

Analysis of Factors Influencing Building Refurbishment Project Performance

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Abstract. Presently, the refurbishment approach becomes favourable as it creates opportunities to incorporate sustainable value with other building improvement. In this regard, this approach needs to be implemented due to the issues on overwhelming ratio of existing building to new construction, which also can contribute to the environmental problem. Refurbishment principles imply to minimize the environmental impact and upgrading the performance of an existing building to meet new requirements. In theoretically, building project's performance has a direct bearing on related to its potential for project success. However, in refurbishment building projects, the criteria for measure are become wider because the projects are a complex and multi-dimensional which encompassing many factors which reflect to the nature of works. Therefore, this impetus could be achieve by examine the direct empirical relationship between critical success factors (CSFs) and complexity factors (CFs) during managing the project in relation to delivering success on project performance. The research findings will be expected as the basis of future research in establish appropriate framework that provides information on managing refurbishment building projects and enhancing the project management competency for a better-built environment.

1 Introduction

Building industry is one of the biggest contributors to pollution and waste through its life cycle [1]. Reference [2] has counselled the building industry to reduce the greenhouse emissions at least 50% in less than forty years and needs to have achieved at least 25% reduction in eleven years to avoid worst-case scenario of climate change. If nothing is done, greenhouse gas emissions from buildings will more than double in the next twenty years. In addition, towards the end of the 20th century, the major issue faced by building industry is the ratio of existing buildings to new construction is become overwhelming [3]. In short, it will affect the inequities huge stock of existing, which makes up the bulk of the

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construction market not sustainably built. It will show that the physical development by building industry could not promise to pursuit the quality of life for future generation.

At this point, by considering the refurbishment principles from vary perspectives in building industry will create the stability environment for current and future generation in holistic long-term benefit. As stated by [4], upgrading an existing building for reuse can represent a 10% to 12% cost savings as opposed to a constructing new building. Thus, it can be concluded that long term benefit can only be achieved by integrate this principles and in order to survive, the refurbishment industry should increase its performance by defining correct strategies and measures regarding with the factors influencing project performance.

In conjunction with this, it might be conflict in concentrated particularly on defining the factors influencing refurbishment project performance because it well knows that refurbishment building projects is more complex compared to new construction [5, 6]. Therefore, addressing this gap by develop an appropriate framework has been the main motivation for this study.

2 The growth and performance of refurbishment building projects

Refocusing on refurbishment principles, there is no specific definition of it. [7] offers the definition of refurbishment is “to make neat, clean or complete as by renovating, re-equipping or restoring”. However, [8] define refurbishment as synonym of rehabilitation has supported the terms conversion and modernization implying an approach that embraces the wider localized environment as well as individual structures. While, [9] reported that refurbishment presents a means of improving the performance of existing buildings without the economic and environmental coast associated with new build schemes.

Today, there is a widespread awareness of the needs to refurbish existing building and to modernize with emphasis on latest methods to accommodate modern building services and energy saving techniques as well as meets the sustainable agenda. Previous literature claimed that by demolishing buildings and preparing the site for the new build involves high embodied energy and costs [10-12]. Also, been supported by [13] which reported that at this rate of new built and demolition, about 70% to 80% of current existing stock will still be standing in year 2050.

Numerous studies have been promotes integration between these two fields; refurbishment and sustainability which will offer a huge potential to improve the performance of existing building stock in sustainably efficient [10, 14, 15]. According [16] discover that “sustainability cannot be achieved without addressing the existing building stock even every new building was a sustainable building, their impact on sustainability as a whole will be minimal for some time”. Nevertheless, there is a missing link in refurbishment’s research agenda. Yet, the majority refurbishment building projects have still been developed in an unsustainable manner and lack of implementing quality and performance management techniques [5, 10]. Despite, the vast number of research initiatives designed to better understand refurbishment industry aimed at improving its performance, therefore, the specific success factors has not been addressed properly.

In Malaysia scenario, refurbishment principles may regard as new phenomenon, which less approach in utilizes it. Particularly in Malaysia, the concept is still new in the field of building industry due on limited empirical research advocates this new area of management compared to sustainable new built [5]. Therefore, the studies on practices applied to the management of this complex construction environment are scarce. Also, the effectiveness of refurbishment management still in question and need to be improve because it would reflect the performance of project.

3 Factors influencing refurbishment building project performance

3.1 Critical success factors of refurbishment building projects

Critical success factors (CSFs) are necessary behind factors in order to assessing the success on the project performance. This is also affirmed [17] that understanding the CSFs could increase the chance of a project's success. Although, there have been several research studies on CSFs in building project success performance, rarely specifically looked at the issues relating to refurbishment projects. It has been supported by [18] suggest that there is need to develop project performance success indicator for refurbishment projects in order to add value to the existing building. Much of discussion in this subject is tended to focus on issues related to development performance of new build construction only [6]. Even though the refurbishment approach have identified as logical solution to reduce the environmental impact preferably [19-21], however little attention has been paid to this area.

There is an evident to address this gap by providing empirical evidence of CSFs influence in the context of refurbishment project performance. In extent literature, many studies have attempted to identify the success factors that could influence a successful implementation [22, 23]. The concept of CSFs is being widely discussed in management literature and has been central theme to the literature of project management. Many CSFs categorizations and frameworks are approached and integrated with the project success criteria in order to provide a comprehensive framework for evaluating the project based on CSFs. According to [24], several studies suggest that for a successful performance management framework, CSFs and performance management should be linked. It is because CSFs are defined as inputs that enhance and direct the project to be achieved successfully whereas, performance measurement are used to judge project success or failure. However, success is 'relative' when the meaning of success differs between different groups of users.

CSFs were first studied by [25]. Further, [26] come out with a list 13 factors affecting project success related to project area, human area and general management area. However, [27] project success factors remain the basis for project management success factor today. Consequently, [28] come out with four main areas of critical success factors related to: the development projects factors; the project manager and project team factors; the organization factors; the external environment factors. Reference [29] argued that the project management success factors are: project team promise; client's competencies; risk and liability assessments; client's competencies; end user's needs; end users imposed restrictions. Most of project success studies hypothesize that the absence of CSFs would lead to failure of project [30].

According to [31] claimed that CSFs relates to internal actions and the fact that project success is more about the holistic view of a project. References [32, 33] the CSFs are something that could be measured over the project lifecycle and relates to performance of the conventional criteria (time, cost, quality). In order to evaluate the success of refurbishment project performance it is important to identify it's CSFs of refurbishment building projects.

3.2 Complexity factors of refurbishment building projects

The significance of refurbishment is aimed at long term remodelling of a building, addressing constraints such as circulation and maximizing the potential offered by the site and building consent. One of the most often cited barrier and challenges for refurbishment

as opposed to new build is the inherent complexity of the works themselves [34-36]. The complexity is measured against the process as a whole, but it must be noted that the challenges faced in this aspect also have singular significance, respectively to the project team that carrying out the works. As for refurbishment building projects, its nature and characteristics are again different due to the complexity of the extent of works as it usually risky and complicated, possibly involving existing and unsecured site conditions.

The complexity of refurbishment involved technical, technological, ecological, social, comfort and esthetical. Generally, the complexity are mainly derives during the planning stage in refurbishment project is reflected from difficulty to obtain the specific information to project organization. In 'Managing Refurbishment Project' book titled by reference [6] pointed out that the degree of complexity shows the gap between information needed and the availability of information, is greatest at the beginning of the project, such as during design stage.

While, lack coordination, delay the decision process and fragmentation is several issues that contributed the complexity during the implementation stage. It is because the occurrences of communication gap between the project organization, ineffective collaboration and limited understanding the nature of the complexity and in addition to the interdisciplinary nature of the planning process [37]. Despite this, the various parties are often to concentrate on their own area of specialization in refurbishment building projects [38]. This can caused the 'over the wall syndrome' that made up of separate parties from diverse professions that need to make a one decision in design and construction stage in refurbishment building project.

Reference [39] discovered that another refurbishment projects barrier which are the occurrence of large numbers of variation orders to the project. The reasons of the changes design are influence by variations from client requirement, designer, amendment of statutory regulations and problem on site environment. References [40, 41] discovered that the difficulty in accessibility also could contribute the level of complexity. Most of the refurbishment building projects site is located inside and the façade of the existing building, the designers need to be smartly planned and consider the available access elements such as door, window, stair and lift to be an access on the site which needs to acquire extra protection to maintain site safety, dust and noise problem.

4 Methodology

The tool used to achieve the relationship between critical success factors (CSFs) and complexity factors (CFs) during managing the project in relation to delivering success on project performance in this research by developing a conceptual framework. In the field of project management, the subject of project success is the heart of the field where it varies with project phases. In fact, though much literature has attempted to list CSFs, it is impossible to list a definite set of all the CSFs for refurbishment projects the refurbishment projects have different success criteria from other new construction projects since the targets and aims of the applications in refurbishment are different from those in other projects. A success criterion has long been considered the ability to fall within time, cost, quality constraint or known as 'iron triangle'. Therefore, for the purpose of this study, the success criteria covered the integrating the three pillars of sustainability in success criteria in order to achieve the goal of attaining sustainable structure. The impact of the energy efficient upgrade was not considered in this study. Same goes to the complexity factors which identified that related with the scope study. The building industry comprises of multidisciplinary professionals who are employed by different organization and specialization. Therefore, this study only covers the complexity factors that been faced by construction organization during managing the refurbishment projects.

5 Discussions

The conceptual framework (refer Fig. 1.) for this study integrates the CSFs and success dimension for refurbishment projects performance variables. The framework is extended and modify from the model that integrates different elements that were built as the basis for a project management theory. The framework is not typically used for explaining complicated process, but it does assist by simplifying the process and making it more understandable [42].

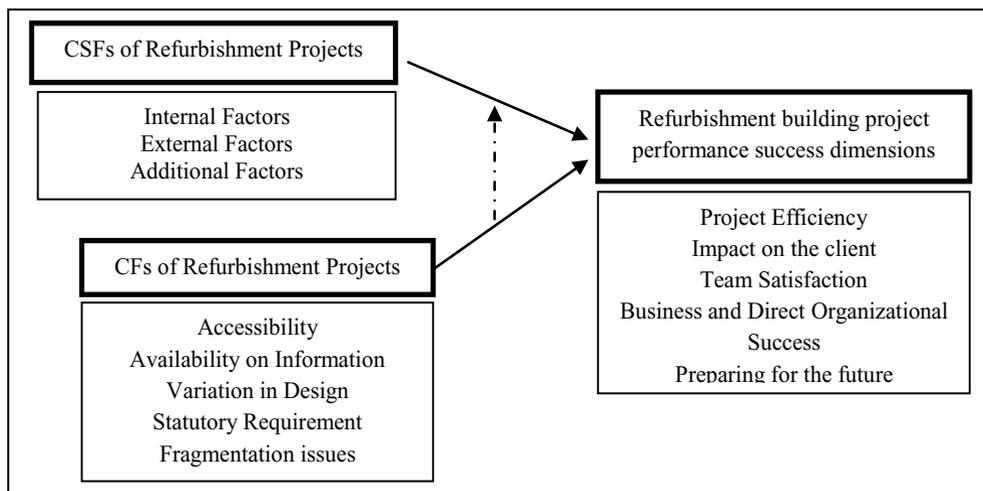


Fig. 1. The conceptual framework.

For the purpose of this study, the independent variables which consists three categories critical success factors (CSFs) are synthesized and re-classification created in order to simplify the conceptual framework of this study which will give influence the success dimension for refurbishment project performance. Therefore, in this study three CSFs have been classified namely internal factors (project management, top management, project team), external factors (environment, economic, social, policy and technological) and additional factor (project characteristic). These CSFs are actually a new classification inspired by the empirical studies of [43, 29, 28]. Meanwhile, for dependent variable, this study selected [44] multidimensional performance of projects model were adapted and presented as a reflective second order factor to capture the multifaceted nature of project success. These success dimensions are comprised of project efficiency, impact of the client, team satisfaction, business and direct organizational success and also preparing for the future. The main reason for adopting this construct as dependent variable was because of its coverage on the basic measures of project success, which have been developed and tested as a generalized success measure.

As mentioned before, that refurbishment project is more complex than new build scheme. Therefore, the moderating variables are taken into consideration in this study in order to recognize the complexity factors (CFs) that been occurred in refurbishment projects. A moderating variables is a third independent variable that causes the relationship between the independent and dependent variables to change where change could be characterized as the direction and strength of the [45, 46]. Five moderating variables are taken into consideration in this study in order to recognize the complexity factors that been occurred in refurbishment building projects and identified which having an effect on the refurbishment project performance success. Determination of the factors that are presents is

the preliminary stage of an on-going research and needs further investigation for final model will be formed.

6 Conclusions

In order to survive and provide a sustainable strategic position in the building industry, a construction organization should increase its project success by seizing the opportunities in either domestic or international market. Moreover, considering the fact that refurbishment building projects have different objective and specialities compared to other new built, it is crucial to determine the factors that will bring success in refurbishment building projects.

For this reason, result from this study; it is aimed to determine valid performance measurement which leads refurbishment building projects to success in order to obtain integration with sustainable approach especially in current trend building industry in Malaysia. Thus, help to bring a rich insight by exploring the integrating ideas between sustainability concept and refurbishment works and its application to project management in Malaysia.

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