

Innovation from the Perspective of Housing Developers in a Developing Country

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Abstract: Innovation is commonly emphasised in the manufacturing industries where changes are fast and nimble. Nevertheless, there are limited studies on what housing developers, the main initiator of housing developments, perceive as innovation. A direct adaptation of innovative concepts developed by other industries runs the risk of being unsuccessful in the housing industry because of the unique characteristics of this industry. The present study fills this void by investigating the concept of innovation in the housing industry from the perspective of housing developers in Malaysia. A survey and interviews were conducted, which revealed that Malaysian housing developers perceived innovation to constitute the improvement of products or services, followed by the notion that it should be useful and put into use. The findings provide insights for policy makers and developer firms regarding the extent of innovation as practiced in the housing industry and offer some guidance on ways to expedite innovation in the industry.

Key words: Concept of innovation • Innovation • Housing developers • Housing industry

INTRODUCTION

Innovation is commonly associated with bringing advancement or improvement to a present situation to produce better products. The fast pace of technological change in the manufacturing industries makes innovation a necessary strategy to survive in a highly competitive business climate. The need for innovation has been extended to various industries, including the housing industry. The increasing technological capabilities, greater customer demands, tighter control over environmental regulations and quality standards, rising construction costs and increased competition make it essential for the industry to be innovative [1-3]. Conventional approaches of relying on standardised design and managing projects are difficult to sustain and no longer applicable [4]. Because of the new global demands for increased competitiveness, firms in the industry need to continuously modify their products, designs and processes associated with housing delivery in order to survive [5].

Nevertheless, there seems to be an agreement among scholars that the industry is lagging behind others in terms of innovation. The characteristics of the housing

industry, which are different from the manufacturing industry, are believed to create a less conducive environment to spur innovation [1]. The firms involved in the delivering of houses in the industry range from very small to medium and very large, with different motives and aims [6], all of which result in different characteristics associated with innovation [7, 8]. The competitive nature of the industry has diverted its players to concentrate the minimisation of risks as opposed to involvement in the potentially risky adoption of innovation [9]. In addition, housing projects are temporary in nature, labour intensive, highly dependent on subcontractors and conducted on construction sites [10, 11]. In such environments, innovative efforts become difficult because knowledge sharing and information flow from one project to another and among industry players are usually poor [12, 13]. Low levels of investment in research and development and disappointing linkages between academia and industry players worsen the situation [14].

In addition, studies on innovation in the housing industry tend to concentrate on very specific areas and are focused on factors behind innovation. Dewick and Miozzo [15] studied the use of solar heating systems in Scottish social housing and found that the main

impediments for using the innovative product were costs and access to the product materials. Yusof and Shafiei [16] concentrated on innovation generation with regard to a new housing delivery system and identified the importance of knowledge sharing among key players for successful innovation adoption. Hoppe and Lulofs [17] focused on energy-efficient technologies and studied how the structure of the housing sector influenced the use of an innovative technology in Dutch homes. Pan *et al.* [3] studied the utilisation of offsite construction methods as an innovative move in the United Kingdom's large house builders and highlighted the low rate of innovation utilisation due to the perception of higher capital costs. It is not surprising that housing scholars are not in agreement regarding what is considered as innovation. Additionally, innovation is difficult to define because the time between the first introduction of a new product or process in the housing industry and its adoption and market placement is usually long [18]. The limited studies in this particular area have led housing scholars to describe innovation based on the perspectives of other industries that are more advanced in innovation adoption compared to the housing industry for the purpose of helping the industry meet the changing demands of today's environment [19]. The efforts to borrow from the manufacturing industry have resulted in mixed success and have received much criticism from industry practitioners [1, 2, 20]. The unique nature of the housing industry, as discussed earlier, makes direct adaptations of external theories difficult in terms of easy application. Moreover, successful innovative approaches from other industries may risk being rejected by the stakeholders in the housing industry ([1, 21]. Therefore, it is important to seek what the housing industry, particularly the developers, considers to be innovation. The rationale for targeting housing developers is that they are the key agents in the housing market, who, according to Koebel [18], respond to market demands, make decisions and act as catalysts as well as translate projects into finish products, or, more specifically, houses.

This paper contributes to the existing knowledge by conceptualising what innovation means within the context of the housing industry. It aims are to explore the developers' understanding of innovation and how innovation is being practiced in the industry. The results point out key characteristics of innovation as perceived and implemented by the main players in the industry: the housing developers. The practical contribution of the paper is that by determining what housing developers

perceive as innovation, one may obtain valuable insights on the extent of innovation as practised in the housing industry that can help policy makers to identify appropriate measures to expedite innovation adoption within the industry. It seems that the current understanding on innovation has been of little help in promoting innovation in the housing industry. This knowledge on housing developers' perception of innovation will also help stakeholders in housing developments to effectively utilise their resources to focus on areas that are crucial for innovation development and adoption.

Defining Innovation-from the Literature: There are two main views governing the concept of innovation. The first view considers the element of 'newness' to define innovation, whereas the latter broadens the concept to include 'improvement or upgrading.' In the first viewpoint, the key characteristic of innovation involves an attempt to realise something new, be it an idea, method or a tool [22]. This characteristic was first put forward by an innovation guru named Schumpeter [23], who defined innovation as the introduction of something new, either in terms of goods, the market, resources, methods of production or operations. In this sense, innovation is described as an idea, material, or artefact perceived to be new by the adopting firm [24]. Therefore, according to this view, innovation is not a matter of being the first to adopt, but a matter of the perception of the adopting firm or individual that constitutes innovation.

In the second view, the definition of innovation is expanded to include the upgrading of products or services so that they are improved. Tidd *et al.* [25] argued that to be innovative, firms must be prepared to renew their products and processes on a continual basis, demonstrating an agreement to include improvement or enhancement of the product or process in comparison to the status quo. Agreeing to this, the Oslo Manual [26] provided a more comprehensive definition, defining innovation as "the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation, or external relations." Therefore, innovation involves the implementation of new ideas or improvements to an existing product or process.

However, innovation is not only about a new idea or an upgrade of an existing product. Badawy [27] claimed that something can only constitute innovation if the novelty has been put into practice. Teece [28] concurred

with this view and suggested that innovation occurs when it has been practiced or completely adopted. Therefore, innovation is not only a new idea but also a new outcome that is realised.

Another feature of innovation is that it must bring success and benefit to the adoptive firms and their consumers. This stricter view of innovation suggests that a new idea followed by its implementation will only be considered as innovation if it creates added tangible value either for the firm or its clients [29]. Urabe [30] even suggested that innovation must have the ability to strengthen and expand the performance of a firm or business. Similarly, Twiss [31] stated that innovation only occurs when the new product or process succeeds in the marketplace. Doyle [32] added another condition to the definition that the new or improved product or process must satisfy immediate consumer needs or offer solutions to the existing needs.

In addition, an innovative firm should be different from its competitors [33]. This view argued that being new, progressive or capable of providing solutions is not sufficient to be considered innovation. This uniqueness includes how far the potential adopter implements the innovative methods that make the adopter different from the others. It is associated with unique selling propositions; if it meets a sleeping customer's needs, it might be considered as unlocking a blue-ocean strategy.

Therefore, from the general literature, innovation can be defined as something that is new or an upgrade of existing ideas, products or processes, transforming them into new products and process that are unique and provide benefits to both the innovator and the receiver. However, as previously discussed, an approach to innovation in one industry may differ in another due to different working environments [34], different types of products or services [35] and the contexts in which innovation is perceived [24]. What may be workable to one industry may not be the same in another. In the housing industry, where the output is one-off and in relatively small quantities as compared to the manufacturing industries involving bulk production, innovation may not be as straightforward as proposed by the general literature. The involvement of multidisciplinary parties to produce an output may lead to complexities in the innovation process. An understanding of how innovation works in the housing industry would provide a more accurate representation of the current practice, instead of adapting to other industries' concepts that may lead to false interpretations.

Not much can be learned from the housing literature regarding innovation. Barlow [36] suggested that innovation in the housing industry involved either the development of products or processes that are new or a change towards a better quality of the existing production process. The newness is not to the world but, more specifically, to the industry, its firms and its sub-units. Therefore, changes in the way firms produce their end products or services with respect to new product or market creation or in terms of improvements to existing products or processes are also referred to as innovation [18]. Similarly, Kamaruddeen *et al.* [4] and Hassell *et al.* [9] considered innovation to be the tendency of a firm to adopt new products, methods, processes, technologies and organisational systems that are new or perceived to be new to either firms or the industry. Sexton and Barrett [37] added that improvements in product design and level of service quality that provide benefits to house buyers are considered innovation.

However, it is still unclear whether innovation necessarily involves benefits specific to the developers. In a way, innovation has been recognised as one of the driving forces that brings wider improvement to performance and expansion of markets at the firm and industry levels [36]. The use of concrete systems and elements such as concrete-panelised systems, for example, is argued to provide a greater economic benefit to housing developers through improved building and design quality and reduced construction costs, as well as higher-quality products to the home buyers [11]. In contrast, the direct benefit that developers can gain from being innovative is short-lived because of their position in the supply chain [37]. At best, the benefits of being innovative, if any, might be temporary because other developers will soon imitate the new product or process through knowledge sharing from the same manufacturers and suppliers where these developers depend heavily for their building materials and components [18]. If the innovation fails, then the developers that field-tested the innovation will have to face market liabilities [18], such as unsold houses [16].

The discussion so far has shown that the concept of innovation in the housing industry is vague at best. The majority of previous studies focusing on the housing industry tended to conceptualise innovation as simply an improvement, with limited studies considering innovation as newness. How valid is this conceptualisation of innovation when applied to the Malaysian housing industry, where innovation is not widely practised?

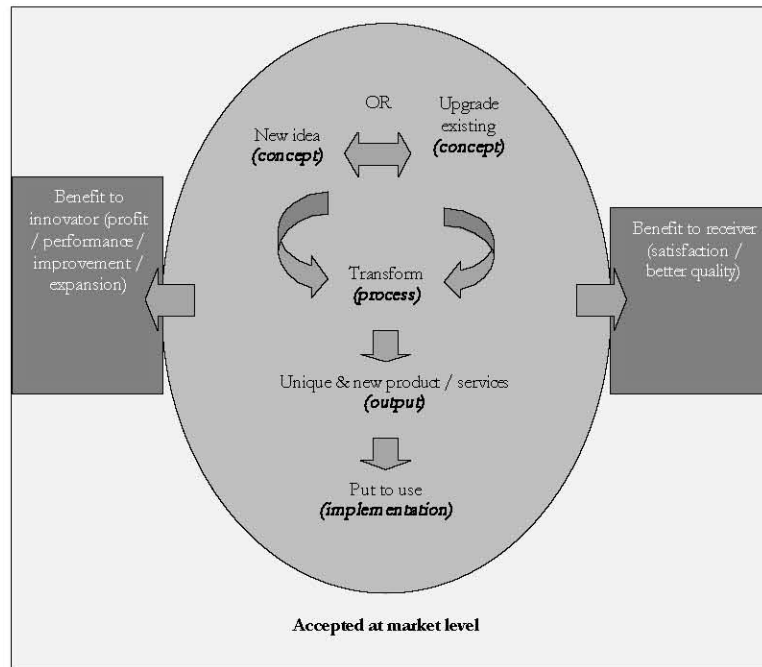


Fig. 1: The holistic view of the concept of innovation

We argue that the broad nature of housing development activities necessitate innovation to be perceived from a multidimensional context. As such, we propose a holistic concept of innovation. Figure 1 illustrates the basic premise of this concept of innovation adapted from both the general and housing literatures. We argue that innovation may occur across all of housing development activities and, thus, may be perceived differently by the developers. Apart from newness and improvement, innovation in the housing industry should include implementation, commercialisation and benefits for innovative developers and house buyers.

Research Methodology: A survey and interviews were arranged to analyse how developers conceptualise innovation within their domain. A questionnaire was developed to survey housing developers in Penang and Selangor. Both states were chosen because housing development activities in Malaysia tend to be disproportionately concentrated in these two states. The survey instrument consists of two sections. Section 1 inquired respondent backgrounds and firm profiles. Section 2 asked about the concept of innovation in the housing industry. Respondents were asked to indicate their degree of agreement with the statements in the questionnaire. A five-point Likert-scale was used to measure the construct (1-strongly disagree, 2-disagree, 3-neither agree nor disagree, 4-agree and 5-strongly agree).

A pilot test was carried out prior to the survey with several housing industry experts to confirm the validity of the content. The population for this study consisted of 338 registered members of the Real Estate and Housing Developers' Association (REHDA). Through simple random sampling, a total of 181 firms were selected, in accordance with the minimum sample size to gain valid quantitative data as suggested by Krejcie and Morgan [38]. To improve the response rate, follow-up calls were made and another set of questionnaires were resent, each with a prepaid return envelope. The targeted respondents were owners or managers with knowledge about firm activities and who were involved in business decision-making. In total, only 33 responded, resulting in a response rate of 18.23 percent, which is considered acceptable and common when using a postal survey [39]. Many other researchers have recorded similar response rates [3, 40].

Follow-up semi-structured interviews were carried out with developers who indicated their willingness to participate in the surveys. The purpose of the interviews was to explore in greater depth the issues arising from the survey. The respondent in each interview was either the owner or the senior project manager. Each interview lasted approximately 45 minutes to an hour and was conducted at the respondents' offices. The qualitative data obtained from the interviews were transcribed and coded into specific themes.

RESULTS AND DISCUSSION

Respondent Profiles: Nearly 82 percent of the respondents were owners, senior managers or executives of their respective firms. The majority of the respondents had more than 10 years of experience working in the industry. Nearly 64 percent of the represented firms were private firms, while the remaining were public limited companies that were able to sell shares to the public. Approximately 70 percent had been established for more than 10 years. Most of the respondent firms employed fewer than 50 full-time employees. This number is considered normal because of the nature of the industry, which subcontracts most of its projects. Most firms build from between 50 to 500 units to more than 1,000 units in one project, with most operating within one state.

Identifying Innovation-developers' Perspectives: The items used to conceptualise innovation were divided into seven items. The items are listed in Table 1. A descriptive analysis of the seven core items was performed to gain insights into the meaning of innovation for the housing developers. The responses were summed to derive to an average score for each item. As shown in Table 1, the respondents agreed to all of the items (mean of >3.5). The top three (TOP3) items of innovation were related to the practicality and applicability of the innovation, as follows: Item 3, innovation leads to improvement (mean: 4.27); Item 4, involves a new idea that is useful (mean: 4.21); and Item 2, put into use (mean: 4.15). Profitability and generic connotations, such as uniqueness (Item 7), newness (Item 1) and provision of solutions (Item 6) and the TOP4-7 attained high scores as well but were considered to be slightly less important than the TOP3. In addition, on average, the standard deviation for the TOP4-7 was also much higher (0.810 compared with 0.539 in the case of our TOP3). This finding indicates that the TOP3-agreement was much more unanimous.

This finding is further supported by the interview responses. The respondents stated that innovation is not only about acquiring knowledge or developing new ideas, but also about what is being practiced in the housing projects and accepted in the market, which are more important. All of the interviewees stressed that any changes to conventional methods (innovation) in housing construction should lead to improvement, be useful and have economic benefit. Thus, according to the interviewees, Items 3, 4 and 5 were interrelated. For example, one respondent stated that he used to design typical terrace houses two years ago but had difficulty selling the units. When he improved the building and introduced an innovative design, the output looked more trendy and sold out faster than anticipated (accepted by the market), resulting in huge profits (economic benefits).

The respondents confirmed that the concept of newness applies to the adoptive firm and not to the industry. Most developers did not have research and development departments to create new technologies, materials or methods. The newness concept was more pertinent to the preparedness of using new technologies, materials or methods, instead of those associated with manufacturing. Thus, developers who want to innovate will seek out innovative products or methods existing in the market. In some cases, they will discuss with the supplier, designer or engineer to invent or modify existing products to suit their needs. For example, one developer had used industrialised building systems to speed up the completion period. Through innovation, a more suitable method can be introduced that provides solutions to problems.

The interest in innovation in the housing industry is elevated by successful experiences. The benefits of past construction, from using offsite precast systems as compared to conventional methods, had also encouraged one respondent to opt for similar innovative methods in his future projects. For another respondent,

Table 1: The items used to conceptualise innovation, the mean scores and standard deviations for each item

Items	Mean	Std.Deviation (SD)
Item 1. Innovation is something that is new	4.09	.843
Item 2. Innovation is a new idea that is put into use	4.15	.508
Item 3. Innovation is something that leads to improvement	4.27	.626
Item 4. Innovation is a new idea that is useful	4.21	.485
Item 5. Innovation is a new idea that is profitable	3.85	.870
Item 6. Innovation is a new idea that provides a solution	4.00	.661
Item 7. Innovation is a new idea that is unique	3.76	.867

Valid N = 33

his innovative design with single-storey terrace houses increased sales. The benefit of innovation was also stressed by another respondent, who stated that innovation saved them money and provided desired qualities. By using different methods of construction for their high rise building, one respondent said it saved them millions of ringgits. The profit gain from innovation is debatable, however. For example, regarding solar energy systems, respondents agreed that it was innovative and saved energy costs for consumers in the long run. However, high installation costs had reduced developers' profit margins and many developers were reluctant to pursue it.

Therefore, the decision to implement innovation will involve a choice of the best option that can result in maximum benefits to both the developer and buyer. Some items may be innovative but may not be suitable for the project. One respondent gave an example of precast concrete use in his housing project. The respondent said that precast concrete is an innovative construction method that is used for his simple square house design; however, the same precast concrete is not suitable for luxury apartments with complicated designs that cater to high income clients.

The developers perceive a benefit to the buyers if the new or upgraded products or technology is accepted by the market. In one respondent's high-end condominium project, the company installed home automation alarm systems and security CCTV, where residents can turn on their lights using a phone and screen or allow lift access to visitors using a security card; these options are a new trend. The house buyers were willing to pay an extra of RM300-RM400 (74.14 EUR-98.83 EUR) per month for this added security. Another respondent revealed that focusing on what buyers can gain from innovation will ensure a long term relationship with the buyers and produce a good reputation that will be beneficial in the long run.

The respondents agreed that uniqueness is an added bonus of innovation. However, they were in unison that it is difficult to stay unique in the housing industry for a long time because the developers usually rely on the same suppliers and manufacturers. As a consequence, the other developers will imitate the new idea soon thereafter. One developer attempted to tackle the issue of imitation by patenting his design, though another issue arose regarding the ownership of patent rights to the house design (whether it belonged to the developer or the architect).

From the survey and interviews, the respondents mutually agreed that innovation includes improvement and usefulness and should be put into use, have an element of newness and uniqueness, provide solutions and lead to profits. This finding supports the general theoretical concept of innovation as discussed in the previous section. However, the way in which innovation is practiced in the housing industry differs from that of the manufacturing industry. The respondents argued that in the housing industry, innovation came from many sources; as such, the developers were unlikely to be the one producing innovation. Developers were, however, encouraging innovation through their interests and demands. Each housing unit comprises many components and has the potential for improvement. One respondent gave an example of the use of solar panels. Developers who wanted to use them in their houses will have to acquire the product from the supplier. It is the suppliers who must produce solar panels that are suitable and affordable for housing use.

Similarly, developers rely on the expertise of the contractors, architects or engineers to improve current methods or house designs. With reference to his past project, a respondent explained that the commonly used foundation for his land properties was either piling or concrete footing, both of which are costly. Thus, they sought advice from a contractor who proposed a foundation that was cheaper and easier to construct. Another respondent had also engaged in a contractor's expertise to reengineer his low and medium price apartment designs and methods of construction by modifying his conventional procurement methods into turnkey projects. The respondents also highlighted that they would utilise the internet, go to other countries or look at changing trend displayed by their local competitors to identify ideas for their new projects. Then, they reported that they would inform designers and engineers of their needs.

In a way, developers' roles in the housing industry are to 'seek,' 'choose' and 'use' innovation prepared by others. They are the 'middle men' that transform individual innovative products, methods or technologies into one usable and profitable output. Therefore, the role of other parties to develop new products or technologies, as well as the promotion of innovation to developers such as the creation of awareness regarding the appropriateness of the innovation in housing projects, is equally important.

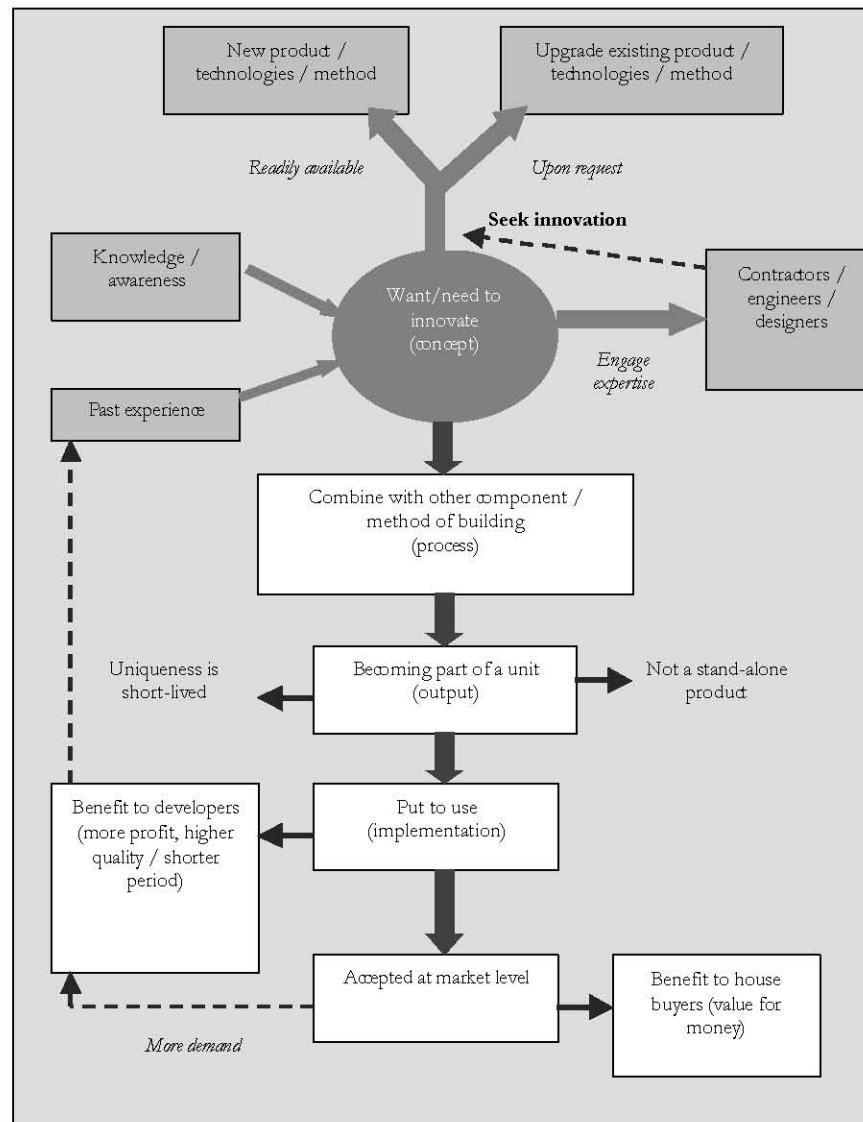


Fig. 2: Concept of innovation: perspectives of Malaysian housing developers

In summary, the seven aforementioned elements of innovation are present in the housing industry, though the manner in which they are being practiced is slightly different. Figure 1, which displays a holistic view of innovation, was modified to take into account the different characteristics of the housing industry. This modification is illustrated in Figure 2. The developers are not the producers of innovation, but users who combine various elements to produce larger outputs. They can obtain innovation by seeking ideas from suppliers and engaging with contractors, engineers or designers. The innovative products are not stand-alone, but only a part of the larger picture. Finally, the element of uniqueness is also short lived, as it can be copied by other developers.

RECOMMENDATION AND CONCLUSION

This study contributes to the existing body of knowledge on the meaning of innovation through surveys and interviews with Malaysian housing developers. Past studies of innovation in the housing industry have focused on specific types of innovation and, thus, provided only a limited understanding of the extent of innovation in the industry. This study revealed that seven elements of innovation, as illustrated in Figure 1, are present in the Malaysian housing industry, though the manner in which they are practiced is slightly different. For this reason, Figure 1 was modified to include the different environments associated with the housing industry. This modification is illustrated in Figure 2.

The survey reveals that housing developers connect innovation with practicality and applicability of the innovation itself. They agree that innovation involves the improvement of products or services while being useful and put into use. The responses obtained through semi-structured interviews provide a better understanding of the statements. The findings reveal that the meanings of innovation to Malaysian housing developers are similar from what previous studies have suggested, which conceptualised innovation in the context of improvement [9, 36, 41] and provided further evidence to the findings in Ball [1] and Blismas *et al.* [11] that innovation should provide benefits to both the firm and its clients.

The implication of the findings is that the time has come for developers to concentrate on new ideas, products or process that can be accepted by the market and provide benefits to the developers and clients. The manufacturers and suppliers have important roles in promoting innovation, by ensuring new products and technologies that are readily available. In addition, contractors, consultants and in particular the engineers and designers need to support innovation and must be qualified to implement it.

Furthermore, the lower scores concerning an innovation's adoptability (Items 5 and 7) could be associated with a low awareness of the viability of innovative housing solutions, especially in the long run. This finding supports the view that housing developers are not risk takers [3] and have a 'wait and see' attitude in order to ensure that the new products are successful before they decide to adopt the products for themselves [42]. Such lack of awareness could be reduced in the future if innovative efforts are rewarded by incentives that result in cost savings and if innovative options become more financially attractive and accessible than conventional ones. Because innovation is, as aforementioned, a risky business, developers should be convinced of larger returns to compensate for the risks. The role of policy makers is to ensure that incentives are in place for innovative developers and maintain a demand for innovative products. In addition, policy makers can promote innovation among housing developers by demonstrating that it will not result in the need to change existing efficient housing processes. The promotion of innovation can be accomplished by involving the manufacturers and suppliers to produce standard housing models and design guidelines, as well as by eliminating restrictions on innovative housing during the planning approval process.

Nonetheless, as in any other study, this work has several limitations. The study was conducted in the context of housing developers in the cities of a developing country where innovation is not the focus of the main players in comparison to other objectives (e.g., profit maximisation). Therefore, the results cannot be simply generalised to different contexts or countries where innovation is the norm and is more advanced. In addition, despite several strategies made to increase the response rate, the 18 percent usable response rate, although methodologically acceptable, was not high. Future studies that wish to use the same postal survey approach should be aware of this potential limitation. Our study shows the important role of other stakeholders, such as the manufacturers, suppliers, contractors and consultants, in ensuring the adoption of innovation. Another study is needed to investigate the characteristics of innovation as perceived by these stakeholders. Last, our study focuses on the concept of innovation from the developers' perspectives. As such, it does not account for factors that influence innovation on the part of the developers. Studies that investigate these two areas will add value to the existing body of knowledge.

ACKNOWLEDGEMENTS

The authors would like to acknowledge support from the Malaysian Government Fundamental Research Grant Scheme (FRGS), grant number 203/PPBGN/671149 for funding the research and making this publication possible.

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