

The Need for Formalization in Innovation Management of Nigerian Construction Industry Consultancy Firms: An Overview

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 Formalization Of Innovation

Abstract - Construction industry has, over the years, been criticized of inefficiency in its project delivery. The industry's operation systems therefore need to be revitalized in order to realize expected and even greater economic gains from its activities. Innovation is the most generally accepted and recommended strategies for re-engineering any economic sector in order to meet the customers' demand, market competition and other challenges of the modern businesses. The roles of the built environment professionals (i.e., the consultants) in the realization of construction projects can never be over-emphasized as they are responsible, especially, in its conceptualization, planning and execution and also in the re-engineering of construction projects. Previous researches show indication of innovation practices among consultancy firms in Nigeria but the desired improvement in the operational efficiency of the construction industry and/or earned benefits from these firms' innovation engagements are often not visible. The reason for this is that most of the construction consultancy firms usually adopt innovation merely for satisfying the current market needs or to achieve business operations convenience in more or less ad-hoc fashion without addressing some critical issues (i.e. proper planning and documentation) deemed associated with innovation in their innovation adoption and practices. The objectives of the study are to review existing literatures on the concept of innovation and its practices and to bring into highlight the need for formalization as vital ingredient of innovation practices in order to realize its potential benefits in the industry. The paper concludes that formalization is an essential ingredient for successful innovation practices and recommends that firm willing to profitably offer satisfactory services to its various clients and become relevant or sustain its relevance in the globalized competitive market need to properly formalize its innovative changes.

Key words: Construction Industry, Consultants, Innovation, Formalization.

1.0 INTRODUCTION

The theme of innovation seemed to resonate everywhere as the solution to the onslaught competition dilemmas faced by construction and other business organisations brought about by the rapid and continuous change arising from accelerating rate of technological changes and market globalization. Previously successful survival strategies now remain extremely ineffective because of the rapid changes in the organisational systems and the social and cultural

processes that hitherto maintain and sustain them (Miller, 2008).

The objective of this study is to bring into highlight two diverse but complementary theoretical concepts to further the understanding of the concept of innovation in the construction industry and to have an overview of the crucial relationships between them (i.e., innovation and formalization) as a way of enhancing innovation practices, especially among the construction industry consultancy services firms. The decision to undertake this study is in response to questions that formed as we observed and experienced failures of some of the transformations programmes which failed to realize their intended objectives in the Nigerian construction industry. Although there are literature evidences that numerous research have been carried out on formalization and innovation concepts, relatively little attention has been devoted to exploring the relationship between them Miller (2008), especially in the construction industry consultancy services firms. This study is therefore intended to fill this gap.

1.1 Concept and meaning of innovation

The term innovation has been variously defined by different researchers from their various perspectives. D'Wan et al, (2005), consider it as a process that involves the generation, adoption and implementation of new ideas or practices within the organisation. The UK's Department of Trade and Industry (DTI) defined innovation as the successful exploitation of new ideas and that 'it is the key business process to compete effectively in the increasingly competitive global environment' (DTI, 2007). Slaughter (1998) however defines innovation as 'actual use of non-trivial change and improvement in a process, product, or system that is novel to the institution developing the change'. It is important to emphasize that the slaughter's definition above aptly capture construction industry innovation, where frequent manoeuvrings (changes in operation techniques) are essential regular features of the construction site operations due to constant construction site and design variations. Hence, for such changes to become innovative, it must be novel and non-trivial and possibly attract considerable commercial benefits as implied in the Slaughters' definition.

Following Rogers (1995), Slaughter (1998) and D.Wan et al, (2005), this paper considers innovation as ‘a deliberate search (or acquisition), establishment and application of change in the organization’s process, product, or system during its production operations or services delivery, with a view to improve performance’. Innovation is also defined as “an idea, practice or an object that is perceived as new (the lapse of time since it was first discovered or used) but the perceived newness of the concept for the individual is what matters and determines their reaction to it. Thus, according to Steele and Murray (2004), innovation is not exclusive to new idea because, an individual may have known an innovation for a long time but, yet did not feel any affinity with it nor held judgement on its adoption or rejection. In this respect, the “newness” aspect of an innovation may only be expressed in terms of knowledge, persuasion or a decision to adopt (Steele and Murray, 2004). It is therefore irrelevant whether or not an idea is objectively new (or lapse of time since it was first discovered or used) but the perceived newness of the concept for the individual is what matters and determine their reaction to it. In effect, therefore, an innovation is any programme, technique or activity (or practice) perceived as being “new” (Rothman, et al, 1976). These definitions also make it clear that innovative activities emerge from the application of intangible assets that integrate knowledge,

skills, and technologies in the development and commercialization of products and processes.

1.2 Attributes of innovation

For proper understanding and measurement of innovation, it is important to understand its characteristics or attributes. Stone et al. (2008), in their work identified ten attributes relating to innovation and these are explained as follows.

Attribute 1. Innovation involves combination of inputs to create outputs: For innovation to occur certain crucial inputs must be available and the exact nature of those inputs differs depending on the desired outputs and outcomes. For construction innovation, there is generally the combined need for material, mental and technical inputs.

Attribute 2. Inputs to innovation can be tangible and intangible: Tangible inputs have a physical embodiment and cost, e.g., land, buildings machineries, etc. Intangible inputs are those that do not have a physical or tangible existence. They include good will, brand value, and patents (Blair and Wallman, 2001; Jarboe and Furrow, 2008; Lev, 2001) but may have a cost. They are commonly referred to as “knowledge assets” in economic literature and as “intellectual assets” in business management literature. See the summary of the classifications in Table 1.

Table 1. Summary of Tangible and Intangible assets.

Tangible Assets	Intangible assets/knowledge assets
Land and landed properties. ICT facilities Production plants and equipment Raw materials Production facilities and infrastructures	Brand value Patents Intellectual assets R&D progress Organizational learning Skilled specialist employees

Attribute 3. Knowledge is a key input to innovation: Innovation involves the application of knowledge in creative activities. Innovation cannot take place without an understanding of the resources, tools, technologies, materials, markets, and needs in the situation at hand. The tremendous importance of knowledge to innovation process explains the reason for which innovating organizations usually spend significant amounts of resources on research and the acquisition of knowledge (e.g., intellectual property).

Attribute 4. The inputs to innovation are assets. Most innovation inputs, e.g., construction equipment, are considered assets because they are used repeatedly after being created for a single innovation pipeline or are used in a pipeline in a way that generates multiple products (Arundel, 2007).

Attribute 5. Innovation involves activity for the purpose of creating economic value.

Fundamental to the concept of innovation is the innovator’s intention to create something of economic value, i.e., something that ‘is non-trivial’, but offers benefits to consumers and provides economic returns to the innovator.

Attribute 6. The process of innovation is complex. Innovation is a complex process not easily reduced to measurable elements (e.g., R&D dollars spent; number or value of patents obtained). Innovation is also not a linear combination of component factors or limited within the boundaries of firms but may require external collaborations to successfully generate result-oriented innovation (relational innovation). Result-oriented construction innovation requires the cooperation of the major contributors, especially the major consultants.

Attribute 7. Innovation involves risk. The combination of inputs often fails to produce the desired innovation and returns. There is always some probability that the innovation process will not be successful.

Attribute 8. The outputs in innovation are unpredictable. While inputs to innovation (i.e., resources and assets) are easy to characterize, the outputs are difficult to characterize, especially before the process is complete. This is because innovation is complex, nonlinear, and risky; responds to opportunities; and inherently includes aspects of serendipity.

Attribute 9. Knowledge is a key output of innovation. Every tangible and intangible output (i.e., product and process) reflects the firm's knowledge of its resources, technologies, markets, and consumers (otherwise called experience). Based on the experience, the firms can predict or determine its level of innovation capability and plans for its sustainability or improvement (where shortfalls are experienced).

Attribute 10. Innovation involves research, development, and commercialization.

Innovation processes typically involves the above three basic but interconnected stages (Lev, 2001): 1. Learning and discovery; acquired either internally within a construction organization or externally through networks or with partners. This stage focuses on the generation and acquisition of knowledge and skills (the research stage); 2. Implementation; is a stage that involves demonstrating technical feasibility (the development stage); 3. Commercialization; the last and crucial stage and involves promoting product diffusion and facilitating financial and economic returns. Commercialization is the mechanism through which the consumer obtains the benefits of innovation and the innovator obtains the return.

1.3 Innovation typologies

Scholars have variously studied, classified and measured innovation from their various perspectives. A brief review of such classifications is presented here for the proper understanding of the concept of innovation. Among the scholars that have contributed in this respect include Handerson and Clerk (1990) who categorised innovation into four as incremental innovation, modular innovation, architectural innovation and radical innovation. Slaughter (1998), looking at innovation from construction perspective, similarly categorised innovation into five by adding system innovation as the fifth innovation category as explained hereunder;

Incremental innovation; where the innovation is small, and based on existing experience and knowledge.

Radical innovation; where a breakthrough in science and technology is involved.

Modular innovation; where a change in concept within a component occurs.

Architectural innovation; where a change is linked to other components or systems.

System innovation; where the change that occurs has multiple and integrated impact within the whole system (i.e., affect the entire system or organization) (Manley and McFallen, 2005).

The Organisation for Economic Cooperation and Development (OECD) in OSLO manual (2005) broadly categorized innovation into two; viz: Technical and Organisational, and each is further sub-divided as explained hereunder.

Technical innovation; involves either process or product innovation. In construction industry, technical innovation implies the construction techniques and operations.

Organisation innovation; this involves changes to the organisation structure, introduction of advanced Management techniques, and implementation of new corporate strategy orientations (Anderson and Manseau, 1999), such as the creation of a monopoly position (for example through growth of trusts) or the breaking up of a monopoly position. Philips' (1997) similarly classified innovation into technical and organisation innovation but included marketing innovation as the third category as explained in the next paragraph. From Schumpeter's (1934) definitions of innovation the following classifications are also clearly identifiable as adapted by Page et al., (2005).

Market innovation; involves the activity of the firm in entering new markets, or developing a new niche within an existing market, or developing new opportunities for business. Marketing innovation also includes implementation of a new marketing method or evolving significant changes in product, price and promotion strategy (Philips, 1997).

Product innovation; which means the introduction of a new good (that is one with which consumers are not yet familiar) or a new quality of a good; product innovation also means the development of a completely new service product or a significant improvement of an existing service product. The application of new construction materials/components that generates new and significantly improved value to a building is an aspect of construction product innovation.

Process innovation; this refers the introduction of completely new or significantly improved methods of producing or delivering services, including new information and communication technologies. The newly introduced systems buildings such as BIM, IBM as well as the modern procurement systems such as Project Management and PPP (Public-Private Partnership are aspects of process innovation in the construction industry.

Organisational innovation; similar to previous explanation for same above.

Resource innovation; refers to the conquest of new source of supply of raw materials or half manufactured goods or components and may involve acquisition, organisation and management of new resources. New resources can mean new sources of people, knowledge and information. The DTI (2007) in United Kingdom classify innovation into four groups; product innovation, process innovation, position innovation and paradigm innovation.

Product and process innovation; has already been explained in the previous paragraphs.

Position innovation; involves changes in the ways in which the products or services are introduced.

Paradigm innovation; refer to changes in the underlying mental models which frame what the organisation does.

It should be noted that the above innovation typology is only intended to bring an overview of the broad classifications from existing literatures and by no means exhaustive. In fact, it is possible to have many other classifications in addition to those presented above or further re-classifications of innovation from the above list depending on the view perspectives.

2.0 Materials and methods

The paper is a conceptual study and attempts to highlight the importance of innovation in the construction industry as well as the need for formalization of the innovation practices of the Nigerian construction industry. The arguments of this paper are derived from previous studies of outcomes of innovative programmes of the Nigerian construction consultancy organizations. The thesis of the paper is therefore based on the evaluated review of relevant literatures on the two focused concepts in the paper - innovation and formalization.

3.0 RESULTS

Studies have shown that many introduced innovative changes in Nigerian construction industry are uncoordinated (i.e., neither properly documented nor formally scheduled for implementation) and as such many of such transformations (innovations) are adopted or allowed to take place in a somewhat ad-hoc manner without any proper plan for it (i.e., they are not properly formalised). For example, in a study carried out by Oladapo (2006) on the Nigerian consultancy firms, it was found that though core architectural, engineering and quantity surveying functions were largely computerised, the data and document management is still done the traditional way in most cases. In other words, such innovative changes are allowed to take place in an unplanned and unfashion manner and lacking provision for assessing or monitoring of their progress and for measuring or evaluating their impacts on the organizational practices. Hence, most of these firms adopt innovation just to satisfy the current market needs or to achieve business operations convenience. Oladapo (2006) further notes that the impact of ICT on professional practice has been mainly in making jobs easier for the professionals, facilitating decision-making and savings in operating costs. As a result, the assessment of the performance and control of such programme during implementation becomes practically difficult if not impossible. Hence, the Nigerian construction industry frequently witness failures in its practice of programmes that have perfectly worked elsewhere/in other industries. The unsatisfactory performance of many innovative procurement systems in Nigeria are special examples in this regards. The unhealthy practice may have partly accounted for the continued inefficiency of the construction industry's overall performance in project delivery in spite of the numerous researches carried out to avert this scenario (Miller, 2008).

3.1 The need for innovation in the construction industry

A number of researchers' works attest to this fact that a firm's ability to innovate is fundamental for its long-term business success (Toole, et al, 2008); especially in the modern dynamic environment (competitive markets) (Damapur and Scheider, 2006; Howell, and Higgins,1990; Slaughter,1998). Gambatese and Hallowell (2011) also view innovation as vital for successful, long-term company performance in the construction industry. Innovation, which is the implementation of a process, system or product that is new to an organisation, can lead to decreases in cost and schedule, and improvement in quality and safety along with an increase in market share, a competitive advantage and increased technical feasibility of projects (Madewell, 1986; Slaughter, 1998). In their contribution to innovation debate Hauser, et al (2006) submitted that innovation is one of the most important issues in today business research and that our understanding and study of innovation can benefit from an integrating review of these traditions.

In the view of Steel and Murray (2004) the development of culture of innovation is of utmost importance if a business is to become universally proactive, entrepreneurial and remain successful. This is due to the fact that the agility and ability of an organisation to respond to the changing marketing environment is driven by its propensity to innovate. Corsino (2011), also agreed on the role of innovation as a key driver of economic growth and has inspired large body of studies exploring the determinants and economic consequences of technical change. O.E.C.D. (2005) also declared in Oslo Manual: "It is now accepted that the development and diffusion of new technologies are central to the growth of construction industry's output and productivity. But our understanding of the innovation process, and its economic impact, is still deficient. For example, we are clearly in the throes of a major technological revolution, with the world economy being reshaped by new information technologies and by fundamental change in fields such as biotechnology and materials science"(O.E.C.D).

According to Gambatese and Hallowell (2011) scholars have demonstrated that innovation is essential for continued organisational success and the advancement of the construction industry and, therefore, innovation should form an important topic for construction research. In their contribution to innovation debate Hauser, et al (2006) submitted that innovation is one of the most important issues in today business research and that our understanding and study of innovation can benefit from an integrating review of these traditions.

It can therefore be understood from the above literature discourse that innovation has been widely accepted as panacea to dilemma of construction industry productivity and other challenges (globalization, competition, meeting of more complex clients' demands and specifications, etc.). These problems are mainly brought about by rapid technological advancement and discontinuous change in the global arena. Hence, slogans

such as “Innovate or Die” and “Innovation on Demand” had great popular appeal.

3.2 Innovation process and formalization

Price and Mueller (1986) defined formalization as “the degree to which the norms of an organization are explicitly formulated” Price and Mueller note that formalization has been operationalized in ways that include “specification of procedure”, ‘job codification’, ‘degree of structure’, and ‘documentation’. Organisational literature review however indicates that formalization results in both positive and negative effects on a variety of work process (Dougherty and Corse, 1995). Formalization which is recognized in organizational literature as a key characteristics of the bureaucratic model has also been operationalized as the extent to which procedures and processes are documented in writing, norms of behaviour and roles are explicitly defined, groups are identified, and membership is bundled (Miller, 2008). Another view of formalization, epitomised by the metaphor of ‘red tape’, is that it is an obstacle to both speed and effectiveness. From this perspective formalization can be regarded as the bane of progress. This, according to Miller (2008), is because formalized processes force projects into standard formats that may be appropriate. The newly acquired legitimacy of a formal process or group embodies power in the form of access to resources that support agenda-setting, budgets and decision-making (Miller, 2008). Another question to this is; how does the understanding of formalization relate to innovation?

Research results indicated that innovation is a complex, intensely social phenomenon requiring preconditions that are not readily duplicated (Dougherty and Corse, 1995; Nonaka and Takeuchi, 1995; Norman and La Manna, 1992; Normann 2001; Thomke 2001; Van de Ven, et al., 2000 and Miller, 2008). According to Dougherty (1996) ‘four sets of activities underlie the development of commercially successful new products’, including: (1) market and technology linking; (2) organizing for creative problem solving; (3) evaluating and monitoring innovation; and (4) developing commitment to innovation. Within each set of activities-formalization is generally defined as a process of standardizing, routinizing and rationalizing-plays a role (Miller, 2008). Consistent with the bureaucratic model, this implies that efforts to increase organizational innovativeness will tend towards formalizing the activities associated with the innovation process which includes; generating and conceptualizing new ideas, solving technical issues that arise during product development, finding or creating markets for new products, monitoring and managing the innovation process, and developing and sustaining the organizational commitment to innovation (Dougherty 1996). However, the trend to formalize activities in the innovation processes-to standardise, communize, routinize or otherwise exert control over the innovation process-is growing thereby promoting the mentality of “innovation on demand”. In other words, what has been ad hoc, spontaneous, and unpredictable is stabilized and made explicit through formulation of a sanctioned routine. The newly acquired

legitimacy of a formal process or group embodies power in the form of access to resources that support agenda-setting, budgets and decision-making (Miller, 2008).

Within the context of this paper, formalization is conceived from the positive perspectives as “a defined, planned, routinized and established process of allocating resources and responsibilities and of carrying out organizational activities or functions such that allowances for progress monitoring, evaluation and control is provided within the framework of the innovation project”

3.3 The need for formalization in innovation management

For organizations especially the construction industry and its consultancy services sectors that must adapt to rapid and discontinuous change in markets and technologies, the development of novel products and services, as well as new processes to improve efficiency and the quality of output (Innovation) is germane. And to effectively practice innovation to achieve and sustain a competitive advantage, formalization is vital (Dougherty and Corse 1995; Porter and Stern 2001). It must be noted however that despite the widespread attention from both practitioners and researchers, many organizations find difficulty in achieving and sustaining organizational innovativeness (Dougherty and Corse 1995). There are numerous explanations for the difficulties firms encounter. One argument being general issue of fundamental tension between the established and the emergent ideas/practices that plays out through sets of innovation activities at all levels, and touching all functional areas within the organization (Dougherty 1996; Jelinek and Schoonhoven 1990; Pelz and Andrews 1966). Organizing for creative problem solving (e.g., organizing for innovation) conjures this core organizational dialectic: the struggle between stability, which seeks to reduce complexity, and flexibility, which tends to generate chaos, instability and uncertainty. More specifically, the argument has been made that the bureaucratic model – the cornerstone of industrial organization – is a primary source of difficulties encountered by large firms as they attempt to enhance the ability to generate innovation (Adler and Borys 1996; Dougherty and Corse 1995).

To overcome these problems, the organization management need to explore ways of convincing and encouraging organization members’ support to its innovation programmes and should adequately cater for the organization capacity in terms of infrastructures and other innovation resources to handle innovation projects/programmes.

4.0 CONCLUSION

Innovation has become a widely accepted and recommended process that need to be adopted by construction organizations as well as consulting services firms that wish to cope with the challenges of the current globalization and its associated intense market competition. For a construction organization or its consultancy services firm’s innovation programme to be effective and result-oriented there is the need to reasonably formalize its innovation practices. Once formalized, a process or group

is able to compete for resources and channel the attention of organizational members around particular activities and specific ways of doing things. This makes the process of organisation learning and assessment smoother and easier because those who are responsible will have a directional scheme and procedures thereby avoiding discretionary and idiosyncrasy opportunism.

Formalized rules generate the occasion for 'workarounds', and formalized groups create boundaries that stymie collaboration and communication both of which are germane to construction innovation generation and practices. In other words, what has been hitherto ad hoc, spontaneous, and unpredictable is stabilized and made explicit through formulation of a sanctioned routine.

5.0 SUGGESTIONS:

It is imperative that all innovation or any form of transformational programme within the consultancy/construction firms be formalized. This will engender the proper allocation of responsibilities and resources and in addition will provide avenues for monitoring the performance and advancing corrective measures to ensure the success of construction innovation programme. It is only by doing so that the desired change and improved efficiency of the construction/consultancy firm's operation expected from such transformation/innovation programme(s) can be reasonably achieved. Furthermore, this paper, being conceptual suffers some limitations. It is therefore suggested that more in-depth studies that use empirical approach be carried out in various sectors of the construction industry to come out with more lucid recommendations that will assist the construction industry to overcome its perennial inefficiency problems.

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