A Model for measuring organizational innovativeness in the house-building industry

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ABSTRACT: Series of criticisms have been leveled at the construction industry for the slow in innovativeness, Abandonment of Government projects; shoddy works, not being environmentally conscious and so forth. For the industry to sustain itself over the next decade, a change in mindset and the way of doing business is fundamental. This has call for research on the organizational innovativeness of the house building industry in Malaysia. Innovation is a complex and systemic process, which is hardly captured in its totality through indicators of input and output. A couple of methods for measuring organizational innovativeness have been identified in the literature. However, none of these methods has been adopted for measuring the organizational innovativeness of the housing developers. The Oslo manual for innovation survey is the most widely used instrument for large scale innovation surveys, it recognize that dissemination mechanisms and incremental change account for most of the innovation occurring in developing countries, owing to the particular characteristics of the society and the economy in many of these countries which influence innovation processes in many ways. How ever, its adoption for measuring firm innovation in developing countries has been criticized. This paper attempts to suggest the most appropriate instrument for the measurement of organizational innovativeness in the house building industry.

Keywords: Measurement, organizational Innovativeness, House-building industry, Developing Country

INTRODUCTION

Scholars and researcher have made attempt to measure the innovativeness of organizations based on different scale of measurement, despite the numerous studies conducted in the field of innovation and innovativeness, Wang and Ahmed, (2004) note that there is little empirical evidence in terms of development and validation of organizational innovative scale. For the fact that the innovation measurement framework in the new Oslo Manual includes, in addition to product and process innovations, marketing innovation and organizational innovation. This paper adopts the definitions given in the OSLO Manual (2005). Innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization, or external relations; A product innovation as the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user

friendliness or other functional characteristics; A process innovation as the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment, and/or software. A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. While an organizational innovation, is the implementation of a new organizational method in the firm's business practices, workplace organization, or external relations.

The first part of this paper provides an overview of innovativeness in an organization from the existing literature. The second part highlights the need for house building industry to innovate. Then, the paper contrasts the various methods for measuring organizational innovativeness. Finally, we suggest the most suitable method for the measuring the organizational innovativeness for the house building industry.

FORMS AND TYPES OF INNOVATION

Innovation researcher like Anderson and King, (1993), Totterdell et al, (2002) understand and consider innovation be to be a complex phenomenon, they classify innovation into the following forms:

1. Technical innovation (e.g. new production methods)
2. Non-technical aspects of innovation (e.g., new markets, new forms of organization)
3. Product innovations (e.g. new products or services) and
4. Process innovations (e.g. new production methods)

The classifications of innovation given by innovation researcher are base on their understanding and the perspective from which they look innovation. It is on the basis of consideration of Anderson and King, (1993); and Totterdell et al, (2002) works, that Armbruster *et al,* (2008) distinguish four different types of innovations and group them as: Technical product innovations; Non-technical service innovations;

Technical process innovations and Non-technical process innovations, understood to be organizational innovations. From whichever perspective one is looking at innovation, there appear to be a common understanding of types of innovation by the researcher mentioned above. Their classification shows that innovation can be in either in technical form and non-technical form of innovation. The technical can be process, product or services, the non-technical can be process, organization, marketing and non-technical services. Out of the four types of innovation mentioned

above, this paper will focus on the organizational innovation specifically, organizational innovativeness.

WHY FIRMS NEED TO BE INNOVATIVE?

House building firms, just like firms from other industry, are facing competition and pressure to provide better quality products and services, to improve the speed in the market, and to improve organizational agility and innovation. Trade liberalization and rapid fall in communication costs; global communications; technological and scientific understanding; and the increasing knowledge ability of, and demand from, clients are some of the reasons why innovation is even more urgent today. It covers product, process, service, technological and market innovations, (Egbu and Anumba 2004).

House building organization need to be innovative because organizational innovations serves as the prerequisites and facilitators of an efficient use of technical product and process innovations as their success depends on the degree to which the organizational structures and processes respond to the use of these new technologies. In addition to that, organizational innovations provides the avenue for competitive advantage since they themselves have a significant impact on business performance with regard to productivity, lead times, quality, and flexibility Armbruster et al (2008).

The environment of organization is constantly in a dynamic state such that, for an organization to survive the competitive edge, it needs to be continuously innovative and adopt managerial response by integrating it resources to ensure corporate survival. For obvious reasons, such as increasing global competitive pressure, shortened product life cycles and ease of imitation, firms has no choice than continue to innovate in order to maintain competitiveness. It is a fact that innovation has become the primary basis of productivity improvements, sales volume growth, and a firm's competitiveness. Also the increased global competition pressures are also forcing firms to continuously adopt, develop and innovate to enhance product competitiveness such as product design and quality, technological service and reliability. As such, a firm must upgrade its innovation capability for developing and commercializing new technologies more rapidly than other firms must, and must facilitate creation and dissemination of technological innovations within its organization to strengthen its competitive advantage (Wang, 2007)

Organizational innovation is very important for competitiveness as proven by previous studies, such as Caroli and Van Reenen, (2001); also, Piva and Vivarelli,

(2002). Their studies did analyzed the impact of organizational innovations on business performance They all indicated that organizational innovations serve as the prerequisites and facilitators of an efficient use of technical product and process innovations as their success depends on the degree to which the organizational structures and processes respond to the use of these new technologies. In addition to that, organizational innovations present an immediate source of competitive advantage since they themselves have a significant impact on business performance with regard to productivity, lead times, quality and flexibility (Goldman et al., 1995). Although these studies have shown the importance of organizational innovations for business performance, defining and measuring organizational innovation in the construction industry, particularly the house building industry still lags behind. Recently, Armbruster et al (2008) observe that there have been few conceptual and methodological contributions to the monitoring of *organizational innovations* so far.

ORGANIZATIONAL INNOVATIVENESS

In his understanding of the term innovativeness, Foxall (1984) postulated that "Innovativeness is the capacity and tendency to purchase new products and services", and further described innovativeness as personality trait which can be linked with obtaining acceptance for new products though vital, but extremely risky process which means a good understanding of consumers acceptance of new product and service is very important. This concept is supported by Subramanian and Nilakanta (1996) equally understand organizational innovativeness as an enduring organizational trait; this means that truly innovative organizations are those that exhibit innovative behavior consistently over time. In other words, innovative firms exhibit a consistently high level of innovativeness not just for a short period of time. The emphasis is on the mean number of innovations over time, mean time of innovations' adoption and consistency of the time of innovations' adoption.

The diverse understanding and interpretations of the term "organizational innovation" and the lack of a widely accepted and unified definition causes difficulties in designing and implementing measures and indicators that sustain validity over a wide coverage (Lam, 2005). In the definition of Wang and Ahmed, (2004), organizational innovativeness is "an organization's overall innovative capability of introducing new products to the market, or opening up new markets, through combining strategic orientation with innovative behavior and process". Damanpour, (1987); Damanpour and Evan, (1984) definition of organizational

innovation does not measure not only whether companies have changed their organization (structure and processes) within a defined period. The definition also provides an analysis of the adoption ratios of concrete organizational concepts in different companies and company types (sector, firm size, etc.) And the extent of use within one company. They define organizational innovation as the use of new managerial and working concepts and practices. While Lumpkin and Dess (1996) perception of innovativeness include both behavioral, related and product related concept which implies that firm innovativeness may start from desire to try something new, to a actual commitment to master the latest in new products or technological advances. Innovativeness reflects a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes. How ever researchers of organizational innovativeness like Sethi et al (2001), Daneels and Kleinschmidt, (2001) still adopt only product innovativeness in their scale, which of course is a unidimentional.

To this end, Wang and Ahmed, (2004) observe that product innovativeness of an organization emphasizes the end-result innovative capability but does not take into account other factors such as behavioral change of the organization, process innovation and strategic orientation towards innovation. The output rate of organizational innovativeness is influence by the work environment in which the organization operates. An organization is an open system that is subjected to influences of its environment and vice versa. Some of the influences aid and some impede the innovation rate of the organization. What provide stimuli and links between the organization and it external environment, and among members of the organization is information and communication. A good information and communication infrastructure is one that would assist member's participation in activities that result to innovation, (Tang 1998).

APPROACH TO MEASUREMENT OF ORGANIZATIONAL INNOVATIVENESS

The two basic approaches and methodologies that can be use to study organizational innovativeness as suggested by Eisenhardt, (1989); Yin, (1994) are top-down and bottom-up; quantitative and qualitative respectively. The top-down is a means by which a researcher views organization through aggregate information and perspective provided by management. The bottom-up is by which the researcher gather information through the individuals whose work in the organization are relates to innovation activities. The data definition, collection and analysis are the quantitative method while the qualitative method is by means of

interview, comparison with best practices and analysis. How ever, the quantitative method requires less efforts ant time and tends to be more efficient but the scrutinizing an organization in action and at close range can be achieve by qualitative methodology. In the study of chiesa et al (1996) they adopt both approaches and methods in their innovation research while Amabile et al (1996) use a combination of bottom-down and quantitative method; Loch et al (1996) adopt a combination of top-down and quantitative method; and Robinson and Stern (1997) use the combination of bottom-up and quantitative method in their research.

MEASUREMENT OF ORGANIZATIONAL INNOVATIVENESS

Organization innovativeness were measured based on the elapsed time of adoption, which has resulted in the categorization of the potential adopter of an innovation according to their type of adoption. They are grouped as “innovator”, “early adopters”, “early majority”, and “laggard”. The second tool used in the measurement of an organizational innovativeness is by asking experienced investigators to rate the technical state of each firm within a study. The third is based on dichotomous variable (0/1), where 1 represents the adoption of an innovation and 0 represent the non-adoption of it. The fourth is base on the innovations adopted by a firm out of a list of innovations, (Avlonitis 1994). However, the measurement of organizational innovativeness based on the time a firm adopts an innovation and the subsequent categorization of firms have been criticized to a great extend. The reason is that firms, which are early adopters for a specific innovation, might be late adopters or even laggards for another innovation, which applies to a different part of that firm. To this end, Avlonitis (1994) argue that the actual time of adoption of an innovation might be, determined by its supplier, rather than the adopting firm. Firms that adopted an innovation(s) earlier or later than other firms can be identified however, not because of their “better” or “worse” innovativeness behavior) but instead due to other factors which lie outside their own control and Subsequently, he developed an alternative conceptualization of organizational innovativeness, which comprise a technological and behavioral part of an organization. In his opinion, when the number of innovations adopted by a firm out of a list of innovations, which Salavou (2004) called “the cross-sectional measure”. It is use as a tool to measure the innovativeness of a firm; changes in the rates of innovation adoption might be a result of significant improvements in the innovation being studied and not of changes in the receptivity of prospective adopters.

The result of an organizational innovativeness measured by the method of elapsed time of adoption of one or few innovations, which Salavou, (2004) called "temporal measure", can not be generalized to other innovations. When a firm adopted an innovation earlier than others, it does not necessarily mean that it will exhibit the same behavior for all other innovations. In addition to the four methods identified by Avlonitis, (1994) above, Salavou, (2004) identified two other means of measuring organizational innovativeness to include the economic value of innovations and the level of R&D expenditures.

Table 1: ***Some Previous Large-Scale Organizational Innovation Survey***

S/N	Title Of Survey	Research Organization	Respondent Organization	Aim Of Research	Year	Remark
1	"**NUTEK**" Survey "Towards flexible organizations"	Swedish National Board for Industrial and Technical development	Mining, manufacturing, Construction, Retail, Whole sale, Hotel, Transport & communication (700 firms)	1. whether firms practice TQM, ISO 9000, Just-in-Time, & technology/ service Development 2. If organizational change exist	1995	Focus on Manufacturing concepts
2	Danish innovation system in a comparative perspective "**DISCO**"	Danish Research Unit for Industrial Dynamics	Manufacturing, service and Construction firms. (1900 Firms)	1. How firms react to a turbulent environment 2. Delegation of Responsibilities and job rotation	1996	Focus on firms strategies
3	"**EPOC**" Survey	European foundation for improvement of living and working condition	5,786 firms	1. Direct employee participation in organizational change and the effect on the employees	1996	Did not covers organizational concept
4	The "**INNFORM**" Survey	Economic and research Council in UK	500 firms across UK, Japan and US	1. Company structure from 1992-1996 2. Link between HQ & business units, IT & human Res. practice	1997	It focus on managerial & organizational innovation

5	Changements Organizationn els etl' Informatisatio n "**COI**"	Economic and Social Research council	400 firms that has more than 20 employees in France	1. organizational change between 194-1997	1998	Focus on organizational structure & inter-firm relation
6	Community Innovation Survey **"CIS"**	European Communities	France, Denmk swedn, Germ, Luxembourg & Romania	organization, Market & Service innovation of firms	2001	Adopt OSLO manual & Org innovation

Table 1 shows the previous large-scale innovation survey conducted by various organizations in European countries and the United Kingdom.

1. The "**NUTEK"** survey was conducted by the Swedish National Board for Industrial and Technical Development in 1995. The respondent were from firms from Mining, construction, Retail, whole sales, Hotel, Transport and Communication. The questionnaire used focused on the adoption of concepts such as TOM, Just-in-time, ISO 9000 as well as organizational change.
2. The second is the "**DISCO"** survey, which was conducted by the Danish research unit for industrial Dynamics in 1996. The respondent were from manufacturing and construction firms. The questionnaire focused on the ability of the firms to react to turbulent environment, delegate responsibilities, and practice job rotation.
3. The third is the "**EPOC"** survey, conducted by the European foundation for improvement of living and direct participation of employees. The aim was to find out the level of participation of employees in the implementation of organization changes and it influence on the employee.
4. The forth, "**INNFORM"** survey was conducted by the Economic and research council in UK. 500 firms participated across UK, Japan, United States of America. The survey looked at the company structure from 1992-1996, and linkage that exist between the Head Quarter of the participated firms and their business units; Information Technology and Human resources practice.
5. The fifth is the "**COI"** survey, conducted by the Economic and Social research Council in 19998. The 400 firms that participated were those with more than 20 employees. The survey focused on the organization changes that occurred in the firms from 1994-1997.
6. The sixth is the **"CIS"** conducted by the European communities. The respondent were firms from France, Denmark, Sweden, Germany, Luxemburg and Romania.

The OSLO manual was adapted to covers organization innovation, market innovation, and service innovation of the participated firms.

The Community innovation survey was more comprehensive for the fact it covers more than two forms of innovation, Non-technical aspects of innovation (e.g., new markets, new forms of organization) and Product innovations (e.g. New products or services).

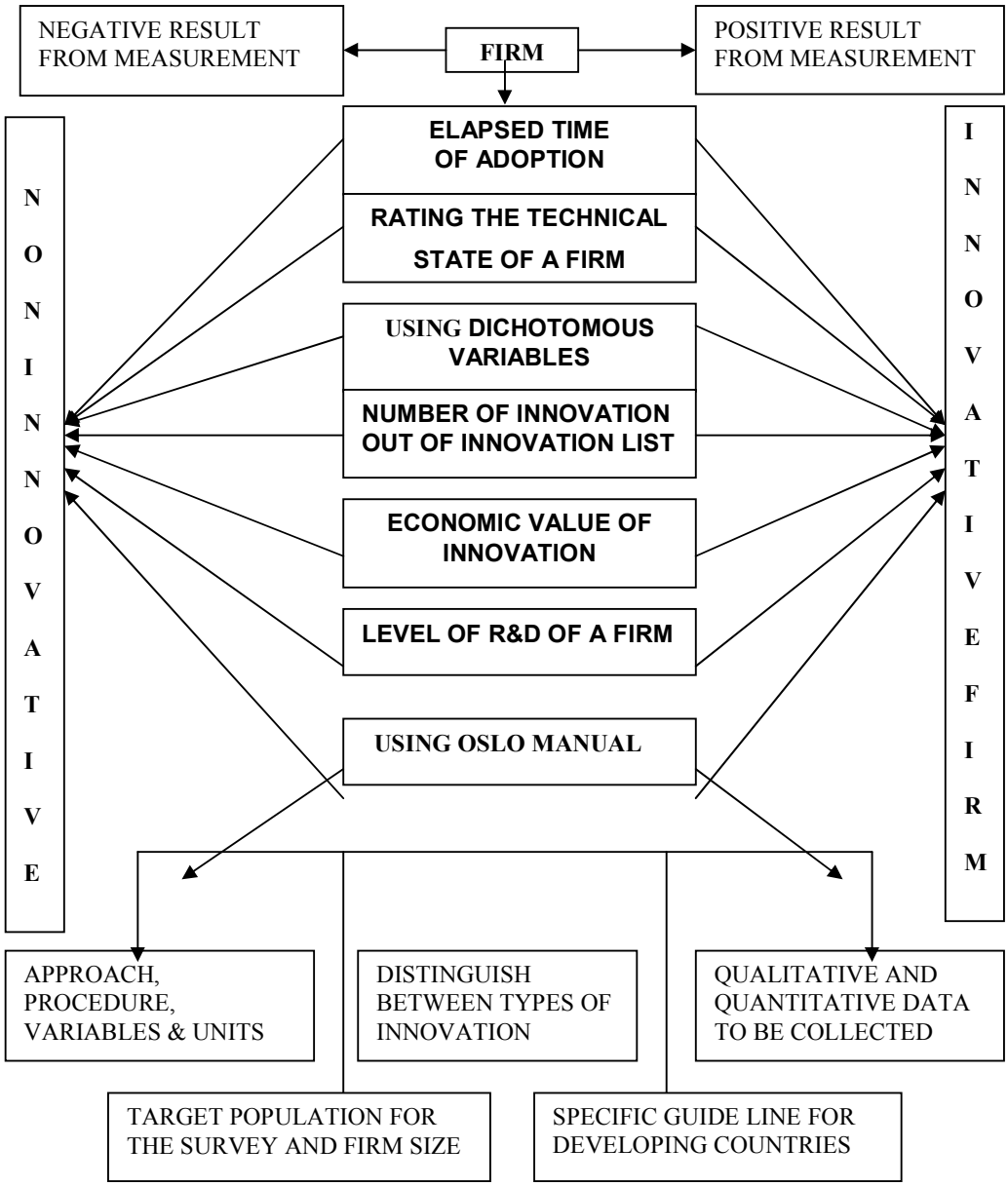
The OSLO MANUAL

The Oslo manual is joint publication by the organization for economic co-operation (OCED) and development statistical office of the European communities (EUROSTAT). It was first published in 1992 by the OECD, provides international guidelines for the collection and interpretation of innovation data, the first in 1997, and the most recent in 2005. The purpose of this Manual is to provide guidelines for the collection and interpretation of innovation data. The scope of the Manual covers innovation in the business enterprise sector only, It deals with innovation at the level of the firm. It covers four types of innovations: product, process, organizational and marketing innovation.

After the publication of the second edition of the Oslo Manual, many developing countries in various regions of the world conducted innovation surveys. The design of these surveys was usually intended to comply with Oslo Manual standards. However, almost all of these innovation measurement exercises resulted in adaptations of the proposed methodologies, in order to capture the particular characteristics of innovation processes in countries with economic and social structures different from those of the more developed OECD countries lead to the designing an additional guidelines suitable for the innovation measurement in developing countries (OECD 2005)

Prior to the circulation of the current edition of the Oslo manual 2005, its application In the “CIS” survey has generated criticisms on the way the concept was made into indicators. Lugones & Peirano, (2004) argument on the exclusion of non -technical innovation; (Salazar & Holbrook, 2003) argument on the omission of the relations Established among firms and other agents in the innovation system; Hansen (2001) argument; and Arundel *et all* (1998) argument on the exclusion of WHO innovate and WHAT was innovated, etc. The current version had incorporated all the omission and the raised by innovation researcher.

Figure 1: *Suitability of Oslo manual for the measurement of Organizational innovativeness for the House-building Industry*



CONCLUSION

This paper has identified seven different tools for measuring firms innovativeness. Except the current edition of the Oslo Manual, Non of the tool is provides detailed procedure for the measurement. The Oslo Manual provides all the required guidelines needed for firm's innovative measurement, as shown in Figure. It also specifies the type of firms for which the manual is applicable. One other interesting

thing about the Manual is the inclusion of specific guideline suitable for the developing countries. The current edition had incorporated all the omissions that lead to series of criticisms to both the manual and the surveys conducted using the manuals. The current version responded to the . Lugones & Peirano, (2004) argument on the exclusion of non -technical innovation; (Salazar & Holbrook, 2003) argument on the omission of the relations established among firms and other agents in the innovation system; Hansen (2001) argument; and Arundel *et all* (1998) argument on the exclusion of basic question like WHO innovate. Haven identified the features of the current edition of Oslo manual, the inclusion of Real Estate in the list of business enterprises for which the manual is applicable; the provision of specific guides for the organizational innovativeness. The current edition of the manual therefore appears to be the most suitable tool and method there in for the measurement of organizational innovativeness for the House-building industries in developing countries.

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