

# An Assessment of the Role of Innovation in Entrepreneurship Development: A Lesson for Nigeria

## 4<sup>TH</sup> Inaugural Lecture

Lead City University, Ibadan

Thursday, 24th April 2014



By

**Prof. Felix Abiodun Onabajo**

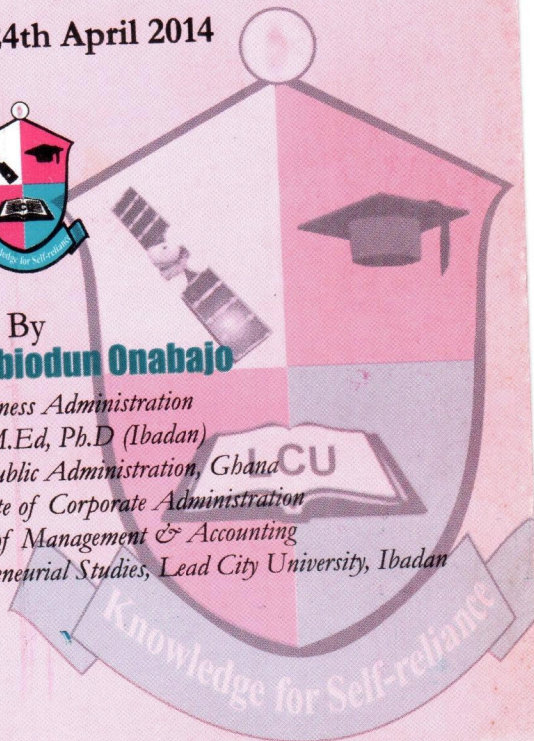
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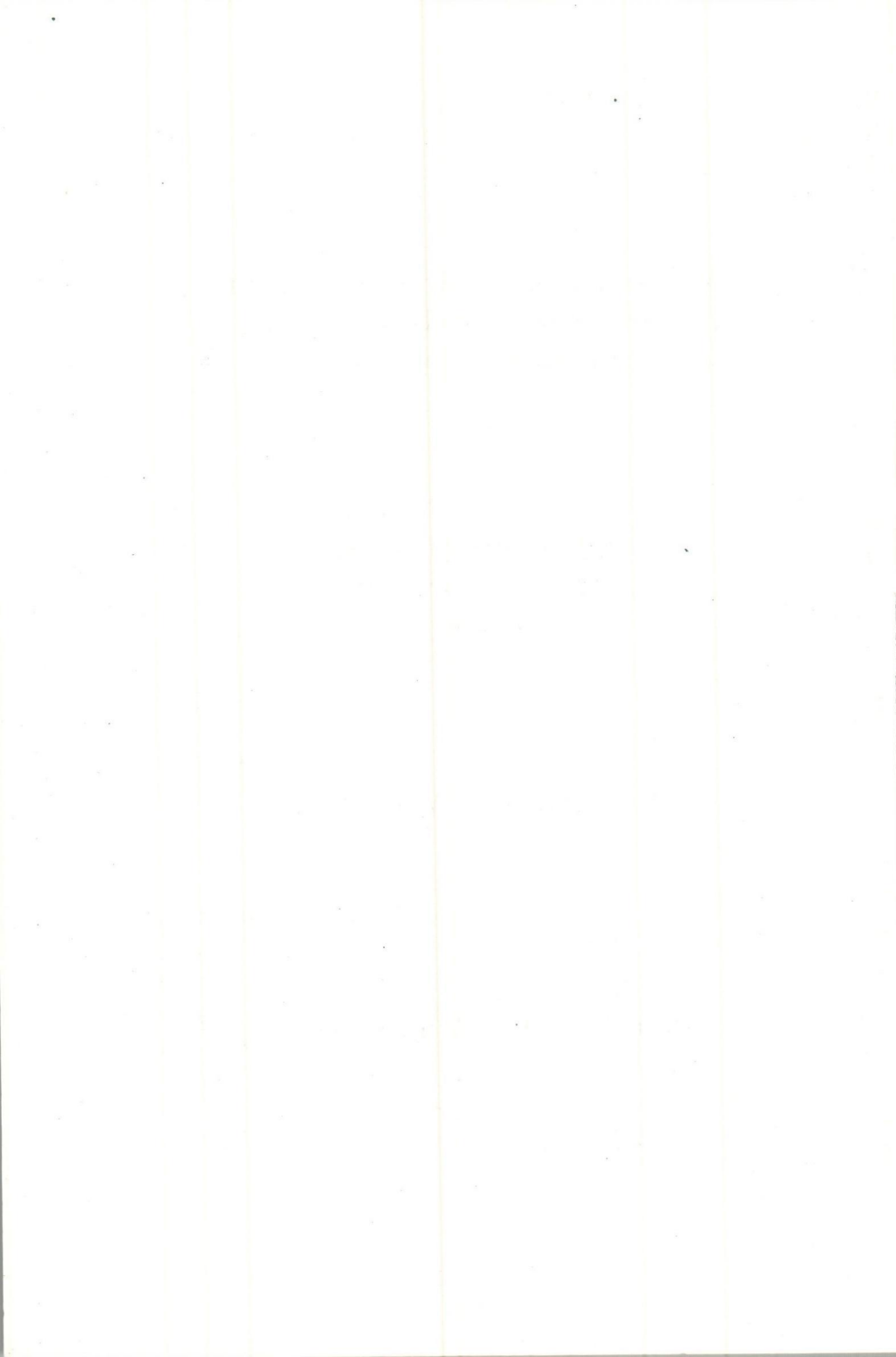
**An Assessment of the Role of Innovation  
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The Vice-Chancellor, Prof. Olufemi Onabajo  
The Registrar, Dr. (Mrs.) Oyebola Ayeni  
Emeritus Professor Johnson B. Aladekomo  
(Pioneer Former Vice-Chancellor, Lead City University, Ibadan)  
Other Principal Officers here present  
Deans of Faculties  
Directors of Departments and Units  
Distinguished Professors and Scholars  
Staff and Students of Lead City University, Ibadan  
Gentlemen of the Press  
Distinguished Guests, Ladies and Gentlemen

I give God the honour and adoration for making me see this day and giving me the rare privilege to deliver my inaugural lecture in the presence of this August gathering of intellectuals and eminent people of our society.

This lecture is aimed at provoking thoughts on issues concerning innovation in entrepreneurship; bringing out their relevance for desired economic growth in Nigeria.

It is essentially focused on the building of capacity through accumulating and improving of physical and human capital to sustain success. It reveals that the adoption of innovation by firms and nations, will significantly influence wealth creation through the gaining of competitive advantage.

## **Introduction**

Innovation is the introduction of modern techniques of doing things to increase productivity level. It is the commercialisation of invention, which has taken place through the use of Research and Development, for instance, when new machines are brought into a firm, they improve efficiency and increase the level of production (Onabajo, 2001).

The term "Entrepreneurship" is used to describe the creative, innovative, risk taking, organisational process and functions of individuals who initiate, run and nurture business ventures (Onabajo, 2011). There are four major types of entrepreneurs. These are:

- The innovator,
- The calculating inventor,
- The over-optimistic promoter, and
- The organizational builder

The types of entrepreneurs are not related to the personality but to the type of opportunities that the entrepreneur faces. The contributions of Entrepreneurs through innovation include:

- Developing new markets,
- Discovering new sources of materials,
- Mobilising capital resources,
- Introduction of new technologies, new industries and new products
- Creating employment (Onabajo, 2013).

It was left to Karl Mark and especially Joseph Schumpeter to identify innovation as the central role of entrepreneurship. According to Schumpeter (1934), "the fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organisation that capitalist enterprise creates" through an entrepreneur. This is what innovation is about and it is very distinct from invention, which is only the springboard or basis for innovation.

### **Concept of Innovation**

The concept of innovation is central to Joseph Schumpeter's model which he set for himself. Innovation is visualised as synonymous with technological change and depicted as the function of the heroic entrepreneur who in return gets pioneer profits. Schumpeter (1968) defined innovation as the setting up of a production function or the carrying out of new combination.

The introduction of a new good; introduction of a new method of production; opening of a new market; conquest of new source of supply of raw material; and carrying out of the new organisation of any industry, are identified as distinct forms of innovation in Schumpeter's model.

Beije (1974) conceptualised innovations as new things applied in the business of producing, distributing and consuming products or services. Beije categorised technological innovation into new machines or equipment (process innovation) and new products (product innovations). He then described technological innovation as the improvements of existing process and products, which have been established on the basis of some technological change created by the innovator and which are commercially exploited.

The overriding motive for innovation according to Mansfield (1982) is the strengthening of the firm's position in the market. This motive may be coming from inherent desire to be the best in a technological sense or it may be forced by the innovative performance of the competitors who are threatening the market share of the firm.

Ejo-Orusa (1980) stressed that; historically, technologically dynamic economies are becoming leading industrial powers and replacing old ones, follower firms and nations that successfully imitate the technological leaders are becoming dominant market forces and developed countries respectively. The process of development is very dynamic; therefore, firms and nations continuously have to keep abreast of the leaders through technological brinkmanship. The policy inference that can be drawn from Ejo-Orusa's submission, is that firms in developing countries especially agricultural firms, must adopt the most modern and most radical technologies because they offer more opportunities for growth. They should also promote diffusion and interlisation of these technologies within the national economy; and they must thoroughly exploit these technologies through minor innovations and continually explore the opportunities for major innovations.

Rosenberg (1969) and other economic historians who have actually studied the technological change process, emphasised that minor or incremental changes may, in fact have more cumulative economic significance than major breakthroughs.

Rosenberg demonstrated with rare clarity that the so-called minor changes are very important facets of innovation. He contended that the economic significance of any major innovation becomes attainable, only after the inevitable modification and numerous minor improvements.

He also contended that innovation can dramatically alter an industry's landscape, making it possible to produce new and/or better products at a lower cost, and opening up a whole new industry frontiers. Technological change can also affect capital requirements, minimum efficient sizes, desirability of vertical integration, and learning or experience curve effects.

## **Globalisation and Innovation**

Globalization is one of the most powerful economic forces of our time. Rapidly shifting global markets are forcing countries throughout the world, to find new competitive niches. The resulting quest for new economic engines is different in every country driven by a nation's distinct economic assets and the specific markets it can tap.

At the same time, economic experts have discovered a whole new set of strategies that offer the greatest potential in helping countries compete in the global marketplace. These new strategies focus more on the country itself, namely, helping entrepreneurs and skilled workers build on their strengths, innovate, and seize new market opportunities, an approach strikingly at odds with past strategies that aimed mostly at recruiting industrial facilities to a country. Under the old strategy national development was often a zero-sum game – one nation's gain was often another's loss (Onabajo, 2014).

Economists have been wrestling with economic development for a long time. It remains an ongoing field of discovery, constantly shaped by innovations in markets, technology, and human behavior. While many important questions are still being investigated, consensus is emerging that national economic development is now driven by principles quite different from the ones that guided practitioners in the 20th century.

Since the early 21st century, researchers have recognised that national economies must constantly create new values in global markets, by exploiting their indigenous strengths. This is a complex process, but one that many experts now refer to as national competitiveness. The process is fuelled by innovation—an ability to invent idea and bases of knowledge that can open up new economic vistas.

If innovation is the fuel in the process, then entrepreneurs are the engines—turning ideas and knowledge into jobs, income, and wealth. Whereas past development strategies often aimed at big firms, small

entrepreneurial companies are the pack mules for economic development in the 21st century.

The importance of innovation in economic growth is not a new idea. Joseph Schumpeter was talking about "creative destruction" nearly a century ago. Over the past decade or so, though, globalisation has brought new attention to his concept, that vibrant economies are constantly churning, with some firms dying and others being born. Under this view, the key to growth is turning a steady stream of new ideas into successful products in the market.

The national competitiveness framework has developed in three distinct strands of economic research. Some economists are focusing on the importance of clusters, suggesting that a concentration of similar firms creates synergies that can fuel growth, (Porter, 1998). Others describe a new economic geography, in which local amenities are critical determinants in creating a pool of skills and capital that can spawn new ideas and businesses to grow a nation's economy, (Krugman, 1991). Still, others focus more on entrepreneurs and innovation, arguing that fresh technologies and the right climate can lead to a rich seedbed of businesses, spurring economic gains. (Acs and Armington, 2004). While each strand has merit in its own right, together, they form a strong consensus that competitiveness is becoming the accepted model for economic growth.

Economic development strategy shifts dramatically when competitiveness is the goal. The very root of competitiveness is a country's understanding of its inherent economic strengths—and the markets available to exploit them. Accordingly, development strategy is moving away from industrial recruitment and being a low-cost competitor, to strategies that help countries identify and exploit their distinct assets—things like human capital and scenic amenities (Onabajo, 2008).

In the 1990s, globalisation forced nations to focus on new sources of competitive advantage. While new strategies to do that are still emerging, the principal strategy is storing innovation and fostering entrepreneurs that exploit the nation's endogenous assets. Because markets shift so sharply and swiftly, the capacity to innovate and to grow a robust seedbed of entrepreneurs increasingly separates countries that can keep pace from

those that cannot. Human capital and the higher education institutions that help create it are crucial assets in this strategy.

The most recent era has been remarkable, in that national strategies are increasingly being shaped by scholarly research. This shift is occurring in part, because development practitioners, confronted daily by tectonic shifts in the global economy, are seeking new answers to pressing challenges. But it is also true that research is developing frameworks that can not naturally address the often conflicting development choices nations must make. While this emerging synergy between theory and practice is encouraging, it is still more evident in local strategy than in national policy.

In every era, the goal for economic development is the same—a prosperity that lifts the economic and social well-being of the residents in the place in question. While that goal has not changed, the era of development thinking, highlights vastly different assets and strategies. In the first two stages, the focus was largely external—rooted in the belief that forces beyond the nation were the drivers of development. By contrast, the current era puts the focus on the country itself, recognising that countries can develop only by exploiting their distinct economic assets, seizing unique opportunities in rapidly shifting markets, and fostering the entrepreneurs that make both happen at once. While some might argue it has ever been thus, the fact remains that the unrelenting pace of globalisation now forces every country to reinvent its economic engine.

In sum, economists have concluded that every nation in the world, must now meet one basic challenge: the vigorous pursuit of a competitive edge in rapidly changing global markets. In this case, building and regaining that edge will involve three steps: understanding the country's critical economic assets, identifying the best market opportunities and crafting a strategy that exploits one to seize the other.

In carrying out this strategy, there are two critical ingredients. First, innovation is the new fuel in creating national competitiveness (Council on Competitiveness, 2004). In a global market where the costs of producing basic products is often several times lower in other countries, the key is to find the next new product, not compete on the old one. Innovation should be the fuel to create the new ones.

Entrepreneurs are the second key ingredient. As old products reach a mature phase and competition intensifies, countries need more than the fuel of new technologies and fresh ideas. They also need entrepreneurial engines to drive new growth. Not all of these engines will keep on running, but those that do, will define a nation's competitive edge in the marketplace. These two key ingredients have strong synergies. Drucker argues that innovation is the "specific tool of the entrepreneur" and the means by which change and innovation are brought to the marketplace (Drucker, 1985). Moreover, he suggests that entrepreneurs can become more proficient in leveraging innovation—that a "purposeful and organized search for change" can yield more and better entrepreneurs.

In many respects, the quest for national competitive advantage is all about a more systematic approach to innovation at the national level. To grow, nations must have the capacity to innovate and grow business enterprises. While the federal government of Nigeria touches both, it does so in an ad-hoc way, and with no clear connections drawn to national economic growth.

Nonetheless, if competitiveness were to become the defining framework for federal development policy, then new policy efforts on innovation and entrepreneurship will be an important part of the policy mix. Drafting a new national policy on entrepreneurship and re-engaging higher education institutions are two clear steps in this direction.

Entrepreneurs will be critical drivers of national competitiveness in the coming years. While the nation's commitment to supporting small businesses now stretches back to 25 years, federal policy has not yet embraced the broader concept of entrepreneurship. Simply stated, entrepreneurship involves far more than simply managing a small business. Many experts believe the time has come to draft a national policy on entrepreneurship and they have identified five policy arenas where federal action should have a big impact on entrepreneurship, these include:

- Creating financial markets for entrepreneurial growth
- Investing in basic research and development, while protecting intellectual property for technologies that underlie many enterprises
- Investing in technically talented people and encouraging mobility.

- Opening of new markets and helping enterprises enter them.
- Establishing a robust and dependable infrastructure (Onabajo, 2011)

There is no doubt that traditional technologies exist in most Nigerian societies prior to the advent of the Colonial era. The available technologies in these societies covered every aspect of human endeavour as far as the basic necessities of life are concerned. With the majority of the population in the country engaging in agriculture and related activities; it seems logical to suggest, that the agro-allied industries provide the best platform for the development of small-scale industries.

In developing appropriate technologies for this class of enterprises, consideration must be given to the level of technology-assimilation capacity, available capital and existing market for the product. Based on this consideration, one of the strategies for technology development is, the upgrading of indigenous technologies particularly in the areas of conversion of raw materials into intermediate products, production of agricultural implements, small metal working tools, arts and crafts, based on locally available resources (Onabajo, 2011).

These innovations are constantly being made available through research and development activities of institutions such as universities, polytechnics and research institutes. These established organisations should pursue their objectives mainly in the areas of development of appropriate technologies suitable for their peculiar environment and in some cases unpack and adapt imported technologies to suit local conditions and capabilities.

Technological innovation may involve the development of process technologies for the production of consumer products or intermediate products that will serve as industrial inputs. It can also involve the modification of existing processing methods, in order to make the processing more efficient and cost-effective with the ultimate aim of enhancing profitability. Design and fabrication of processing equipment, modification of imported machinery and local fabrication of spare parts, are other areas of technological innovations that are very essential in the promotion and survival of small-scale industries.

Surprisingly, generating profitable innovation in Nigeria today is far from easy. Many companies fail to effectively generate big new concepts and assess whether they are "sustaining" (improvements to existing lines) or "disruptive" (potentially cannibalising, and thus needing to be nurtured as a whole new business). And, once a new concept is developed, the value chain that builds and brings it to market often cannot cope effectively with the dramatically increasing complexities of global markets (Adegoke, 1993).

The reasons for this are many. Some manufacturers lack incisive information on customer needs, supplier capabilities, product profitability, and supply chain costs. Others are ineffective at collaborating internally with customers and suppliers. Still others have difficulty matching supply with uncertain demand or are thwarted by inflexible, high-cost supply chains. Given the challenges for effectively managing the entire product lifecycle—from idea to launch to after-sales service—it is perhaps of little surprise that entrepreneurs overall, are reluctant to spend appreciably on Research and Development.

Based on the success factors behind innovations and in-depth analysis of best practices, there are some very decisive steps that enterprises in this country can take to enhance productivity through innovation (Onabajo, 2011):

#### **i. Exploiting Innovation**

Turning ideas into growth and profits: Enterprises that successfully exploit innovation maximise profits throughout the entire lifecycle of a new product; essentially they look at it as a "profit cycle" rather than as a lifecycle. Most companies focus on the front end of the cycle creating a product that will make a big splash with customers. Good companies realise that this is only the first leg of a long race. They know the profitability of a new product can erode rapidly if its design cannot be updated quickly and cheaply, if it cannot be marketed and serviced cost-effectively, and if other "downstream" activities are not dealt with at the outset.

## ii. Building Innovation Capabilities

Behind the ability to create and exploit new ideas are four key capabilities that should propel entrepreneur to success:

- Better visibility, both upstream and downstream in the value chain, through access to information on product profitability, production and distribution costs, and the ability to model future scenarios.
- Flexibility in product designs and platforms that allow for quick modification of product offerings to meet market demands, and flexibility in the supply chain network to quickly shift manufacturing loads, production volumes, and product mixes.
- More extensive collaboration with customers to define product requirements; and with suppliers, to design components and new materials. Entrepreneurs are also far more likely to have methodologies and processes in place for managing the lifecycle of their products.
- Use of advanced technologies for product life-cycle management (PLM), product data management [PDM], customer relationship management (CRM), and advanced planning and scheduling (APS).

Such capabilities give these manufacturers an edge in creating, evaluating, and exploiting innovation throughout the entire lifecycle, from idea to launch to after-sales service. Profitable growth through innovation may be difficult initially, but without innovation, companies will eventually languish and fail. As current researches show, however companies with an in-depth understanding of the challenges, opportunities, and capabilities for building an "innovation machine" are rewarded handsomely with high profits, stronger growth, and more value for shareholders.

## **Factors in Success and Failure of Application of Innovation to Productivity**

There are no magical formulae for innovatory success, and it is more or less possible to sum up the results of various studies by asserting that, success is a matter of 'good common sense' and 'overall management competence'. This lecture shall deal with a number of the success factors separately below:

**Understanding and Meeting User Needs:** The need to gain an imaginative understanding of user's needs, and of interpreting them in the design of a new product or process, is obvious. Nevertheless it is evident from the many empirical studies in this area, that firms are very often deficient in this respect. For whatever reason, they are simply unable to establish the optimum performance and price combination from the point of view of the eventual user, and this is the most frequent quoted cause of failure, (World Bank, 2010).

**Effective Coupling with the Marketplace:** This is essential in establishing the optimum performance and price combination. In some industries, it means actually involving the customer in the development process. Indeed, in certain industries, as we have seen, the user will often play a very significant and sometimes the major role in invention and early prototype construction. It is also important, of course, to keep in touch with supplier innovations in materials and components (Carter, 2004).

**Effective Internal Coupling:** This is especially important with respect to linking effectively the R&D and marketing functions; in other words, ensuring that development activity is clearly directed towards meeting user needs. It is also important with respect to linking the design and development function to the manufacturing function in order to ensure that products are designed to be efficiently and reliably manufactured (Hornaday, 1982). This is one area in which the Japanese, for example, are particularly strong (Hirsrich, 1992).

**Effective Coupling with External Sources of Scientific and Technological Expertise:** Whilst there is no substitute for inhouse technical skills, it is nevertheless important to complement these skills when necessary with external expertise. The ability to identify external expertise in specific areas and to do this rapidly, can often make a crucial contribution to innovatory success.

**Gifted And Committed Intrapreneurs:** These are the so-called project champions, business innovators and technological gatekeepers (Rothwell *et al.*, 1974; Rothwell, 1975). The project champion enthusiastically supports the innovation, especially during critical phases. He remains committed to it when things appear to be going wrong and others are thinking of abandoning it. The business innovator plays the key managerial role of integration, coordinating the efforts of those involved in the project especially from functionally separated departments. The technological gatekeeper plays an invaluable role in bringing technological information into the firm and in disseminating it throughout the firm. Whether or not these key individuals can operate effectively, is a function of both corporate culture and structure.

**Efficient Manufacturing Procedures:** The importance of eliminating technical bugs before commercial launch is obvious. Nevertheless, it is a message that does not appear to reach many would-be innovators in Nigeria to their cost; however this is another area in which the Japanese have great comparative strengths.

**Efficient Aftersales Service and User Education Selling:** a new product is not simply a matter of transferring a piece of technology, but rather of offering an economic package. Servicing and spares supply are important components of this package; so too is user education. It is crucial to train users in the right uses and limitations of a new device, otherwise if they do misuse it and it malfunctions, they will, with some justification, blame the supplier and not themselves.

It can be seen that all the factors listed above are concerned with what the firm actually did or did not do during the innovation process; in other

words they are all project execution variables. To these we can add a second set of factors that outline essentially the preconditions for corporate innovation, i.e, that define a corporate framework in which innovation can take place (Onabajo, 2013).

The first of these factors is top management commitment to, and visible support for, innovation. Top management visibility is absolutely crucial, especially in the case of major innovations, to overcoming the barriers and resistances to innovations that often exist in companies. For example, people committed to one area of production might resist moves to new areas and it is a top management function to facilitate such shifts. This is especially important within the framework of reindustrialisation.

The second factor is the importance of having a long-term corporate strategy in which innovation plays a key role. Innovation should not be an ad hoc process, but one that has direction and purpose. It might be that firms are sometimes compelled to innovate in response to unexpected competitive actions, in response to sudden market shifts, or in response to the emergence of a significant new technological capability, but such cases should be the exception rather than the rule. Firms need a strategy in order to obtain synergies between R&D projects, manufacturing projects and marketing projects. Properly planned, one project can contribute to the next project and so on. In order words, a coherent strategy enables firms to build on past successes and to capitalise effectively on emerging strengths. The third factor is the need for an associated long-term commitment to major projects, based not on criteria of short-term return on investment, but on considerations of future market penetration and growth. There is a good deal of evidence to suggest that many firms, particularly in the United States and the UK, increasingly have adopted a 'cash flow' view of development activity and as a consequence, have focused increasingly on short-term projects that yield quick returns. While innovation, and especially major innovation, requires a longer-term view, at least some of the firm's projects should be funded with patient money (Hayes and Abernathy, 1980) to nurture them to success.

The fourth factor is corporate flexibility and responsiveness to change. In some industries, production sequences have tended to become increasingly specific with respect to the production of dominant product

designs. This means that, they become more and more rigid and less able to accommodate product changes. In other words, because of increasing inflexibility in production, it is often seen as being too expensive to introduce product improvements. It seems likely that the introduction of flexible manufacturing systems will largely overcome the problem, enabling innovative firms to offer not just a single dominant design, but a 'family' of designs having a broad range of operation characteristics to appeal to a wide range of customers. We should also recognize that technological innovations might require organizational and market innovations to facilitate their implementation, and again this is especially the case with radical innovations. Management must accept this and the company should be sufficiently flexible to accommodate it. The fifth factor is top management acceptance of risk. Innovation is inherently a high-risk undertaking and one of the few things we can be sure about is that, there will be failures. Management must accept this, and not use one failure as an excuse for withdrawing from the innovation race altogether. In addition, attempts should be made to learn the lessons of failure through analysing unsuccessful projects, which many firms fail to do.

### **1) Impact of Technological Innovation on Entrepreneurship**

One of the main impacts of technological change on production and on employment as related to entrepreneurship, is the requirement of higher flexibility. This fact has adopted different ways that have implied necessary changes in organization of Production, in firm's structure and in the demand of employment.

Flexibility has acquired namely the following dimensions:

#### **i. Automation**

Investors nowadays look for the substitution of labour to improve efficiency and productivity through automation associated to the development of new technologies such as microelectronics, information and telecommunication technologies. Firms have implemented new manufacturing tools that permit them to obtain products faster, to improve their quality and their design. In fact, this is part of the innovation strategy that has led firms to find new sources of competitive advantages.

Computers, new flexible systems of production, numerically controlled machines and digital systems, have improved productivity and the result of production. However, the automation of production processes may destroy jobs or at least reduce rates of employment increase: besides, these new tools have altered the qualifications and skills requirement of the work force. In general, some skills have become obsolete, and higher levels of expertise are required. This will imply a new policy on education and training. This policy should be focused on the continuous training of work force at their jobs, and education of management on new techniques of production.

#### ii. **Work Re-organisation**

If we define innovation as the first successful application of science and technology to a new commercial idea, it implies that it is necessary to consider a wide field of subjects, such as research, development, production or distribution. For this reason, it is important to be an expert and at the same time, be able to cooperate with those experts on other subjects where the firm is not specialised in. As a result, new ways of organising production like decentralization or subcontracting have appeared. Besides, the creation and promotion of networks have become the main focus of any policy for innovation, technology or employment. Internally, at firms, support is necessary to assist the complex decisions that the firms have to make out. This means that the consultancy and advisory services should help to make out better decisions to concentrate in those tasks where firms really have an advantage.

#### iii. **New Division of Labour**

In a context of increasing globalisation of economies, advanced countries have concentrated on quality, design and added value competition. For this purpose, they have adopted a strategy of diversification in innovation. As a result, firms have transferred manufacturing operations of low added value to low-wage developing countries, and have specialised in high technology activities and in those products with a significant content in terms of knowledge. For this reason, in advanced countries of Europe, cheap labour has become less important in manufacturing industries and in

services. As long as Technology development implies productivity growth, this reduces the direct labour content of production in almost all sectors. This is also a result of liberalisation of capital markets and flexibility of firms to decide where they will locate their investments. Capital flexibility and mobility have advanced faster than labour mobility. Therefore, Europe and the other developed economies are competing in knowledge, technology and innovation, but no longer in prices or costs. Consequently, taking into account their work force, there must be competent terms of qualifications, skills and know-how.

#### iv. **New Demand of Qualification**

If Europe is competing in qualified manpower, the less qualified workers will be the worst affected group by technological change. If there is not an accurate policy of training, there will also appear permanent differences in terms of wages.

The wages will reflect the increasing demand of qualified workers and the decline of low qualifications demand. Differences in wages are becoming higher depending on qualifications. Technological change has led firms to increase the level of expertise of their workers, and as a result to pay higher wages. The demand of low qualified workers has declined as the ways of production have changed. Even though unemployment does not rise, in fact, job quality is going to be affected, provided that there is an increasing group of workers poorly paid. Therefore, the capacity of economies to adapt to technological change and to provide work force according to the new demand of qualifications, is going to be the determinant factor in order to check if finally, the result will be a better qualified work force, better paid and more flexible, or on the contrary, the economy will face increasing unemployment rates or a damage of working conditions. In fact, the main cause of technological unemployment is the lack of adequacy of correlation between education and professional training and the new opportunities of employment. New technologies have obliged to develop human capital and to the workers, to continuously train themselves in their work. Workers must specialise strongly in their work and develop their expertise, but at the same time, they must be aware

of the need to interact with other actors taking part in the production activities (Onabajo, 2010).

Mobility and the development of skills for creating working teams for organisational learning, for the exchange of information, for participation, communication and cooperation, are the key elements in the new training and education policies. Besides, it is very important considering possibilities of new information and telecommunication technologies, to accelerate their diffusion in society and their introduction in production as they may enrich work and increase productivity.

### Methods of Transferring Innovation

Generally the methods used to transfer innovative changes are:

- i. Diffusion of technology mental process, through which an individual passes from first learning about an innovation to final adoption.  
This involves the following steps:
  - (A) **Awareness:** The stage when the individual first learns of innovation but lacks full information about it.
  - (B) **Interest:** The stage when he deliberately seeks out the missing information
  - (C) **Evaluation:** The individual considers the use of innovation and makes decision whether to try it or not
  - (D) **Trial Test:** To assess the values of the innovation to meet present and future situation.
  - (E) **Adoption:** The stage when the trial is extended to full use of innovation.

### Transfer of Innovation by Contract:

This is the commercialisation of technology transfer. It may take the forms of;

- (a) Trade (Importation of machinery and equipment, supply of special materials, components parts, intermediaries, etc.)
- (b) Direct investment ranging from the setting up of wholly owned subsidiaries to buying of minority interest in trading companies.

- (c) Licence agreements covering patents, management, and technical services. Know-how, trademarks,
- (d) Flow of published information, financial support, technical assistance under international programme that can permit new business opportunities. In this sense, training is necessary not only to avoid unemployment and to adapt skills to technological change, but also to transfer innovative potential into new possibilities of employment (Turkson, 2007).

### **Innovation as a Tool for Creating Employment**

Technological changes open new possibilities of investment, of benefit and improvement of competitiveness. If investment is carried out, then technological change through innovation occurs, this is, commercial exploitation of technological potential, which can provide new opportunities of employment. The problem is that investment must be understood in a wider sense. Investment is more than financial capital. Investment must be focused not only in tangible actions but also in intangible actions. This implies technology transfer, development of know-how, training and education that permit assimilation of new knowledge and utilisation of research results. Obviously, these aspects ask for necessary changes in current institutions. They imply making more innovative industrial organisations, and more entrepreneurial, research institutions. Therefore, coordination, cooperation and integration of objectives are imperative. Firms will not survive in the market without useful ideas, this makes it necessary, to promote innovation and endogenous potentials of firms, like human resources, as new sources of growth and employment.

Nowadays, in the current context of economic and production relationships, firms have become the promoters of change and the main vehicle of innovation diffusion in the market. Firms are the meeting point between scientific knowledge, production and the market. Their significance in the innovation process is clear in their role as instruments of training, learning and exploitation of research results. Technological change has made possible in some cases, production of goods and services at a small scale. This fact opens new possibilities for SMEs in a context of

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How I wish my parents Papa & Mama N.A. Onabajo were alive to witness their son's glorious occasion. They gave me the impetus to succeed in life.

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Mr. Chancellor sir, Pro-Chancellor and the distinguished guests, please permit me to end this lecture with the expression "I thank God for all our lives".

Osuji. All of the University of Ibadan; Prof. Titi Hassan and our own indefatigable Prof. Jide Owoeye, who apart from being my employer at Lead City University, generously subsidised the cost of many of my publications. I will also cherish the contribution of his wife, Mrs. Taiwo Owoeye, who despite her busy schedules, personally takes time to edit and correct errors in many of my articles due for publication at the College Press.

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To my siblings and in-laws who are here today, Prof & Mrs. Olufemi Onabajo, Chief & Mrs. Gboyega Awokola, Engr. & Mrs. Dele Onabajo, Mr. & Mrs. Bisola-Ojo, Mrs. Tito Omogbeyin, Mr. & Mrs. Oguntolu, Mr. & Mrs. Olaseinde, Mr. & Mrs. Jide Adeyemo, Mr. & Mrs. Oluwole Adeyemo, Mr. & Mrs. Oke, Mr. & Mrs Femi Adeyemo, Mr. Yinka Adeyemo, the Babatundes and others, I say a big thank you.

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My journey into the Academia is somehow funny. Even though I combined a rare combination of wit, intelligence and style, I was very reluctant to go into teaching opting rather to join the Administrative cadre where I made hay as the examination and records officers deployed by the registry to serve in the Postgraduate School, University of Ibadan. The desire to be independent and enjoy some form of academic freedom lured me into the noble profession of teaching. I hastily took up the challenges and completed the Doctor of Philosophy degree of the same university between 1985 and March, 1989.

Instead of joining the Academia on completion of the programme, the urge to get rich quickly drove me into the finance world, where I rose to become the General Manager and then Director of Public Finance Securities, Lagos.

Nevertheless, the frustration and disillusionment occasioned by the annulment of the 1993 famous election, broke the spines of several finance companies that could not cope with the run on them by the investing public.

It was then God intervened and used my elder brother, Prof. Olufemi Onabajo, the current Vice-Chancellor of Lead City University, to redirect my footsteps to where I should be.

I thank him greatly for being my mentor and guide. In fact, he taught me how to write and publish articles in respectable journals.

Today, I am a proud author of fifty articles and two books, notwithstanding my contributions in Books of Reading. I have also successfully supervised 128 M.Sc and M.BA Dissertations in addition to seven Doctoral Theses.

I am particularly also appreciative of the mentor-roles of Prof. Michael Omolewa of the UNESCO, Emeritus Prof. V. A. Oyenuga, Prof. Depo Akintayo, Prof. Olujimi Faturoti, Prof. B.L.A. Fetuga, Prof. Emma

- (j) lack of resolution in overcoming difficulties of government regulation, material supply, skill availability, etc.
- (k) poor labour relations policy;
- (l) sluggish internal decision-making systems.

If measures can be put in place to rectify all these anomalies, Nigeria's innovation potentials will thrive and bring out the best in the Nation's Entrepreneurship desires.

## Conclusions

Innovation is necessary to compete in an increasingly globalised market. Besides, innovation provides new sources of employment. As a result, imperative strategies should consider the significance of technology, and what is more important, the commercial exploitation of technology; and the need to develop the human potential as a differentiation factor and a key element, in managing innovation and acquiring knowledge. The unemployment associated to technological change may be due to the fact that technologies have changed the demand of qualifications. As a result, human potential has now become key element not only at starting new initiatives, but also at adapting to innovative change. In general, current human skills do not match labour availability as innovation requires specialisation and very qualified manpower.

For this reason, it is important to provide the necessary tools for the society to acquire new qualifications adapted to the new requirements of technology. This means involving not only employees or enterprises in innovation but also research centers, universities, training centers from an interactive approach, trying to bring together all these actors. Interaction takes place through networking and networks make possible specialization and flexibility. The learning process must be reinforced and continuously promoted, encouraging the utilization of new information and communication tools, and the development of new skills such as team working, creativity, participation and leadership. The aim should not only be that of maintaining actual jobs through adaptation, but the creation of new jobs by self-employment and enhancing quality of jobs.

- c. the wrong balance of competition and safety - too little competition leading to complacency and too much of short views unfavourable to a planned innovation policy;
- d. persistently depressed profits, making ventures more difficult to launch;
- e. exaggerated uncertainty about the pay-off on projects produced by high and varying rates of inflation;
- f. inadequate personal expectation of reward from taking the risk of innovation.

(2) **An Unfavourable Social and Educational Context:**

It is appropriate to treat the educational defects, allowing shortages of essential skills, as subsidiary to social attitudes. Any major innovation is liable to create demands for skills for which adequate training facilities do not previously exist.

(3) **An Insufficiently Supportive Government:**

The interventions of government in advanced economies are so numerous and complex that it is almost impossible to assess whether, on balance, one government is better than another in its efforts at innovation. But there may be a chance that, even within present budgets, the Nigerian government's interventions could be made more effective in supporting innovation.

(4) **Inadequate Management:** This include:

- (a) inability to understand what an innovation is about;
- (b) lack of a policy to draw in relevant information;
- (c) unwillingness to take new knowledge on licence from outside;
- (d) lack of resolution in developing an idea;
- (e) poor assessment of markets, and of needs for customer service;
- (f) poor assessment of investment opportunities;
- (g) tendency to run machines for too long a life;
- (h) undue caution, and readiness to seize excuses for delay;
- (i) unwillingness to alter structures or to seek cooperative arrangements to deal with problems of scale;

The present trend among firms in the competitive market is that of survival of the fittest, where firms are viewed as behaving like organisms constantly under threat and using whatever means available to perpetuate their existence.

These firms now involve in what is known as 'innovative competition; a concept based on the notion of differentiation as the chief means by which firms gain market advantage over their competitors.

Firms spend resources on R and D to establish a competitive lead over rivals, take over other firms where this is their interest and diversify horizontally and vertically as the case may be, to insure against future risks. The firms are not just maximising profits but profit seeking. In order to create a greater chance of success than failure in an innovation process, the control and supervision, in other words the management, are put in the hands of a project champion. This is somebody who by virtue of his senior position in the firm, can convince decision makers that the new product is promising and should be developed and marketed. He could be the chairman or the technical director and should be prepared to stake his reputation to achieve acceptance of a new idea. It is now known that of all the factors considered as favoring success in innovation, the project champion is the most common single factor, representing on the average, about 25% in all the various types of industries.

Since innovation process is complex, costly and risky in nature, the project champion sometimes called the 'top person', must have the courage; persistence, and expertise specialisation in the process of generating innovation.

### **Reasons for not Innovating**

A number of reasons exist however in Nigeria that make firms shy away from innovation. These include (Onabajo 2014):

- (1)
  - a. An unfavourable economic environment for innovation
  - b. slow growth implying few opportunities to embody new ideas in expansion: but, of course, slow growth may be the consequence as well as the cause of a failure in innovation;

cooperation and interaction with other actors of the science, technology and industry system. In this way, enterprises find out new possibilities of business in the application of technology through innovation (Onabajo, 2010).

Nigeria is interested in promoting her competitiveness and at the same time, a sustainable growth based on the creation of employment. This has to be not only with the creation of new jobs, but also with enhancing the quality of jobs in order to attain industrial and commercial success.

To transfer innovation into employment, concerns an articulated policy around the basic following aspects:

### **1. Integration of Science, Technology and Industry Systems**

Innovation policy must be adapted to the specific possibilities and needs of national industry so that synergies can emerge. In this way, innovation can be introduced in production structures. This has implications in terms of research policy. Research must therefore be oriented and planned in order to match industrial needs. In this way, and with the accurate support, spin offs may be possible.

In this sense, mobility schemes between research laboratories, R&D departments, universities and firms may help scientists to understand the behaviour of the market.

### **2. Technology Transfer Support:**

Knowledge is more and more complex. Besides, it is not always transferable. Actually, it is acquired through practice, experience and learning. At the beginning, innovative firms and start-ups do not have these abilities.

They need expertise to acquire knowledge and technology. Technology transfer programmes may contribute to achieve it. This concerns advisory services, technical experts support, and support for commercialisation in terms of information and also, infrastructure and physical equipment availability that firms cannot afford by themselves. The Federal and State Governments therefore have to come to their aid.

### 3. Fostering Entrepreneurship

One of the biggest difficulties in transferring innovation is the commercialization. It is at this stage, that added value is really generated, leading to exploitation of research results. In this sense, it is important for the anticipation of changes, new trends and the knowledge of the industrial needs and the market. Prospective activity and assessment to start ups must be provided in order to detect new market niches. Lack of relevant information on markets, technologies and financial instruments is often an obstacle in establishing a new firm. Generally, government should promote the culture of entrepreneurship in order to achieve meaningful development for the economy. It is necessary to look for new financial mechanisms, to improve the access and the availability of risk capital to support the creation of new firms.

A rigorous activity, in order to develop schemes with public support at first stages, to orientate private capital towards emergent firms, must be carried out. Exchange of best practices in this aspect and demonstration activities, may contribute to increase the amount of available risk capital. Intellectual property must also be encouraged. In the one hand, it is necessary that research results are known. The diffusion of available knowledge alerts possible entrepreneurs on opportunities of business. Sensitisation of the need to establish intellectual property is necessary to avoid research results remaining secret. This means that accurate strategies to protect innovation need to be established. The improvement of the access to patent information will foster the utilisation and dissemination of knowledge.

Furthermore, the human element greatly determines the success of entrepreneurial projects. The access to skills and competences is a key element for firms. Firms need human and technological resources. However, it is possible and probable that human competences in Nigeria have not been developed yet by new firms. This concerns entrepreneurial, managerial, marketing, financial and technological competences. This should be done through Technological Incubation Centres, attendance of seminars and workshops to facilitate innovative changes in all states of the federation.

## **Strategies Adopted by Firms in Dealing with Innovation**

When confronted with technological change, there are generally six strategies classified in a descending order of the measure of risk and costs involved:

### **1. Offensive Strategy**

This is adopted by firms, which intend to achieve technical and market leadership through innovation. These firms are Research and Development (R & D) intensive and their research personnel are of the highest quality. These firms are rarely found in inert economies like Nigeria.

### **2. Defensive Strategy**

This applies to firms that want to avoid the risk and cost of being a leader in the field, but at the same time do not want to be left behind in the technological race. Efforts are more concentrated on the adaptive research, which is concerned with improvement rather than fundamental advance. They take advantage of any mistake by the initiating firms and try to improve on the original technology. Most companies in the industrialised countries adopt this strategy. Again, they rarely exist in the inert economies of the world.

### **3. Imitative Strategy**

In this strategy, resources are invested to reproduce carbon copy of what is already in the market. The ambition is not therefore to improve on innovations but merely follow the lead given by others. R and D expenditure is normally low with concentration on scientific and technical services.

These firms survive on low cost production and bear relatively low risk as they would normally sell known products, which would have been introduced into market by the earlier producers. Firms in this strategy exist more in competitive industrial environment and a few of them exist in inert economies like Nigeria and Ghana (Onabajo, 2001; 2009).

4.

### **Dependent Strategy**

The firms in this category accept satellite or subordinate role to other firms, operating as sub-contractors to dominant companies. Normally, they do undertake research but whatever budget they have for R and D, is geared to the technical requirement of their customers. They do not even imitate products as this is normally specified for them by the firms they are supplying. They are usually small in size. These firms abound in industrial economies and in newly industrialising ones.

### **Traditional Strategy**

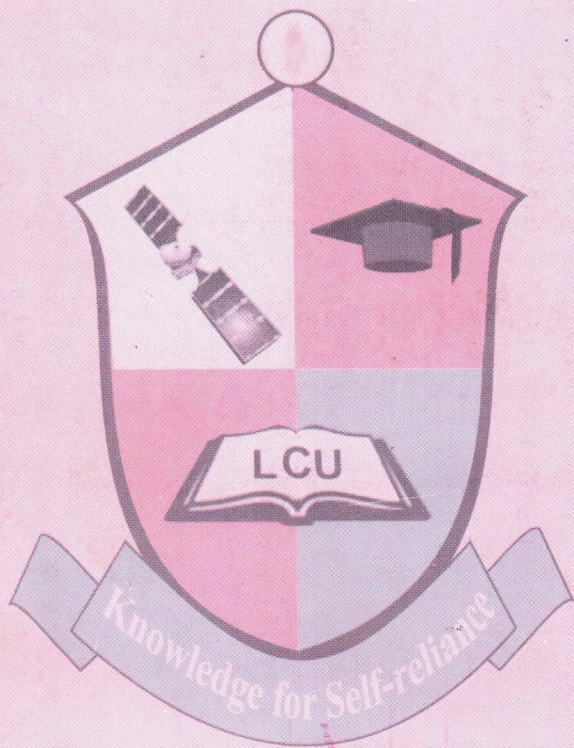
The firms in this category engage mainly in craft such as hand-weaving or pottery and the like. The market for their products requires little innovation and therefore does not force the firms to adjust. Mere fashion and design changes are often enough to guarantee their survival. As 'peasants of industry', they do not undertake any R and D. These firms exist both in industrial and in developing economies.

### **Opportunity Strategy**

This is the strategy adopted by companies that survive on their ability to identify opportunities in the economy and are able to respond to them. Efforts are concentrated on excellent management control and the stocking and ordering efficiency.

No one would expect therefore that firms in inert economies would be adopting offensive and defensive strategies, and any policy that compels all manufacturing companies in poor economies shows a lack of good understanding by policy makers of the complex issues involved in the innovation process.

Even in highly developed countries, many firms do not invest in R and D, some preferring to wind up instead of innovating. Because of the complexity, cost and uncertainty of the innovation process, it is probably only a threat to their survival in a competitive environment, that would motivate them to innovate.



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