



Tools for Making a Decision at the Planning Phase of Housing Development Project

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Abstract: Literature discovered that the selection of the right tool affects the decision-making process at the planning phase of housing development project. Imprecise decision-making are capable of generating big threat to project completion. Therefore, the adoption of the right tool by decision makers are compulsory to prevent the occurrence of any difficulties on the final stage of the project. The objective of this research is to define the decision-making tool applied at the planning phase of housing development project in Malaysia. A total of 80 sets of structured questionnaires were distributed to the private housing developers in Malaysia and out of 67 were found usable after data screening. The descriptive statistical analysis and the correlated analysis are conducted in this study aided by Statistical Package for Social Sciences (SPSS) software. The results of this study show that most of the Malaysian private housing developers applied potential analysis, comparison analysis, economic analysis, feasibility study and 4P's analysis as tools when making a decision at the planning phase of housing development project. Hence, this paper is supposed to lead the potential private housing developers along with the governments by providing a number of tools in making decisions at the planning phase of housing development project in Malaysia.

Keywords: Decision-making tool, decision-making process, planning phase, housing development

1. Introduction

Managing projects efficiently is a major challenge in the business world. In housing development projects, the project teams need to plan, organise, conduct, monitor, and control. Various changes that arose in the planning phase contributes to the difficulties in the decision-making process (Omar, Bambang & Johny, 2009). A right decision must be made as failing to do so will risk the housing development project (Rajaprasad, 2018). Besides affecting the decision maker's business, this situation also worries the buyers who are likely not satisfied with their house. Hence, it is vital to select and apply the right tool and technique at the different project life cycle phases (Al-Hajj & Zraunig, 2018) especially in the planning phase.

2. Literature Review

The planning phase is crucial to a project's success (Agus, 2002; Mohd, Ahmad & Wan Abdul Aziz, 2009; Abdullah, Harun & Abdul Rahman, 2011; Mohd & Alias, 2011). Together with the huge assortment of planning fields, planning, generally is the act of systematising activities within a framework to achieve the desired goal (Marzuki, 2015). In reliance

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on the current knowledge and prediction of future development, the planning sketches how the project would be built to reach specified goals based on discussion and decisions made (Chitkara, 2014). According to (Chitkara, 2014; Angus, Gundersen & Cullianane, 2003; RIBA, 2013; Turner, 2014; PMI, 2013), the planning phase consist of five important stages which are the project scope, time framework, cost budgeting, risk analysis and procurement. Refer to Appendix A for the decision-making process at the planning phase of a housing development project.

The process of decision-making during the planning phase requires a high level of thinking and some tough decisions. Due to that, the selection of the right tool is essential to complete the decision-making process at each stage in the planning phase. Proper application of decision-making tools increases the output, efficiency and effectiveness as well as provides several businesses with a comparative advantage over their rivals (Omar, Trigunarsyah & Wong, 2008). Previous researchers recognised different kinds of decision-making tools in their studies to assist the private housing developers in forecasting the conditions of their housing development project. Table 1 shows the lists of decision-making tools by (Lester, 2003; Zainal, 2015; Adagha et al., 2017).

Table 1 - Decision-making tools

| Author | Year | Decision-making tool |
|---------------|-------------|---|
| Lester | 2003 | Program evaluation and review technique (PERT) Critical path method (CPM) Primavera P3 Microsoft Project Riskman @Risk Pandora Plantrac Marshall |
| Zainal | 2015 | Interest and loan analysis (rate of cost (ROC) Rate of investment (ROI) Payback period method Cash flow-net present value (NPV) Internal rate of return (IRR) Interest rate analysis Profitability index (PI) Account method Discounted cash flow |
| Adagha et al | 2017 | Questionnaire surveys Visual analytic tool |

3. Methodology

The quantitative method is used for this study. It is a survey method using a structured questionnaire distributed to the selected respondents (private housing developers). Questions asked are related to the decision-making tools applied by the Malaysian private housing developers. Data are collected from 67 respondents. Before proceeding with the survey, a literature review was prepared to collect the primary data related to this study. This review covers the issues and basics for this research and supported the development of the preliminary conceptual framework. Also, this study is limited to the private housing developers in Peninsular Malaysia which are selected from the registered list of developers in the Real Estate and Housing Developers Association (REHDA, 2017). Next, data gathered was examined using the Statistical Package for Social Sciences (SPSS) software where the descriptive analysis is conducted and the mean value from the analysed data is used to define the objective of this study. Lastly, the analysed data then is validated through the checklist surveys with the help of professionals from private housing developer firms which have experienced more than 10 years in the housing project.

4. Result

Table 2 indicates the outcome of the survey conducted on 67 (n) respondents (private housing developers). The results are based on the mean value achieved, to decide the importance level of each decision-making tool. The level indicates the respondents' agreement on the importance of decision-making methods in each stage of the planning phase of the housing development project. The standard values for the agreement level regarding the importance of decision-making methods can be referred to in Appendix B.

Table 2 - The outcome of the study

| (Stage)/ Decision-making tools | Mean (n=67) | Ranking | Level of importance |
|---|------------------------|----------------|----------------------------|
| (Project scope) | | | |
| [1] Cash flow (NPV) | 4.4925 | 7 | Most importance |
| [2] Discounted cash flow | 4.3731 | 11 | Most importance |
| [3] Payback period method | 4.5522 | 5 | Most importance |
| [4] Profitability index | 4.3582 | 13 | Most importance |
| [5] 4P's analysis | 4.6119 | 4 | Most importance |
| [6] Cumulative analysis | 4.3134 | 14 | Most importance |
| [7] Comparison analysis | 4.6716 | 3 | Most importance |
| [8] Potential analysis | 4.7910 | 1 | Most importance |
| [9] Economy analysis | 4.3731 | 12 | Most importance |
| [10] Trend analysis | 4.4030 | 9 | Most importance |
| [11] Cost-benefit analysis | 4.4478 | 8 | Most importance |
| [12] Feasibility study | 4.7015 | 2 | Most importance |
| [13] @Risk | 4.2239 | 15 | Most importance |
| [14] Critical path method | 4.5224 | 6 | Most importance |
| [15] Microsoft project | 4.4030 | 10 | Most importance |
| (Time framework) | | | |
| [1] Interest and loan analysis | 4.2687 | 9 | Most importance |
| [2] Interest rate analysis | 4.4030 | 5 | Most importance |
| [3] Payback period method | 4.3284 | 7 | Most importance |
| [4] Cumulative analysis | 4.5373 | 4 | Most importance |
| [5] Comparison analysis | 4.7313 | 1 | Most importance |
| [6] Potential analysis | 4.3582 | 6 | Most importance |
| [7] Feasibility study | 4.3284 | 8 | Most importance |
| [8] @Risk | 4.2239 | 10 | Most importance |
| [9] Critical path method | 4.6269 | 2 | Most importance |
| [10] Microsoft project | 4.5522 | 3 | Most importance |
| (Cost budgeting) | | | |
| [1] Account method | 4.2687 | 10 | Most importance |
| [2] Interest and loan analysis | 4.4776 | 5 | Most importance |
| [3] Payback period method | 4.4627 | 6 | Most importance |
| [4] Profitability index | 4.3433 | 9 | Most importance |
| [5] 4P's analysis | 4.2537 | 11 | Most importance |
| [6] Comparison analysis | 4.4627 | 7 | Most importance |
| [7] Economy analysis | 4.6866 | 1 | Most importance |
| [8] Cost-benefit analysis | 4.3582 | 8 | Most importance |
| [9] Feasibility study | 4.5373 | 3 | Most importance |
| [10] @Risk | 4.2239 | 12 | Most importance |
| [11] Critical path method | 4.6418 | 2 | Most importance |
| [12] Microsoft project | 4.4925 | 4 | Most importance |
| (Risk planning) | | | |
| [1] Cash flow (NPV) | 4.4925 | 2 | Most importance |
| [2] 4P's analysis | 4.3284 | 9 | Most importance |
| [3] Cumulative analysis | 4.2239 | 11 | Most importance |
| [4] Comparison analysis | 4.3731 | 5 | Most importance |
| [5] Potential analysis | 4.3433 | 7 | Most importance |
| [6] Economy analysis | 4.4179 | 4 | Most importance |
| [7] Trend analysis | 4.3731 | 6 | Most importance |
| [8] Cost-benefit analysis | 4.2836 | 10 | Most importance |

| | | | | |
|---------------|-----------------------|--------|----|-----------------|
| [9] | Feasibility study | 4.5821 | 1 | Most importance |
| [10] | @Risk | 4.3433 | 8 | Most importance |
| [11] | Critical path method | 4.4328 | 3 | Most importance |
| [12] | Microsoft project | 4.2239 | 12 | Most importance |
| (Procurement) | | | | |
| [1] | Payback period method | 4.2537 | 9 | Most importance |
| [2] | 4P's analysis | 4.5522 | 1 | Most importance |
| [3] | Cumulative analysis | 4.3731 | 5 | Most importance |
| [4] | Comparison analysis | 4.2836 | 7 | Most importance |
| [5] | Potential analysis | 4.2687 | 8 | Most importance |
| [6] | Economy analysis | 4.4478 | 4 | Most importance |
| [7] | Trend analysis | 4.4627 | 3 | Most importance |
| [8] | Cost-benefit analysis | 4.3134 | 6 | Most importance |
| [9] | Feasibility study | 4.5522 | 2 | Most importance |

5. Discussion and Conclusion

The finding shows that all the elements are very important for ensuring the completion of the decision-making process at the stage of project scope. According to (Lake, 2011), market potential analysis help decision-makers to identify market opportunities and invest resources where they will have the greatest return in the long run. While the feasibility process includes consideration of alternative solutions and the benefits and economic capability of each alternative (Nicholas & Steyn, 2008).

The next stage of the planning phase (time framework stage) indicates comparison analysis, critical path method (CPM) and Microsoft Project as the most important tools used while making decisions for housing development. After the project tasks are compared according to the significance, the decision-maker will schedule the tasks based on time estimates for each task. Some tasks can start only when others are finished, while some can be carried out parallel to another task. Thus, with the use of computers and software, planning countless activities and maintaining the network has become quite easy.

Third, for the cost budgeting stage, all respondents state economic analysis, critical path method and feasibility study as the most essential tools while deciding the planning phase of housing development. Those three tools have the greatest significant weight in the decision-making process. As mentioned by (Khanna, 2011), the whole impact of the housing development project on society needs to be identified and not the direct costs and profits only. Hence, the scheduling activities will guide the decision-makers to allocate resources accordingly and plan their cash requirements along with any conflicts that may arise due to competing requirements.

In the fourth stage (risk planning), feasibility study, cash flow (net present value, (NPV)) and critical path method have been identified as the most important decision-making tools for the housing development project. In this stage, decision-makers need to identify risks that may occur and can cause huge losses based on preliminary studies done at the initiation phase. By conducting a feasibility study, enhances the possibilities of success, reduces project failures and minimises mistakes due to the lack of research, study and analysis of all aspects of the project.

To end, all respondents agree that 4P's analysis, feasibility study and trend analysis are the most important decision-making tools in the procurement stage of the planning phase. The housing developer can reach multiple clients within their target market by using variations of the 4P's analysis. Also, with the guide from feasibility study and trend analysis, the decision regarding the best products and services is made easier in this stage. Hence, the use of the right tools in making a decision will help in producing a better outcome in terms of time, cost and the quality of the housing project.

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Appendix A:

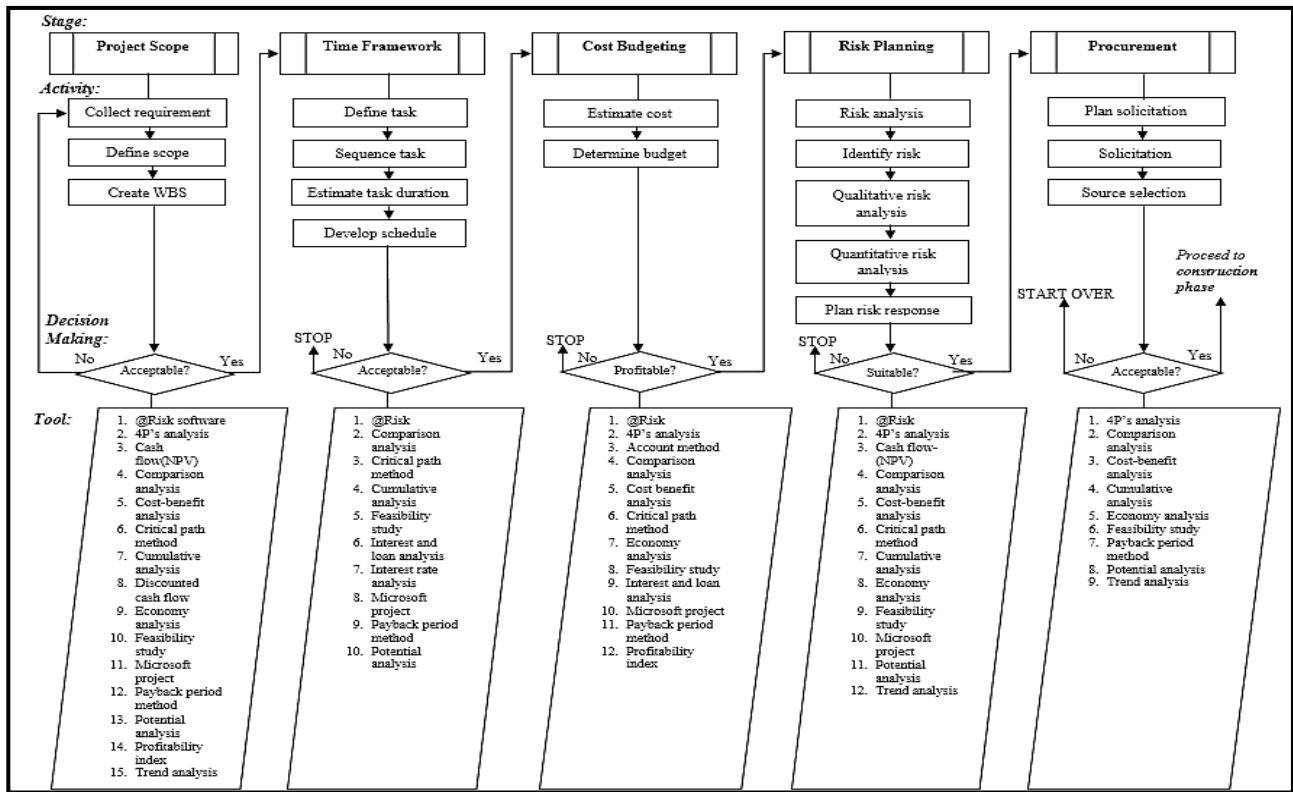


Fig. 1 - Overall finding of the decision-making tools in the construction planning phase

Appendix B:

Table 3 - Level of the agreement value

| Agreement Level | Mean Value |
|----------------------|--------------------|
| Not important at all | $1 < X \leq 1.8$ |
| Unimportant | $1.8 < X < 2.6$ |
| Undecided | $2.6 < X \leq 3.4$ |
| Important | $3.4 < X < 4.2$ |
| Most important | $X \geq 4.2$ |

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