Assessment of complexity factors in briefing stage of refurbishment projects in Malaysia

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Abstract. In Malaysia, building refurbishment is fast becoming an important sector in the construction industry. Refurbishment projects are generally characterised to be of higher risk, more complex and needs greater coordination than new build. As briefing stage is one of the main source of design information, meeting the clients’ requirements in briefing stage and working within the complexities of existing building may pose a difficult task to produce the required information for designers to start design. Quality of required design information in refurbishment projects is affected by level of complexity factors in briefing stage. Affected design information is one of the considerable factors, which leads to refurbishment projects performance failure. Therefor this research aim is to assess the level of potential complexity factors in briefing stage of refurbishment projects that hinder designers to acquire the required information to start design.

This research employs the quantitative approach, that is, a questionnaire survey targeted at experienced architects and interior designers involved in refurbishment projects within Klang valley area to provide the data in investigating the level of complexities in briefing stage of refurbishment projects. The result indicated that the key complexities in briefing stage of refurbishment projects can be divided into three main categories; Lack of document, Project characteristic and Client’s characteristic.

Keywords: Briefing stage, complexity, refurbishment

1. Introduction
In recent years, there has been an increasing interest in building refurbishment works due to the change in economic conditions and the emphasis on sustainable development [1-2]. Buildings owners still need to refurbish their property, despite the economic slowdown [3]. In Malaysia, building refurbishment is fast becoming an important sector in the construction industry. The key factors that contribute to the growth of building refurbishment works in Malaysia are; economic recession, building deterioration, obsolescence and growing demand for green buildings [4]. Hence, building refurbishment of existing buildings plays a significant role in achieving sustainable environment in the urban area [2]. In Malaysia, the building refurbishment sector contributes to 17 percent in 2005 and increased to 22 percent in 2014 [5]. This shows the increasing importance of building refurbishment sector in Malaysia and It should be highlighted that many building refurbishment projects are not reported. The main reason of performance failure of building refurbishment projects is the high level of complexity in these projects [6-7-8]. Quality of required design information in refurbishment projects is affected by level of complexity and uncertainty factors in these projects. Affected design information is one of the considerable factors, which leads to refurbishment projects performance failure. [8]. Ali [8], also indicated briefing is one of the most important information sources for designer in refurbishment projects. In refurbishment projects, there is a need to improve the briefing process through capturing the client’s needs, information
and requirements to acquire the required information for design. Despite of conducting several researches on complexity and uncertainty factors in refurbishment projects, none of them focused on briefing stage. Due to the increasing importance of briefing stage of refurbishment projects, more research needs to be done to resolve some of the pertinent issues of designers at early stage and it is only possible to rightly identify and assess the complexities in briefing. The purpose of this study is to identify and assess the level of complexity factors faced by designers in briefing stage of refurbishment projects in Malaysia.

2. Literature Review

2.1 Briefing stage of refurbishment projects
The briefing process in construction projects involves the documentation and communication of clients’ requirements and represents a cornerstone for achieving client satisfaction. The inefficiency of the briefing process has long been recognised as an area which needs improvement. Refurbishment projects are generally characterised to be of higher risk, more complex and needs greater coordination than new build, thus meeting the clients’ requirements and working within the constraints of existing building structures may pose a difficult task in briefing stage of refurbishment projects hence It is crucial to the success of projects [9].

2.2 Complexities in briefing stage

2.2.1 Lack of archive documents
Lack of archive documents in building refurbishment projects is one of the main factors that causing complexity [10]. Archived document is an accumulation of historical records. Archived documents and files can serve as records of results of the decision made [11]. Moreover, from the archive documents, the architects obtained a relatively high portion of their design information [8].

2.2.2 Incomplete building site survey result
Watt et al., [12] defined Site surveys as detailed studies done to verify and supplement site information provided by the client. The literature review also reveals that incomplete and inadequate building site survey is a factor that contributes to complexity in building refurbishment projects [4].

2.2.3 Insufficient building inspection results
A building inspection has to be carried out to obtain accurate, sufficient, and clear information about the building conditions before any building refurbishment project started [13]. Also, complete and accurate building inspection results are considered ideal for building refurbishment buildings [14].

2.2.4 Lack of services information of the existing building
The literature review also reveals that apart from archive documents, lacking services information is a factor that contributes to uncertainty [15]. Services information of the existing building is information about the services, structural elements and the systems installed in buildings and in building refurbishment projects, services information is often critical, especially in old concrete buildings [16].

2.2.5 Difficulty in accessing to the existing building
Doran et al. [17] revealed that access to the existing building site is one of the factors that contributes to uncertainty in building refurbishment projects. Access to the site is a fundamental problem in most of the building refurbishment projects which make operations very slow and challenging due to an occupied building and existing conditions [18].

2.2.6 Unforeseen Site Condition
Bernstein et al. [10] observed that all participants involved in building refurbishment projects know unforeseen site conditions as one of the main factors which cause complexity on the projects. Similarly, Acharya et al. [19] noted that unforeseen site conditions cause the complexity in early design stage.

2.2.7 Unclear scope of the work
A building refurbishment works often suffer from delays and escalating cost due to a high degree of complexity in defining the scope of work during briefing and design stage [20-21]. However, Rahmat [22] noted that the unclear scope of works caused the complexity of tasks in building refurbishment projects. When the scope of work is not clear or well defined in briefing stage, clients tend to add, delete, or revise the existing scope of work within the current project by submitting written changes order [23].

2.2.8 Lack of client’s knowledge in refurbishment project
Knowledge of the clients is a very important factor in decision making through the briefing and planning of the building refurbishment projects [7]. Haapasalo et al. [24] observed that because clients are rarely knowledgeable in construction and building, client’s lack of skill and knowledge contributes to the complexity in early stage of building refurbishment projects.

2.2.9 Lack of client skill and experience in briefing stage of refurbishment project
The client must be able to communicate the information and at the right time in briefing stage. Having enough experience in the construction process especially in briefing stage, will enable clients to choose the right material and equipment options [25]. In refurbishment projects, most of the clients don’t have enough skill and knowledge about the construction process, and they do not know about the complexity of the construction procedure.

2.2.10 Ambiguity of client’s needs
Ali et al. [26] observed that the client’s needs are the main cause of complexity in building refurbishment projects. Meeting client’s needs in building refurbishment projects can pose a challenging task for designers. There is a need to improve the briefing process through capturing the client’s needs. It is only possible to rightly identify the client’s needs through a team of knowledgeable participants involved in briefing stage of refurbishment [9].

3. Research Methodology
A quantitative method research approach is employed in this study to provide the basis for primary data in investigating the level of complexities in briefing stage of refurbishment projects. The main research method involved the distribution of the questionnaires to experienced architects and interior designers within Klang valley area. A total of 700 questionnaires were distributed to architects and interior designers involved in refurbishment projects. From those questionnaires distributed, 143 were found to be valid enough to form a database for data analysis.

3.1 Data Collection
The data collection method was accomplished through distributing questionnaire survey. The research instrument used in this study was a questionnaire containing open – ended and closed – ended type questions. A 5-point Likert scale was used in gathering some of the data, using a measurement scale of 1-5 in which number 1 stands for very complex factor and number 5 stands for not complex factor.

3.2 Method of Data Analysis (Quantitative Method)
Quantitative approaches can help to provide large representative samples of communities reliably assert cause and effect relationships among constructs as well as confirm or disconfirm theoretical hypotheses and summarize numerical data [27]. The collected data were analyzed using the Statistical Package for Social Science (SPSS) computer software. Descriptive statistics such as frequency tables were used to analyze the data. The mean scores computed from the descriptive statistics of SPSS were used to formulate the ranking of potential complexities in briefing stage of refurbishment projects. Basically, the mean is used to describe the average score or central tendency of variables. The formula of mean is derived as:

\[
\text{Mean} = \frac{\sum X}{N}
\]

where \(\Sigma X\) is the sum of the \(X\) scores; \(N\) the total number of scores.
4. Results and Findings
Seven-hundred questionnaires were distributed and collected, with a response rate of 20.4%. The results for the Mann-Whitney U test for the objective of the research is as shown in Table 1.

4.1 Complexity factors in briefing stage of refurbishment projects

| Complexity                  | Items                                           | Rank | Mean  |
|-----------------------------|-------------------------------------------------|------|-------|
| Lack of documents factors   | • Lack of Archive document in briefing stage     | 6    | 2.7794|
|                             | • Incompleteness of service information of the existing building | 5    | 2.6912|
|                             | • Unavailability of building inspection          | 3    | 2.5662|
|                             | • Unavailability of building site survey result  | 7    | 2.7794|
| Client’s characteristics factors | • Lack of client skill and experience in briefing stage of refurbishment project | 4    | 2.6765|
|                             | • Lack of client’s knowledge in refurbishment project | 1    | 2.5147|
|                             | • Ambiguity of client’s needs                   |      |       |
| Project characteristics factors | • Difficulty in accessing to the existing building | 9    | 3.1985|
|                             | • Unforeseen Site Condition                      | 8    | 3.0000|
|                             | • Unclear scope of the work in refurbished projects | 10   | 3.5074|
| Overall                     |                                                 |      | 2.8240|

From Table 1, it can be concluded that all of the chosen complexity factors have been assumed as a considerable complexity by architects and interior designers. The result shows the highest rank of complexity in briefing stage of building refurbishment is the Lack of client’s knowledge in refurbishment project followed by the Ambiguity of client’s needs in briefing stage of refurbishment project. Surprisingly the lowest considerable factors in this survey is Unclear scope of the work followed by Difficulty in accessing to the existing building.

| Construct                              | Items                              | Rank | Mean  |
|----------------------------------------|------------------------------------|------|-------|
| Client’s characteristics factors        |                                    | 1    | 2.57  |
| Lack of documents factors               |                                    | 2    | 2.70  |
| Project characteristics factors         |                                    | 3    | 3.23  |

Table 2 shows that among the three main categories of complexity factors in briefing stage of building refurbishment, Client’s characteristics factors is the highest concern for designers to challenge with to get the required information to start design. Lack of documents factors ranked as the second more complex factor from the respondents’ point of view and Project characteristics factors is chosen as less complex factors comparing to the first two mentioned categories.

4.2 Discussion on findings
From the results, it can be shown that the Client’s characteristics factors’ impact in briefing stage of building refurbishment is more critical compared to the Lack of documents factors and Project characteristics factors due to the vital role of clients in briefing stage to prepare and sharing the required information for designers to start design.

Based on the findings, the highest rank is the Lack of client’s knowledge in refurbishment project followed by Ambiguity of client’s needs. This is supported by Ali [26] that observed the client’s needs are the main cause of complexity in building refurbishment projects and understanding client’s needs in building refurbishment projects can pose a challenging task for designers. Ali [26] also indicated that
poor briefing and breakdown of communication always happens when the client always changed their needs. Client’s input is one of the main source of information and according to the findings of this research, unclear client’s needs and their poor knowledge about refurbishment projects are the biggest concern for designers in early stage of building refurbishment. This is supported by Shen [28] that mentioned inexperienced and not knowledgeable client is unable to provide an appropriate and adequate brief information and this always contributes to additional work and design variations.

It can be concluded that the quality of required information that designer needs to start design is partly dependent upon the knowledgeable and experienced client’s involvement in the briefing stage and similarly, a strong design team that plays effective roles can better ensure clients’ active participation to communicate more and acquire the needed information.

5. Conclusion
This study investigated the level of complexity factors faced by architects and interior designers in briefing stage of refurbishment projects in Malaysia. The results indicate that lack of client’s knowledge in refurbishment projects and lack of client’s skill and experience in managing briefing stage of refurbishment projects are the main concern for the designers of refurbishment projects to acquire the required information to start design. These results can be a useful basis for developing a framework to assist construction practitioners to get awareness about the main complexity factors in briefing stage of refurbishment projects that they may encounter. Furthermore, understanding the level of complexity in briefing stage of building refurbishment can be valuable in further researches when considering and applying some initiatives for mitigating such complexity factors, which may lead to successful briefing by generating the desired level of information for designers to start design. The outcomes of this study can help researchers and participants involved in briefing stage of building refurbishment to increase their knowledge on the levels of complexity factors and prepare proper initiative actions to overcome these factors.

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