leading to dangerous and life-threatening consequences for the organization. Situation awareness is a vital command skill in a crisis because the first step in decision making is to evaluate the situation.

McManus (2007) define keystone vulnerabilities as components in the organizational system, which by their loss or impairment have the potential to cause exceptional effects throughout the system; associated components of the system depend on them for support. Management of keystone vulnerabilities defines those aspects of an organisation, operational and managerial, that have the potential to have significant negative impacts in a crisis situation. The impacts of keystone vulnerabilities may be either instantaneous (occur suddenly and take the failure of only one component to have a significant negative impact) or insidious (small failures of key components lead to a large scale cascading-type failure over time). It is important for organizations to also have a clear understanding of the links between components and the vulnerabilities that may arise from these. These may include specific tangible organizational components such as: buildings, structures and critical supplies, computers, services and specialized equipment, individual managers, decision makers and subject matter experts.

Furthermore, Dalziell and McManus (2004) define adaptive capacity as the ability of an organization to respond to changes in its external environment and to recover from damage to internal structures within the system that affect its ability to achieve its purpose. McManus (2007) observed that adaptive capacity is a measure of the culture of the organisation that allows it to make decisions in a timely and appropriate manner both in day to day business and also in crises. Adaptive capacity considers aspects of an

organisation that may include (but not be limited to): leadership and decision making structures, the acquisition, dissemination and retention of information and knowledge, and the degree of creativity and flexibility that the organisation promotes or tolerates.

RESEARCH METHODS

The method of the study has to do with various procedures used in obtaining and analyzing data as well as the tools used in carrying out the research. To reach our purpose of this study, we used a qualitative approach, more specifically through secondary information which was obtained from published and unpublished sources in libraries, newspapers, textbooks, journals, and other relevant sources to develop literature.

DISCUSSION RESULT/FINDINGS

Supportive Information Technology and Organizational Resilience

Supportive information technology has a strong impact on organizational resilience in the sense that an integrated information technology infrastructure across the organization links various units and provides a seamless flow of accurate, consistent, and timely information to employees and customers. Information is the key to formulating information technology-enabled strategies for competing in turbulent environments. Information has become an invisible asset for gaining a competitive advantage in an increasingly changing global environment (Tippins and Sohi, 2003). Incorporating information technology into business strategy enables firms to develop an efficient and quick reaction to changes in the market (Lin, Chiu and Tseng, 2006). Hence, a high level of information technology capability is a prerequisite to provide the foundation for developing core organizational competences for resilience in the telephone service sector.

An information technology provides a myriad of opportunities and productivity improvements, increases complexity and interdependences of organizational services and assets (Butler and Gray, 2006). As a consequence, provides organizations ability to managing complexity and uncertainty as it is imperative for modern organizations to ensure resilient operation and to protect the transmitted and stored data. Information technology activities and capabilities can support business strategy and improve business performance through the achievement of competitive advantage which provide resilience for organization (Chan and Reich, 2007; Kyobe, 2004).

Furthermore, Haeckel (1999) argues that supportive information technology capability directly supports sensing and responding capabilities in contemporary environments. Firms increasingly need to process growing amounts of information in regards to the environment, customers, suppliers, competitors and so on; information technology systems enable firms to make sense out of this data. Similarly, responses in contemporary environments are often too complex for timely implementation without such information technology support as communication infrastructure and automation. Supportive information technology capability is critical for responding to opportunities in information technology driven industries such as financial services, retailing, telecommunications, and hardware/software (Sambamurthy, Bharadwaj and Grover, 2003), which gives the organization the capacity to adapt in times of difficulty in order to sustain superior performance and rebound more quickly to superior levels of performance following performance loss. Tallon (2008) observed that information technology lead to the development of technical capabilities associated with organizational resilience, which in turn drives a firm's ability to react to change in its products and markets.

A complex, turbulent, and uncertain business environment creates a need for resilience, which could be beneficial to the application of information technology. Mooney, Gurbaxani, and Kraemer (1996) argue that firms derive business value from information technology which can provide adaptive capacity to mitigate the impact of negative environmental events through its impacts on intermediate business processes. Intermediate processes include the operational processes that comprise a firm's value chain and the management processes of information processing, control, coordination and communication. It is expected that information technologies in various layers make resilience more attainable (Melarkode, 2004). Moreover, information technology helps to speed up information processing so that timely

decisions can be made, tasks can be performed rapidly, enabling firms to capture new opportunities which gives them the capacity to pursue their goals despite disruption.

Also, effective and efficient management of information technology could improve the organizational capacity for resilience. Resilience means a sustained superior performance, that is, resilient organizations can always maintain a high performance and can self-renew over time through information technology. Richtner and Lofsten (2014) suggest that a resilient organization is also a creative organization through the aid of information technology, for organizational resilience is positively related to organizational creativity. Information technology that is supportive can ensure the long-term survival of telephone service organizations by providing access to external information, identifying new market opportunities, enabling managers to effectively manage their customer base, and share knowledge efficiently and by offering products/services closer to customers to cope with challenges and to be resilience.

More so, advancements in information technologies such as Internet connectivity, data warehousing, and customer relationship management systems are pivotal in presenting telephone service firms with immense options to speed up the convergence of their activities. Successful Internet enables organizations have seamless flow of information and sharing of order and customer information across all channels so that data about customers and stocks are synchronized across databases to ensure consistency. This enhances an organization's ability to innovate and respond to its environment rapidly, thus firms with a higher level of Internet infrastructure capabilities would be able to achieve a higher level of organizational resilience.

The application of Information and Communication Technology (ICT) can result in a reinforced sense of traditional communication patterns, or the creation of new organizational communication and technological structures. As people respond to the altered conditions created by disaster or changes and events, they constitute and reconstitute both their communication and technological structures by adapting ICTs to access the resources and contacts necessary for recovery (Carey, 2003). There is also evidence that using not only one, but multiple, information technologies together can help people and organizations enact recovery following disaster and changes. Katz and Rice (2002) found that in a crisis, people and organizations develop ad hoc solutions using a variety of media in order to maintain contact with their network.

Given the organizational complexity present in this fast changing business environment in telephone service sector, it is important to advance our understanding of the role in which information technology affects the capability-building processes of those firms. Recent thinking about the performance enhancing role of information technology in organizations suggests that information technology alone does not have a direct and unequivocal impact on organizational resilience; rather, it is the complementary effect of information technology with other organizational resources that results in improved organizational resilience (Melville, Kraemer and Gurbaxani, 2004; Wade and Hulland, 2004). More so, based on the organizational resource complementary perspective, the business value of information technology depends on the presence and influence of other organizational, business, and technical resources. A complementary organizational resource that is critical to reinforce the role of information technology is the top management's level of pro-activeness in formulating forward-looking strategies for organizational survival. This managerial characteristic is necessary for the organization to be able to sense and detect information technology-enabled market opportunities to innovate rapidly under a turbulent environment.

CONCLUSION

In today's world of business, an organization wide vision for resilience is imperative for it to gain and sustain its competitive advantage. Telephone service organizations cannot afford to be ill-prepared for unanticipated events and must develop a strategy to respond rapidly to disruptions. Demands, risks and opportunities abound, ranging from market fluctuations to employee error and misconduct to earthquakes and terrorism. Disruptions can be catastrophic and can lead to loss of market opportunities, degraded brand and reputation, loss of customers, and decline in shareholder value. Building a vision for resilience begins with the recognition and understanding of the infrastructure vulnerabilities an organization faces, and an analysis of the potential impact of those vulnerabilities on its business. It includes a holistic

examination of the various working layers: strategy, organization, processes, and applications of information technology.

Information technology plays an essential role in building a resilient and flexible business organization. In today's business environment, the ability to constantly provide reliable information to people both inside and outside the organization from multiple, disparate data and application sources is a requirement for organizational resilience. Specific measures, such as determining the tolerance level of key applications to infrastructure failures and possibly diversifying data and applications, must be done to help ensure a resilient enterprise. This diversification of applications and data will allow for greater workload balancing as well as protection against organizational impacts.

Important information technology components to consider when planning for resiliency in the organization include hardware architectures, system software, middleware and networks, internet, information and communication technology. Each component must be examined to ensure that its level of availability through reliability, redundancy or failover is in line with the enterprise's resiliency objectives. Specifically, defined architectures must be in place for critical hardware functions; single points of failure should be known and addressed in support of overall resilience goals; actual availability measurements should be taken and compared to the enterprise's availability requirements; and the ability for infrastructure to recognize and repair itself with little or no human interaction should be examined.

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