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CRITICAL SUCCESS FACTORS (CSFS) OF CONSTRUCTION PROJECT MANAGEMENT FROM THE PERSPECTIVE OF PROJECT MANAGERS

Qanish Aizet Affendi¹, Kartina Alauddin^{1*}

¹Department of Built Environment Studies & Technology,
College of Built Environment,
Universiti Teknologi MARA, Perak Branch,
32610, Seri Iskandar, Perak, Malaysia

aizetaffendi@gmail.com, *karti540@uitm.edu.my

ABSTRACT

Developing countries rely heavily on the construction sector to implement their long-term development plans. Certain factors are more critical than others in project success. Successful construction project greatly depends on how the project has been managed and controlled. Once critical success factors have been identified, it is likely to achieve the project success. Therefore, this research aim is to identify the Critical Success Factors (CSFs) of construction projects management (CPM) from the perspective of project managers. The objective of this research is to identify the CSFs of the construction project management implementation in construction projects and to determine the key factors of CSFs in assisting the project manager in managing the construction projects in Perak. The research identifies eleven factors which are critical in the CPM. The findings also indicated that effective communication was the most critical in CPM. To achieve success in construction projects, improving communication skills can assist the construction project manager in managing the construction projects.

Keywords: *Critical Success Factors (CSFs), Construction Project Management (CPM)", project manager.*

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INTRODUCTION

The construction sector plays a vital role because it represents the prosperity, health, and quality of life of the country's citizens. The construction sector acts as a backbone of the economic growth of any country. Therefore, it influences every sector's role in the aspects of all levels in an economy. Developing countries rely heavily on the construction sector to implement their long-term development plans. Certain factors are more critical than others in project success. These are known as critical success factors (CSFs). According to Saqib et al. (2008), Rockart was the first to use the term "critical success factors" in the context of projects and project management (1982). Since then, the subject has become a thriving research area.

The term CSFs implies a number of prominent issues on which industries should focus their limited resources in order to succeed. CSFs have been widely used in a variety of industries, including construction, information technology, medicine, and manufacturing. CSFs, according to Rockart (1982), cited in Yong & Mustafa (2013), are related to specific characteristics of a specific industry. They differ depending on the operating environment from country to country. They frequently change in response to policy changes, changes in the industry's environment, or when a specific problem or opportunity arises for that industry. In short, there is no universal set of metrics that can be applied to all industries at all times. Identifying CSFs requires specific and diverse situational evaluations, many of which must be examined on a regular basis using soft and subjective data (Rockart and Bullen, 1981, cited in Yong & Mustafa, 2013).

According to Mladen Radujkovic & Mariela Sjekavica (2017), successful project management commonly refers to the traditional measurement factors of the project triangle, which are cost, time, and quality. Project management involves planning, organisation, monitoring, and controlling of all aspects of the project in question, with motivation of all included to achieve project goals in a safe manner, within agreed schedule, budget, and performance criteria. A Construction Management Plan outlines the client's intentions for a construction project and acts as a key information document for the project team, statutory authorities and other stakeholders. It can also act as a gateway to detailed technical information. However, current project management practices of organisations in the construction industry sector do not always ensure project success. Success of a construction project greatly depends on how the project has been managed and controlled. The critical success factors (CSFs) are more useful in decision-making support; as such, more player-based research studies should be conducted. Once critical success factors have been identified, the likelihood of attaining project success can be deemed as achievable.

The aim of this study is to identify the Critical Success Factors (CSFs) of construction project management from the perspective of project managers. To obtain this aim, the objectives are:

- i. To identify the CSFs of the construction project management implementation in construction projects.
- ii. To determine the key factors of CSFs to assist the project manager in managing the construction projects.

LITERATURE REVIEW

Construction Project Management

Construction project management begins when the contractor is brought into the project. Construction project management entails directing and organising every stage of the project's life cycle, from conception to completion. It is a comprehensive practise with the goal of completing projects on time and on budget. Construction project management is a complex discipline that necessitates addressing numerous critical issues, such as cost control, scheduling, procurement, and risk assessment. Project managers work with all members of the construction team, from architects to owners to contractors. The goal of the project manager is to ensure that the entire construction process runs smoothly and according to plan. They are responsible for maintaining a tight schedule, staying within budget, allocating resources, avoiding scope creep, and ensuring work done is of quality. They evaluate risks in real time and keep stakeholders updated. The project manager enables efficient processes that would not be possible otherwise by centralising information and streamlining communication.

Critical Success Factors of Construction Project Management

The success of a construction project is heavily dependent on how well it is managed and controlled. Factors that contribute to project success are part of the strategic perspective, and several influences stem from stakeholder expectations (Fortune et al., 2013 cited in Abylova & Salykova, 2019). A better understanding of the critical success measures is extremely beneficial to project management performance. Based on previous literature, eleven critical success factors have been identified as key success factors in construction project management.

According to Zakaria et al. (2015), communication is one of the fundamental skills that every project manager must possess. Communication is essential not only within the project team but also between the team and the rest of the organisation as well as with the client. Next, one of the critical factors relating to project implementation success is the ability to handle unexpected crises and deviations from the plan

(Rohaniyati Salleh, 2009). Problem-solving skills entail a combination of problem definition and decision making that is concerned with previously occurring problems (Edum-Fotwe & McCaffer, 2000). According to Alshammari et al. (2020), possessing teamwork skills is important for a project leader. Much research considers teamwork effectiveness to be a component of project management success (Vrchota et al., 2020). In addition, decision making is critical to the success of a construction project (Thi & Swierczek, 2010 cited in Jian Zuo et al., 2018; Vrchota et al., 2020). Alvarenga et al. (2019) have added that decisions are needed both to solve the challenges and to maximise the opportunities that exist. Furthermore, according to Vrchota et al. (2020), leadership is one of the most important factors in project management in the construction industry. As team leaders, project managers must have strong leadership skills (Alvarenga et al., 2019). Moreover, Zakaria et al. (2015) mentioned that planning skills are critical for a project leader to achieve project implementation goals, such as budget, scope, schedule, and quality. Thorough, adequate, and effective project planning is essential for all work in order to give the team the best chance of meeting project objectives during project execution (Baccarini and Collins, 2003). According to Baccarini and Collins (2003), the project manager's competence is vital for the project success. The more competent the project manager, the better the project's performance (Thi & Swierczek, 2010). Commitment was identified as one of the success factors for construction projects by Nguyen et al. (2004), as cited in Jian Zuo et al. (2018). Thus, according to Rohaniyati Salleh (2009), all team members must understand and be dedicated to achieving, maintaining, and fulfilling project goals. Experience is undoubtedly among the vital factors influencing project success (Vrchota et al., 2020; Alvarenga et al., 2019). According to Edum-Fotwe and McCaffer (2000), project managers gain a variety of knowledge and skills through their work experiences. The importance of time in project management success cannot be overstated (Turner & Muller, 2005; Aneesha et al., 2017). According to Ramo (2002), as cited in Zakaria et al. (2015), time management is important to ensure that the project is completed within the agreed time frame. Client involvement and consultation in the project delivery process are essential for the project's success (Baccarini & Collins, 2003; Aneesha et al., 2017). The client must be strongly committed to the project goals and frequently involved in the project management process.

The Key Factors of CSFs to Assist the Project Manager in Managing the Construction Projects

As we know, the construction industry makes a major contribution to the development of economies. According to Shibani & Sukumar (2015), the project manager plays an important role in ensuring the success of construction projects. The project manager's role in construction project management is one of the top responsibilities. An effective construction project manager must have a wide range of skills, qualities, and abilities in order to respond to the majority of the challenging situations that arise during construction projects (Gharehbaghi & McManus, 2003). This framework concept

below shows the relationship between 11 CSFs, which are the main points of the key factors of CSFs. Key factors of CSF will assist construction project managers in improving their management skills to achieve the success of the projects they manage.

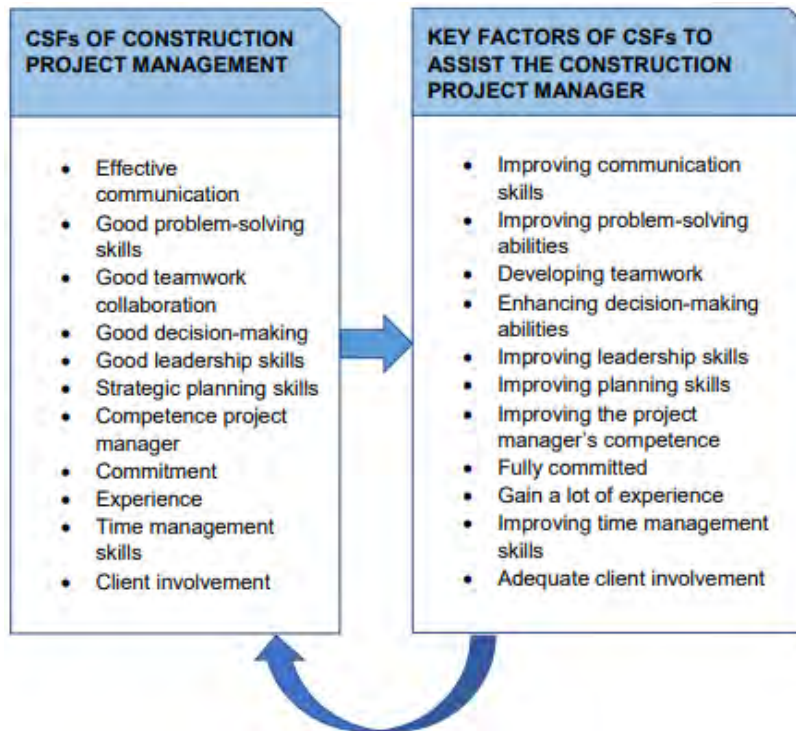


Figure 1: Conceptual Framework of Key Success Factors

RESEARCH METHODOLOGY

The tool used to achieve the relationship between the key critical success factors of construction project management and project performance in this study is by developing a conceptual framework. Critical success factor is a variable that can have a significant impact that delivers measurable improvements to the project success. Organisations/companies look to forecasting tool to help them speed their progress toward performance improvement, and to guide them around pitfalls that might otherwise slow or even halt their initiatives of project performance. Therefore, in order to improve the project performance, it is essential to determine the critical success factors in the current project management practices. In order to achieve this, the variables for key project success are essentially important to be identified and established towards achieving the objective of this study. The target population of the

questionnaire survey will be the construction project manager consists of architect, engineer, quantity surveyor and others construction project managers that are related who have experienced in the construction industry in Malaysia. This research is limited to Peninsular Malaysia only since this country running many construction projects. Sets of the questionnaire will be distributed to identify the critical success factors project management practice in Malaysia. A questionnaire will be designed with the objective of ranking the important factors for achieving successful building projects. The analysis of data from the questionnaire's responses can provide precise data from which tables can be produced. Interview will be conducted to the target group of construction project managers such as the architect, engineer and quantity surveyor. This will involve project managers and attempt to get more inputs on the critical success factors of construction project management from their own perspectives.

ANALYSIS OF FINDINGS

This section explains analysis and findings from the observations. Generally, the section is divided into three parts: (a) Demographic information (b) Level of agreement of the CSFS in construction project management (c) Identify the level of agreement on how far the CSFS can assist the project manager.

Analysis of the Demographic Factors

Table 1: Section A - Demographic Information

Items	Demographic Factors	Frequency	Percentage %	
Q1.	Age	20 – 29 years old	16	22.2
		30 – 39 years old	10	13.9
		40 – 49 years old	21	29.2
		Above 50 years old	25	34.7
Q2.	Profession background	Architect	12	16.7
		Engineer	12	16.7
		Quantity Surveyor	40	55.6
		Others	8	11.1
Q5.	Experience	0 – 5 years	6	8.3

		5 – 10 years	9	12.5
		10 – 20 years	23	31.9
		Above 20 years	34	47.2
Q6.	Are you aware of the factors that contribute to successful construction project management?	Yes	68	94.4
		No	4	5.6

Table 1 details the respondents' demographic backgrounds. Based on the table, 35 percent of the respondents are above 50 years old, 29 percent of the respondents are 40–49 years old, 22 percent are 20-29 years old, and 14 percent are 30-39 years old. Thus, it can be concluded that most of the respondents participating in this research are above 50 years old.

The second question under demographic data in Section A was about the respondent's professional background. 56 percent of the respondents are quantity surveyors. Both architects and engineers make up 17 percent of the respondents, while the remaining 11 percent consists of site supervisors, land surveyors, site managers, construction estimators, and contract managers. This means that many construction project managers participated, and most of the respondents participating in this research were among quantity surveyors, whose total frequencies were 40.

As for the work experience of the respondents, Table 4.1 describes the frequencies and percentage distribution. Most of the respondents had above 20 years of work experience, with 47 percent. The total frequencies of this particular question were 34 respondents.

Finally, the last question for this section was about the respondents' awareness of factors that contribute to the successful management of a construction project. Based on Table 4.1, 94 percent of the respondents answered yes, while only 6 percent said they were not aware of it. This shows that most of the respondents are aware of the factors that contribute to successful construction project management.

Analysis of Level of Agreement on the Critical Success Factors (CSFs) in Construction Project Management

In this section, all the respondents were asked about their level of agreement relating to the Critical Success Factors (CSFs) in construction project management.

Table 2: Section B - Critical Success Factors (CSFs) of the Construction Project Management Implementation in Construction Projects

Item	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Total	Mean	Rank
	Respondents' frequency	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		
1	Effective communication is Important in Coordinating the Team	0	0	10	62	72	3.86	1
2	Good problem-solving skills are important in reducing the risk involved	0	0	10	62	72	3.86	2
3	Good leadership skills in coordinating the work	0	0	14	58	72	3.81	3
4	Good decision-making skills to achieve the desired outcome	0	0	15	57	72	3.79	4
5	Good collaboration of teamwork involving project managers and all parties involved	0	1	15	56	72	3.76	5
6	Strategic Planning Skills to Achieve Project Objectives	0	0	18	54	72	3.75	6
7	The project manager's competence in various aspects	0	0	24	48	72	3.67	7
8	Time management skills in completing the work within stipulated time	0	0	39	33	72	3.46	8
9	Commitment among all parties involved	0	5	34	33	72	3.39	9
10	Level of experience	2	6	33	31	72	3.29	10
11	Client involvement in the project management process	2	7	37	26	72	3.21	11

Table 4.2 indicates the analysis summary on the level of agreement of the CSFs in construction project management. The top three ranked on the level of agreement of the CSFs in construction project management were effective communication, good problem-solving skills, and good leadership skills. The highest scores ranked on the level of agreement of the CSFs were effective communication, where it is important in coordinating the team, and good problem-solving skills, which are important in reducing the risk involved, with a mean of 3.86, respectively. The researcher found that the majority of the respondents agreed with these two factors. The second highest score was on good leadership skills, with a mean of 3.81. According to Geoghegan and Dulewicz (2008), as cited in Jian Zuo et al. (2018), project managers' leadership skills contributed to the project's success. In addition, according to Rohaniyati Salleh (2009), the project manager should be able to persuade other members of the team to follow their perspective and resolve conflict between parties. Therefore, an appropriate leadership style can lead to improved overall project performance (Turner & Muller, 2005).

On the contrary, the three lowest-ranked on level of agreement of the CSFs in construction project management include commitment among all parties involved, level of experience, and client involvement in the project management process. It was found that commitment among all parties involved was the third lowest-ranked factor

with an average mean value of 3.39, while the level of experience was the second lowest-ranked factor with a mean value of 3.29. Moreover, the lowest-ranked factor that affected the successful project was client involvement in the project management process, with a mean value of 3.21. Client involvement and consultation in the project delivery process are essential for the project's success (Baccarini & Collins, 2003; Aneesha et al., 2017), as clients are expected to take the initiative to provide a clear requirement at the commencement of the project and accept the consultant's advice and solution. Therefore, to achieve a successful project, the client must be strongly committed to the project goals and frequently involved in the project management process.

Analysis on Identifying the Level of Agreement on How Far the CSFs can Assist the Project Manager

All the respondents were asked about their level of agreement on how far the CSFs can assist the project manager. This section aims to determine the key factors of CSFs in assisting the project manager in managing the construction projects.

Table 3: Section C: Key Factors of CSFs to Assist the Project Manager in Managing the Construction Projects

Item	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Total	Mean	Rank
	Respondents' frequency	f	f	f	f	f		
1	Improving communication skills	0	0	14	58	72	3.81	1
2	Improving problem-solving abilities	0	0	15	57	72	3.79	2
3	Improving leadership skills	0	0	16	56	72	3.78	3
4	Enhancing decision-making abilities	0	0	19	53	72	3.74	4
5	Developing teamwork	0	0	19	53	72	3.74	5
6	Improving Planning Skills	0	0	19	53	72	3.74	6
7	Improving the project manager's competence	0	0	19	53	72	3.74	7
8	Fully committed	0	5	32	35	72	3.42	8
9	Improving time management skills	0	5	34	33	72	3.38	9
10	Gain a lot of experience	2	6	32	32	72	3.31	10
11	Adequate client involvement	2	7	38	25	72	3.19	11

Table 4.3 tabulates the analysis summary to identify the level of agreement on how far the CSFs can assist the project manager. The top three were improving communication skills, improving problem-solving abilities, and improving leadership skills. The highest score ranked on the level of agreement of the CSFs was improving communication skills, with a mean of 3.81. The researcher found that the majority of

the respondents agreed with this CSF, and that it can assist the project manager in managing the construction projects. The second highest score was for improving problem-solving abilities, with a mean of 3.79. A project manager must constantly improve himself by reading and being actively involved in a construction project (Nasaruddin & Rahman, 2016). A project manager with strong problem-solving skills is required because they can guide teams towards goal achievement by removing tension, uncertainty, and misunderstandings before they become unmanageable (Guzmán et al., 2020). Lastly, on the statement regarding improving leadership skills can assist the construction project manager in managing the construction projects, with a mean of 3.78. According to Farler and Haan (2021), understanding what leadership style works best for employees is critical for an organization's management success and effectiveness. Great influential leaders must understand how their team fits into the big picture in order for its goals, strategies, and targets to be successful.

On the other hand, the three lowest-ranked CSFs in terms of level of agreement on how far the CSFs can assist the project manager include improving time management skills, gaining a lot of experience, and adequate client involvement in the project management process. It was found that improving time management skills was the third lowest-ranked factor with an average mean value of 3.38, while gaining a lot of experience was the second lowest-ranked factor with a mean value of 3.31. Moreover, the lowest-ranked level of agreement on how far the CSFs can assist the project manager was adequate client involvement in the project management process, with a mean value of 3.19. Increased client involvement in planning and production will help to ensure that the larger set of goals is maintained (Munns & Bjeirmi, 1996). The client cannot expect to abdicate responsibility by delegating all responsibilities to the project team (Munns & Bjeirmi, 1996). Therefore, to achieve a successful project, adequate client involvement is critical to ensuring that the project stays on track.

DISCUSSION OF FINDINGS

There are 72 sets of questionnaires that have been completed and valid for analysis from the 123 set questionnaires which have been spread. Based on the overall analysis and study, most of the respondents participating in this research are above 50 years old. Furthermore, quantity surveyors were most of the respondents participating in this research. Next, most of the respondents had above 20 years of work experience. Moreover, data shows that most of the respondents are aware of the factors that contribute to successful construction project management

Based on the responses given by the construction project managers in Perak, the critical success factors of construction project management implementation in construction projects in descending order starting with the most agreed factors are effective communication in coordinating the team, good problem-solving skills, good

leadership skills, good decision-making skills, good collaboration of teamwork, strategic planning skills, the project manager's competence, time management skills, commitment, level of experience, and client involvement.

In this study there are eleven (11) key factors of CSFs to assist the project manager in managing the construction projects. Those factors include improving communication skills, improving problem-solving abilities, improving leadership skills, enhancing decision-making abilities, developing teamwork, improving planning skills, improving the project manager's competence, fully committed, improving time management skills, gain a lot of experience, and adequate client involvement. Based on the findings it shows that the most key factors of CSFs to assist the project manager in managing the construction projects is by improving communication skills. Meanwhile, the least key factor of CSFs is adequate client involvement.

CONCLUSION

It can be concluded that the results of this study are expected to help construction project management practitioners achieve specific construction performance levels. Then it will define the critical factors that lead to project success and provide a forecasting tool to enable parties involved to rapidly assess the possibility of a successful project from their viewpoint. This study also elaborates a conceptual framework for determining key factors of critical success in project management practises based on eleven (11) variables for project success, which should be taken into consideration during the project management phases from inception until project completion in order to enhance project success. Thus, the context of the critical success factors (CSFs) to be considered when examining project management practises and project outcomes. Finally, it is hoped that this study will be beneficial, especially to new construction project managers and all parties involved in the construction industry, and will serve as a good basis for future research.

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Tarikh : 20 Januari 2023

Prof. Madya Dr. Nur Hisham Ibrahim
Rektor
Universiti Teknologi MARA
Cawangan Perak



Tuan,

**PERMOHONAN KELULUSAN MEMUAT NAIK PENERBITAN UiTM CAWANGAN PERAK
MELALUI REPOSITORI INSTITUSI UiTM (IR)**

Perkara di atas adalah dirujuk.

2. Adalah dimaklumkan bahawa pihak kami ingin memohon kelulusan tuan untuk mengimbas (*digitize*) dan memuat naik semua jenis penerbitan di bawah UiTM Cawangan Perak melalui Repositori Institusi UiTM, PTAR.

3. Tujuan permohonan ini adalah bagi membolehkan akses yang lebih meluas oleh pengguna perpustakaan terhadap semua maklumat yang terkandung di dalam penerbitan melalui laman Web PTAR UiTM Cawangan Perak.

Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

“BERKHIDMAT UNTUK NEGARA”

Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
Timbalan Ketua Pustakawan

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Setuju.

27.1.2023

PROF. MADYA DR. NUR HISHAM IBRAHIM
REKTOR
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PERAK
KAMPUS SERI ISKANDAR