SKILLS AND KNOWLEDGE OF PLANNER FOR REFURBISHMENT PROJECTS

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ABSTRACT

There are several problem involved in rises of refurbishment projects which are due to inconsistency in client's needs, the project exceed the targeted cost and time, increase in the number of deteriorating buildings and lack of information of a certain task. Refurbishment projects involve many complicated process. Therefore, there is a need to identify the specific skills and knowledge required that include the roles of planner, the planning construction methods and the planning tools in organizing the overall of the project. The degree of complexities, the preparation process of different type of plan for planning technique as well as the skills and knowledge required for a project planner in refurbishment projects are crucial. The methodology adopted for this study was questionnaire survey with participation from professional that has direct involvement in refurbishment projects. The result of this study has identified that currently the refurbishment projects are full of complexities such as poor storage area, changes in design during construction and the difficulty of occupancy of the refurbishment building. Hence a very high skill and knowledge are needed in handling refurbishment projects especially technical and multi tasking skills.

Key words: Construction projects, Project Planner , Refurbishment, Skills and Knowledge.

INTRODUCTION

Refurbishment of building is an important sector in Malaysian construction industry. In Malaysia, refurbishment projects involve mostly residential and office type buildings with contract value less than RM500, 000.00. There are several problem involved in rises of failures in refurbishment projects which the main problems are due to inconsistency in client's needs, the project exceed the targeted cost and time, increase in the number of deteriorating buildings and lack of information of a certain task throughout the project.

A normal project cycle goes through six phases during its time. First is defining the goals, objectives and critical success factors for the project. Second project initiation where to prepare all that is needed to set-up the project before work can start. Next is the project planning where all detailed plans are established to define the process of work including time, cost and estimates. Project execution is the most important process of all, which all the work must be done to deliver the product, services and desired outcome. Fifth is the project monitoring and control. This is to ensure that a project stays on track and taking corrective

action to ensure it does. Lastly, project closure where the formal acceptance of the deliverables and disbanding of all the elements that were required to run the project is handed over. In addition, construction project planning is receiving growing attention as the limitations of formal deterministic planning are becoming more widely recognized. There has been considerable debate over the last decade or so on the effectiveness of construction project planning. However, there is remarkably little research into what construction project planners actually do help the construction industry in improving the technology for the construction industry.

Laufer et al (1994) look at the definition and allocation of planning work where they found that there was no clear system used and planning was done in a multiplicity of ways. They discuss the problem of who should do construction planning and when they should do it. The specialist planner has the time to do the work but incomplete practical knowledge. The line manager has the practical knowledge but does not have the qualitytime to carry out the task. The specialist planner has better strategic decision-making skills than the short-term decision-making focus of the line manager. Line managers see the delegation of key decision-making to another as a threat to their position.

In a study by Laufer et al (1994), they provide a critique of construction planning where they argue that: (i) the planning and evaluation of planning processes are non-existent, (ii) there is over-emphasis on critical path methods, (iii) planners lack construction experience, (iv) planners have poor information gathering methods, (v) planning is control-oriented instead of action-oriented, and (vi) plans are poorly presented with overly complex information.

It has become more important nowadays to study the planning process and the method of handling the overall project in order to achieve maximum satisfaction and optimum result. By doing so, the planner is highly responsible in applying all planning tools such as Gantt chart, CPM and PERT diagram. After all of this has been taken into consideration, a project can be handled in a tip top way even for the large or complex projects such as refurbishment works. There are four main reasons for refurbishment RED (NST June 2012), which are: (i) to meet modern standard or to meet changing demands, (ii) the upgrading standards as conversion to new users, (iii) rearrangement of public service facilities with stringent operational safety requirements and (iv) the conversion of buildings by extant use such as warehouses.

Refurbishment is needed also due to the increasing number of ageing buildings, limited vacant land for new development and technological change, especially the use of information communication technology (Rahmat et al., 2003). According to Chartered Institute of Building Malaysia, repair and maintenance work (which include refurbishment activity) has tremendous opportunity for growth in Malaysia construction industry.

PROBLEM STATEMENT

Refurbishment projects have difficulties in achieving optimum plans and objectives due to the uncertainty and complexity of the project. In addition, lack of knowledge by project planners will worsen the situation. According to Ali et. al. (2010) refurbishment projects are more difficult to manage compared to new-builds. The problem mainly derives from the lack of information available to perform a task, especially during the initial stage of the design process. The main reason for lost time was rework in design due to errors made during the design process.

Generally, refurbishment projects involve many complicated process. Most of the planners wish to have a useful guide and reference which covers the entire project sequence. There is a need to identify the specific skills and knowledge required in the

refurbishment projects that include the roles of planner, the planning construction methods and the planning tools in organizing the overall of the project. A good construction plan is the basis for developing the budget and the schedule for work. Essential aspects of construction plans include the generation of required activities, analysis of the implications of these activities and choice among the various alternative means of performing activities.

Daoad (1997) stated that one of the factors that contribute to uncertainty of the refurbishment project is the planning process. It is important to identify the factors that will lead to uncertainty in the planning process because it could affect the overall performance to the refurbishment projects. (Rahmat,1997; Hashim, 2004). There are many uncertainties in the refurbishment projects that need detail supervision by planners and other organization where all the supervision would be base on the various planning technique that are available in the project.

LITERATURE REVIEW

To identify the degree of complexities in refurbishment project.

The review of literature reveals numbers of examples on the issues of complexity and uncertainty. However, it has different definition for both uncertainty and complexity in refurbishment project. At the beginning of any refurbishment project, it is important to collect all relevant information such as the building's and services's degree of deterioration, energy demand, waste management, indoor environment quality, etc. (J.L. Genre et al. (2000).

There are several problem associated with refurbishment of older properties in Malaysia which can be summarized as financial, technical, emotional, lac of technical knowledge and the limited amount of information available (Real Estate & Décor, New Straits Times, June 2012). Boyd and Weaver (1994) and Quah (1992) observed that when the refurbished building is occupied during the design stage, the survey of the structure works gets complicated and difficult as the access to the building is very limited where this lead to lack of detail and complete drawing to both the designer and builders in managing the refurbishment works. In order to complete the detail drawings, it will then relate back to the knowledge of the planner in performing his skills in managing the project together with occupants of the building itself. Without proper skills and knowledge, this will give bad impact in performing his task as a project planner.

Young et al (1996) stated that managing refurbishment project is managing a dynamic environment where there is a condition which the situation change the present data may turn out to be poor guide to future states. The complexity and uncertainty of refurbishment projects are often cited as one of the main reason of unsatisfactory project performance. There is a strong correlation between complexity task and uncertainty task in all construction project (Winch, 1989).

There are several literatures that many management writers have proposed the method of measuring the complexity and uncertainty for a project. Lawrence and Lorsch (1967) measured complexity and uncertainty based on people's perceptions. While Santana (1990) measure complexity by aggregating number of variables such as cost and financing, location of the site, impact on natural and social environment, technology used, access to site, resources and logistic of construction, number of specialized workers and number of contractors and subcontractors. The degree of complexity was measured using ten point scale where the range starts from 1 (normal) to 10 (singular). From the scale, the project could be classified as singular, normal or complex.

However for Naoum (1994), the measurement of complexity is probably too broad and is very unlikely to offer any significant contributions towards solving the management of refurbishment projects. The managers are responsible in identifying the variables that could contribute to the complexity and uncertainty of refurbishment projects where different situational variables will need different effective solution.

All complexity variables are given equal weight which for example the number of subcontractor employed in construction projects is important as the impact of environment (Santana, 1990). The measurement of project complexity and uncertainty by the construction management writers cited above are resulting too unsatisfactorily. It is insubstantial to claim that refurbishment project are full with complexity and uncertainty as the measurement of the complexity and uncertainty is too broad. The complexity and uncertainty are referred to as situational variables throughout this paper.

There are many issues encountered when dealing with refurbishment project. It is important to identify what is needed before, during and after the construction of refurbishment project.

To measure the preparation process of different type of plan for planning technique in refurbishment projects

By planning it will help to ensure that all the plans are fully considered, well focused, practical and cost-effective. It will also ensure that the team learns from any mistakes that have been made, and feed this back into future planning and decision making (Winch, 2002). Planning using the cycle will help planner to plan and manage ongoing projects up to a certain level of complexity which this will depend on the circumstance of the project. For projects involving many people over a long period of time, more formal methodologies and approaches are necessary (Laufer et al, 1994).

Most project planning tools and techniques have been around for a long time and have proved themselves to be useful, enabling the project planner to deliver the project to time, cost and quality. There is various type of planning techniques available in the market. It includes master plan, site layout, master programme, method statement, labour schedule, material schedule and machineries schedule.

According to Tague (2004) Gantt Charts, Critical Path Analysis (CPA) or the Critical Path Method (CPM) helps planner to plan all tasks that must be completed as part of a project. They act as the basis both for preparation of a schedule and of resource planning. During management of a project, they allow planner to monitor achievement of project goals. They help planner to see where remedial action needs to be taken to get a project back on course.

In order to have a project success, there are many steps to be taken into consideration. All the planning methods process and during the construction process need to be clear to all parties.

To identify the skills and knowledge required for a project planner in refurbishment projects

It is the responsibility of a project planner in the sign making industry to make sure that sign production and installation projects are carried out within budget, to the right quality and within the required timescales (Winch and Kelsey, 2004). The work of project planner starts with an initial meeting with the client or with project managers and the construction team, to ascertain the exact requirements of the project. The planner then decides which methods, resources and systems should be used to meet the requirements. Costing, forecasting and budgeting are aspects of the planning process and the planner will work closely with the teams at this stage (Winch, 2002).

According to Winch and Kelsey (2004), the role of the planner is one of great responsibility. It is the planner's job to direct, supervise and control the project from beginning to end. In short, there are several important role of a planner which includes: (i) define the project, obtain appropriate resources and build a team to perform the work, (ii) set the final goal for the project and motivate the team to complete the project on time, (iii) inform all stakeholders of progress on a regular basis and (iv)assess and monitor risks to the project and mitigate them to adapt to and manage change.

The ideal planner is an individual from the local community who has training, skill and experience in refurbishment projects, planning and management. Such a specialist is not available in every community but the architect may be an excellent candidate if they have strong design, planning and management skills, a general background in refurbishment projects, an aptitude for design and time to study examples of refurbishment projects. There may also be a perception that an objective professional should be involved in the initial planning process. In these cases, the ideal planner is an independent refurbishment project management specialist who can help define the client's requirements and deliver a well-designed project on time and on budget (Winch, 2002).

The construction planner has some general responsibilities which correspond with the job role. They are the ones who help in the acquisition of land, the planning process, obtain permits, hire workers, keep tabs on the progress of the construction job and ensure that it is being completed in a correct manner. They are the go-to person for most of the parties involved with the entire project. The construction planner is also responsible for handling complaints or problems along the way (Winch, 2002).

RESEARCH METHODOLOGY

Scope and Sampling

The method of data collection was based on literature review from various sources and sending a set of questionnaire to the managers or consultant firm and contractors whom are involved in refurbishment project. Key variables included in this study were: project characteristics, complexities of the project, skills and knowledge, planning techniques and performance of planning refurbishment projects.

The targeted respondents were from refurbishment contractors and consultants that were randomly selected in Kuala Lumpur and Selangor, Malaysia. The structured questionnaire was based on six (6) major categories, which are background information, project characteristics, complexities of the project, skills and knowledge, planning techniques and performance of planning refurbishment projects. It was developed for completion by analyzing the survey data.

In view of project characteristics, the respondent is to identify the type of refurbishment building, the contract value of the project, the type of client and the type of procurement used for the project.

In terms of complexities of the project, the respondent were asked to rate the degree of complexities of the refurbishment project variables to the project that they have carried out in Kuala Lumpur and Selangor. There are ten (10) variables in the complexities of the project that need to be identified and analyzed. 5-point Likert Scale was used which ranked from very simple, simple, moderate, complex and very complex, respectively.

For skills and knowledge, the respondent is needed to identify the most useful to the not useful skill and knowledge used in refurbishment projects. There are ten (10) skills and knowledge that need to be identified. The categories not useful, low useful, moderate, useful and very useful was coded as 1,2,3,4 and 5 respectively.

Next, in view of the planning techniques, respondent to the questionnaire were asked to rate the degree of efforts that are used by them in managing refurbishment project. The categories not important, low important, moderate, important and very important was coded as 1,2,3,4 and 5 respectively. The respondents were also asked to rate the frequency of evaluating the project plans and schedules. The categories include every week, fortnightly, every month and others.

For the last question, respondent is required to indicate the type of planning tools used in the refurbishment project and to rate the extent of the tools used in controlling and monitoring the refurbishment project. Besides planning tools, respondent is also required to indicate the ratio for the actual construction cost to the target construction cost and the ratio of actual construction time to the target construction time for the refurbishment project. The ratio scale starts from less than 0.80 up to more than 1.20. After rating the ratios, the respondent is required to indicate how often is the planning techniques had to be revised during construction stage in refurbishment project.

Data Analysis

Forty (40) sets of questionnaire had been distributed to the construction and consultant firms in able to obtain data from the questionnaire to the parties that were related to the refurbishment project. This includes the Architect, Engineer, Quantity Surveyor and Contractor. The results were derived from the respondent's feedback and analyzed by using SPSS software. SPSS software can be divided into three main areas which are frequency test, descriptive statistics and reliability statistics.

From the forty (40) sets of questionnaire, only sixteen (15) questionnaires were returned, giving a rate on 38% responded. There are two (2) questionnaires that are found not useful due to the respondent refurbishment experience are base in Penang, Malaysia where this study only focused on areas in Selangor and Kuala Lumpur, Malaysia.

KEY RESULTS

To identify the degree of complexities in refurbishment project

Table 1 summarises the overall results of the analysis of the complexities issues in refurbishment project. The result shows that the availability of storage is the most complex issues in refurbishment project as it has the highest mean value by 3.60. This is supported by Rahmat (1997), says that about 60 percent of refurbishment projects have small or very small space on site. The second highest mean value is occupancy of refurbishment building and change in design during the construction stage with 3.47. Rahmat (2008) agree that occupancy must be accepted as a major management task in refurbishment building and the implementation of change control system early in the refurbishment stage is important. Both of these statements prove that occupancy and change in design could affect the entire building planning. Third most complex issue is completeness of the refurbishment building design with 3.33. The interdependency makes refurbishment building complex because more works are required to coordinate the different parties involved in the project (Rahmat, 2008). This is supported by Rahmat (2008), because restriction on storage, delivery of materials and disposal of excavated material or other waste materials, the refurbishment projects may have to be carried out in uneconomically small batches. Okoroh (1992) agrees that inadequate specifications and design information made by the architects as the works are carried out will make the contractors work to be difficult as they could not define the exact scope of work for the refurbishment project where this would lead to increase of cost and time.

Table 1: Complexities Issues in Refurbishment Project

ITEM	N	Mean	Std. Deviation
Occupancy of Refurbishment Building	15	3.4667	1.12546
Confined Site	15	3.1333	.91548
Size of the Project	15	3.1333	.99043
Completeness of the Design	15	3.3333	.81650
Change in Design During Construction	15	3.4667	.91548
Numbers of Sub Contractors Employed	15	3.2667	.79881
Availability of Material	15	3.0000	.92582
Availability of Skilled Labour	15	3.0667	.88372
The difficulty of Access	15	3.0667	1.22280
The availability of storage	15	3.6000	1.05560
Valid N (listwise)	15		
AVERAGE MEAN		**3.25334**	

Table 2 shows the result on the planning techniques available to manage refurbishment projects. High effort is needed for each step of planning cycle. Table shows that the plan implementation is the most important stage in planning cycle. This is proven by it has the highest mean with 4.13 as the planner had spend the most effort in this technique. The second highest mean value is analysis of current site, plan evaluation and explores options with 3.93. Third most important planning technique is identifying the aim of the plan with 3.87. This is followed by detailed planning with 3.80 and the lowest mean is 3.53 for closing of plan. In general, planning cycle is needed in handling refurbishment projects because the average level of mean is rather high. All the 7 variables are techniques that are highly important in handling a refurbishment project. This is supported by Winch and Kelsey (2004), by the time planner start detailed planning, he should have a good picture of where he is, what he want to achieve and the range of options available for him.

Table 2: Planning Techniques

ITEM	N	Mean	Std. Deviation
Analysis of current site	15	3.9333	.96115
Identifying the aim of the plan	15	3.8667	.91548
Explore options	15	3.9333	1.09978
Detailed Planning	15	3.8000	.94112
Plan Evaluation	15	3.9333	.88372
Plan Implementation	15	4.1333	.74322
Closing of the plan	15	3.5333	.74322
Valid N (listwise)	15		
AVERAGE MEAN		**3.876171**	

To identify the skills and knowledge required for a project planner in refurbishment projects

Table 3 summarised the overall results of different skills needed in refurbishment projects. The result shows that that the technical is the most important skills and knowledge needed by a planner in refurbishment project as it has the highest mean

value by 4.27. This is supported by Winch (2002), the construction planner is responsible in handling complaints or problems along the way and they are the to-go person for most of the parties involved in the entire project. The second highest mean value is multitasking skills with 4.20. Construction planner are the ones who help in the acquisition of land, the planning process, obtain permits, hire workers, keep tabs on the progress of the construction job and ensure that it is being completed in a correct manner (Winch, 2002). Third most important skill and knowledge is problem solving skill and leadership skill with 4.07. This is followed by costing and budgeting skill with 3.93, communication skill with 3.87, organization skill with 3.80, presentation skill with 3.67, second lowest mean is 3.60 for writing skill and the lowest mean is 3.53 for computer skill.

Table 3: Skills for Refurbishment Projects

ITEM	N	Mean	Std. Deviation
Costing and Budgeting Skill	15	3.9333	.79881
Writing Skill	15	3.6000	.98561
Presentation Skill	15	3.6667	1.23443
Computer Skill	15	3.5333	.83381
Communication Skill	15	3.8667	.91548
Organization Skill	15	3.8000	.94112
Technical Skill	15	4.2667	.79881
Multitasking Skill	15	4.2000	.86189
Problem Solving Skill	15	4.0667	1.03280
Leadership Skilll	15	4.0667	.88372
Valid N (listwise)	15		
AVERAGE MEAN		**3.90001**	

From this study, it shows that the most important skill and knowledge needed by a planner for a successful refurbishment project is technical skill. However, most of the data obtain from this study has a high mean which shows its importance for the refurbishment project. In general, skills and knowledge by a planner are needed in handling refurbishment projects because the average level of mean is rather high.

Out of 10 variables, there are 2 variables, i.e. technical skill and multi tasking skill are skills that are highly important in handling a refurbishment project. This is supported by Winch and Kelsey (2004), the role of project planner is one of great responsibility where a planner's job is to direct, supervise and control the project from beginning to end.

Summary of key results

The study shows that the most complex issues in handling refurbishment building are the availability of storage. This is followed by occupancy of the refurbishment building and change in design during the construction stage. Okoroh (1992) prove that the difficulties in handling hazardous material supply and the amount of protection required for the existing and adjacent buildings in refurbishment projects are much greater compared to the normal site.

Next finding is on the skills and knowledge required by planner in order to handle the refurbishment building in a greater and experience manor. The finding shows that technical skills are needed the most in handling refurbishment building. Second is multitasking skill and third is problem solving skill. This is supported by Winch and Kelsey (2004) where it is the responsibility of a project planner in the sign making industry to make sure that sign production and installation projects are carried out within budget, to the right quality and within the required timescales.

Third finding is on the effort placed on different steps of planning cycle that are applied to refurbishment building. From the study, it shows that plan implementation is the most important issue in a good planning technique. All the consultants and contractor should implement the plan accordingly and work closely with the plan to avoid any discrepancies. Besides that, most of the planner updates their master plan fortnightly and update their labour schedule every week. This is to monitor the work and labour on site closely. According to Winch and Kelsey (2004), the master plan should be reviewed and updated at least every two years, to keep up with the on-going changes in the building. This shows that the planner is doing their best level in updating their master plan every fortnightly.

The final finding is on the performance of planning. Most of the planner use Gantt chart and Critical Path Analysis. This is supported by Barker (1992), Gantt charts are useful tools for analyzing and planning more complex projects. While Barker (1992) proves that a further benefit of Critical Path Analysis is that it helps planner to identify the minimum length of time needed to complete a project. Where it is needed to run an accelerated project, it helps planner to identify which project steps should accelerate to complete the project within the available time. Furthermore, all this tools are used to a large extent in controlling and monitoring the refurbishment building. In terms of the ratio for cost variance, most of the refurbishment projects are completed over budget. While for time variance, almost 60% of refurbishment projects are delayed. Lastly, all this planning technique is updated at least 1 to 5 times due to several revisions.

CONCLUSION

The purpose of this research was to investigate the degree of complexities in refurbishment building, to measure the preparation process of different type of plan for planning techniques in refurbishment projects and lastly to identify the skills and knowledge required for a project planner in refurbishment projects. Therefore this study can be concluded as follows:

To identify the degree of complexities in refurbishment project

The first objective was to identify the degree of complexities in refurbishment project. Generally the refurbishment projects are of moderate complexities. The study shows that availability of storage, change in design and occupancy of refurbishment building during construction is complex. Refurbishing existing building is challenging where the uncertainty of refurbishment projects is high. Due to lack of space for storage, the delivery of materials can be carried out in an uneconomically small batch to reduce the complexity issues. The multi-disciplinary design team members require good coordination efforts to ensure all parties are constantly aware of the changing information or design and the status of the project. Refurbishment construction can

be broken into work packages and detailed design where it can be done in phases to reduce any changes of design during the construction.

To measure the preparation process of different type of plan for planning technique in refurbishment projects

The second objective was to measure the preparation process of different type of plan for planning technique in refurbishment projects. The study shows that all the steps in planning cycle are needed in handling refurbishment projects. The most important stage of step in planning cycle is plan implementation. All the parties involved in implementing the plan should have a good discipline, high motivation effort, good attitude of following schedules and plans, punctual person in time and able to handle all kind of situation. Furthermore, Gantt chart and critical path analysis are the most common technique used in refurbishment projects where all the charts and schedules are updated in a frequent manner. Planning and control are the most difficult functions facing by refurbishment managers. In order to achieve integration, the client, planner, subcontractors, site management and contract management must be involved in the preparation of all plans such as master plan, labour schedule, method statement, short term plans and site layout.

To identify the skills and knowledge required for a project planner in refurbishment projects

The third objective was to identify the skills and knowledge required for a project planner in refurbishment projects. Study shows that all variables for skills and knowledge by a planner are important in handling refurbishment projects. The most important skill needed is technical skill and multi tasking skill. A planner should be able to handle all kind of situation and able to come up with a solution for each matters to avoid any delay in the construction of refurbishment projects. Besides that, refurbishment projects require an informal culture where close relationship and teamwork are important between all parties in any situation.

To sum up, refurbishment projects are demanding due to its inherent complexity and uncertainty where refurbishment needs a more flexible and integrated approach. Besides that, refurbishment process needs some improvement to its practice. Collaboration between all parties in many areas needs to be considered in ensuring smooth process of refurbishment work in future. It is important to initiate a standard process for refurbishment project. The basic understanding of refurbishment process should be achieved to provide a unified and collaborative work among all parties. Moreover, it is important for the continuity of relationship between planners and the public, between professional and the others in order to reduce the complexities issues in refurbishment projects. This requires a good skills and knowledge from various parties that are involved in refurbishment project including the public that occupies the building. All the parties should work and collaborate together in having the best result with a minimum problems derived from the project.

In short, if all the planning techniques, the planner roles and the risk level identified for refurbishment project, this will help the project to be completed in the target cost and time. Proper planning is required in order to achieve the project outcome. By having all the principles right, this will help the planners to make success of the refurbishment project.

Limitations of Research.

This research has been managed and completed successfully. The first limitation of this study was that the scope is only focused and limited to Kuala Lumpur and Selangor. Besides that, the scope of this study was only limited to the views expressed by the contractors and consultants. Lastly, some of the companies were found to adopt different project planning which was not captured in this research.

Recommendation for further study

Further research may be required to be conducted later in the future on the refurbishment projects where the recommendations are as follows: (i) Roles of the professional team in refurbishment projects, (ii) A study on availability of storage, occupancy of refurbishment building and design change of refurbishment projects, (iii) A study on investigation of disputes in refurbishment projects and (iv) A study on the importance of technical and multi-tasking skills in refurbishment projects.

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