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PROCESSES INVOLVED IN CONSTRUCTION PROJECT PLANNING

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ABSTRACT

Project planning is essential to a construction project. It has been identified as one of the critical success factors for a construction project. However, most of the local main contractors are not equipped with the knowledge and skills related to the project planning processes. The main objective of this study is to investigate the processes involved in the preparation of construction project planning. A questionnaire survey was conducted to achieve the objectives of the study. Data analysis was performed by using the established statistical software that is Statistical Package for Social Science (SPSS). The processes involved in the preparation of construction project planning have been identified and ranked accordingly. Results show that twenty processes are involved in the preparation of construction project planning by the contractors as follows; identify client's requirement, determine project objective, determine scope of work, determine strategic and tactic for execution the project, produce hierarchy of project's organization for all parties involved, determine activities and prepare work breakdown structure, determine task and responsibility for each activity, identify project duration, identify sequence of activities, identify duration, identify resources, identify cost, identify early start and late finish for each activity, co-ordinate sequence of activity duration, resources, cost early start and late finish, prepare schedule of work, prepare budget, supervise and control the prepared schedule, select and supervise selected sub-contractors, prepare project summary and analyze project risk. Based on these results, project planning evaluation model will be developed and will be validated.

Keywords : contractor, construction project planning, project planning process.

INTRODUCTION

Project planning is essential to a construction project. It has been identified as one of the critical success factors for a construction project. Project planning has been evolved from forecasting and recording event to a dynamic process M. Radosavljevic (2007), has defined planning as a management. Meanwhile, Richard H. Neale (1989), Micheal Mawdesley (1997), Illingworth (2000) and O.Faniran (2005) defined planning as a process.

Planning is important not only for decision making process but also needed to co-ordinate with all parties involved in a project. Planning is a tool for controlling and monitoring a construction project. Elizabeth and Richard Larson (2006) stated that one of the critical factors for project success is having a well-developed project plan. Sarini (2003) conducted a study on implication of construction project planning to the contractor's organization has found that an effective construction project planning attained a positive impact to the contractors' organization. The main objective of this study is to investigate the processes involved in the preparation of construction project planning by the main contractor.

CONSTRUCTION PROJECT PLANNING

Several issues in construction project planning have been identified in previous studies. M. Radosavljevic (2007) had identified that construction project planning was unrealistic. There was no standard available for preparing construction project planning. Tucker (1988) in his study suggested shift the focus of research from planning techniques to the processes of construction project planning as a whole.

Alexander Laufer (1994) stated there was no system for preparation of construction project planning and it's has been prepared in many ways. Besides, Mohamed (2002) found in his study that, contractors were incapable to produce a construction project planning efficiently and systematically.
In Malaysia, Malaysian government has taken initiative regarding those issues. One of the initiatives is to make it compulsory for the main contractors to submit their construction project planning to the client after receipt of Letter of Acceptance of Tender. Thus, in preparing an effective and efficient construction project planning, several processes are involved.

In this study, the list of processes involved in the preparation of construction project planning was identified from literature review. Several authors have stated that there were numbers of processes involved in preparation of construction project planning. For instance, Kezner (2000) stated six processes in project planning as follows; identify project specification, identify activity involved, determine start and end date for each activity, co-ordinate each process identified and prepare schedule of work. N.Ahuja (1984), stated only three processes involved namely, identify project activity, determine task and responsibility and prepare project schedule. While Verzuh (1999) stated that six processes involved in preparation of construction project planning were identify activities, determine task and responsibility for each activity, determine resources, determine start and end date for each activity, co-ordinate processes that have been identified and prepare work schedule.

With regard to the literature review including the Project Management Body of Knowledge Guide (PMBOK), twenty processes for preparation of construction project planning were derived. These processes were developed as a framework to be used by the main contractors to indicate the processes that is important in preparation of construction project planning.

RESEARCH METHODOLOGY

The instrument used for collecting the primary data in this study is a postal questionnaire. The questionnaire was designed to measure the processes involved in preparation of construction project planning by the main contractors. Respondents in this study were main contractors registered under Grade 7 with Construction Industry Development Boards of Malaysia (CIDB). The scale of one indicated the processes are essential; two, very important; three, important; four, somewhat important; and five, unimportant.

The data collected was analyzed by using the established statistical software that is Statistical Package for Social Science (SPSS) Windows. The importance indexes (IN) were calculated for each process involved in the preparation of construction project planning by using the formula as follows;

$$(IN) = \frac{5(n_1) + 4(n_2) + 3(n_3) + 2(n_4) + 1\,(n_5)}{5(n_1 + n_2 + n_3 + n_4 + n_5)}$$

where n_1 = the number of respondents that answered "essential", n_2 "very important", n_3 "important", n_4 "somewhat important" and n_5 "unimportant"

RESULTS AND DISCUSSIONS

In total, thousand (1000) sets of questionnaire have been posted and 130 sets (13%) were returned. Figure 1 shows the location of the respondents and most of the respondents were from Selangor, where the majority of established contractors are located.

Figure 2 indicates year of experience of respondents in construction industry and it determined that most of the respondents had experience in construction industry between ten to twenty years. This explained that the data are reliable for this study.

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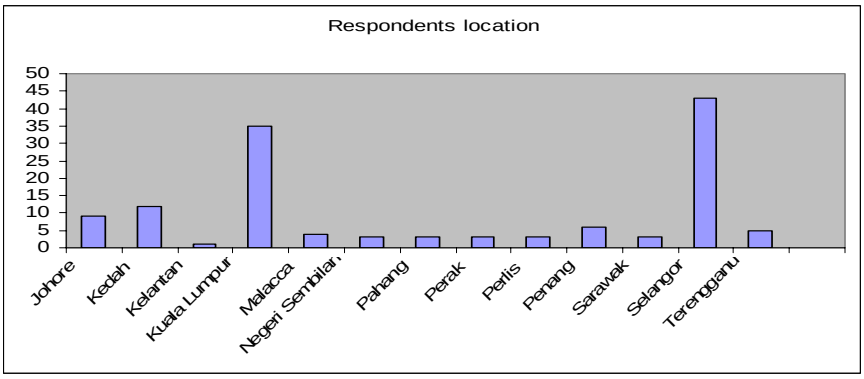

Figure 1 : Location of respondents

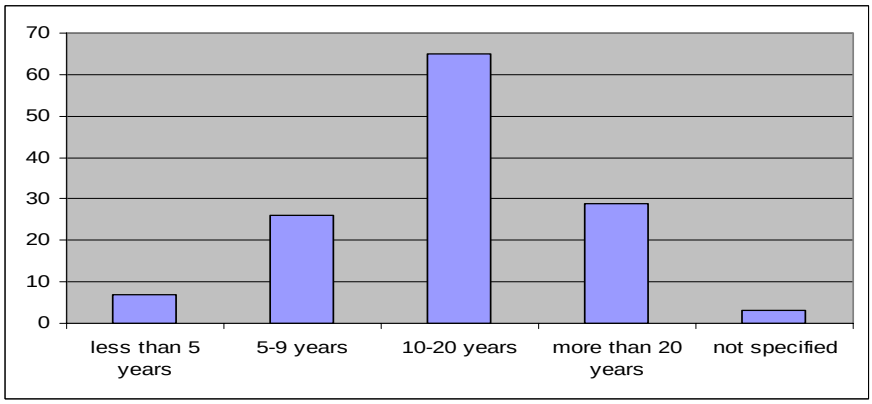

Figure 2 : Respondent's experience.

Processes in the preparation of construction project planning

From the analysis, results shows that all the processes involved in the preparation of construction project planning described in the literature are important. The calculated importance index for each process of the preparation of construction project planning is shown in Table 1. The table shows the number of important level indicated by the contractors for each process of preparation of construction project planning. Over 86% of the main contractors indicated with a level of importance, very important and essential for the twenty processes involved. And less than 13% of the main contractors indicated the processes involved are unimportant and somewhat important.

The processes of preparation of construction project planning are listed in Table 2 respectively. The processes are arranged in descending order according to their calculated importance index. The importance index ranges between 0.868 for "identify the project duration" and 0.771 for "produce hierarchy of project's organization for all parties involved". Those processes are as follows; identify the project duration (0.868), identify cost (0.863), prepare schedule of work (0.862), determine scope of work (0.849), identify duration for each activity (0.846), identify sequence of activities (0.840), prepare budget (0.837), supervise and control the prepared schedule (0.837), identify resources (0.834), determine the project objective (0.829), identify client's requirement (0.828), determine activities and prepare work breakdown structure (0.828), select and supervise selected sub-contractors (0.825), identify early start and late finish for each activity (0.823), prepare project summary (0.817), co-ordinate sequence of activity duration, resources, cost early start and late finish (0.812), determine the strategic and tactic for execution the project (0.811), determine task and responsibility for each activity (0.805), analyze project risk (0.785) and produce hierarchy of project's organization for all parties involved (0.771). This proves that all of the processes involved in the preparation of construction project planning are important.

Since the processes of the preparation of the construction project planning are important, the assessment of the processes for the preparation of construction project planning by the main contractor is essential to them. This is to ensure that the main contractors produce an effective construction project planning. Hence, upon receipt of the Letter of Acceptance of Tender, main contractors are required to prepare the construction project planning according to those processes.

Table 1: Frequency of Importance of Contractor's Construction Project Planning Processes

Process	Frequency					
	Not Important	Somewhat Important	Important	Very Important	Essential	Importance Index
Identify client's requirement	5	12	14	28	71	0.828
Determine the project objective.	5	7	12	46	60	0.829
Determine scope of work.	7	9	7	29	78	0.849
Determine the strategic and tactic for execution the project.	8	7	19	32	64	0.811
Produce hierarchy of project's organization for all parties involved.	4	15	23	42	46	0.771
Determine activities and prepare work breakdown structure.	6	8	14	36	66	0.828
Determine task and responsibility for each activity.	6	8	14	51	51	0.805
Identify the project duration.	11	6	1	22	90	0.868
Identify sequence of activities.	5	9	11	35	70	0.840
Identify activity duration.	8	5	8	37	72	0.846
Identify resources (labour, plant and equipment, material).	7	7	10	39	67	0.834
Identify cost.	7	7	8	24	84	0.863
Identify early start and late finish for each activity.	8	8	15	29	70	0.823
Co-ordinate sequence of activity, activity duration, resources, cost, early start and late finish.	4	10	19	38	59	0.812
Prepare schedule of work.	6	9	7	25	83	0.862
Prepare budget.	5	11	10	33	71	0.837
Supervise and control the prepared schedule.	6	7	12	37	68	0.837
Select and supervise selected sub-contractors.	9	7	13	31	70	0.825
Prepare project summary.	5	10	14	41	60	0.817
Analyze project risk.	8	7	22	43	50	0.785

Note : A total of 130 contractors responded to the survey

Table 2: Processes in Preparation of Contractor's Construction Project Planning

Processes	Importance Index
Identify the project duration.	0.868
Identify cost.	0.863
Prepare schedule of work.	0.862
Determine scope of work.	0.849
Identify activity duration.	0.846
Identify sequence of activities.	0.840
Prepare budget.	0.837
Supervise and control the prepared schedule.	0.837
Identify resources (labour, plant and equipment, material).	0.834
Determine the project objective.	0.829
Identify client's requirement.	0.828
Determine activities and prepare work breakdown structure.	0.828
Select and supervise selected sub-contractors.	0.825
Identify early start and late finish for each activity.	0.823
Prepare project summary.	0.817
Co-ordinate sequence of activity, activity duration, resources, cost, early start and late finish.	0.812
Determine the strategic and tactic for execution the project.	0.811
Determine task and responsibility for each activity.	0.805
Analyze project risk.	0.785
Produce hierarchy of project's organization for all parties involved.	0.771

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CONCLUSIONS

Project planning is one of the project management processes and has been identified as one of the critical success factors for a construction project. In a construction project, contractors are required to prepare an effective construction project planning and there are several processes involved. This study investigates the processes involved in the preparation of construction project planning by the main contractor. From the results of this study, it is determined that all of the twenty processes in the preparation of the construction project planning are important in the preparation of an effective construction project planning.

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