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Knowledge Management and Organizational Resilience in Nigerian Manufacturing Organizations

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Abstract
This study examines the relationship between knowledge management and organizational resilience. The sample for the study consisted of one hundred and twenty eight (128) employees from the thirty four manufacturing companies that are registered with the manufacturers Association of Nigeria, Rivers State Council. The study utilized both quantitative data (questionnaire) and qualitative data (interview). The spearman rank correlation coefficient and Multiple Regression Model using the Statistical Package for Social Sciences (SPSS) version 15 were utilized for the analysis of data. Our finding revealed a positive and significant relationship between knowledge management and organizational resilience. Specifically, knowledge acquisition, knowledge storage, knowledge sharing and knowledge utilization were revealed to have a positive and significant influence on organizational resilience. Based on this finding, it was concluded that knowledge management enhances organizational resilience. More specifically, it was concluded that knowledge acquisition, knowledge storage, knowledge sharing and knowledge utilization enhances organizational adaptation, organizational resourcefulness, and organizational learning. It is recommended that organizations should continue to strengthen their knowledge management practices especially knowledge acquisition, knowledge storage, knowledge sharing and knowledge utilization in their everyday activities as this is a sure guarantee for their resilience. The managerial implications of these findings were also discussed.
Keywords: Knowledge Management, Organizational Resilience, Knowledge Acquisition, Knowledge Storage, Knowledge utilization, Organizational Adaptation, Organizational Resourcefulness, Organizational Learning, Knowledge Sharing.

1. Introduction

Organizations are faced with variety of complexities which proliferates because of the changes that occur in the environment they are operating in. These complexities are disturbances which can be internal and external. As Koontz and Weihrich, (1999) succinctly puts it, "Organization does not exist in vacuum rather it is mutually dependent on its external environment." These external disturbances include: labour strikes, availability of raw materials, change in customer taste and preferences, power supply, terrorist attacks and natural disasters like (e.g flood, earthquakes, etc). The world also is becoming a global village and as Stephenson (2010) rightly argues "investment choices on one side of the world can affect the cost of living on the other" and organizations in Nigeria have not been immune to the impacts of the recent global financial crises. However, according to Weick and Sutcliffe, (2001), organizations prepare themselves for failure, much like nuclear aircraft carriers, and this preparation alone is the main ingredient to the organization's resilience—they are always preparing for the worst, and therefore, attempts at dismantling such an organization have remained a monumental task. Anyanwu, (2000) listed low level of technology, low level of capacity utilization rate, low investment, high cost of production, inflation and poor performing infrastructure as the lingering problems facing the Nigerian Manufacturing Sector. The biggest problem facing manufacturers over the past decade has been inadequate infrastructure in general and lack of power supply in particular (Corporate Nigeria, 2010). They went on to state that between 2000 and 2010, more than 850 manufacturing companies were either shut down or temporarily halted production. Capacity utilization in manufacturing is around 53%. Imports of manufactured goods dwarf sales of home-grown products – manufactured goods have constituted the biggest category of imports since the 1980s. Other problems facing the Nigeria manufacturing industries, include; heavy tax payment, corruption, counterfeiting, kidnapping/youth restiveness, flood, poor purchasing power, etc.

In the midst of all these disturbances, however, organizations strive to make profit and continue to exist no matter the circumstances surrounding them. These natural and man-made crises and disasters have raised an awareness of the need for organizational resilience. According to Umoh, (2009), "only variety absorbs variety." This implies that organizations cannot control the variety unless they possess the requisite variety to bring the organization to a state of acceptable space. Within today's litigious environment, corporations and their leadership can no longer claim "we didn't know" as an excuse for corporate resilience failures. Business resilience is now an established need within corporations and should be an embedded institutional capability and defining ethos within the day-to-day business operations of a company (Stephenson, 2012). Hence, it is important for organizations to develop resilience for two key reasons: firstly because community and

organizational resilience are interdependent in a complex environment (Dalziell & McManus, 2004), and secondly because being resilient can provide organizations with competitive advantage (Parsons, 2007). The importance of resilience cannot be over emphasized because the benefit outweighs the cost.

Over the past decade, a great deal has been written about Knowledge Management and the role it plays in successful resilience of organizations (Durodie, 2003;Dalziell & McManus, 2004, Mitroff, 2005; Ichijo and Nonaka, 2006; Parsons, 2007). Despite this growth of scholarly publications on the influence of Knowledge Management on organizational resilience, little empirical evidence exists in developing countries, especially Nigeria. To bridge this gap in literature, this study examines the relationship between Knowledge Management and Organizational Resilience of selected manufacturing companies in Nigeria. By exploring the relationship between Knowledge Management and Organizational Resilience, organizations can enhance their competitive advantage and effectiveness.

2. Literature review

Bell (2002) defines organizational resilience as "the capability to respond rapidly to unforeseen changes, even chaotic disruption. It is the ability to bounce back- and, in fact bounce forward- with speed, grace, determination and precision." For an organization to be able to continue and even increase turnover in the midst of crises is resilience. Organizational resilience is a continuously moving target which contributes to performance during business-as-usual and crisis situations (Mitroff, 2005). It requires organizations to adapt and to be highly reliable (Weick & Sutcliffe, 2007), and enables them to manage disruptive challenges (Durodie, 2003). Flin, Mearns, and Bryden, (2000) argue that leading indicators, "may reduce the need to wait for the system to fail in order to identify weaknesses and to take remedial actions". In the context of resilience, this is very important because leading indicators can provide organizations with information on their resilience strengths and weaknesses before a crisis happens.

In a competitive environment, an organization that is aware of its resilience strengths is also more equipped to find opportunities out of a crisis situation (Knight & Pretty, 1997). McManus, Seville, Vargo and Brunsdon (2008) argued that the resilience of organizations directly contributes to the speed and success of community recovery following a crisis or disaster, Buckle (2006) reflects this when he discusses organizations as a level of social resilience. McManus, Seville, Vargo and Brunsdon (2008) went on to discuss communities' expectations of organizations and argue, "Consumers and communities are increasingly demanding that organizations exhibit high reliability in the face of adversity and that decision makers are able to address not only the crises that they know will happen, but also those that they cannot foresee". As stated by Bell, (2002) "It is not just the terrorist acts of September, 11, but a decade of unprecedented change, wrenching economic instability and business discontinuities that demand organizational agility and organizational resilience. In many respects, resilience represents the next phase in the evolution of traditional place-centric enterprise structures to highly virtualized, people-centric structures that enable people to work anytime, anywhere."

Fortunately, we are currently in the midst of great change, a condition which Thurow (2003) called the third industrial revolution. It is a shift towards a knowledge-based economy, where knowledge is the most important resource, superseding the traditional management resources of land, capital, and labour (Drucker, 1993). This has stimulated more active discussion about the theory and practice of "knowledge management." Yet most manufacturing organizations still have serious difficulty understanding the knowledge resource, and they still lack an effective theoretical framework for understanding the operations of the manufacturing industries in the knowledge-based economy. To buttress this point, Ichijo and Nonaka (2006) argue that "in the knowledge-based economy, the organizations do not just plan for the future, it continuously creates the future. In this era of globalization, one important factor that differentiates successful firms from unsuccessful ones is their vision of the future and their practical ability to act to realize that future by using their aesthetic sensibilities to create knowledge." Currently, we live in a knowledge intensive era where knowledge plays a key role to resilience and thus organizations need to consider how they manage knowledge within their organization.

Although knowledge has always existed in all type of organizations, societies and individuals. However, in the past knowledge was treated like something trivial, something that always existed and taken for granted (Zack 1999). Today knowledge is seen as one of the most important strategic resources with the ability of creating and maintaining a competitive advantage (Zack, 1999). The concept called knowledge-based view is a view in which a company uses knowledge to gain advantage over its competitors by knowing more about its customers, products, technologies, markets and environment. The knowledge-based view is a management concept and is achieved by increasing the organizations employees' involvement on different levels when striving to reach the operational goals (Encyclopedia.com 2009). Besides, effective knowledge management for resilience can be very meaningful.

As Christensen and Raynor, (2003) bluntly stated that "Resources are usually people or things – they

can be hired and fired, bought and sold, depreciated and built". "The only irreplaceable capital an organization possesses is the knowledge and ability of its people. The productivity of that capital depends on how effectively people share their competence with those who can use it." Andrew Carnegie (IKM-Corporation 1999-2003). Despite the growing interest in knowledge management and the initiatives many organizations have taken to manage knowledge, few companies have succeeded in creating a knowledge-based competence to gain and establish resilience.

2.1 Knowledge management

The search for knowledge has always been a focal point in the evolution of mankind. As the earliest civilizations appeared in Mesopotamia, Egypt, India and China, they were heavily influenced by their environment, diminishing the impact of the environment on their civilization. Through the centuries, humans have acquired and constructed new knowledge that permitted them to understand and adjust to the world they inhabited, as well as transforming it to suit their needs. Knowledge has helped humans to become the "subject" of change, as opposed to being the "object" of change. The current literature on knowledge management is replete with distinctions among knowledge, information, data and wisdom (Nonaka and Takeuchi, 1995; Wiig, 2004). It is also common to see distinctions drawn between different kinds of knowledge, such as tacit and explicit (Nonaka and Takeuchi, 1995), actionable and passive (Wiig, 2004), or knowledge and meta-knowledge (Wiig, 2004).

There are several definitions of knowledge. Davenport and Prusak (1998) define knowledge as a fluid mix of experiences, values, contextual information and intuition that provides a structure to evaluate and incorporate new experiences and information. Nonaka and Takeuchi (1995) regard knowledge as true and justified belief.

Similarly, Nonaka and Takeuchi (1995) have categorized knowledge into tacit knowledge and explicit knowledge and further state that tacit knowledge is that which resides in the people's minds and is difficult to articulate. Given that tacit knowledge resides within the mind of a person, individuals who are rich in tacit knowledge constitute a wealth of intangible assets of an organization. This also implies that as long as they stay in employment with an organization, they continue playing a competitive figure through effective decision-making, communication and contribution". Since tacit knowledge resides in people's brains, it is advisable that organizations take definite steps to retain their workers' critical knowledge. If workers can easily walk out of the organization, knowledge in their heads will also disappear much to the disadvantage of the organization. Accordingly, it is upon an organization to gather and retain this knowledge through various means at work, meetings, workshops and seminars or in tutor and apprentice roles. In this way Nonaka and Takeuchi (1995) argue that there will be little risk that the know-how of the company will leave at the same time as the employees's retirement. Tacit knowledge is personal, context-specific, and therefore hard to formalize and communicate. Tacit knowledge is deeply rooted in individuals' experiences, ideas, values and emotions and as such it is important because expertise rests on it. Irick further argues that tacit knowledge is internal or interior knowledge, highly personal and important because expertise rests on it. Tacit knowledge can only be transmitted via training or gained through personal experience. Nonaka (1994) describes tacit knowledge as "know-how" - as opposed to "know-what" (facts), "know-why" (science), or "know-who" (networking). While knowledge transfer contributes to the retention of organizational knowledge, Nonaka (1994) states that effective transfer of organizational tacit knowledge generally requires extensive personal contact and trust. For knowledge and skills transfer (for retention purposes) in organizations to take place there has to be some degree of mutual trust between the individual employees.

On the other hand, explicit knowledge refers to knowledge which is transmitted in formal and systematic language (Nonaka and Takeuchi, 1995). Explicit knowledge is found in an organization's documents, data bases, manuals and procedures manual, policies, code of conduct, annual reports, records and archives. Explicit knowledge is easy to share unlike tacit knowledge. According to Nonaka and Takeuchi (1995) "Explicit knowledge can be expressed in words and numbers and easily communicated and shared in the form of data, scientific formulae, codified procedures, or universal principles." Nonaka and Takeuchi, (1995) further point out that explicit knowledge can easily be processed by a computer, transmitted electronically or stored in databases…" Since explicit knowledge is codified many find it easy to transfer and it is regarded as leaky and migratory.It is not possible to see one as more important over the other; rather they should be seen as complementary to each other. An example of this is about the written language. It is not possible to learn how to write unless you have developed your skills in the verbal language; hence, the explicit knowledge makes no sense without the tacit knowledge. Knowledge is created through interaction between explicit and tacit knowledge.

Some other researchers classify knowledge differently. For example, Bock (2001) divided knowledge using generality and analyzability. Generality means the scope of different cases and situations covered by that knowledge. Analyticity refers to the degree to which a person inferences by using the rules of logic to acquire hat knowledge. He also classified knowledge into tacit, implicit and explicit on the basis of knowledge

representativeness. Tacit knowledge is defined as knowledge which cannot be expressed in verbal, symbolic and written form. Implicit knowledge is knowledge that can be expressed in verbal, symbolic and written form but not expressed yet. Explicit knowledge refers to knowledge which exists in symbolic or written form. Demarest (1997) divided knowledge into scientific, philosophical, and commercial knowledge. In these types, he focus on commercial knowledge which is an explicitly developed and managed network of imperatives, patterns, rules, and scripts, embodied in some aspect of the firm, and distributed throughout the firm, that creates marketplace performances. Jang and Lee (1998) divided knowledge into task knowledge and domain knowledge. The domain knowledge involved with manual, reports, patents, products, services, advertisement and software and task knowledge consists of know-how, skill, benchmarking, brainstorming, analysis, and best practices and so on.

Leonard-Barton (1995) classified knowledge into scientific, industry-specific, firm-specific knowledge. From scientific to firm-specific knowledge, this knowledge is increasingly less codified and transferable. Pan and Scarbrough (1998) divided knowledge into factual knowledge and behavioural knowledge. Factual knowledge is an accumulation of structured information and is transferable in formalized processes. Behavioural knowledge includes mind structures co-coordinating to social interaction of individuals and organizations. Probst (1998) classified knowledge into individual and collective knowledge. Individual knowledge relies on creativity and on systematic problem solving. Collective knowledge involves the learning dynamics of teams.

Ruggle (1997) classified knowledge into process knowledge, catalog knowledge, and experiential knowledge. Schuppel et al (1998) classified knowledge along the four bipolar dimensions. First, the inner and outer knowledge, related to the bearer of the necessary knowledge. Second, the actual and future knowledge, related to content of the relevant knowledge. Third, the explicit and implicit knowledge, related to the aspect of visibility and communicability of knowledge. Fourth, the knowledge created out of experience and rationality, related to the aspect of richness and validity of knowledge. Wiig (1995) distinguished between different forms and types of knowledge. The forms are public, shared expertise and personal knowledge. The types are factual, conceptual, expectational and methodological knowledge. Although knowledge is recognized as a key source of competitive advantage, very little is known about how to create and leverage it in practice (Wenger in Chauvel and Despres 2000).

2.1.1 Knowledge management defined

Knowledge management has been defined as the systematic, effective management and utilization of an organization's knowledge resources (i.e., ones that contain or embody knowledge) and encompasses the creation, storage, arrangement, retrieval, and distribution of organization's knowledge (Saffady, 1998). This includes the 'methods and tools for capturing, storing, organizing, and making accessible knowledge and expertise within and across communities' (Mack, Ravin and Byrd, 2001). It also includes the active management and support of human expertise (Blair, 2002). In this sense, knowledge management deals equally with the acquisition, handling and use of explicit knowledge as well as the management of tacit knowledge in terms of improving people's capacity to communicate and collaborate with one another (Al-Hawamdeh, 2002). Du Plessis (2003) posits that "knowledge management is a planned, structured approach to manage the creation, sharing, harvesting and leveraging of knowledge as an organizational asset, to enhance an organization's ability, speed and effectiveness in delivering products or services for the benefit of clients, in line with its organizational strategy." Knowledge management is a capability pertaining to knowledge creation, knowledge organization, storage and retrieval, knowledge transfer, and knowledge applications which enhances a firm's ability to gain and sustain a competitive advantage (Carlsson, 2008). Knowledge management is defined as the process of consciously creating new knowledge, disseminating it widely through the organization and embodying it quickly in new products/services, technology, and systems (Takeuchi and Nonaka, 2004).

2.1.2 Knowledge Management Process

knowledge management process is the heart of knowledge management. Therefore, most researchers present phase of knowledge management process. Arthur Anderson and APQC (1996) proposed process to design tacit knowledge and make it explicit for all individuals within organization. This process consists of applying, sharing, creating, identifying, collecting, adapting and organizing. Little (1998) proposed knowledge management processes as acquisition and creation, saving, disseminating, and use. Delphi (1998) proposed four key knowledge management processes. Capturing is related to obtain external knowledge and create knowledge by research or experience. Sharing is making organization to access knowledge in anytime and anyplace. Leveraging is concerned with conversion knowledge into product or service. In feeding process, knowledge is embedded in product to increase value. Demarest (1997) divided knowledge management processes into construction, embodiment, dissemination, and use. Construction refers to the process of discovering or structuring a kind of knowledge. Embodied refers to the process of choosing a container for knowledge. Dissemination refers to the human processes and technical infrastructure that make embodied knowledge available to the people within the firm. Use refers to the ultimate objective of any knowledge management system.

Ernst & Young (1998) provided four knowledge management processes which is consisted of planning, acquiring, applying and assessing. Jang and Lee (1998) proposed knowledge creation organizational memory process. It is consisted of knowledge acquisition, schema codification, knowledge codification, knowledge retrieval, knowledge embedding, problem analysis, problem-solving and knowledge shaping. Kolb (1984) proposed knowledge development process. It consists of experiencing, observation, conceptualization, and experimentation. KPMG (1998) proposed knowledge cycle which represents the seven basic processes of knowledge. Basic processes are creation, application, exploitation, sharing and dissemination, encapsulation, sourcing and learning.

Lee and Kim (2001) suggested that three knowledge management processes; accumulation, integration and reconfiguration. The accumulation of knowledge through the acquisition of knowledge from external sources and internal creation. The major management processes are integrating and reconfiguring them according to the environmental changes. Leonard-Barton (1995) suggested knowledge management processed which are consisted of problem solving, implementing and integrating, experimenting and importing knowledge. Nevis et al. (1995) proposed three knowledge management processes; acquisition, dissemination and utilization. Knowledge acquisition means the development or creation of skills, insights and relationships. Knowledge dissemination means that the dissemination of what has been learned. Utilization means that the integration of learning so it is broadly available and can be generalized to new situations. Nonaka and Takeuchi (1995) proposed knowledge creation process which is made up of sharing tacit knowledge, creating concepts, justifying concepts, building archetype and cross leveling knowledge.

Pan and Scarbrough (1998) proposed five phase processes which are consisted of knowledge generation, processing, storage, dissemination and use/reuse. Pentland (1995) proposed a set of five knowledge management processes based on Holzner and Marx (1979). Construction is the process through which new material is added or replaced within the collective stock of knowledge. Organization is the process by which bodies of knowledge are related to each other, classified or integrated. Once a new observation or experience has passed the test and been socially ratified as knowledge, it is concerned with storing. Distribution is a critical issue in any organization. Application is concerned with possibility of obtaining the kind of performance improvement. Probst (1998) suggested eight building blocks which are composed of knowledge goal, identification, acquisition, development, distribution, preservation, use and measurement. He presents more detailed knowledge management processes.

Ruggle (1997) proposed generation, codification and transfer. Knowledge generation includes all activities which bring to light knowledge which is new, whether to the individual, to the group, or to the world. Knowledge codification is the capture and representation of knowledge so that it can be re-used either by an individual or by an organization. Knowledge transfer involves the movement of knowledge from one location to another and its subsequent absorption. Schuppel et al (1998) suggested four knowledge management processes that are composed of use and multiplication, development and acquisition, transfer, institutionalization. On their part, Stewin and Zwass (1995) suggested mnemonic functions which are composed of knowledge acquisition, retention, maintenance, search and retrieval. Szulanski (1996) focused on knowledge transfer process, which is composed of initiation, implementation, ramp-up, and integration. Nevis et al (1995) split knowledge into acquisition, sharing and utilization. Knowledge acquisition is the development or creation of skills, insights, and relationships. Knowledge sharing is the dissemination of what has been learned. Knowledge utilization is the integration of learning so it is broadly available and can be generalized to new situations.

Walsh and Ungson (1991) divided organizational memory process into acquisition, retention, and retrieval. Wiig (1995) divided knowledge management processes into creation, manifestation, use and transfer. Creation and manifestation is related to how it is created and manifested in people's minds as well as procedures, culture and even technology. Use is concerned with how it is used in making decisions and other knowledge-related work by individuals and businesses. Transfer is related to how we learn and how we otherwise can capture and exchange knowledge. Wijnhoven (1998) proposed organizational memory processes as made up of acquisition, retention, search, maintenance and dissemination.

2.2. Organizational Resilience

The concept of resilience emerged in the late 1960s/early 1970s in relation to the resilience of ecosystems (Folke, 2006) where the focus was upon the ability of systems to cope with change and still persist (Petak, 2002). From the mid-1980s resilience referred increasingly to human environmental interactions, exemplified in discussions of sustainability (Lélé, 1998) and in the late 1970s/early 1980s it appeared in behavioural studies where it referred to an individual's ability to withstand and rebound from crisis (Walsh, 1996). The concept was first used with respect to organizations by Wildavsky in 1988 but it was not until the late 1990s that the application of resilience to organizations gained in popularity. Since then there has been discussion of resilience with respect to disasters. For example, resilience in the face of earthquakes (Petak, 2002). There have also been specific case studies, for instance, relating to Hurricane Katrina and the capacity of New Orleans to recover (Campanella,

2006), and 9/11 (Kendra and Wachtendorf, 2003). There has also been broader discussion of resilience in relation to healthcare systems (Mallak, 1998), business supply chains (Christopher and Peck, 2004), information systems (Comfort *et al*. 2001) and resilience engineering (Hollnagel *et al*. 2006; Woods and Wreathall, 2003).

In his classic work "Searching for Safety" Wildavsky, (1988), juxtaposes anticipation and resilience. Wildavsky urges caution in the use of anticipatory strategies and advocates enhancing resilience through trial and error. He argues that anticipation can lead to a great deal of unnecessarily wasted effort and wasted resources because of the high volume of hypothesised risks, many of which are exaggerated or are false predictions. Definitions or descriptions of resilience may be drawn from several fields including materials science, ecology, developmental psychology, organizational studies, and the wider social sciences. Perspectives from different fields suggest some difference of opinion regarding the meaning of resilience and how it is operationally defined. Broadly, resilience refers to the maintenance of positive adjustment under challenging conditions (Weick *et al.,* 1999).

In materials science, resilience can mean the ability to absorb energy in the elastic range (Nash, 1998). In soils science, resilience defines the ability of soils to recover from different external stresses that may occur through agricultural and industrial land use, and is measured by the rate and level of recovery (Seybold *et al.,* 1999). Ecologist Holling (1973) proposed resilience as a measure of the ability of systems to absorb changes and still persist. In this context resilience envisions ecosystems as constantly changing and focuses on renewal and reorganization processes rather than stability or equilibrium. From a socio-ecological systems perspective, Walker *et al.,* (2004) define resilience as the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain the same function, structure, identity and feedbacks. There is a distinct difference between the materials science equilibrium view of resilience and the ecologist's view of renewal and reorganization.

More in line with renewal, a developmental psychology perspective is useful for understanding the development of resilience in organizations. From this perspective resilience develops over time from continually handling risks, stresses and strains, where an entity not only survives and thrives by positively adjusting to current adversity, but also, in the process of responding, strengthens its capability to make future adjustments (Sutcliffe and Vogus, 2003).

Organizational studies exhibit the tension between equilibrium seeking and renewal focused perspectives of resilience. Wildavsky (1988) described resilience as the capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back, a view that reflects Meyer's (1982) study of how hospitals adapted to an unexpected doctors' strike. Here the term resiliency was used to refer to an organization's ability to absorb a discrete environmental jolt and restore prior order. Lengnick-Hall and Beck (2003) argue resilience extends beyond 'bouncing back' and suggest resilience is an organization's transformational capability comprising a complex blend of perspectives, behaviours, processes and contexts. An example of beyond 'bouncing back' or transformational resilience is evident in the case of Sandler O'Neill and Partners following the attacks on the World Trade Centre in 2001. Formerly of the South Tower, the company lost almost forty percent of its people and the majority of physical assets and records. Yet despite the massive losses they began trading again the week after the attack. Within one year the company was doing better than ever with record profits and revenues and new highly desirable lines of business (Freeman *et al.,* 2004). A key element of the resilience shown by Sandler O'Neill was the company's ability to re-engage a mass of retired people and ex-workers, including many volunteers, to fulfil important roles knowing that these people had a good working knowledge of the company's business. The good relations with staff and customers extended to the company's reputation, as on Wall Street, Sandler O'Neill and Partners were known as a 'relationships' firm.

Other examples where organizations appear to have transformed crises to advantage include Odwalla Inc in 1996, where a girl died from drinking apple juice contaminated with E. coli bacteria, and Johnson & Johnson's Tylenol poisoning crisis in the 1980's which led to the death of seven people in Chicago. Both of these events were managed in a way that not only dealt effectively with a tragic situation, but also enhanced organizational core capabilities enabling them to thrive (Lengnick-Hall & Beck 2003). One challenge is to understand why and how some organizations manage to thrive and enhance core capabilities when faced with crisis and others fail, or at best return to equilibrium. Resilience begins with enterprise leadership setting the priorities, allocating the resources and making the commitments to establish organizational resilience throughout the enterprise. Bell, (2002) also argue that component of organizational resilience is enterprise culture. A resilient culture is built on principles of organizational empowerment, purpose, trust and accountability. He added that the bedrock of organizational resilience is the enterprise workforce. People who are properly selected, motivated, equipped and led will overcome almost any obstacle or disruption.

From the discussions above, it is obvious that there are many theoretical definitions of organizational resilience in the literature. Resilience can also be seen as the ability to anticipate a perturbation, to resist it by adapting and to recover by restoring the pre-perturbation state as much as possible (Madni, 2007). The numerous

concepts that emerge from definitions of organizational resilience include knowledge of the environment, level of preparation, anticipation of perturbations, capacity to deploy resources, degree of adaptation, capacity to recover, etc. (McManus *et al.*, 2008) Resilience is a system's capacity to maintain or restore an acceptable level of functioning despite perturbations or failures. (Pinel, 2009). There is a clear split in the literature between individual psychological resilience being something that some people have (Ripley, 2008) or being something that is learned or done. Much of the academic research appears ambiguous in terms of what causes resilience, though there is widespread agreement on the personality traits of those who are considered to be more resilient than others. Without more firmly identifying underlying causes of personal resilience, it is difficult to prove herein the argument that it can be learned. Yet many, including Coutu (2003), are very clear that it can*: "We'll never fully understand it, but we can learn it – and we must." (Coutu, 2003)*

2.2.1.Organizational Adaptability

More recently, adaptability has also come to be considered an important response option worthy of research and assessment, not simply in order to guide the selection of the best mitigation policies, but rather to reduce the vulnerability of groups of people to the impacts of change, and hence minimize the costs associated with the inevitable (Kane and Shogren, 2000; Smit and Pilifosova, 2001). This has, in part, stemmed from a realization that a certain amount of change will occur, and that society can take concrete steps to minimize the net losses (including taking advantage of opportunities for gains).

Social scientists' contribution to the study and assessment of adaptation has crossed several disciplines, and drawn off of a long tradition of studying vulnerability to natural hazards and to food insecurity (Dilley and Boudreau, 2001). Geographers and anthropologists have identified many ways in which traditional practices allow for greater adaptive capacity, and how a disruption of social cohesion reduces people's adaptive capacity, making them less resilient to environmental stress (Adger, 2000). At the same time as traditional practices and power structures may increase a society's adaptive capacity, they may stand in the way of people making more permanent adjustments in response to the occurrence, or threat, of longer-term environmental change (Adger, 2000). Specialists in particular areas of adaptation (e.g., agriculture, or coastal zone management) have identified particular policies, such as enhanced communication of information or the development of insurance networks that can assist adaptation (Freeman and Kunreuther, 2002).

Adaptability is the degree to which an organization has the ability to alter behaviour, structures; and systems in order to survive in the wake of the environmental change (Denison, 2007). Adaptability entails translating the demands of business environment into action. Organizations as open systems exist in environment that is complex and uncertain. To survive and make profit, organizations need to adapt continuously to the different levels of environmental uncertainty (Amah and Baridam, 2012). Environmental uncertainty represents an important contingency for organization structure and internal behaviours (Daft, 1998). Organizations need to have the right fit between internal structure and the external environment.

2.2.2 Organizational Resourcefulness

The literature for this variable is mainly from the work of Vilikangas (2010). How do you build organizational resilience beyond the leadership's capability? The defining dimensions are resourcefulness, robustness, and adaptiveness. This considers each issue in turn and describes strategies that will enhance such organizational resilience. Sometimes the most useful strategy may be counterintuitive—rather than hoarding resources for a safety cushion, perhaps the resilient response is to use a resource constraint as a catalyst to develop an innovation capability.

2.2.3 Organizational Learning

The concepts of organizational learning and learning organization did not emerge until the 1980s, but their scientific background and principles can be traced back into many perspectives of management (Garratt, 1999). The idea of organizational learning is accredited to the creation of the 'action learning' process (Revans, 1982), which uses small groups, rigorous collection of statistical data, and the tapping of the group's positive emotional energies (Garratt, 1999). This technique is also reflected in Deming and Juran's quality control system using quality circles, SPC (statistical process control) and PDSA (plan-do-study-action). A few works contributed positively to open up the debate of organizational learning and subsequently the popularity of the concept. These include Argyris and Schon's (1978) double-loop learning notion, Senge's (1990) the 'Fifth Discipline' and Pedler, Burgoyne & Boydell (1991) learning company model. Today, the concept of organizational learning and learning organization has flourished and been defined in a wide range of literature (Levitt & March, 1988; Senge, 1990; Cohen & Sproul, 1991; Argyris & Schon, 1996). However, the definitions bear some concurrent criticism. First, the concept of organizational learning and learning organization is "excessively broad, encompassing merely all organizational change … and from various other maladies that arise from insufficient agreement among those working in the area on its key concepts and problems" (Cohen & Sproul, 1991). Similiar criticism has been raised by many other researchers such as Daft and Huber (1987), Dodgson (1993), Garvin (1993), Hawkins (1994), Huber (1991), Miller (1996), and Popper and Lipshitz (2000). Secondly, most of the definitions

appear to be complementary rather than fundamentally original or conceptually different (Matlay, 1997). This provides overwhelming, but unclear, information to both researchers and practitioners. Finally, the prevailing concept of organizational learning and learning organization bear a strong bias towards the traditional scientific approach to management, and stress the importance of systems thinking and continuous improvement. A few researchers have identified the limitations of the existing framework in current industrial contexts (Kim & Mauborgne, 1999; Wang & Ahmed, 2001). Therefore, there is a need to review the existing literature of the concept of organizational learning to explicate understanding of the organizational learning concept and practices and essentially upgrade the concept to conform to the requirements of current industrial developments.
An organization must learn so that it can adapt to changing environment (Lee, 1999). Given the ever-accelerating rate of global scale change, the more critical learning and adaptation become to organization relevance, success and ultimate survival. Managers must encourage their employees to share and develop their knowledge bases with each other to improve performance. Personal relationships are very important for the meaning full internal transfer of information that will enable the organization to adapt to changes in the environment. Davis and Nutley (2000) gave two reasons why organizations seek enhanced learning. First, because of the desire to maintain flexibility and competence in the face of rapid change and profound uncertainty, in their environment. Second, because of the need to improve their capacity to innovate and compete

2.3.1.Relationship between Knowledge Retention and Organizational Resiliency-

The main objective of knowledge retention is to achieve resiliency and the capability of the organization to operate effectively even under stress. Adler (2008) avers that knowledge retention is a critical component of resiliency. By identifying and codifying critical knowledge, procedures, and processes from individual employees, knowledge retention contributes to organizational resiliency. Should individuals become unavailable temporarily or leave their positions permanently through retirement, promotion, and workforce turnover, organizations can then utilize this core knowledge to maintain or restore operations.

2.3.2 Relationship between Knowledge Management and Organizational Learning

Organizational learning and knowledge management are two parallel-developed concepts in the new economy and are often referred to each other in their definitions and practices. Organizational learning is referred to the changes in the state of knowledge (Lyles, 1992, 1988), and involves knowledge acquisition, dissemination, refinement, creation and implementation: the ability to acquire diverse information and to share common understanding so that this knowledge can be exploited (Fiol, 1994), and the ability to develop insights, knowledge, and to associate among past and future activities (Fiol & Lyles, 1985). Bierly, Kessler and Christensen (2000) define "learning is the process of linking, expanding, and improving data, information, knowledge and wisdom". Organizational knowledge is stored partly into individuals in the form of experience, skills and personal capability, and partly into the organization, in the form of documents, records, rules, regulations and standards, etc. (Weick & Roberts, 1993). Part of knowledge between an organization and individuals is complementary and part of it incongruent to each other's belief systems. Organizational memory maintains the organizational knowledge-base, acts as the foundation of knowledge accumulation and creation, and reflects the absorptive capability of the organizations. Therefore, to create learning environment between individuals and the organization to facilitate interaction and strengthening of each other's knowledge base becomes the main task for management (Adler, Goldoftas & Levine, 1999).

Only recently has organizational learning been essentially linked to knowledge creation. The understanding of the impact of organizational learning on knowledge management can be taken from the "ontological dimension" of Nonaka and Takeuchi's knowledge creation model, which is the process of knowledge transfer among individual, group, organizational and inter-organizational levels (Nonaka & Takeuchi, 1995). It is increasingly important that the learning process move onto a higher level of triple-loop learning, which, combined with organizational unlearning, leads to knowledge creation. From the foregoing the following hypotheses were derived.

Ho_1: There is no significant relationship between knowledge acquisition and organizational adaptability.

Ho_2: There is no significant relationship between knowledge acquisition and organizational resourcefulness.

Ho_3: There is no significant relationship between knowledge acquisition and organizational learning.

Ho_4 There is no significant relationship between knowledge storage and organizational adaptability.

Ho_5 There is no significant relationship between knowledge storage and organizational resourcefulness,

Ho_6 There is no significant relationship between knowledge storage and organizational learning

Ho_7 There is no significant relationship between knowledge sharing and organizational adaptability
Ho_8 There is no significant relationship between knowledge sharing and organizational resourcefulness
Ho_9 There is no significant relationship between knowledge storage and organizational learning
Ho_{10} There is no significant relationship between knowledge utilization and organizational adaptability
Ho_{11} There is no significant relationship between knowledge utilization and organizational resourcefulness
Ho_{12} There is no significant relationship between knowledge utilization and organizational learning

3. Research Methodology

This correlational study was conducted as a cross-sectional survey. The study units for data generation were employees in the manufacturing companies registered with the Manufacturing Association of Nigeria Rivers State Council. The micro-level of analysis was adopted. A sample size of 124 employees was determined using cluster sampling. . Cluster sampling is ideal since the target population is heterogeneous. The independent variable in this study is knowledge management and it has four components; knowledge acquisition, knowledge storage, knowledge sharing and knowledge utilization. On the other hand, the independent variable in this study is organizational resilience and it has three measures: Organizational adaptation, Organizational resourcefulness and Organizational learning. Knowledge management is operationalised using Dewah, (2012) KM questionnaire. On the other hand, three different instruments were utilized in operationalising organizational resilience. The Resilience Scale was used to measure adaptation of the organization; the measures for resourcefulness were based on the earlier study of Valikangas, (2010); while the measures for organizational learning was based on the earlier study of Watkins & Marsiek (2002). The response mode followed a five-point Likert type scale with 5= 'agree strongly', 4= 'agree slightly', 3= 'neither agree nor disagree', 2= 'disagree slightly' and 1= 'disagree strongly'.

Data for this study was analysed using the Spearman's Rank Correlation Coefficient. The test measures the relationship between two sets of ranked observations and degree of relatedness among ordinal variables when ranked respectively. The value of the Spearman's correlation lies between -1 & +1, the sign indicates the direction of association between the independent variable and the dependent variable. The Spearman correlation is positive if the dependent variable increase when the independent variable increases; and it's negative if the dependent variable decreases when the independent increases. A spearman correlation of zero shows no association between the variables (Wikipedia, 2012).on the other hand, multivariate analysis was utilized in testing the moderating effect of technology on the relationship between the dependent and independent variables.

4. Research Results

4.1. Correlation between variables

spearman rank correlation is used to show the correlation between the predictor and criterion variables as depicted in Table 1.

Tab1. Correlation between Knowledge Acquisition and Organizational Resilience

			Knowledge Acquisition	Org Adaptation	Org Resourcefulness	Org Learning
Spearman's rho	Knowledge Acquisition	Correlation Coefficient	1.000	.994**	.267**	.952**
		Sig. (2-tailed)	.	.000	.002	.000
		N	128	128	128	128
	Org Adaptation	Correlation Coefficient	.994**	1.000	.263**	.947**
		Sig. (2-tailed)	.000	.	.003	.000
		N	128	128	128	128
	Org Resourcefulness	Correlation Coefficient	.267**	.263**	1.000	.315**
		Sig. (2-tailed)	.002	.003	.	.000
		N	128	128	128	128
	Org Learning	Correlation Coefficient	.952**	.947**	.315**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	128	128	128	128

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

Tab 1 show significant positive relationship between knowledge acquisition and organizational adaptation (.994); significant positive relationship between knowledge acquisition and organizational resourcefulness (.267) and significant positive relationship knowledge acquisition and organizational learning (.952). Hence, the null hypotheses 1, 2 and 3 are rejected.

Tab 2 Correlation between Knowledge Storage and Organizational Resilience

			Knowledge Storage	Org Adaptation	Org Resourcefulness	Org Learning
Spearman's rho	Knowledge Storage	Correlation Coefficient	1.000	.283**	.306**	.908**
		Sig. (2-tailed)	.	.001	.000	.000
		N	128	128	128	128
	Org Adaptation	Correlation Coefficient	.283**	1.000	.116	.243**
		Sig. (2-tailed)	.001	.	.191	.006
		N	128	128	128	128
	Org Resourcefulness	Correlation Coefficient	.306**	.116	1.000	.389**
		Sig. (2-tailed)	.000	.191	.	.000
		N	128	128	128	128
	Org Learning	Correlation Coefficient	.908**	.243**	.389**	1.000
		Sig. (2-tailed)	.000	.006	.000	.
		N	128	128	128	128

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

Tab 2 show significant positive relationship between knowledge storage and organizational adaptation (.283); significant positive relationship between knowledge storage and organizational resourcefulness (.306) and significant positive relationship knowledge storage and organizational learning (.908). Hence, the null hypotheses 4, 5 and 6 are rejected.

Tab 3 Correlation between Knowledge Sharing and Organizational Resilience

			Knowledge Sharing 3	Org Adaptation 3	Org Resourcefulness3	Org Learning 3
Spearman's rho	Knowledge Sharing 3	Correlation Coefficient	1.000	.297**	.301**	.595**
		Sig. (2-tailed)	.	.001	.001	.000
		N	128	128	128	128
	Org Adaptation 3	Correlation Coefficient	.297**	1.000	.225*	.308**
		Sig. (2-tailed)	.001	.	.011	.000
		N	128	128	128	128
	Org Resourcefulness3	Correlation Coefficient	.301**	.225*	1.000	.257**
		Sig. (2-tailed)	.001	.011	.	.003
		N	128	128	128	128
	Org Learning 3	Correlation Coefficient	.595**	.308**	.257**	1.000
		Sig. (2-tailed)	.000	.000	.003	.
		N	128	128	128	128

*. Correlation is significant at the 0.05 level (2-tailed).

Tab 3. shows significant positive relationship between knowledge sharing and organizational adaptation (.297); significant positive relationship between knowledge sharing and organizational resourcefulness (.301) and significant positive relationship knowledge sharing and organizational learning (.595). Hence, the null hypotheses 7, 8 and 9 are rejected.

Tab 4 Correlation between knowledge utilization and organizational resilience

			Knowledge Utilization	Org Adaptation	Org Resourcefulness4	Org Learning
Spearman's rho	Knowledge Utilization 4	Correlation Coefficient	1.000	.300**	.891**	.177*
		Sig. (2-tailed)	.	.001	.000	.045
		N	128	128	128	128
	Org Adaptation 4	Correlation Coefficient	.300**	1.000	.260**	.113
		Sig. (2-tailed)	.001	.	.003	.202
		N	128	128	128	128
	Org Resourcefulness4	Correlation Coefficient	.891**	.260**	1.000	.264**
		Sig. (2-tailed)	.000	.003	.	.003
		N	128	128	128	128
	Org Learning 4	Correlation Coefficient	.177*	.113	.264**	1.000
		Sig. (2-tailed)	.045	.202	.003	.
		N	128	128	128	128

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

Tab 4 show significant positive relationship between knowledge utilization and organizational adaptation (.300); significant positive relationship between knowledge utilization and organizational resourcefulness (.891) and significant positive relationship knowledge utilization and organizational learning (.177). Hence, the null hypotheses 10, 11 and 12 are rejected.

5. Discussion of Findings, Conclusion and Recommendation

5.1. The Relationship between Knowledge Acquisition and Organizational Resilience

The findings of this study revealed a positive and significant relationship between knowledge acquisition and organizational adaptation (Rho=0.994, $p<0.01$). Similarly, a positive and significant relationship was revealed between knowledge Acquisition and Organizational learning (Rho=0.952, $p<0.01$). The finding of this study also revealed a significant positive relationship between knowledge acquisition and organizational resourcefulness (Rho=0.267, $p<0.01$). Based on the above it was concluded that knowledge acquisition enhances organizational adaptation, organizational learning, and organizational resourcefulness within manufacturing organizations in Nigeria. These findings may be explained by the fact that most of the manufacturing organizations engaged in continuous acquisition of relevant knowledge. They consider the ideas, experience and skills of workers; they scanned their environment to know if there are changes and bring the change to their organizations; they develop the capacity of worker periodically by sending them for trainings, seminars and workshops; and they also draft in experts from other organizations.

5.2. The Relationship between Knowledge Storage and Organizational Resilience

The finding of this study revealed a positive and significant relationship between knowledge storage and organizational learning (Rho=0.908, $p<0.01$). Similarly, the finding of this study revealed a positive and significant relationship between knowledge storage and organizational adaptation (Rho=0.283, $p<0.01$). A positive and significant relationship was also revealed between organizational resourcefulness significant (Rho=0.306, $p<0.01$). Based on the above it was concluded that organization's knowledge storage practices enhances their learning capacities, adaptation and resourcefulness. These findings may be explained by the fact that most organizations carry out knowledge storage; they processes, ideas and innovations and properly extract and codify them; they encourage experienced and productive employees not to leave the organization; they encourage the use of IT facilities and programmes for information processing; they retain retirees by giving them contract opportunities.

5.3.The Relationship between Knowledge Sharing and Organizational Resilience

The finding of this study revealed a positive and significant relationship between knowledge sharing and

organizational learning (Rho=0.595, p<0.01). The finding of this study also revealed a positive and significant relationship between knowledge sharing and organizational adaptation (Rho=0.297, p<0.01). Similarly, a positive and significant relationship was revealed between knowledge sharing and organizational resourcefulness (Rho=0.301, p<0.01). Based on the above it was concluded that knowledge sharing practices within the Nigerian manufacturing organizations enhances organizational learning, organizational adaptation, and organizational resourcefulness. These findings may be explained by the fact that most organizations carry out knowledge sharing; community of practice is a regular activity for them; they encourage and reward experienced and productive workers to mentor new and less productive worker; they encourage socialization/interaction.

5.4 The Relationship between Knowledge Utilization and Organizational Resilience

The finding of this study revealed a significant positive relationship between knowledge utilization and organizational resourcefulness (Rho=0.891, p<0.01). A positive relationship was also revealed between knowledge utilization and organizational adaptation (Rho=0.300, p<0.01). Similarly, the finding of this study revealed a positive relationship between knowledge utilization and organizational learning (Rho=0.177, p<0.01). Based on the above it was concluded that knowledge utilization brings about resourcefulness, enhances organizational adaptability, and encourages organizational learning. These findings may be explained by the fact that most organizations utilize knowledge acquired; they test and implement innovations and ideas; they make most experienced and most productive persons team leaders; they make conscious efforts to recreate products and services and modify processes to meet up with the ever changing environment in; they empower workers to use their initiatives with little supervision to do what they know best. In terms of Resilience of organizations the following findings were made;

The findings revealed that most organizations today exhibit a high level of knowledge management in terms of knowledge acquisition, knowledge storage, knowledge sharing and knowledge utilization. These findings confirm the researcher's observation while interacting with some of the top, middle and lower management staff of the organization. Their responses during oral interactions show they practice high level of knowledge management. As a result, these practices have made the organizations resilient. This is seen in their organizational adaptation, organizational resourcefulness and organizational learning. Thus, these research findings show that the problem of lack of organizational resilience does not emanate from the province of lack knowledge management as it concerns the manufacturing companies in Rivers State.

From the discussion above, it is evident that knowledge management is a practice which help organizations achieve resilience. It also help enterprise mangers and organizations to develop new opportunities, create value, gain competitive advantages and improve performance to attain the organizations objectives and emerging needs (Anand, 2011). Most of the manufacturing organizations have adaptive capacities; they are not rigid and not slow to adopt new ideas; they are agile and able to adapt to any and all crises; they recover quickly after shock; they are on the leading edge of innovation. Most of the manufacturing organizations are resourceful; resources are used to their maximum capacity and beyond; they turn threats and weaknesses into opportunities and strengths; they support creativity; innovation and entrepreneurship; they have alternative to most components. Organizational learning is done in most of the manufacturing companies; people in the organizations identify skills they need for future work tasks; people can get funds and other resources to support their learning and are rewarded if they learn; people view problems in their work as an opportunity to learn; people give open and honest feedback to each other.

Based on the findings and conclusion above, the following recommendations are made: firstly, Nigerian manufacturing organizations should continue to strengthen their knowledge management practices especially knowledge acquisition, knowledge storage, knowledge sharing and knowledge utilization in their everyday activities as this is a sure guarantee for their resilience. One strategy is the creation of posts of Knowledge Management Officers who should oversee the implementation of a Knowledge Management programmes in the organizations. Secondly, the culture of resilience should be instilled in people at all levels of the organization. Thirdly, Nigerian manufacturing organizations should continue to invite experts to train their employees so that they will learn from internationally recognized best practices, knowledge management and organizational resilience. Fourthly, the study established that not all offices in the organizations were computerized and not all employees had access to internet. Therefore it is recommended that every office of the organizations be computerized. In this digital age where every job is dependent on ICT facilities, it is not an option but a survival kit to have access to latest technologies to enable employees to work smartly, effectively and efficiently (Jain 2011). Given that some of the professional's offices are not computerized the study recommends the speedy computerization to enable computer networking, access to internet/intranet, online social networking and establishing online communities of practice. Tacit or personalized knowledge is retained in the organizational systems through sharing, collaboration, socialization. Computers are also used to store and preserve explicit or codified knowledge for future use.

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