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Competency Requirement for Project Manager in Improving Sustainable Construction Project Success

Norliana Sarpin^{1,2*}, Ahmad Shawqee Hasan¹, Mohd Afiq Mohd Iskak¹

¹Department of Construction Management, Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, MALAYSIA

²Centre of Sustainable Infrastructure and Environmental Management (CSIEM), Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, MALAYSIA

*Corresponding Author

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Abstract: The role of project manager become more complex as the construction industry is focusing on sustainable development. Competencies of a project manager are critical in reducing the encountered challenges in improving sustainable construction project success. However, lack of competency among project managers and mismanagement are among critical problems in the Malaysian construction industry. Therefore, the objectives of this study were to identify the key competencies needed by the project managers in managing the sustainable projects, to examine the key challenges for the project manager and to suggest the strategies for project managers in undertaking a successful sustainable construction project. The scope of this research is among the sustainable construction project practitioners in Kuala Lumpur due to the highest number of sustainable projects registered as recorded in the latest executive summary of the Green Building Index (GBI). The quantitative method was used to collect data from respondents by distributing questionnaires through e-mail and WhatsApp applications. The collected data from 47 responses which representing 31% of the sample size was analyzed using Statistical Package for Social Science (SPSS). The results of the study have shown the key competencies needed by the project managers in successfully managing sustainable construction projects are namely professionalism, emotional resilience and stress tolerance and negotiation skills. The study also identified the key challenges for project managers are including inefficient decision-making and lack of sustainability concept knowledge. In addition, the research also suggested some strategies for project managers to undertake sustainable construction project includes analyzing and mitigating the threat, corrective action plan, and efficient resource allocation. In conclusion, all parties in the construction industry especially project manager needs to play an important role in improving their competency towards the success of sustainable construction project in Malaysia.

Keywords: Competencies, project manager, sustainable construction project

1. Introduction

The term sustainable construction refers to balancing environmental, social, and economic considerations in order to ensure a sustainable and viable industry for future generations. The concept of "Sustainability" were introduced by the "Brundtland Report" in 1987 by the World Commission on Environment and Development, and it was defined as

“development and promotion of economic activities which are in harmony with earth’s ecosystem” (Mehta PK, 1997). Sustainable building has a lot more than conventional building including with the design of buildings, management of construction process and the choice of materials. The building also designed on purpose of conserving the energy towards efficiency and followed by other sustainable element on the building.

Statistic from Construction Industry Transformation Program (CITP, 2016-2020) shows that among the top issue that facing Malaysian construction industry are regarding the quality issue and sustainability issue. The issue mainly contributed by working environment at the site, environment sustainability and wastage or disposal management. Besides that, when it comes to sustainable construction, Southeast Asia's construction industry is still in its infancy. One of the most significant barriers to sustainable construction in the region is a lack of awareness and training (Shafii & Othman, 2006). Therefore, according to Robichaud & Anantatmula (2011), Sustainable construction necessitates specific goals that consider not only market conditions and physical requirements, but also environmental goals.

In general, project management philosophies, process, methods, and tools are among the important elements for the successful management of construction project; however, the capability of project manager can somehow become the important factor (Mohammad Reza et al., 2014). Project managers in construction project were responsible in developing the project within the constraints of cost, quality and time. A competent personnel are needed to ensure the success of the project using their skills, knowledge and their own ability in the sustainable construction project. As Hwang and Ng (2013) has also confirmed that the construction industry’s growing awareness on the relationship between achieving project success and construction project management competencies. Compared to traditional buildings, sustainable building tends to encounter more complex problem during the construction phase. This additional challenge only can be seen by the rear view of sustainable project manager. In other terms, sustainable project must accomplish additional goals compared to the traditional building project in terms of energy conserving, green material or waste management and environmental friendliness.

According to the local government, the Malaysian construction industry is still plagued by a lack of professional project managers and mismanagement. According to the statistics, management concerns accounted for about 90% of the projects that were abandoned (Bettencourt et al., 2011 & Ministry of Housing and Local Government, 2012). Therefore, this study will identify the key competencies needed by project manager in completing sustainable project, to examine the key challenges for Malaysian project manager to undertake sustainable construction project and to suggest the strategies for Malaysian project manager to undertake sustainable construction project. The scope of this research mainly focused on sustainable construction project in Malaysia. It was focusing on the key competencies needed by project manager in completing sustainable project. The respondents selected are the project manager that previously have experience handling sustainable project in Kuala Lumpur. The area of research was selected based on GBI executive summary as on 31 March 2019. The executive summary stated that the GBI project registered in Kuala Lumpur and rated as the highest among the state or territory in Malaysia.

2. Literature Review

2.1 Sustainability Concept

The concept of “Sustainability” was introduced by the “Brundtland Report” in 1987 by the World Commission on Environment and Development, and it was defined as “development and promotion of economic activities which are in harmony with earth’s ecosystem” (Mehta PK. , 1997). The concept of sustainability has grown in recognition and importance over the last ten to fifteen years. (Silvius et al., 2012), Stakeholders of the construction industry have addressed issues of sustainability, climate change, and environmental preservation. The same concept has been expressed by Kyoto protocol (1997), an international environmental treaty with the goal of achieving the “stabilization of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic (air pollution) interference with the climate system”.

2.2 Sustainable Development

Sustainable development has become a widespread development paradigm as a tagline for international aid agencies, the focus of conference and research papers, and the motto of development and environmental activists (Ukaga, Maser, & Reichenbach, 2011). As a result, many people are still confused about what it means or what it entails, as well as what it signifies for development theory and practise (Montaldo, 2013; Shahzadal & Hassan, 2019).

2.3 Malaysia Construction Industry Involvement in Sustainable Construction Project

As a developing country, the construction industry is crucial to the country's economic growth. The Construction Industry Development Board Malaysia (CIDB), a corporate established with the primary goal of developing, improving, and expanding the Malaysian construction industry, has identified the environment and other sustainability-related issues as one of the construction industry's top priorities (CIDB, 2000).

Other organizations that contribute to the promotion of sustainable construction, in addition to CIDB, are the National Institution of Valuation, Malaysia (INSPEN), the Malaysian Science and Technology Information Centre (MASTIC),

and local universities. To achieve the goal of sustainable construction, the Board of Architects (Malaysia) has collaborated with the Association of Consulting Engineers Malaysia (ACEM) to create the Green Building Index (GBI) (Abidin, 2010). This concept is similar to world-renowned rating schemes such as Leadership in Energy and Environmental Design (LEED), Building Research Establishment Environmental Assessment Methodology (BREEAM), Green Mark, and Green Star, all of which aim to recognize an organization's efforts to implement sustainable construction projects.

2.4 The Roles of Project Manager in Sustainable Construction Project

Project manager have variety competencies based on their experience, professional ethics, technical knowledge, superior social skills and their ability to manage the construction projects. Therefore, the role of a project manager will successfully improve the chances of success of the construction project implemented, and the capability of project manager is critical in reducing challenges encountered (Mohammad Mirghasemi *et al.*, 2014).

Project manager also plays a significant role in the process of a construction project, the personnel with adequate experience, supported by qualified professional and clerical staff, will head the project and be responsible for the day-to-day implementation of project activities (Mohammad Mirghasemi *et al.*, 2014).

2.5 The Competencies Needed by Project Manager in Managing Sustainable Construction Project

The competency is often associated with the Iceberg Theory introduced by Spencer and Spencer (1993). Competencies, in this theory, is compared to an iceberg in the water, which is separated into two parts: the Knowledge and skill are represented by iceberg's visible and hidden parts, which are interpersonal, motive, trait, concept and value or morale as shown in Figure 1. In addition, a focus on capabilities is crucial for an organisation aiming to achieve superior performance and maintain a long-term competitiveness (Emtseva *et al.*, 2020 & Sarpin, 2016)

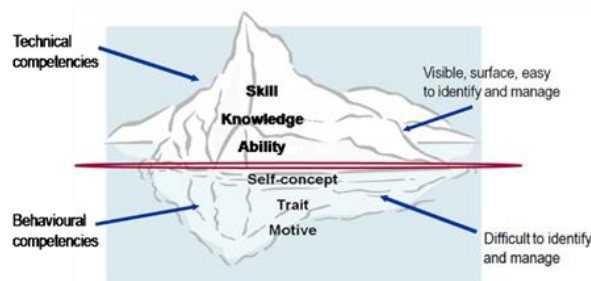


Fig. 1 - The Iceberg Theory on project manager competencies

2.5.1 Technical Competencies

To properly manage a sustainable construction project, a project manager must learn a variety of skills and competence. According to Fryer, numerous published studies have effectively identified management abilities such as social skills, decision-making skills, problem-solving skills, the capacity to detect opportunities, and the ability to manage change as essential markers of project success (1985). According to Parry (1996), competence is a set of information, talents, and characteristics that determine individual performance. Blancero, Boroski, and Dyer (1996) defined competency as "knowledge, skills, ability, and other traits that demonstrate expected future behavior.

"Similarly, in Malaysia, project manager and the team associated are among the key factors contributing to the success of sustainable project implementation (Sharif *et al.*, 2014). In order to correctly design, implement, maintain, and develop a construction project, a project manager must improve their knowledge management skills (Achara, 2016). According to Hwang and Ng (2013), the construction industry is gaining a better knowledge of the relationship between project success and construction project management competencies. To ensure the long-term sustainability of the construction project.

2.5.2 Behavioral Competencies

Several competency traits, such as personality and behavior, influence the efficacy of job performance (Abraham *et al.*, 2001). According to Majid *et al.* (2012), project managers are categorized into three degrees of competence: competent, outstanding, and amazing. He implied that a capable project manager have the necessary knowledge, skills, and experience. Then, he implies that an excellent project manager has more skills beyond their individual characteristic, and a great project manager has two additional skills that is the motivation and talent to be a leader. Competency is also referred to motive, personal, skills and ability shown through consistent behaviour (Fleisher, 2003). In addition, Meyer and Semark (1996) added that "trait" and "value orientation" when they describe the meaning of competency.

Similarly, in Malaysia, the project manager and the associated team are among the significant factors influencing the success of long-term project execution (Sharif et al., 2014). As a result, project managers should develop and implement their project management knowledge and abilities for their construction project while improving their own knowledge management skills (Achara, 2016). According to Hwang and Ng (2013), the construction industry is becoming more aware of the link between project success and construction project management competencies.

2.6 Key Challenges for Project Manager in Managing Sustainable Construction Project

2.6.1 Adaptation on New Practices

Many project managers and the teams are having difficulties in confronting new issue and and roles in adapting new practices, thus hard to accept the changes from conventional practices to sustainable or green project management (Sharif et al., 2014). Therefore, the implementation of sustainable construction requires knowledge, consciousness and full understanding of individual action consequences (Abidin , 2010).

Samari et al. (2013) have listed some of the challenges that faced by Malaysian practitioners includes cost effect, lack of policy to guide and support the stakeholders and low level of awareness regarding the sustainable construction. Two reasons suggested by Elsenburg et al, (2002) are insufficient knowledge or technical expertise and unfamiliarity with the products, materials, system or design. A professional project manager is required to deliver a sustainable project successfully and in accordance with the client's expectations (Robichaud & Anantatmula 2010). Despite the fact that numerous standards are addressed in project management, the role of project managers in implementing sustainable development is hampered by their incapacity to consider the sustainability component on their projects (Silvius & Schipper, 2014).

2.6.2 Client's Understanding

Häkkinen et al. (2011) has considered that the client's understanding of the sustainable construction project is critical. They stated that the demand and willingness of clients are the determinants for the sustainable development to be delivered successfully. Different types of clients can have an impact on a building's sustainability in a variety of ways. One of the main group clients is an investor who owns and develops private buildings. The other one of organisation is the government and local government organisations that own and develop public buildings. (Häkkinen & Belloni, 2011). Because the goals are long-term and the benefits appear unclear, understanding them is critical in sustainable construction. As a result, clients are unable to be persuaded of the benefits of green buildings and do not perceive the necessity for them to be implemented (Hwang & Tan, 2010).

2.6.3 Timing

Sustainable construction projects, which have more special concerns than standard ones (such as minimizing resource depletion and lowering harmful emissions), should explore the possibilities of proper design solutions in the early stages (Häkkinen & Belloni, 2011). During the pre-design phase, project managers are responsible for interviewing and selecting architects, engineers, estimators, land surveyors, and other consultants. A project must be planned, timed, and have all of the necessary actors present for it to be successful. (Häkkinen & Belloni, 2011).

2.7 Strategies Needed by Project Manager in Managing Sustainable Construction Project

2.7.1 Effective Communication Skills

It is proven that in the construction industry, green building and sustainable solutions are becoming more common. This shift occurred as people gained a better understanding of the long-term benefits of sustainable solutions. (Fuerst F et al, 2014).

This is supported by the fact that poor communication skills can be identified as one of the most common project risks in construction by the project managers (Ceric, 2014).

(i) Communication to clients and suppliers (economical stakeholder)

As each stakeholder usually has their own interest and different priorities, conflict and complexity of the situation may arise (Karlsen et. al, 2008). During the construction processes, builders often experienced information changes that can distort the time frame, therefore, in order the idea of sustainability to be accepted by all stakeholders, it needs to be communicated well on how it will contribute to the interest of the company (Deliotte & Touche, 1992).

(ii) Communication to team (organization/organizational stakeholders)

According to Caproni (2011), there are many different types of teams, each with its own set of responsibilities. As a result, it's critical for the project manager to get to know his or her subordinates well. A good project manager improves cross-cultural communication not by stereotyping, but by recognising potential cultural differences in communication that can contribute to the development of a sustainable team.

(b) Project Risk Management

It is also the result of tight deadlines, limited or unexpected funding, designs that are at the edge of attainable performance, and frequently changing needs. Creating a risk portfolio is typically the most effective strategy to accomplish optimal risk management. The four stages of this approach include communication and consultation, risk assessment, contingency planning, and lastly review and approval (Redwood, 2016).

3. Research Methodology

3.1 Research Design

This study employs a quantitative methodology to collect data from a pre-selected group sample via questionnaires. These approaches are deductive in nature, with the purpose of debating or gathering evidence in support of particular theories and hypotheses. It is frequently used in explanatory research to explore for correlations, links, and causal relationships (Patricia, 2017). This approach is used to examine and identify what is the needed competencies of project manager in improving sustainable construction project success. As a result, this study comprises numerical data from surveys, which were analysed and translated into graphs, charts, and tables using the Statistical Package for the Social Science (SPSS).

3.2 Questionnaire

In this research, 150 sets of questionnaires were sent out through email to the selected company to be collect the data. The content in the questionnaire consist of four main parts. The first part collecting the data about the correspondent company information such as gender, level of education, years of experience involved in sustainable construction project and types of sustainable construction project that been involved. The second part contains the Five Likert scale questions on key competency needed by project manager in managing sustainable construction project. The third part contains the Five Likert scale questions on key challenges faced by project manager in managing sustainable construction project. Then, the last part that also contain the Five Likert scale questions on the strategies that can be implemented by project manager in managing sustainable construction project.

3.3 Population and Sampling

In this research, the population selected is from the list of contractor's companies, in Kuala Lumpur that have experienced in sustainable construction project. The population selected under criteria of G6 and G7 in Kuala Lumpur that registered their project under GBI is 267 contractors.

Random sampling method was used for this research based on Krejcie & Morgan's (1970) as shown in Table 2 in Appendix aid in determining the sample size for this research activities. The most fundamental sampling approach is simple random sampling, which includes selecting a subset (a sample) of participants from a larger group (population). According to GBI (2019) executive summary, the targeted population was 267 Malaysian contractor that registered their project under GBI. A total of 149 respondents were chosen randomly from the target population based on Krejcie & Morgan (1970) table. The sampling frame of this research was from the main contractor from Kuala Lumpur, Malaysia that has registered their project company under the GBI. The respondents were the project managers who involved in managing sustainable construction project.

3.4 Data Analysis and Findings

In this research, data were analysed after collected from the primary data. This process is using Statistical Package for Social Science (SPSS). By using this tool, it will be able to assist researcher to manage, present and analyse by interpreting large data to accurate result in form of table and graphical chart either to determine percentage, mean and ranking of data collected.

The result of this being analysed and summarize by using descriptive analysis. Descriptive analysis can assist researcher to describe the data and phenomenon so that it will be easier to be understand (Nassaji, 2015). Therefore, the result and findings in this research allow the researcher to determine which competency will be needed by the project manager in successfully managing sustainable construction project. Researcher also will be able to determine the most common challenges faced by the sustainable project manager and the most preferred strategies in improving the sustainable construction project success.

4. Result and Discussion

4.1 Response Rate

Despite the total of 150 questionnaires that distributed, 47 questionnaires were responded. Thus, the total response rate percentage was 31% which is acceptable. According to Dulaimi *et al.* (2003) that stated the normal response rate in construction industry for questionnaires is within the range of 20-40 %.

4.2 Respondents Background

The number of male respondents who answered this questionnaire is 34 people equivalent to 72.3%. While the total number of female respondents is 13 people equivalent to 27.7%. In conclusion, the average respondent involved in this questionnaire is male.

Next, the level of education of respondents. The frequency for respondents that graduated from diploma was 17 equivalents for 36.2%. Next, respondents that graduated from degree was 26 people equivalent for 55.3%. Then, there are 3 respondents that graduated from Master that equivalent for 6.4%. Then, there are 1 respondent that graduated from PhD that equivalent to 2.1%. Table 3 below summaries the findings related to respondents' background.

Table 3 - Respondents background

Variable	Category	Frequency	Percentage (%)
Gender	Male	34	72.3
	Female	13	27.7
Level of Education	Diploma	17	36.2
	Degree	26	55.3
	Master Degree	3	6.4
	PhD	1	2.1
Years of Experience In Managing Sustainable Construction Project	1-5 years	21	42.6
	6-10 years	19	44.7
	11-15 years	4	12.8
Types of Sustainable Construction Project Involved	Housing	18	38.3
	Office	12	25.5
	Infrastructure	17	36.2

Then, for the years of experience of respondent in Sustainable Construction Project, 20 respondents have 1 to 5 years' experience that equivalent to 42.6%. Meanwhile 21 of the respondents have 6 to 10 years' experience in sustainable construction project. Lastly, 6 of the respondents have 11 to 15 years of experience in sustainable construction project. For the types of sustainable construction project that involved by the respondents, 18 of the respondents involved in sustainable housing project that equivalent to 38.3 % of the respondents. Meanwhile 12 respondents involved in office sustainable project that equivalent to 25.5%. Then, there are 17 respondents that involved in infrastructure sustainable construction project that equivalent to 36.2% of the overall respondents.

4.3 Competency of Project Manager in Managing Sustainable Construction Project

Based on the result obtained, all of the competency in this section shows a high level of tendency level. Competency that achieve the highest mean with an average value of 4.65 is the professionalism of project manager in managing construction project. The word "professionalism" can be defined, according to Greenhalgh (1997), as the possession and independent control of a body of specialized knowledge that confers power on its owners when combined with honorary status. Besides that, the second highest rank goes to project manager's emotional resilience, stress tolerance and flexibility in managing construction project that is with average mean 4.6. These can be crucial tool in overcoming high-stress scenarios in sustainable construction project. Based on Table 4 below, it shows the summary of competency of project manager in managing sustainable construction project.

Table 4 - Competency of project manager in managing sustainable construction project

Rank	Competency	Average Mean
1	Professionalism	4.65
2	Emotional Resilience and Stress Tolerance	4.63
3	Excellent Negotiator	4.63
4	Creativity and Originality	4.59
5	Good Ability in Green Technology Use	4.59

6	Analytical Thinking and Innovation	4.57
7	Complex Problem-Solving Ability	4.57
8	Communication Skills	4.55
9	Leadership	4.55

Then, the third highest rank is the ability of project manager as an excellent negotiator with average mean 4.63. A competence project manager tends to be an excellent negotiator so that all parties involved in the construction project will have a win-win situation in decision making process.

Meanwhile in fourth rank, creativity and originality and initiative of project manager to understand the bigger picture of significant aspects in sustainable construction project. As stated by Kingsley *et. al* (2010), The successful project managers particularly, in are partly due to their creativity and innovation in work, and many of them have collapsed too because lack of innovation and creativity. Then the fifth rank is project manager's good ability in green technology use with average mean 4.59. This ability needs to be developed in order to successfully manage sustainable construction project. Next, project manager's ability to analytical thinking and innovation with average mean 4.57. These can assist project manager to determine an appropriate risk response and contingency plan for sustainable construction project.

Then, project manager's complex problem-solving ability that have a mean average 4.57. This ability can assist project manager in handling large or complex sustainable construction project, Faisal Alshammari *et al* (2020). Next the eighth rank that is communication skills of project manager that have a mean average of 4.55. The research from Zulch (2014) illustrated that the project managers' skill to communicate has an impact on the cornerstone areas of project management. Lastly, leadership skill that have mean average of 4.55. Ahmed *et al.* (2013) stated in his research that the role of project manager currently shifting from managing or directing to leading the construction project that needs them to possess essential knowledge, skills and leadership style.

4.4 Challenges of Project Manager in Managing Sustainable Construction Project

The first rank is the inefficiency of decision making with the average mean of 4.59. This challenge could lead to fatality in the final outcome of construction project. The second highest rank goes to lack of sustainability concept knowledge with average mean 4.57. Then, workplace miscommunication challenge with average mean 4.57. Workplace communication can negatively impact employee engagement and organization bottom line in sustainable construction project. Next, lack of technical expertise such as foundational knowledge of IT infrastructure that can interfere the process of monitoring and controlling sustainable construction project with average mean 4.51. Based on Table 5, it shows the summary of challenges faced by project manager in managing construction project.

Table 5 - Challenges of project manager in managing sustainable construction project

Rank	Challenges	Average Mean
1	Inefficient Decision Making	4.59
2	Lack of Sustainability Concept Knowledge	4.57
3	Workplace Miscommunication	4.57
4	Lack of Technical Expertise	4.51
5	Under Skilled Project Manager	4.48
6	Lack of Open Communication	4.44
7	Insignificant Role in Delivering Information	4.44
8	Improper Cost Management and Control	4.42
9	Difficulties in Adapting Sustainable Practice	4.27

Besides that, the fifth rank goes to the challenge of under skilled project manager that can tremendously affect the success of sustainable construction project by average mean 4.48. As a result, in order to construct and implement project management knowledge and skills for the project, a project manager's ability and knowledge must be increased. Achara Khamaksorn (2016). Then, lack of open communication with average mean of 4.44. As stated on research by Olanrewaju *et al.* (2017), the poor performance of Malaysian construction Industry is the effect from poor communication in work environment.

Next, insignificant role of project manager in delivering information that will restrain the client from understanding risk and opportunities in sustainable construction project with average mean of 4.44. The eight-rank chosen by respondents is the improper cost management and control with mean average 4.42. Improper cost management and control by project manager can jeopardies sustainable construction project to be completed based on planned budget and scope. Lastly, difficulties in adapting sustainable practice with average mean of 4.27. According to Leiper *et al.*, (2003), the construction industry is slow to adopt sustainable methods of construction.

4.5 Strategies Implemented by Project Manager in Managing Sustainable Construction Project

The first rank is to analyse and mitigate the threat that can harm the project while exploring positive consequences that can positively improve the success of project with average mean 4.68. The second rank is motivation towards employee to keep committed on doing the job with average rank of 4.68. Motivation of employees has been suggested as one of major factor that catalyze the efficiency in construction industry said K.N. Hewage & J.Y. Ruwanpura (2006). The third highest rank is the corrective action plan with average mean of 4.68. The corrective action plan recommended to be taken due to variance usually happened in complex construction project (Veronika *et. al* 2006). Based on Table 6, it shows the summary of suggested strategies for project manager to successfully managing sustainable construction project.

Table 6 - Strategies implemented by project manager in managing sustainable construction project

Rank	Strategies	Average Mean
1	Analyze and Mitigate the Threat	4.68
2	Motivation Towards Employee	4.68
3	Corrective Action Plan	4.68
4	Resource Allocation	4.59
5	Utilization of Information System	4.57
6	Performance Measurement	4.53
7	Feasibility Study	4.51
8	Project Management Methodologies	4.14

Then, the fourth rank is by doing resource allocation with average mean 4.59. The function of resource allocation is to minimize the duration of project and increase the utilization of equipment and labour workforce available (Khattab *et. al* 1996). Next, utilization of information system with average mean 4.57. Development and utilization of information system in construction can provide the management with information necessary to support decision making processes. Next, feasibility study with average mean 4.51. Ali *et. al* (2019) stated that feasibility study in early stage plays the most important role before commencing the project design and construction project Lastly, project management methodologies with average mean 4.14. Project management methodologies such as Waterfall, Critical Path Method, Critical Chain, Agile and others can be used by project manager as a set of guiding principles in managing sustainable construction project

4.6 Discussion

As being mentioned before, competency can be referred to set of knowledge, skills and ability of a personnel to deliver the task successfully. Overall, 9 competencies were identified in the findings of this study which are professionalism, emotional resilience and stress tolerance, excellent negotiator, creativity and originality, good ability in green technology use, analytical thinking and innovation, complex problem-solving ability, communication skills and leadership ability. These competencies were believed to be reflected as the key competencies for project manager in successfully managing sustainable construction project. As being mentioned in research of Achara Khamaksorn (2016), there is exactly a linkage between the rate of project success and project managers' competency in construction industry. In addition, she also mentioned that a project manager is a special type of professional with very special skills and training. By comparing with some previous researches, there are a lot more competencies that can be identified and highlighted as the competencies that needed by project manager in managing sustainable construction project.

In addition, a few challenges have been discovered in this research as the key challenges for project manager to successfully managing sustainable construction project which are inefficient decision making, lack of sustainability concept knowledge, workplace miscommunication, lack of technical expertise, under skilled project manager, lack of open communication, insignificant role in delivering information, improper cost management and control and difficulties in adapting sustainable practice. By involving multi- disciplinary designers and engineers with green expertise and multi-cultural project teams, sustainable construction seems to be more complex and harder to be accomplished. This supported by Robichaud *et. al* (2011), that mentioned project managers faced challenges in implementing sustainable practice particularly when they need to establish a framework for future decision making within all construction phases.

This study also has identified a few strategies that can be suggested for project manager to successfully managing sustainable construction project which are by analyze and mitigate the threat, essential motivation towards employee, corrective action plan, resource allocation, utilization of information system, performance measurement, feasibility study in early stage of construction and implementation of project management methodologies such as Agile, Scrum, Critical Path Method and others. A framework of strategic planning is essential to set direction and priorities to ensure the

construction process going smoothly towards the end. This is supported by Pamulu (2010) and Gong & Liu (2020) in their research that many construction firms still delivering poor performance and the reason behind it was the lack of strategic direction and planning to improve their competitiveness level in this industry.

5. Conclusion

As a conclusion, the awareness on the implementation of sustainable practice in construction project need to be raised among the project manager and other party involved in construction project. The findings related to competencies needed by project manager in managing sustainable construction project can help them in preparing themselves in facing the challenges in managing sustainable project. The project managers need to train themselves to be involved in uncertainty situation to develop their knowledge and capability to solve high- risk situation in sustainable construction project. Additionally, construction company need to take an initiative by emerging with the construction industry outside the country. It is in order to gain the knowledge and capability on the green technology that still unavailable or unaffordable in Malaysia. Furthermore, the government must play an important role in helping construction industry players to find the right channels to facilitate the transfer of green or sustainable technology from foreign countries. These initiatives are crucial for project manager to implement strategic initiation and planning to undertaking the upcoming challenges in sustainable construction project.

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