

APPLICATION OF PROJECT MANAGEMENT METHODS IN THE CONSTRUCTION OF BUNGALOW HOUSE PROJECT: A CASE STUDY IN KUALA TERENGGANU, MALAYSIA

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ABSTRACT

This paper seeks the suitability of project management methods in bungalow house construction project in Kuala Terengganu, Malaysia. The data are collected through interviews. There are a total of 24 respondents interviewed, all of whom were home builders (contractors) from several locations in Kuala Terengganu, Malaysia. The data collected were based on the premise of the implementation of project management methods of construction of bungalow house project. The findings from the study revealed that close monitoring by responsible parties would result in successful solution to the existing problems in construction industry. Furthermore, it is believed that the current management issues at site could have been minimised or resolved should the home builders adapt to the proper project management methods of construction. The studies further suggested that government plays a vital role in assisting home builders, especially the inexperienced or the newcomers. The government, through various agencies especially the Construction Industrial Development Board (CIDB) could assist the builders to establish their footing in the industry. These agencies should make available programs that act as a platform to impart the knowledge and skills to the home builders. Further, the government could enforce a new policy that make it compulsory for the would-be home builders to enrol in a specially-designed project management training before embarking in the construction business. These moves could help boost up the growth of the construction industry, particularly in the development of bungalow houses in Kuala Terengganu, Malaysia.

Keywords: Project Management, Home Builders, Bungalow Houses

1.0 INTRODUCTION

1.1 Background of the study

Historically, construction has been related to the level of a country's developmental progress. As such, its success and failure inadvertently becomes national issues and problems. Anyway, what does construction means? One of the best definitions of the construction industry is the extent of which the facilities are designed and constructed with the available materials from the suppliers and labour as stipulated by the government's regulatory agencies in the area of safety, health and employment (Barrie and Paulson, 1992).

Residential construction is a sector that plays a vital role in our country's development. Hence, proper and systematic management of this sector should be applied and implemented by the parties involved, particularly the builders or the contractors. Construction covers both small and big projects. The application and implementation of modern project management methods should be adopted by single-family-dwelling home builders regardless of the size and level of the businesses.

1.2 Construction Scenario in Malaysia

Construction is one of the largest industries in Malaysia and plays a big role in the growth and development of the country. This sector ranks fourth after agriculture, manufacturing, and service in terms of labour usage in Malaysia. The Malaysian productivity report in 2005 (MPR) recorded that the construction industry contributed

0.6% towards employment in the country¹. It added that construction contributed 8.8% towards gross domestic product (GDP) as opposed to agriculture 13.4%, manufacturing 20.3% and service 52.2%. The productivity report of 2006 also indicated that the construction sector contributed to 2.7% of gross domestic product (GDP) for that particular year. To illustrate the importance of implementing methods of construction management in residential construction, we have got to look at the rapid growth of construction sectors. The demand for housing have been on the rising mode for the past decade or so. Table 1 shows the high demand of housing in the different states in Malaysia covering from year 2001 to 2005.

Table 1: Housing demand by state, 2001-2005

State	Total Demand
Johor	90174
Kedah	55514
Kelantan	54272
Melaka	20591
N. Sembilan	30753
Pahang	44642
Perak	76569
Perlis	7672
Pulau Pinang	41421
Selangor	106055
Terengganu	36940
W.P. Kuala Lumpur	46093
W.P. Labuan	2347
Sabah	100034
Sarawak	69223

Sources: Malaysian Journal of Consumer and Family Economics.

In Malaysia, public basic infrastructures project such as bridges, roads, school buildings, hospitals, water supply, piping and electrical supply lines depend heavily on proper project management in their implementation. The contractors, project managers, engineers, architects, quantity surveyors, site supervisors, machine operators, and labourers are the prime movers to ensure successful completion of these projects. However, the issue of whether proper project management being applied at all levels or otherwise remains a question due to some problems that has resulted in tremendous lost. (Abdullah, 2006).

Statement of the problem

In the context of performance and profitability of the construction industry, they are mostly caused by internal problems (Barrie & Paulson, 1992). The continual existence of construction industry bring about to why there problems in performance and profitability still coexist up to the present day and become pressing issues that need to be resolved (Barrie & Paulson, 1992). In the residential constructions, for instance, the performance of the home contractors is considered to be lower where the quantity of houses built per year is one or two units (Tan, 2005). There is growing number of complaints from potential home owners of the poor performance and low productivity of the home builders (Badron, 2005) as the number of construction units of houses increases.

The Malaysian Productivity Report (MPR) 2005 further reported that complaints recorded by the clients are low quality workmanship, cost overrun, delayed completion, poor communication, excessive material and labour used, building failure, and industrial related accidents. As such these issues are not only raised in the previous construction of homes but also a recurring problem in the construction bungalow houses in Malaysia that deems requires special attention.

1.3 Research Question

The study on application and implementation of project management methods in the construction of bungalow houses is to assess their consciousness towards the quality of work. In lieu of this several questions raised in the study are:

¹ Malaysian Productivity Report 2005

1. What are the elements of project management methods that can be applied and implemented in bungalow house construction?
2. Should project planning, project scheduling and project control concepts be applied to the construction of bungalow house?
3. How methods of project management can be applied and implemented in bungalow house construction.

1.4 Objective of the study

The aim of this study is to examine the suitability in applying and implementing project management methods in bungalow house projects in Malaysia. Therefore, to answer the research questions, the following are the objectives;

1. To identify the elements of project management methods in the construction of bungalow house.
2. To examine the roles of government agencies to the home builders in the bungalow house construction projects
3. To establish the application and implementation of project management methods in the construction of bungalow house project.

1.5 Significance of study

The outcome of this study will be of immense value to the success of Malaysia, as well as a contribution to the literature. Perhaps, the information obtained from this research can be used by the government policy maker and regulators and thus develop better understanding of the application and implementation of modern project management of construction of bungalow houses in Malaysia.

Other than giving significantly positive ideas to the policy makers in imposing rules and regulations that need to be practiced by homebuilders, the findings of the study should help to improve the quality of project management in bungalow house construction. These are the rules and regulations that have to be practiced by homebuilders. By imposing new policies that need to be practiced by homebuilders in bungalow house construction, problems and issues which arise in the residential construction as a whole could be solved. This research empirically lends significant general knowledge of proper project management in residential constructions project to homebuilders. The homebuilders will realize that applying and implementing modern methods and techniques of construction in bungalow house projects such as project planning, project scheduling and project control acts as a guidance to improve work performance and increase productivity. For other researchers, the findings of this study could provide for them a source of reference.

2.0 LITERATURE REVIEW

The illustration in the literature review covers the entire construction industry. It is then narrowed down to the types and resources of construction from global and local studies in the past. Subsequently the review is focus to the results and recommendations in applying and implementing project management methods in small and big scale projects.

2.1 Construction as an Industry

The literatures presented here magnify the importance of application and implementation of a proper project management methods regardless of the magnitude of the project. Building construction includes construction of office and commercial buildings, airport terminal buildings and public buildings such as schools and hospitals. Heavy engineering construction includes factory and plant buildings, bridges and tunnels, whilst industrial construction includes oil refinery, piping, cables and electricity.

Those who play important roles in the construction industry can be divided into three levels of professional types (Wong, 1977). The first level consists of quantity surveyors, architects, engineers, land surveyors, and project consultants and government authorities. The second level is made up of project managers, site supervisors, material suppliers and machines operators. And finally construction workers, plumbers, electricians, welders, plasterers, carpenters and steel workers constitute the third level. Barrie and Paulson (1992), on the other hand, defined that the construction industry is divided into four categories; residential construction, building construction, heavy engineering construction and industrial construction. Residential construction is further explained as single family homes, multi unit town houses, garden apartments, high-rise apartments and condominiums.

2.2. The Elements of Project Management

The project management elements consist of planning, scheduling and controlling (Keizer & Render, 2008). The review of literature finding are discussed in the following sub-sections.

2.2.1 Project Planning

Project planning is the first element in project management. It is initiated in the early stage of the construction. The planning, organizing, directing and controlling of project activities are part of project planning. It is the basis of project management while contractors or home-builders are required to comply with the client's needs and wants (Keizer, 2006; Barley & Saylor, 2001). Generally, small project is defined by the length of time it can be completed, i.e. within six (6) months (Rowe, 2000). Meanwhile, the construction of each bungalow house normally takes between 6-12 months to complete. There are several indicators of unplanned projects activities (Zamini & Bachan, 2008). Two common indicators are project delay and financial loss (Badron, 2005; Alan, 2007).

2.2.2 Project Scheduling

Project scheduling is another important element in project management. Projects with proper scheduled activities can produce better quality work, cost saving and faster construction periods (Keizer & Render, 2008). Indeed, project scheduling is vital to project execution success and in accomplishing the objectives and goals of a project (Graham, 2006). What is equally important is that the contractors adhere to the schedule of projects so that it does not breach the obligation and responsibility of completing the construction of house according to the stipulated time (Al-Kharashe & Skitmore, 2009). The failure to employ proper project scheduling might result in high risk of project being delayed, interruption in project completion and project financial lost (Badron, 2005; Alan, 2007).

2.2.3 Project Controlling

Another important element of project management is project control. Its function is to coordinate resources, people, money, equipment, machinery and time into a designated time frame to accomplish project objectives and obtain satisfying performance and results (Keizer, 2006; Tan, 2005; Pinto & Traylor). The area of control in project management are objective control, design control, budgeting and cost control, authority and approving control as well as financing control and to control costs (Tan, 2005). In Malaysia, the controlling activities of construction and providing its guideline are facilitated through the Construction Industrial Development Board (CIDB). Thus, in short the basic rule of management is that no project is likely to be successful unless objectives are properly defined and adequate allocations are being made for the necessary labour and materials.

Project cost is equally important as project control regardless of the size of the project (Keizer, 2006). The success of the project is determined by the effective implementation of the management of the project cost (Pinto & Traylor, 1999). Hence managing cost with the scope of time would provide good project outcome (Melton, 2008). Otherwise, the consequence of not applying project costing during the construction process would be reflected by improper material control thus causing excessive wastage of resources (Poon Yu & Jai Bon, 2004).

2.2.4 Resources of Construction

The method of project management in residential constructions in Malaysia still remains backward primarily in terms of the methods used (Kader et al. (2004). This was supported by Tan's (2005) argument that in Malaysia, builders are in general slow to respond to the changing needs of the building industry. Home builders, particularly in small constructions are too sluggish in their approach to new methods and techniques. These factors result in poor workmanship, low standards, longer project durations, completion delays, massive cost overruns, industrial related incidents and building failures (Tan, 2005). What that has been described by Tan (2005) is the reality of home builders not only in the area of this study, but also in the whole nation. The application of management methods in residential construction acts as an adjustment (Wong, 1997) to the building industry. If project management methods were to be employed, a lot of improvements can thus be achieved. The successful factors in managing housing construction industry are linked to the economic environment, project manager experience and qualification as well as commitment of the project team (Inna Didenko & Ivan Kohrt, 2009). The residential construction productivity is still low due to the incapability of the contractor to organize activities (Kader et al., 2006). To put it more succinctly, contractors (home builders) of single-family housing or bungalow are still lacking in their ability to adopt project management methods in the implementation of the project.

3.0 RESEARCH DESIGN AND METHODOLOGY

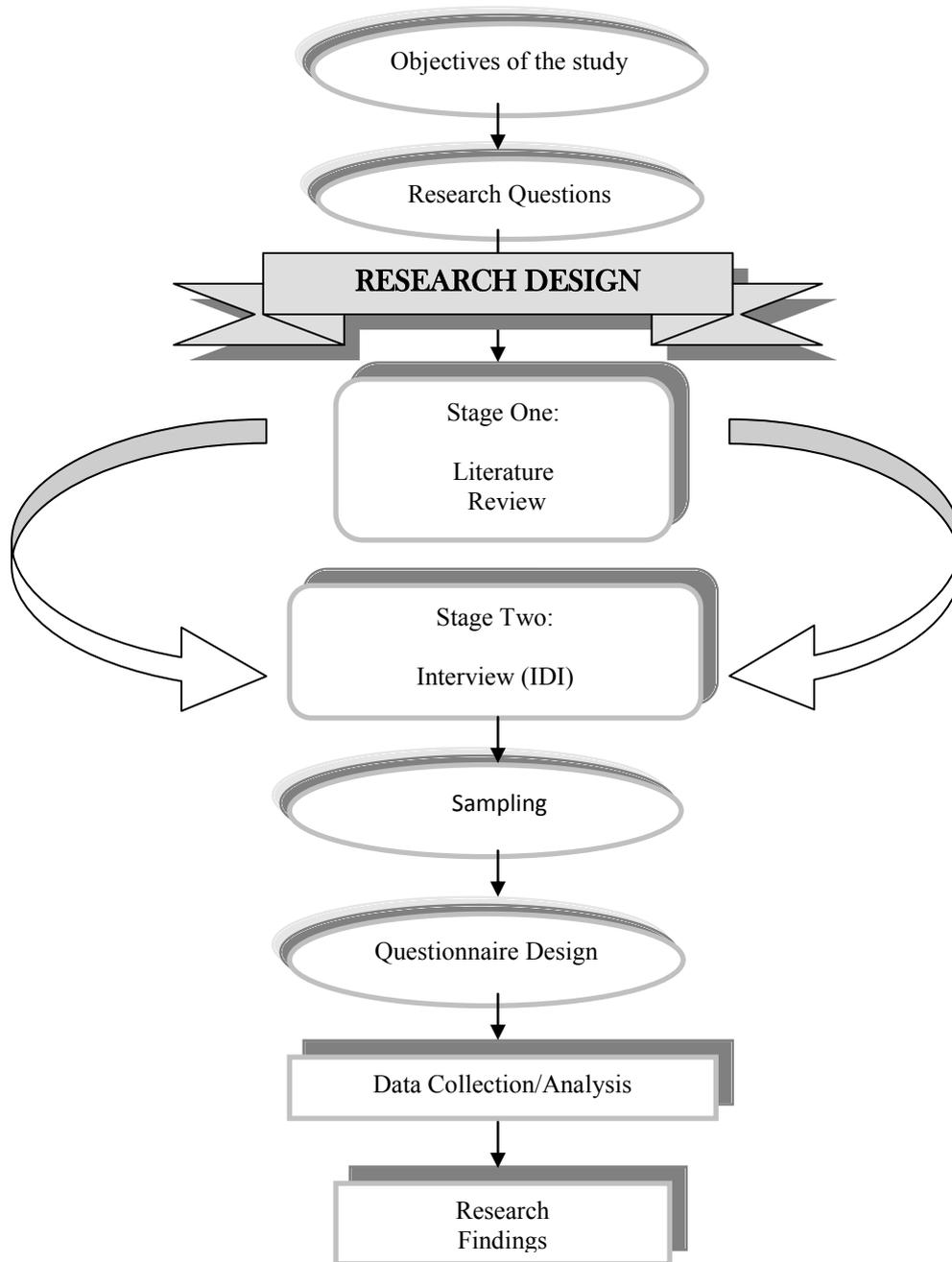
The examination of the bungalow house have been focused on the management prospective which are directed strategically towards application of project management elements such as project planning, project scheduling, project control and project costing. The study is designed to look into two aspects. The first one is to investigate the home builders' profiles and types of project management they practice. The second aspect is to identify what affirmative action need to be taken by the government to ensure successful implementation of project management methods. The interviews were intended to identify the need for project management

methods among home builders. They were asked about their action plans, written project planning and project scheduling, and also their strategies during project execution. The last question asked was an open-ended question about their opinion regarding the type of project management methods.

3.1 The Overview of Research Design and Process

This research is qualitative by nature. The study is based on the researcher’s intension to conduct face to face interview. The illustration of the conceptual model of the research design and process is shown in Figure 1. The research is conducted in two stages. The first stage is the review of literature. The purpose is to acquire a preliminary insight of the project management element concept and to find out the benefits of its application and implementation in a small size project such as the construction of single family house (bungalow). Rowe (2007) defined small size projects as a project that needs about six months to be completed.

Figure 1: Research Design and Process



Sources: Cooper & Pamela (2008)

The Individual–Dept–Interview (IDI) is employed to acquire reliable answers from the respondents (Cooper & Pamela, 2008). IDI is an instructed-questionnaire administrated interview where the respondents are free from outside pressure when providing the answers to the questions asked (Cooper & Pamela, 2008). The advantage of this method verified good question can produce an accurate and truthful answer (Sudman & Wansik, 2004).

3.3 Sampling

Sample frame is defined as parties or subjects representing the whole population of the subject (Cooper and Pamela, 2008). The parties normally involved in the project consist of clients, consultants, authorities' contractors, site supervisors and sales officers (Tan, 2008). It has also been suggested by Wong (1997) that individuals directly involved in single-detached-family house or bungalow house construction can be among the owners or financial consultants, project management consultants, architects, town planners, quantity surveyors, engineers, homebuilders, the main contractor, sub-contractors or suppliers.

In this study, the sampling frame is one of the stakeholders in the bungalow house construction of which it can be either homebuilders or contractors. The sample is the individual (home builders or contractors) in the sampling frames. The contractors are from population who actively participated in the construction of bungalow houses in the area of Kuala Terengganu, Malaysia.

3.4 Data Collection

There are a total of 24 respondents. They were interviewed at the pre-designated locations. Out of these samples, 20 are from the public sector, 2 from the local authorities and the other 2 respondents are from government department. The illustrations of interviewing process are organized in the following manner. Subsection 3.4.1 presents the interview.

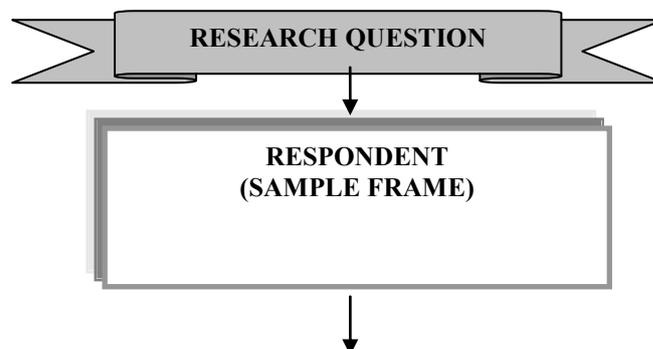
3.4.1 Interview

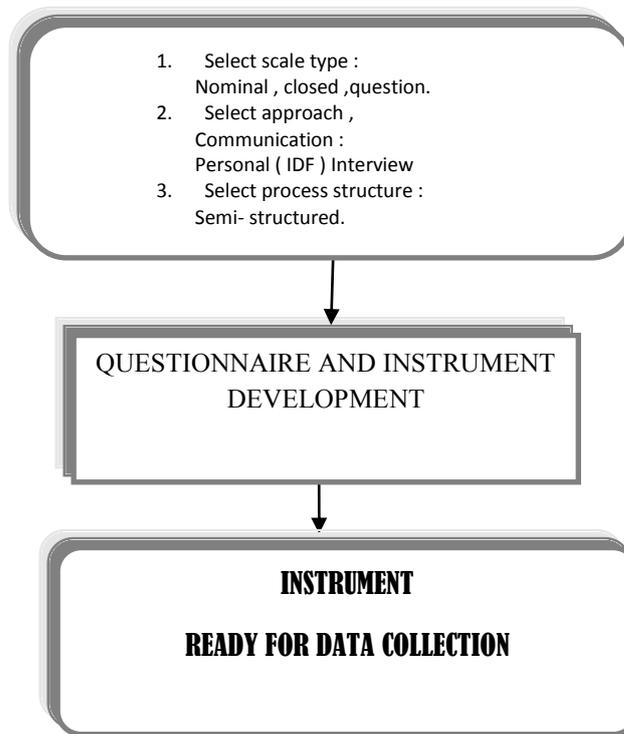
This study adopted a face-face interview with semi structured open ended questions as method of data collection. The advantages of this method are plenty. One of the advantages is that the researcher can ask the respondent a series of questions pertaining to the topic of the study (Ackroyd & Huges, 1981). The process of interview requires listening and understanding skills and at the same time respecting what people say in a systematic way (Robin & Robin, 1995). As such, the other advantage is that by performing face to face interview confusion and misunderstanding can be avoided (Bruce 2004). At the same time ambiguous answers from the respondents can be dealt with on the spot, thus vague question can be avoided. During the interviewing process, answers from the respondents were recorded immediately in an interview sheet and tape recorder. Each interview session is estimated to take about 30 to 45 minutes.

3.4.2 Interview Procedures

The interview session is conducted in a preserved manner whereby several rules and regulations have to be abided. First of all, the interview must be performed at a timely hour whereby it does not interfere with the work activities of the homebuilders or intervenes with the respondents' quality time with their family. Second, the place where the interview to take place must be agreeable by the respondents. Long travelling time to get to the location of the interview session must be avoided. Therefore, the place chosen for interview must be easily accessed to by the respondents. In addition, the words in the questions should be simple, clear and acceptable to respondent. Any words that affect the sensitivity of religion, race, culture, and ethnicity of the respondents should be avoided.

Figure 2: Data Collection Process





3.5 Design of Interview Questions

The interview questions were designed based on size and location of the sample frame. Cooper and Pamela (2008) defined the sample frame of qualitative research as few of dozens of individual departmental interviews, close-ended questions, nominal scale, mutual response as well as a yes and no answer. explained that good questions are free from ambiguity and produces only one answer to choose from (Bradburn et al., 2004). The three benefits of interview-administrator questions are clarity, converted questions and high-comment respondents (Bruce, 2004). Figure 3 depicts the interview question design outline.

The question has two sections: Section I and Section II. Section I interview questions are intended for the individual respondent's profile. Section II is a combination of close and open-ended interview questions. The first part of the section is to examine the current project management practise. It describes the possibility of project management methods application in construction of bungalow house. A series of interview questions were formulated to identify the criteria or factors needed in order to assist in facilitating the application of project management methods in bungalow construction. The question asked was related to the home builder's current personal skill, methods currently used and the reason for failing to apply project management methods. The last question of this section was an open-ended question enquiring the promotion of using methods of construction in bungalow house.

3.6 Pilot Study

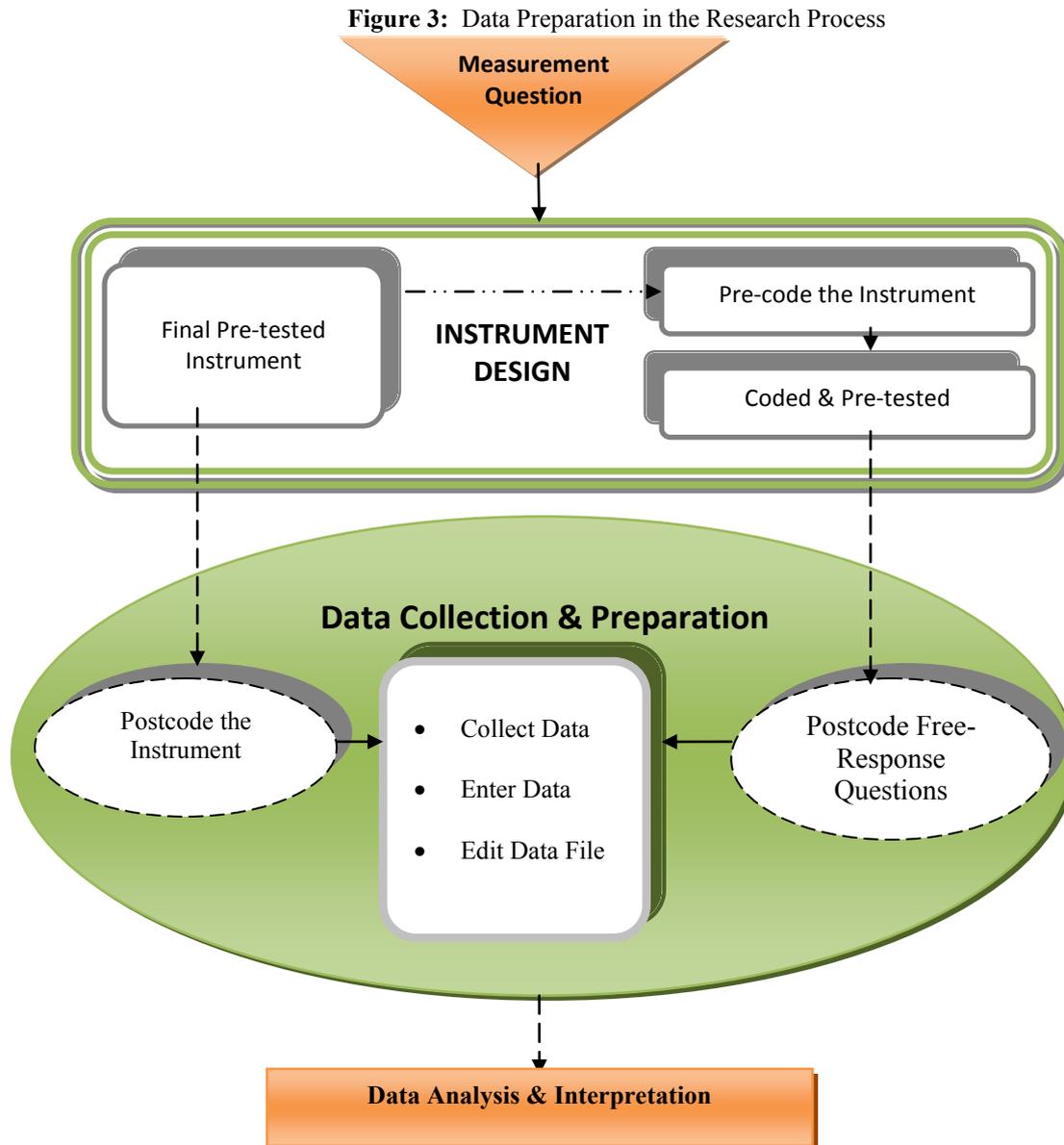
Both the open-ended and structured interview questions are subjected to pilot study. One of the purposes of pilot testing of any measurement instruction is to identify and anticipate categorization issues (Cooper & Pamela, 2008). Otherwise, the purpose of the study is to actually improve on the contents, validity, and time spent for measurement instrument (Dillman, 1978). The pilot study was conducted on 12 respondents in the area of Kuala Terengganu, Terengganu. Among these respondents are 8 contractors and 4 consultants.

The contents of the questions were fined-tuned by modifying the wordings; sentencing and paraphrasing to meet the level of understanding of the respondents who are mostly homebuilders. Any difficult words or sentences were omitted and replaced with more easily understandable words or sentences.

The number of questions asked were also reduced to a minimum number which is the least time-consuming. The arrangements of the questions were also rectified. The boxes were arranged horizontally instead of vertically. The feedback from the respondents was taken into consideration and they were used as references to improve the question features. The question is once again redefined and improved in its physical appearance, presentation, sentence sequencing, wordings and brevity of time. After completing the pilot study, the questions were then finalized to only 12 questions and ready for actual full-scale study.

3.9 Full-Scale Data Collection

There were 24 copies of questions distributed to the respondents in the area under study. When the full-scale study for data collection was carried out, each respondent was allocated half an hour to forty-five minute to answer all the questions. The interview sessions were conducted both in natural settings and in pre-designated locations. Nonetheless, due to time constrain, all the process were performed during the one (1) month period. The data preparation in the research process is as indicated in Figure 3.



3.10 Method of Analysis

There are two stages of method of analysis. The first stage was to prepare data while the second stage was to analyze the data. Data preparation involves several processes and steps including editing, coding, interpreting, and summarizing (Corbin & Strauss, 2007) while data analysis involved the gathering and collection of information from the interview which had been formed into real data that can be analyzed and interpreted. Miles & Huberman (1994) described method of analysis as the process of analysing the raw data while Corbin & Strauss (2007) mentioned that data entry is the process of conversion of the information obtained from primary sources into a medium for viewing and manipulation.

Descriptive statistics such as tables, pie charts and figures were chosen as a mean to display and show the analysed data. Also, a segmented analysis is employed to examine, analyze and interpret the data. Data analysis and interpretation of the interview responds to all of the 3 research questions earlier in the section.

4.0 DATA ANALYSIS AND FINDINGS

4.1 The Respondents' Profiles

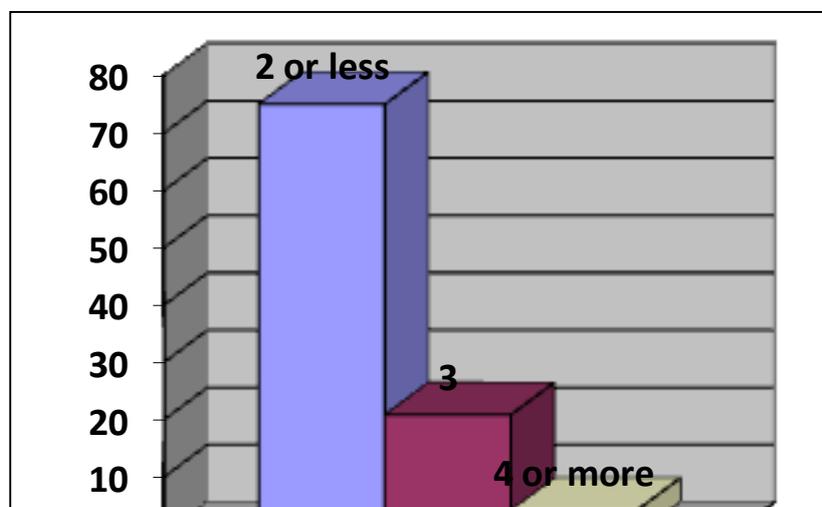
Table 3 depicts the profile of the respondents. The respondent's personality was classified into five variables namely gender, age, experience, qualification and capacity. The results of the last column are showed in percentages. It revealed that 100% of the Home Builders were males. It also showed that almost 80% of Home Builders (contractors) interviewed were forty years of age or above, all of whom had more than ten years experience. At this juncture, they should have acquired more knowledge and skills in home building construction. Ironically, all the builders have had no Diploma or Degree from any institutions of higher learning either locally or abroad. The highest academic qualification of the respondents are SPM certificates. This result signalled that the contractors would have had some personal limitations and obstacles in practicing the Project Management methods concepts due their minimum academic qualification.

Table 3: Respondents' Profile

Variables	Home Builders	Frequency	Percentage
Gender	Male	24	100
	Female	0	0
Age	<40	1	4.17
	40	4	16.67
	>40	19	79.17
Experience (year)	<10	0	0
	10	2	8.33
	>10	22	91.67
Qualification	SPM	24	100
	Diploma	0	0
	Degree	0	0
Capacity (unit) of construction per year	2 or less	18	75
	3	5	20.83
	4or more	1	4.17

The other measure of performance is the capacity of the home builders to construct bungalow house in a year expressed terms of percentage (Table 3 and Figure 4). The results indicated 75% of the contractors were only capable of building two or less unit per year. It clearly indicates that home builders are incapable of constructing more than 4 units per year (Table 3 and figure 4). The construction performance is reflected from the low academic qualification of home builders which resulted in the inability to apply project management methods in construction. This is in line with the empirical study conducted by Kader et al. (2004) which revealed that low qualification staff should not be employed because their weakness would likely create barriers and obstacles in achieving company's goal and objective. Likewise, low productivity is common during the construction of single dwelling house due to the inability of contractor to manage and organize activity (Kader et al., 2004).

Figure 4: Capacity percentage Among Home Builders



4.2 Data Analysis and Finding of the Project Management Methods in Bungalow House Construction

The results of this interview revealed the findings of project management methods in bungalow house construction that had been practised by home builders in the area of Kuala Terengganu, Terengganu, Malaysia. This finding was presented in Table 5 and Figure 5.

Figure 5: Project Management in Bungalow Construction

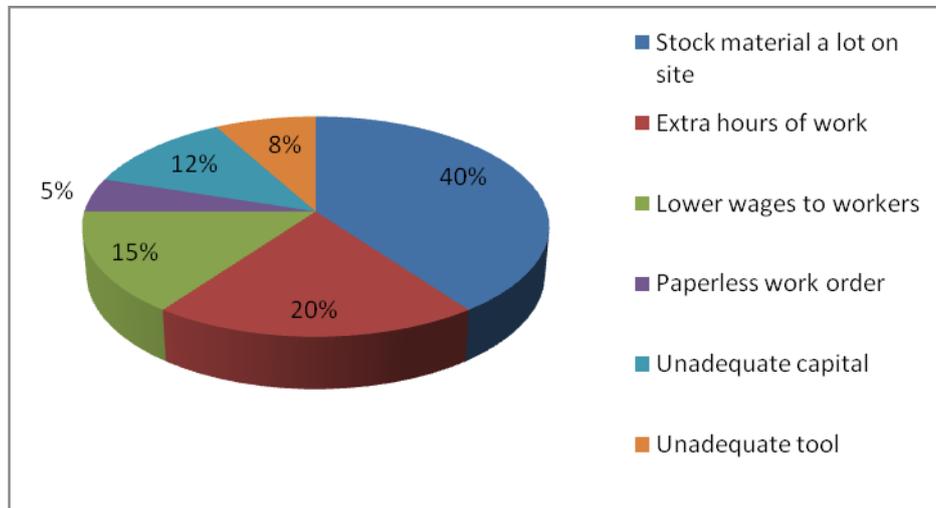


Table 5: The components of project management practised by the home builders

Action Plans	Number of Respondents	Percentage
1.To prepare written plans	0	0
2. To find material suppliers	20	85
3. To contact friends	4	15
Tools for work activities	Number of Respondents	Percentage
1.Project schedule	0	0
2.check list	0	0
3.verbal	24	100
Strategy of uncertainty	Number of Respondents	Percentage
1.Project controlling	0	0
2.Excessive inventory	18	75
3.Extra work hours	6	25
Opinions	Number of Respondents	Percentage
1.Depends on individual	4	15
2.Traditional	20	85
3.Cotemporary/modern	0	0

The analysis responded to the interpretation of the first research question : (*What are the elements of project management methods that can be applied and implemented in bungalow house construction?*). Understandably, 20 home builders (85%) would proceed with finding suppliers for materials once awarded the contract as they believed that stocking up materials could guarantee smooth implementation of their construction work. However, should there be shortage of materials like cement, clay bricks, cement bricks, aggregates, steel bars, formworks and sand, the delay in the work activities is unavoidable. In some instances, construction activities may be temporarily halted. Apparently, materials should be readily available during the construction process. The materials used at the site are an estimated amount.

The other aspect of management is that the adopted by home builders by verbal planning during the construction of the bungalow. Table 5 indicated that only 4 (15%) of the builders decided to seek a second opinion about their work. Through discussion with friends, project planning can be used to implement bungalow house

construction. The finding further suggested the home builders should be able to plan their time on how and when to execute the construction work based on verbal planning.

Another result showed that none (0%) (Table 5) of the home builders used or employed project management methods of construction after performing written project planning as the first step that should be taken after being awarded the contract by the client. The results also indicated that most home builders are ignorant of written project planning as a way to achieve project objective (Table 5).

Another finding indicates that home builders failed to apply accurate methods of project planning to achieve the targeted project objective. Instead of a written project planning or project scheduling, the home builders prefer verbal communication to organize daily work activities. Further analysis is with regard to the tools that home builders can employ to organize their work activities and to develop network. As the data shows, all (100%) (Table 5) home builders who were interviewed failed to apply the technique of modern methods of construction.

The home builders could overcome the problems and be able to resume the construction operation if strategic planning is to be applied in the bungalow house construction. The interview indicated that 18 (75%) (Table 5) of the home builders considered excessive inventory of materials as the right strategy to tackle uncertainty in material availability. On the other hand, 6 (25%) home builders chose to add extra work hours to speed up completion time. It was believed that this was the best way to counter uncertainty in price hikes and unavailability of the materials. Based on the finding, the strategies adopted were very effective and practical. Thus, the decision to apply and practice project costing and control was based on previous experience and logic. The finding also indicated that this strategy has been used for a long time and had saved many home builders from losses.

By adding more workers (Table 5), the completion time could be shortened and the burden of tasks carried out by the workers would be decreased. This strategy seemed to be more acceptable and reasonable. It was discovered that current home builders are still practicing and using the traditional methods of construction. This result was supported by the finding from Rowe (2007) which stated that the absence of proper project planning, project scheduling and project control could result in the inability of the project to produce work breakdown structure, a key structure in project management.

When referring to the opinions concerning the trend or the practice project management in operation of the bungalow construction, the result showed that 20 (25%) home builders said that the current practice was regular and normal, or academically referred to as "Traditional". The term used to describe the current project management in bungalow house construction meets the criterion as described by Rowe (2007), and Al-Khrashe & Skitmore (2009).

From this analysis, it was discovered that home builders still practice traditional methods of construction instead of project management methods. Therefore it was recommended that the builders employ methods of construction which are more systematically planned and well executed. This claim concurred with the statement by Keizer and Render (2008), Yu & Boon (2004).

4.3. Data Analysis and Finding of Home Builders Acceptance on Project Management Method

Table 6 shows the data analysis and finding of home builders acceptance of project management methods of bungalow houses construction.

Table 6: Acceptance of Project Management by Home Builders

Criteria	Distribution	Percentage
Skill		
1. Interpret drawing plan	24	100
2. Draw breakdown structure	0	0
3. Form project scheduling	0	0
Methods used		
1. Regular practice	24	100
2. Contemporary Project management	0	0
3. Microsoft project software	0	0
Reasons		

1.Lack of knowledge	0	0
2.Unaware	24	100
3.Costly	0	0
Opinions		
1.Accept the promotion	16	66.67
2.Reluctant	0	0
3. Not decided yet	8	33.33

Table 6 represents the analysis and interpretation of the responds to the second research question: (*Should project planning, project scheduling and project control concepts be applied to the construction of bungalow houses?*). The first analysis goes to possession of personal skill among the respondents (home builders). It was established from the interviews that all (100%) of the respondents possess similar skills of interpreting the drawing plan. This basic skill enables the contractors to build the bungalow unit as specified in the architect's plan.

The findings indicated that all the home builders (100%) (Table 6) interviewed had resorted to current practice of project management in constructing bungalow house. The current practice means the contractors use project planning, scheduling and monitoring in every aspects of management in construction of houses. Based on the result of the interviews, their only perceived task in project management was building the physical form of the building. The absence of paper work or proper project management was apparent. Therefore, the finding implies that the basic knowledge and implementation using project planning, project scheduling, and project control, the elements of project management are not very much required in small scale construction. These elements of project management mostly required for big scale projects.

Planners do determine the length of time to complete various elements of the project and cost is often accomplished through Work Breakdown Structures (WBS), (Stevenson, 2005). From this finding, the home builders are lacking in skills and unable to extract all the information available in the plan (Table 6) into more detailed instruction of tasks, equipment, capital, materials and manpower. This scenario indicates that the skill and knowledge of home builders on utilising project management methods are very limited. Thus, there is a need to train home builders to acquire knowledge and theory on project management methods in construction before going to the site.

Furthermore, the third analysis focused on the encouragement of the application of project management method in construction of bungalow houses. The finding indicates that there is an absence of encouragement in championing project management methods in the construction of bungalow houses. This is indicated by 24 (100%) (Table 6) of the home builder responded on the lack of promotion or encouragement from authorities to use project management methods in the construction of bungalow houses (Table 6). The home builders are not only to be blamed for not taking the initiative to acquire the knowledge on project management methods. But there should be parties responsible for providing training to contractor in project management methods in the construction.

In another finding, cost and lack of knowledge (Table 6) are not the determinant factors of home builders to accept project management methods. In order words the cost of bungalow and absence of knowledge of house builders are not affected during construction of bungalow houses.

The last part of the analysis is regarding the outcome of the open-ended questions which was to identify the idea for promoting the application of project management methods in bungalow house construction project. The finding indicated that 66.67% of the home builders claimed that they were never informed about project management (Table 6). Whilst 8 (33%) of the home builders claimed project management are expensive due to heavy machinery and equipment usage. Notably, the opinions on project management methods are diverse.

None of the home builders (Table 6) refused to take the opportunity to acquire knowledge project management methods. From the findings, it can be interpreted as follows: the coordination between the housing contractors and other parties involved can be termed as weak. It is clearly indicated by the results of the findings where house builders are isolated and go on their own to get the job done. The authorities who are supposed to be responsible in promoting project management methods among house builders apparently failed to do so. Up to now, home builders are still using old methods in construction.

Nevertheless the house builders are willing to take the opportunity to learn the new knowledge of project management methods provided they are given the chance. This is indicated in the finding that home builders are willing to change from the traditional to the project management methods (Table 6). However, training has to be provided to them.

It can be summarized that there are possibilities that project management methods can be applied and implemented by home builders in bungalow house projects not only in the area under study but in the entire nation. This recommendation is supported by Pinto & Trailer (1999) & Melton (2008) which stated that the ever readiness of home builders to adopt the project management method in their construction. In view of that, the Construction Industrial Development Board (CIDB) which is a government body could take the lead to encourage and train up home builders to use project management methods in construction of bungalow houses.

4.4. Data Analysis and Finding of the Implementation of Project Management Methods in Bungalow House Construction.

This section presents the outcome of the interview that corresponds to answering the third research question (*How methods of project management can be applied and implemented in bungalow house construction*). Table 7 indicates the data analysis and the finding on how the method of project management can be implemented in bungalow houses construction.

Table 7: The Implementation of Project Management Methods in Bungalow House Construction

Organizations	Interview results	Percentage
Agent		
1.PWD (JKR)	4	16.7
2.PKK	4	16.7
3.CIDB	16	66.6
Authority		
1.Government	20	83.3
2.Local Authority	3	12.5
3.Architect/engineer	1	4.2
Implementation		
1.Make as policy	18	75
2.Course/Training	4	16.7
3.Other	2	8.3
Opinions		
1.Government	24	100%

From Table 7, 20 (83.3%) (Table 7) of the respondents agreed that the Government should take full responsibility in introducing and promoting project management methods to house builders. Only 3 (12.5%) (Table 7) of the respondents believed the local authority should shoulder the responsibilities. The majority of the respondents (83.3%) suggested that the federal and local governments should collaborate to strategically design and implement a program for home builders can acquire the skills of project management methods to implement the construction of bungalow houses. On the other hand, only 1 (4.2 %) (Table 7) of the respondents selected professional bodies such as architects and engineers to be directly involved in introducing and promoting project management to home builders.

Table 7 also indicated the lists of government agencies which were believed to be able to assist the federal and local government to promote and facilitate the use of project management method. Among the lists, 16 (66.7%) (Table 7) of the respondents prefer CIDB as the place to attend the training programme. Only 4 (16.67%) (Table 7) of the total respondents prefer PWD and PKK respectively to act as agent to assist in providing project management methods on bungalow house implementation. In terms of percentage, the results showed that 16 (66.6%) (Table 7) of the respondents selected CIDB as the training centre to attend the course. According to them, CIDB is highly capable of delivering good lessons not only in theory but also practically. PKK or PWD are only capable of providing practical training but not theory because they do not have the facilities and training centre specifically for home builders unlike CIDB. For example, ABM, the training arm of CIDB, acts as facilitator in the development and upgrading of skill of construction personnel.

The next finding indicated 18 (75%) of the contractors urged the government to make the implementation of project management method as a policy to all home builders. In order to accomplish this purpose, the acquiring

of project management method should be compulsory and gazetted as a policy to all home builders. By doing so, home builders are obligated to apply, implement and practise it in their daily work activities at construction sites.

Another interesting finding revealed all (100%) (Table 7) of the respondents collectively agree that the government must lead the way for home builders to adopt, apply and implement methods of construction in bungalow house. This finding seemed to support the study conducted by Marchman (1998) which stated that having skills and knowledge prevent the project from going out of control. In addition, all the resources will be utilised to the maximum level to achieve high productivity. With this understanding, home builders will make good project controllers.

In order to make this proposal a reality, the government must provide courses and training through its agencies, in particular, CIDB. By doing so, the home builders will be able to cope with the introduction and application of project management methods on bungalow house constructions.

Another interesting finding revealed that all home builders (100%) did not received high academic qualifications. Hence, they are unable to acquire much high technical knowledge and understanding of modern project management which could boost their performance and productivity.

Needless to say the application of project management methods requires a systematic and well-organized and structure implementation. However the other finding indicated that the contractors have certain limitation which can be an obstacle to progress and apply project management concept and operation. Therefore, the finding suggested that the way the home builders can manage effectively project is by replacing the existing method of management to project management methods of construction which can make project to be well organized, planned and systematically executed. As such the government should provide courses and training programmes to home builders through its agencies like CIDB. By doing so, the home builders will be able to cope with the newly introduced project management methods on how to apply and use these method in bungalow house construction. In sum, the findings on project management methods can be applied and implemented to enhance home builder's performance and productivity, provided the government lend the support.

5.0 CONCLUSIONS AND RECOMMENDATION

5.1 Conclusion

The aim of this study is to examine the application concept of project management methods in bungalow house construction project. It is achieved through the finding of the studies described in the subsequent sections.

5.1.1 Elements of the Project Management methods

The finding of the study indicated that once the contract is awarded, the first action plan the home builder did was to search for material suppliers and to seek for the second opinions of what needed to be done before commencement of the work. However, none of the home builders interviewed really sat down and prepare a plan such as project planning, project scheduling and project controlling in writing. Hence they were unable to break down the activities involved in the construction of bungalow project. Project management methods were clearly not practiced by the builders.

Although bungalow house project is considered a small project, it still involved a lot of activities just like a large scale project (Tan, 2005 & Rowe, 2007). All the activities need to be planned, organized and controlled in an orderly manner. A good contractor is characterized by the ability to control and organize all the resources of the project (Marchman, 1998). The finding of this study revealed that home builders of bungalow construction project provide the information and knowledge in project management. Primarily, such methods are project planning, scheduling, and controlling. These tools and methods are extremely important in the application and the management of the bungalow house projects. Thus, home builders can apply project planning, scheduling and controlling in the construction the bungalow house projects specifically in the area of Kuala Terengganu, Terengganu or in Malaysia in general.

5.1.2 The need for Project Management Methods in Bungalow House Construction

Despite their low academic qualifications, all home builders are expected to be able to read and interpret the plans of the building (refer to Table 3). Their experience can certainly help them acquire the most basic skills needed for a home contractor (Abdullah, 2006). Apparently, the home builders are capable of transforming the plan into completed houses. None of the governmental bodies actually provide the home builders training and guidance in project management.

Given the opportunity, the home builders were willing to learn and implement the modern methods and techniques of project management. The finding indicated that 20 home builders (66.67%) (Table 6) agreed to accept the program organised by the government to acquire the knowledge and skill in project management methods. It is noticed that there is high desire among the home builders in Kuala Terengganu, Malaysia to apply project management methods of construction project. With the application of the project management method, the number of units successfully constructed every year.

5.1.3 Application of Project Management Methods in Bungalow House Construction

All the home builders agreed that the government and its functional agencies must play a vital role and be fully committed to ensure that the application and implementation of project management methods of construction the home builders become a reality. The first question is what roles the government must play to ensure these methods are practiced by home builders. The second question was what mechanism that can be used by the authorities to impose and extend the practise of project management methods among home builders in bungalow house project. The finding suggested, the government should aggressively promote the use of project management methods among home builders. It can be achieved through three government agencies. These three agencies are CIDB, Public Works Department (PWD), and Centre for Contractor Services or *Pusat Khidmat Contractor* (PKK). The finding also revealed that 20 (66.67%) (Table 7) of the home builders prefer CIDB while 16.67% prefer PWD and PKK respectively. Furthermore, the finding indicated that the government should take affirmative action in order to sustain the use of modern management concept and successfully apply and implement it by making it a policy and regulation. The home builders also viewed that the authorities should have frequent checks in monitoring the systematic application and implementation of project management method.

5.3 Contribution

This paper is limited to investigating the feasibility of applying project management methods of construction in bungalow house projects only. The first contribution is to the academic. In fact it is a source of reference and as a stimulant for any higher institution of learning to persuade a full-scale research with a reliable budget and a broader context. The academia will rely on the findings of this paper to refer and to support the point of views. On the other hand, contractors, engineers, architects, project managers, site supervisors and developers will use the findings of this paper to support them in their decision making process.

The second contribution is that this finding can serve as guideline to draw a policy for all home builders specifically in the construction of bungalow houses. What it really means is an effective policy related to housing construction that can be transpired out of this study. Hence the home builders can follow once these rules and regulation set by the government. Failure to do so by the said parties will result in having to bear the consequences of project delay and financial loss.

The third contribution of this paper is to the construction industry. As discovered, education level, knowledge and skill of construction workers and the contractors are essential and crucial in order to cope with the changes and challenges in the industry itself. By having a high level of education, the contractor will be able to cope with technology application in the industry, such as the use of project management software especially in the project initiation.

5.2 Recommendation

The discussion of findings emphasized how significant it is to adapt, apply and implement project management methods construction of bungalow house project. This significance does not only apply to the home builders in the area of Kuala Terengganu, Malaysia but also to others who are involved in residential construction industry. As such, the application of such methods could reduce cost over-run, delay of completion time, building failure, low quality workmanship, and industrial-related incidents.

The application and implementation project management methods were proven by previous studies. In the UK, for example, the study conducted by Gibb and Dainty (2007) indicated the acceptance of home builders toward the construction methods. Surprisingly, this finding revealed a similar previous study in which more than 66% (Table 7) of the home builders who were interviewed were ever willing to emulate the construction methods in building a single-unit family dwelling.

In a similar finding in Saudi Arabia by Al-Kharshe and Skitmore (2009), there is a need to have a proper project planning in construction. Without which, problems can arise in the construction project. One of the problems is the causes of the delay in the Saudi Arabian public-sector construction project. This delay, in turn

will result in the inability to develop strategic plans for scheduling of construction project. Although bungalow house project is considered a small project, similar to a big scale project, proper project planning, project scheduling, and project controlling are still needed (Sandra, 2007). At the same time, it was proven that this management style can result in high productivity. Gibb and Dainty (2007) for example discovered that project management of construction used by house builders have changed performance and productivity due to proper project planning and assistance from modern technology equipments to speed up work activities.

Based on previous literatures and current research findings, the researcher recommends the project management method is suitable to be applied and implemented in bungalow house project. It can improve the performance and increase the productivity of home builders.

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