



Risk Management Benefits and Challenges in Malaysia's Landscape Architecture Project

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Abstract

The study aims to review risk management benefits and application challenges in Malaysia landscape architecture projects. Twenty-four professional landscape architecture from Klang Valley region interviewed. Then it analysed using content, and thematic analysis method interpreted and concluded. Found a modest project awareness on risk management benefits to improve project outcome, but multiple challenges factor permits effective risk management application. The study recommended an extensive strategy integrating risk management into the landscape project management process formulated in enabling effective application.

Keywords: landscape architecture project; risk management; benefit; challenges;

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1.0 Introduction

Landscape architectural practise is part of the environmental activity to improve the interrelationship between social and cultural influences and landscape setting physical aspects. Recognising environmental concerns such as biodiversity, emissions, energy efficiency, infrastructure, environmental risk, heritage, and innovations in tourism; demand for more socially significant landscape architecture projects have increased over the decades. Landscape architecture projects are seen as dynamic, with unpredictable results and different obstacles due to the variability and difficulty like the projects, resulting in several risks that are bound to occur. As a result of this situation, the element placing risk in a landscape architecture project incorporated with the project procedures, climate and stakeholders. Therefore danger must be handled earlier until it becomes an issue impacting the outcome of the project. Malaysia's landscape architecture project is part of the construction industry, which has recognised a multitude of risks, mostly economic, financial, technological, quality and environmental (Adnan & Rosman, 2018; Ansah, Sorooshian, Mustafa, & Duvvuru, 2016; Fadzil, Noor, & Rahman, 2017; Hasan, Othman, & Ismail, 2018; Ismail, Ahmad, Janipha, & Ismail, 2017; Kurzi & Schroth, 2018; Marmaya & Mahbub, 2018; Maruthaveeran, 2016; Mohit, 2018; Omer, Adeleke, & Chia, 2019; Razi, Ali, & Ramli, 2020; Saaidin, Endut, Samah, Ridzuan, & Razak, 2016; Sani, Sharip, Othman, & Hussain, 2018; Shafie, Omar, & Karuppanan, 2018; Shamsudin & Majid, 2019; Thani, Mohamad, & Abdullah, 2017; Wena, Ismail, Hashim, & Romeli, 2017).

Risk management is a crucial area of project expertise for addressing these problems and their challenges in advance. The primary aim of risk management is to increase project performance through the structured process of risk assessment, review and response to project goals (ISO 31000:2018, 2018; Keers & van Fenema, 2018; Olechowski, Oehmen, Seering, & Ben-Daya, 2016; PMI, 2017; Willumsen, Oehmen, Stingl, & Gerdal, 2019). Given the existence of different risk management principles and guidelines in practice, Malaysia risk management activity in a construction project is at the lowest level. Risk management remains a rhetoric subject and does not practice systematically to its full advantage. Reviewed enormous challenges were enabling effective application of risk management in the Malaysian construction project, found in (Abdul-Rahman, Wang, & Mohamad, 2015; Adnan & Rosman, 2018; Fadzil et al., 2017; Goh & Abdul-Rahman, 2013; Kang, Fazlie, Goh, Song, & Zhang, 2015; Mohamed, Abd-Karim, Roslan, Mohd Danuri, & Zakaria, 2014; Omer et al., 2019; Taofeeq, Adeleke, & Lee, 2020). Understand the current practice of risk management and the implementation of risk management which is essential for project managers to methods for successful application of risk management. Contrary to this, analysis of the advantages of risk management and the design problems specifically relevant to the project in landscape architecture not discussed extensively in the literature.

In Malaysia's landscape architecture initiative, therefore, this study aims to examine existing risk management advantages and implementation challenges. The goals to be accomplished are 1) defining risk management benefits, 2) analysing challenges in managing project risk, and 3) anticipating risk management application challenges. A review performed on the benefits of project risk management and application challenges in Malaysia construction project. This industry is near comparable resemblance with the context of the project's landscape architecture.

2.0 Literature Review

2.1 Risk Management Benefits In Project

Risk management is no longer a choice but is a must for any project. The principal objective of risk management is to increase project efficiency (Goh & Abdul-Rahman, 2013; Ward & Chapman, 2003) through the systematic method of identifying, analysing, and responding to risk to achieve project objectives (APM, 2010; BS 6079-1:2010, 2010; PMI, 2017). Risk management is a crucial aspect of overall project management that reflects on the possible risk and creates an action plan to avoid potential issues from being issues and adversely affecting the project. It emphasises constructive steps, including risk-based contingency planning (Abdul-Rahman et al., 2015). Such threats, if unmanaged, have the potential to cause a project to deviate from the plan and fail to achieve the established project goals (PMI, 2017), namely deadlines, cost objectives and quality results. The advantages of applying risk management to projects set out in Table 1.

Table 1. Risk management benefits

| Risk Management Benefits | Author |
|--|--|
| <u>Improves project performances</u> | |
| Increases the likelihood of achieving objectives – time, cost, schedule, and quality | Ansah et al. (2016), APM (2010), Du et al. (2016), D. Hillson (2009), ISO 31000:2018 (2018), Jusoff, Yusuwan, et al. (2008), Kang et al. (2015), Marcelino-Sádaba et al. (2014), Mills (2007) Siang & Ali (2012), S. Ward & Chapman (2003) |
| Encourages project innovation | HB 436:2004 (2005) |
| Improves performance and effectiveness | Ansah et al. (2016), HB 436:2004 (2005), Mills (2007), Siang and Ali (2012), Du et al. (2016), Marcelino-Sádaba et al. (2014) |
| Enhances project productivity and efficiency | Mills (2007), Loosemore and Cheung (2015) |
| Creates value to the project | Kang et al. (2015), Siang and Ali (2012), Du et al. (2016), Marcelino-Sádaba et al. (2014), Willumsen, Oehmen, Stingl, and Geraldi (2019) |
| Improves profits | Kang et al. (2015), Ansah et al. (2016) |
| Improves project performance | ISO 31000:2018 (2018), Mohamed et al. (2014), Siang and Ali (2012), Du et al. (2016), Loosemore and Cheung (2015), Marcelino-Sádaba et al. (2014) |
| Keeps within the stipulated time for approvals, design and construction | Jusoff, Yusuwan, et al. (2008), Marcelino-Sádaba et al. (2014) |
| Meets the required technical standards for quality, function, fitness for purpose | Ansah et al. (2016), Jusoff, Yusuwan, et al. (2008) |
| <u>Improves project management</u> | |
| Encourages proactive management | ISO 31000:2018 (2018), Siang and Ali (2012), Du et al. (2016), Loosemore and Cheung (2015) |
| Improves mandatory and voluntary reporting and documentation | ISO 31000:2018 (2018), Jusoff, Yusuwan, et al. (2008), Dyer (2017) |
| Improves governance | ISO 31000:2018 (2018), Siang and Ali (2012), Ansah et al. (2016), Dyer (2017), Du et al. (2016), Loosemore and Cheung (2015) |

| | |
|--|--|
| Improves project decision making – accurate, reliable, and systematic | HB 436:2004 (2005), ISO 31000:2018 (2018), Mills (2007), Mohamed et al. (2014), Siang and Ali (2012), Ward and Chapman (2003), Ansah et al. (2016), Dyer (2017), Du et al. (2016), Loosemore and Cheung (2015), Marcelino-Sádaba et al. (2014) |
| Improves controls and understanding of the project | APM (2010), Hillson (2009), ISO 31000:2018 (2018), Mills (2007), Ward and Chapman (2003), Dyer (2017), Marcelino-Sádaba et al. (2014) |
| Improves and controls outcomes of project issues | HB 436:2004 (2005), Siang and Ali (2012), Dyer (2017) |
| Enables better informed and more believable planning for schedules and budgets | APM (2010), HB 436:2004 (2005), Hillson (2009), ISO 31000:2018 (2018), Siang and Ali (2012), Ansah et al. (2016) |
| Assists for most suitable types of contract selection | APM (2010), Hillson (2009), Du et al. (2016) |
| Framework for data acquisition and reference for a future project | APM (2010), Hillson (2009), Siang and Ali (2012), Ward and Chapman (2003) |
| Clarifies the initial thinking process | Ward and Chapman (2003), Dyer (2017) |
| Clearer project communications | Ward and Chapman (2003), Dyer (2017), Loosemore and Cheung (2015), Marcelino-Sádaba et al. (2014) |
| Selecting a suitable type of contract | Siang and Ali (2012) |
| Enables a more objective comparison of alternatives | APM (2010), Hillson (2009) |
| Formulation of practical cost and schedule strategy | Siang and Ali (2012), Dyer (2017) |
| Reviews project financial stand | Siang and Ali (2012), Dyer (2017), Marcelino-Sádaba et al. (2014) |

Managing risk effectively

| | |
|---|--|
| Active response and plan to risk | Mills (2007), Siang and Ali (2012), Dyer (2017) |
| Enabling efficient risk management and construction process. | ISO 31000:2018 (2018), Siang and Ali (2012) |
| Improves risk assessment and evaluation justification | APM (2010), Hillson (2009), Mills (2007) |
| Effectively allocates and uses resources for risk treatment | ISO 31000:2018 (2018) |
| Identifies and allocates responsibility to the best risk owner | APM (2010), Hillson (2009), Siang and Ali (2012) |
| Improves the identification of threats and opportunity | ISO 31000:2018 (2018), ISO 31000:2018 (2018), HB 436:2004 (2005) |
| Provides a fresh view of the personnel issues in a project | APM (2010), Hillson (2009) |
| Handles the risks from uncertainty efficiently and successfully | APM (2010), Hillson (2009), Mohamed et al. (2014) |
| Facilitates greater risk-taking, instead of keep avoiding | APM (2010), Hillson (2009) |

Project protection

| | |
|--|---|
| Enhances health and safety performance | ISO 31000:2018 (2018), Jusoff, Yusuwan, et al. (2008) |
|--|---|

| | |
|---|--|
| Improves loss prevention and incident management | ISO 31000:2018 (2018) |
| Reduces unwanted surprises | HB 436:2004 (2005), Dyer (2017) |
| Protects from litigation consequences | HB 436:2004 (2005) |
| Secures accountability and assurance | HB 436:2004 (2005) |
| Compliance with corporate governance requirements | Ward and Chapman (2003) |
| Environmental protection | ISO 31000:2018 (2018), Jusoff, Yusuwan, et al. (2008) |
| <u>Enhance organisation culture</u> | |
| Improves organisational learning | APM (2010), Hillson (2009), ISO 31000:2018 (2018) |
| Improves personal wellbeing | HB 436:2004 (2005), Ward and Chapman (2003), Dyer (2017) |
| Improves organisational resilience | ISO 31000:2018 (2018), Dyer (2017) |
| Improves corporate experience and general communication | APM (2010), Hillson (2009), Ward and Chapman (2003), Dyer (2017) |
| A less stressful working environment | APM (2010), Hillson (2009) |
| <u>Enhances business</u> | |
| Minimises financial losses | ISO 31000:2018 (2018), Willumsen et al. (2019) |
| Improves economy, profitability, and efficiency | HB 436:2004 (2005), Siang and Ali (2012), Ansah et al. (2016) |
| Enhances business reputation and credibility | APM (2010), HB 436:2004 (2005), Hillson (2009), Siang and Ali (2012), Loosemore and Cheung (2015), |
| Enhances potential for future business | APM (2010), Hillson (2009) |
| <u>Manages stakeholders</u> | |
| Better customer relations | APM (2010), Hillson (2009), Du et al. (2016) |
| Improves stakeholder confidence and trust | ISO 31000:2018 (2018), Willumsen et al. (2019) |
| Improves stakeholder relationships | HB 436:2004 (2005), Marcelino-Sádaba et al. (2014), Willumsen et al. (2019) |
| Better customer relations | APM (2010), Hillson (2009) |
| Avoids project stakeholder dissatisfaction | Siang and Ali (2012), Willumsen et al. (2019) |

Risk management impacts project performance success because the threats that occur in construction projects depend on the performance of the project. Risk management is a strategic decision-making mechanism used most efficiently and acceptably to reduce and handle risks (Hamzah Abdul-Rahman & Chen Wang, 2015). Failure to handle such risk could lead to financial loss, reputational harm and loss of potential business (Hamzah Abdul-Rahman & Chen Wang, 2015). According to Dyer (2017), not only the project manager derives the benefits from risk management but also the building projects' clients, consumers and future end-users. Omer et al. (2019) further clarified that when deciding to start a building project, the customer will quickly see the importance of risk management. The writers added that no matter how small or easy a project is, thanks to the involvement of two separate parties, it can still go wrong.

By summary, risk management increases project efficiency through early detection, prevention, and control of the life cycle of a project. It increases the deliverables of a project in

three ways, including the critical goals of time, expense and efficiency. Risk management plays an essential role in a construction project's decision-making process, as it can impact the project's profitability, efficiency, quality and budget. It is an integral element of value creation by effective decision-making and preparation for the construction sector. A systematic approach to risk management also strengthens and encourages to find more significant opportunities for quality improvement through creativity. This approach helps managers to maximise performance by defining and evaluating a wide variety of problems, which offers a structured basis for informed decision making.

2.2 Risk Management Application Challenges in Malaysia Construction

For different construction projects worldwide, risk management has been practised since the 80s and has shown to affect project performance. There is no shortage of risk management program and ready project manager to use it. However, in the Malaysian construction industry, it has not been commonly practiced (Omer et al., 2019), and the industry tends to have a weak reputation in managing risk. Few authors (Abdul-Rahman et al., 2015; Adnan & Rosman, 2018; Fadzil et al., 2017; Goh & Abdul-Rahman, 2013; Jusoff et al., 2008; Kang et al., 2015; Mohamed et al., 2014; Omer et al., 2019; Taofeeq et al., 2020), attempted to provide insight into the difficulties and shortcomings associated with the implementation of risk management and the explanations for this in Malaysia's construction projects. Table 2 outlines the problems and drawbacks of a framework for risk management in Malaysia.

Table 2. Risk management application challenges

| Challenges and Limitations | Author |
|--|--|
| <u>Risk management system</u> | |
| Much of the practice is ill-structured, and no suitable methods implemented. | Abdul-Rahman et al. (2015), Adnan & Rosman (2018), Goh & Abdul-Rahman (2013), Kang et al. (2015), Omer et al. (2019) |
| Poor reporting, review and monitoring | Jusoff et al. (2008), Mohamed et al. (2014) |
| Lack of / No uniform protocols and procedures. | Jusoff et al. (2008), Mohamed et al. (2014) |
| Unavailable and not regularly exercised. | Abdul-Rahman et al. (2015), Kang et al. (2015) |
| <u>Managing risk practice</u> | |
| Informally manages risk, incomplete and unstructured. | Adnan & Rosman (2018), Kang et al. (2015), Omer et al. (2019), Taofeeq et al. (2020) |
| Uses quick, easy, and inexpensive methods. | Adnan & Rosman (2018), Fadzil et al. (2017), Omer et al. (2019) |
| Identifies the unmanaged risk and remains redundant. | Adnan & Rosman (2018), Mohamed et al. (2014) |
| Risk handled only when it happens and when it is understood. | Abdul-Rahman et al. (2015); Goh & Abdul-Rahman (2013), Mohamed et al. (2014), Omer et al. (2019) |
| Depend on expertise and reasoning of the project manager. | (Fadzil et al., 2017; Kang et al., 2015; Omer et al., 2019) |
| <u>Risk knowledge</u> | |

Limited skills to develop risk strategy and mitigation program. (Abdul-Rahman et al., 2015; Adnan & Rosman, 2018; Taofeeq et al., 2020)

Lack of knowledge in managing risk causes usage restriction. (Abdul-Rahman et al., 2015; Adnan & Rosman, 2018; Fadzil et al., 2017; Goh & Abdul-Rahman, 2013; Mohamed et al., 2014; Taofeeq et al., 2020)

Exposure and experience

No leading know-how. (Jusoff et al., 2008; Mohamed et al., 2014)

Low-risk practice exposure. (Abdul-Rahman et al., 2015; Goh & Abdul-Rahman, 2013; Taofeeq et al., 2020)

Lack of experience in early risk detection. (Mohamed et al., 2014)

Still a new concept. (Jusoff et al., 2008; Kang et al., 2015; Omer et al., 2019; Taofeeq et al., 2020)

Awareness

Comfortable with traditional culture and wary of change. (Abdul-Rahman et al., 2015; Adnan & Rosman, 2018; Fadzil et al., 2017; Goh & Abdul-Rahman, 2013; Kang et al., 2015; Taofeeq et al., 2020)

Unsupportive top management and restricted in other industry personnel, (Jusoff et al., 2008; Kang et al., 2015; Mohamed et al., 2014; Taofeeq et al., 2020)

Lack of positive attitude-linked to time-consuming and costly (Abdul-Rahman et al., 2015; Fadzil et al., 2017; Goh & Abdul-Rahman, 2013; Kang et al., 2015; Taofeeq et al., 2020)

Low awareness and hardly justified application value. (Abdul-Rahman et al., 2015; Fadzil et al., 2017; Goh & Abdul-Rahman, 2013; Kang et al., 2015; Mohamed et al., 2014; Omer et al., 2019; Taofeeq et al., 2020)

Risk management remains a rhetorical topic in the Malaysian construction industry due to lack of knowledge and awareness of its advantages, leading to a reluctance to adopt it (Adnan & Rosman, 2018; Jusoff et al., 2008; Siang & Ali, 2012). Risk management in the Malaysian construction industry is adapted differently and based on client practices, resource distribution and project structure (Jusoff et al., 2008; Taofeeq et al., 2020). They generally adopt simple, rapid, reasonable, and inexpensive methods of identifying risk rather than managing it as a whole (Adnan & Rosman, 2018; Siang & Ali, 2012).

All the authors agreed that the biggest challenge in the implementation of risk management is that there are no formal guidelines and standards to be applied in the construction sector in Malaysia. Only particular organisations and on specific project scale sizes manage the risk. It is not adequately managed and does not follow the suggested process due to lack of knowledge on the implementation of risk management and lack of awareness of its benefits. Building project practitioners are, therefore, reluctant to implement risk management into their projects. There is no substantial evidence that formal risk management applied in landscape architecture projects, similar to construction projects.

3.0 Methodology

Exploratory case analysis was engaged in the research methodology (Yin, 2016). The study takes a four-stage procedure, namely, preliminary study, data gathering, data analysis, and interpretation. First, a preliminary study that examines the background of the study, the need,

identifies the gap, and aims and goals. Data collected via a semi-structured interview with 24 professional landscape architect based in the Klang Valley region. Registered interview audios and project documents; transcribed in the text; documented and organised in research software *ATLAS.ti 8*. Then, a content analysis used to describe and interpret deductive codes, categorise and finalise the topics (Mayring, 2014). Besides, a thematic analysis then used in the search for inductive codes to synthesise and draw thematic maps between the themes. The analysis includes exploring the relationship between the subject categories studied and looking for patterns (Maguire & Delahunt, 2017). Finally, finding mapped and reported interpretations to discuss the benefits of risk management, application challenges and improvement. The conclusion draws from the goals of research to answer. This study could become a prominent discussion point in the future and a priority. This study restricted by 1) project management of landscape architecture; 2) case project focused on urban landscape architecture preference; and 3) spectrum problems linked to the experience of architectural landscape practitioners.

Twenty-four interviewees were responding based on predetermined sampling criteria from the organisation of landscape architecture. The criteria of the interviewees were; the interviewees were from landscape architecture firms and were professional landscape architects. In their current organisation, they held managerial and decision-making positions, indicating that they influenced the policy and practice on the ground. All the interviewees had more than ten years of industry experience. They had involved from various project sizes, locations and scopes in a full cycle of landscape projects in an urban area within Klang Valley, Malaysia. Data for the interviewees shown in Table 3 below.

Table 3. Interviewees information

| Interviewee No. | Interviewee's Position | Interview Duration (hh:mm:ss) | Interviewee's Background | | Interviewee's Organisation Background | | |
|-----------------|------------------------|-------------------------------|--------------------------|----------------------------------|---------------------------------------|-----------------------------|------------------------------------|
| | | | Education | ¹ Years of Experience | ² Years Established | ³ Headcount Size | ⁴ Total Ongoing Project |
| L01 | Director | 0:40:08 | Abroad | Expert | Established | Small | Medium |
| L02 | Project Director | 0:58:11 | Local | Intermediate | Established | Small | Medium |
| L03 | Director | 1:13:19 | Abroad | Expert | Established | Medium | High |
| L04 | Director | 1:19:44 | Local | Expert | Established | Small | Medium |
| L05 | Principal | 1:02:32 | Local | Intermediate | New | Small | Low |
| L06 | Director | 1:01:02 | Local | Expert | Established | Small | Low |
| L07 | Director | 0:40:28 | Local | Intermediate | New | Micro | Medium |
| L08 | Director | 1:16:52 | Local | Intermediate | New | Micro | Low |
| L09 | Director | 0:55:53 | Abroad | Expert | New | Small | Low |
| L10 | Director | 0:44:45 | Abroad | Expert | Intermediate | Small | Medium |
| L11 | Associates | 0:50:19 | Local | Intermediate | Established | Small | Medium |
| L12 | Head of Contract | 0:41:42 | Local | Intermediate | New | Small | Medium |
| L13 | Director | 1:11:16 | Abroad | Expert | Intermediate | Small | Low |
| L14 | Director | 0:55:13 | Local | Intermediate | New | Small | Medium |
| L15 | Director | 0:44:42 | Local | Expert | Established | Small | High |
| L16 | Director | 1:13:45 | Local | Intermediate | Intermediate | Micro | Medium |
| L17 | Principal | 1:29:10 | Local | Intermediate | Intermediate | Small | Medium |

| | | | | | | | |
|-----|-----------------------|---------|--------|--------------|--------------|--------|--------|
| L18 | Director | 1:06:52 | Local | Intermediate | New | Micro | Low |
| L19 | Principal Director | 1:47:07 | Abroad | Expert | Established | Small | Medium |
| L20 | Director | 1:47:11 | Local | Intermediate | New | Small | Medium |
| L21 | Director | 1:18:51 | Abroad | Expert | Established | Small | High |
| L22 | Managing Director | 1:38:42 | Local | Expert | Established | Medium | High |
| L23 | Director | 1:05:04 | Local | Intermediate | New | Micro | Low |
| L24 | Director | 1:05:47 | Local | Intermediate | Intermediate | Small | Medium |

Notes : ¹Beginner (< 10 years) / Intermediate (10 < 20 years) / Expert (> 20 years)
²New (< 10 years) / Intermediate (10 < 20 years) / Established (> 20 years)
³Micro (< 5) / Small (5 < 30) / Medium (30 < 75) : according to Malaysia's SME classification (SME, 2013)
⁴Low (< 20) / Medium (20 < 40) / High (> 40)

4.0 Results

Interviewees asked about their views about the benefits of risk management and the application challenges. Their responses addressed in three areas, namely the benefits of risk management, the challenges of managing risk and the expected challenges of implementing risk management.

4.1 Benefits of Risk Management towards Project

The research explored the possible benefits of risk reduction in the reduction of landscape projects. The interviewees asked to share their views on the benefits they would reap from integrating risk reduction in projects. The study coded a total of 135 benefits, as shown in Table 4, which classified into eight categories.

Table 4. Benefits of risk management

| Interviewees | Interviewees' Feedback |
|--|---|
| | <u>Improves project control and management</u> |
| L01, L04, L08, L12, L15, L16, L19 | Better control and governance |
| L05, L12, L14, L17, L21 | Improves project management |
| L01, L03, L08, L16, L21 | Minimises project disruption |
| L01, L03 | Practical treatment strategy in design and planning |
| L04, L08 | Improves project understanding |
| L04, L07, L16 | Project's operational effectiveness and efficiency |
| L07 | Better control over technical error |
| L13 | Manages to project cash flow |
| L04, L08 | Avoids and reduces project impact |
| L01 | Manages a big project effectively. |
| | <u>Improve the project's identification of opportunities and threats</u> |
| L01, L07, L12, L15, L16, L18, L21, L22, L23, L24 | Manages opportunities and threats effectively. |
| L01, L08 | Assists to detect potential harm and hazard. |
| L01, L21 | Enhances health and safety |
| L21 | Environmental protection |

| | |
|---|---|
| L07, L08, L12, L23 | Reduces and eliminates the occurrence of risk |
| L04, L10, L15, L21 | Minimises the risk impact |
| L07, L12, L18, L19, L21, L24 | Effective risk treatment strategies |
| L13 | Detects errors or mismanaged site operation |
| L15, L24 | Improves resilience over the risk threat |
| <hr/> | |
| <u>Improves decision making</u> | |
| L04, L06, L09, L10, L15, L16, L17, L19, L21, L23, L24 | Makes accurate and right project decision |
| L04, L22, L24 | Structure and objectify decision making |
| L04, L08, L22, L24 | Makes strategic planning, design, and coordination input |
| L09, L10, L14, L15, L21, L23, L24 | Profiling and choosing potential projects |
| L09, L24 | Better perception of project risks and consequences |
| L10, L21 | Speeds up decision making |
| L24 | Gives more options on decision making |
| L07 | Quantified and feasible decision making |
| L07, L12, L17 | Better modelling for future projects |
| <hr/> | |
| <u>Manages project uncertainties</u> | |
| L03, L24 | Detects and controls uncertainties |
| L12 | Reduces uncertainties and changes to feasible risk |
| L01, L16 | Decreases the instability of the project activities |
| <hr/> | |
| <u>Communication and information management</u> | |
| L09, L11 | Enhances project communication and information sharing |
| L11 | Future project reference |
| L24 | Encourages structured and systematic communication |
| L12, L15 | Avoids miscommunication |
| <hr/> | |
| <u>Increases the likelihood of achieving objectives</u> | |
| L03, L05, L06, L08, L15, L17, L24 | The project objective is achievable |
| L02 | Better cost estimation |
| L02 | Avoids cost overrun |
| L04, L13 | Improves project performances |
| L08, L17 | On-time project completion |
| <hr/> | |
| <u>Proactive management</u> | |
| L01, L09, L10, L21, L24 | Encourages proactive project operation |
| L01, L09 | Early resource allocation to treat risk |
| L01 | Better preparedness over the potential risk impact |
| L10 | Project to be more cautious and prepared for unwanted events |
| L21 | Avoids project surprises by early risk identification and treatment |
| <hr/> | |
| <u>Protects the credibility and reputation of the organisation</u> | |
| L04 | Enhances the organisation's reputation |

| | |
|----------|--|
| L12, L15 | Sustains business - enhances cash flow and eliminates losses |
| L24 | Enhances the organisation's portfolio |
| L04, L17 | Improves stakeholders' confidence and trust |

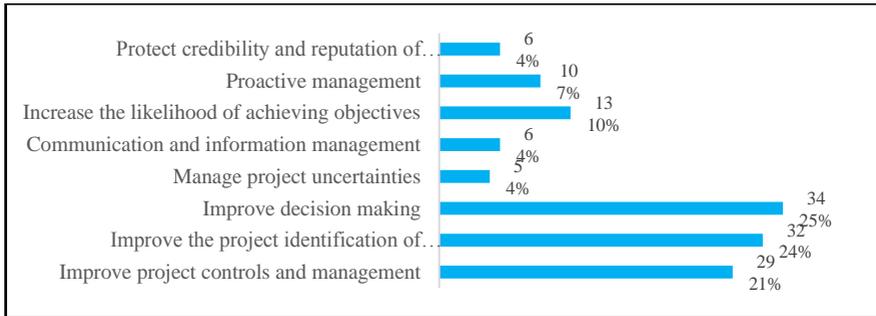


Fig 1. Summary of the significance of risk management

Figure 1 findings indicate that most interviewees see risk management as improving decision making (25%). This helps with project identification in making correct and appropriate project decisions. Second, risk management is considered as improving the project's identification of risk (24%), as active management can maximise opportunities and reduce risks. This would reduce the uncertainties of the project and make them project risks. Efficient risk control can increase the chances of attaining project goals. Third, risk management considered to improve project control (21%) by improving governance and management while minimising undesirable disruption

4.2 Challenges When Managing Project Risk

The research described many challenges the interviewees face when managing the risks of the project. The challenges are divided into six categories, as outlined in Table 5.

Table 5. Challenges when project managing risk

| Interviewees | Interviewees' Feedback |
|---|--|
| | <u>Lack of stakeholder support</u> |
| L02, L03, L04, L05, L12, L13, L17, L20, L22 | Client not responsive to the identified risk. |
| L02, L13 | Lack of mandate and commitment by the client over the risk. |
| L02, L20 | No contingencies or additional resources allowed to treat the identified risk. |
| L03, L12, L17, L20 | Stakeholder pushing away risk ownership - one party dealt with it. |
| L04, L05, L12, L20, L22 | Difficulty in convincing the client to agree with risk treatment. |
| | <u>Lack of managing risk experience</u> |
| L01, L03, L05, L08, L19, L23 | Inexperienced project manager handing project risk and left it unattended |
| L01, L23 | Incompetency to identified risk at early project lifecycle. |
| L12, L20, L23 | Poor risk treatment strategy. |
| L03, L07, L19, L20 | It is challenging to manage - Landscape scope uncertainties and subjective. |
| | <u>No formal risk management guideline</u> |

| | |
|---|---|
| L01, L03, L06, L08, L10, L11, L16, L21 | No specific formal standard procedures and guidelines practised. |
| L03, L10, L11, L16 | Heavy reliance on the project manager's experience and thinking process. |
| L11, L16 | Absent of structured risk process. |
| L21 | None enforcement of risk management policy. |
| L01 | Risk management guideline deemed generic - not suitable for the landscape architecture context. |
| <u>Communication & information barrier</u> | |
| L01, L02, L07, L15, L20, L24 | Miscommunication causing inefficient risk process. |
| L02, L15, L24 | Identified risk not recorded and not retrievable for treatment at later phases of the project. |
| L15, L20, L24 | Project manager not informed of potential risk by others - unknown site condition, utilities underneath the ground, and changes of the significant scope. |
| L01, L07 | Poor integration between project parties - miscommunication and information sharing. |
| <u>Risk managed reactively</u> | |
| L01, L03, L08, L22, L23 | No attempt to foresee the risk earlier and only managing it when it materialised. |
| L08, L23 | Unavailability of cost and time allocation to treat the surprise risk. |
| L01, L22 | Poor anticipation and forecasting risk beforehand – inexperienced. |
| <u>Limited scope of managing risk</u> | |
| L08, L20 | The limited risk treatment strategy option towards risks caused by others. |
| L10, L14, L20 | Small content of landscape architecture scope compared to architecture or engineering - forced to accept risk rather than avoiding, mitigating, or transferring it. |

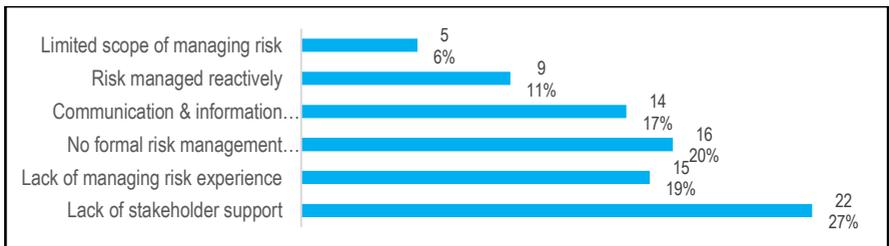


Fig 2. Summary of managing risk challenges

As shown in Figure 2, lack of stakeholder support (27%), lack of experience (19%), and no formal guideline (20%) described the interviewees as the most common challenges when managing risk in a landscape architectural project. The lack of support from stakeholders for the defined risk further affects risk miscommunication, knowledge sharing barrier and restricted allocation of contingencies for risk management. Such issues are close to the problems facing the building industry in Malaysia, as the literature has illustrated. No standard formal risk management found to restrict challenges toward successful risk management.

4.3 Anticipated Risk Management Application Challenges

The study identified several anticipated risk management application challenges in landscape architecture projects, as expressed by the interviewees. The study coded 143 anticipated challenges and then grouped them into six categories, as shown in Table 6.

Table 6. Anticipated risk management application challenges

| Interviewees | Interviewees' Feedback |
|--|--|
| | <u>Lack of support and acceptance</u> |
| L03, L06, L22 | Possible rejection - associate risk management as another system for scrutinising project performance. |
| L09, L10, L15, L16, L17, L18, L24 | Another redundant management system - impractical to project delivery. |
| L17, L20, L22, L24 | The application may disrupt ongoing project progress. |
| L05, L09, L11, L13, L15, L16, L19, L20, L22 | Local construction culture - work with the minimal system and standard. |
| L05, L09, L13, L20 | Unsupportive client towards application output. |
| L15 | Client preference towards actual output and financial tolerance management system like value engineering management and cost management. |
| L05, L13, L19, L22 | Comfortable with the current operating system. |
| L06, L09, L15, L16, L17, L21, L24 | Poor motivation and unwilling to learn. |
| | <u>Lack of awareness</u> |
| (L01, L09, L23 | Fail to understand the application benefits to project and organisation. |
| L03, L05, L09, L15, L17, L20, L22, L24 | Sceptical on the application - may delay decision making and limit creativity. |
| L15, L20, L22 | May limit project decision making and flexibility due to its rigid structured process. |
| L09, L07, L15, L20 | May limit business opportunities - too concerned about risk rather than the opportunities ahead. |
| L01, L09, L10, L16, L20, L24 | Rejection - application rarely or none used in the landscape industry. |
| L01, L10, L16, L18, L20, L22 | Irrelevant application - landscape scope is small, the risk is insignificant, and risk impact is minor. |
| | <u>Resistance to change</u> |
| L02, L03, L06, L17, L18, L20, L21, L24 | Satisfied with the current project management operation. |
| L09, L16, L20 | Current project operation is sufficient to manage risk. |
| L16, L21, L23 | Rely on the project manager's experience and knowledge. |
| L10, L16, L18, L20, L24 | Unwilling to allocate time and cost. |
| L16 | Challenges to attain the internal operation team's mandate and commitment. |
| L13, L18 | Then the stringent procedure of government client - application disregarded. |
| | <u>Lack of resources</u> |
| L02, L05, L06, L09, L11, L15, L17, L18, L20 | Regarded risk management application as consuming time and efforts - limited budget. |
| L06, L09, L10, L11, L17, L18 | Project nature that is rushing and time constraint - no time allowance. |
| L04, L05, L06, L09, L10, L11, L15, L17, L20, L24 | Worried the application requires extensive paperwork and protocol, further delaying the project. |
| L06, L16, L17 | Increases business cost - to employ a specialist to manage risk. |

| | |
|--|---|
| L17, L20 | Limited staff and time constraint in handling multiple projects - application may be put aside. |
| <u>Lack of knowledge</u> | |
| L01, L05, L10, L15, L17, L19, L20, L21 | Lack of risk and risk management knowledge. |
| L04, L09, L21 | Lack of risk management exposure - application is new to the industry. |
| L06, L15, L17, L21 | Need a great time to understand the risk process. |
| L16, L19 | Difficult to transfer the risk management knowledge to the organisation's project team - to junior and non-technical staff. |
| <u>Lack of expertise</u> | |
| L05, L06, L08, L16 | No specialised landscape expertise to handle risk management - relying on other industries to study their risk. |
| L05 | Landscape architects not trained with project management knowledge, including risk management. |

Figure 3 findings show that the problems in the implementation of risk management differ due to internal as well as external factors. The interviewers were most concerned about the lack of support and acceptance for the application for risk management (27%). Poor awareness (21%) of the principles and advantages of risk management further delays the successful implementation of risk management. Lack of resources (21%), such as limited budget and allocation of time, is also a threat to risk management practice. The remaining challenges in adopting a risk management application are resistance to change, lack of expertise and lack of knowledge. The anticipated application challenges are close to the problems facing the construction industry in Malaysia, as discussed in the literature. The anticipated challenges of risk management application are often close to the project mentioned above issues that relate to low client participation and understanding of the landscape scope.

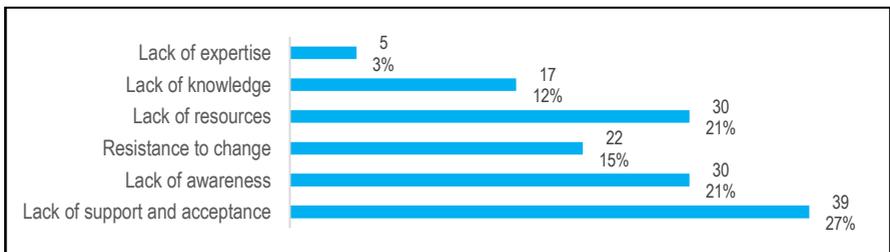


Fig. 3. Summary of anticipated risk management application challenges

5.0 Discussion

The study found that the interviewees highly recognised risk management application benefits for their projects to improve decision making, improve risk identification, reduce the uncertainties and took better control of project outcome. This similar benefits found in literature whereby risk management improves project performance, improve project deliverables, assist decision-making and enhance productivity, performance, quality, and the budget of the project (Ansah et al., 2016;

APM, 2010; Du et al., 2016; Dyer, 2017; Hillson, 2009; Kang et al., 2015; Marcelino-Sádaba et al., 2014; Siang & Ali, 2012; Ward & Chapman, 2003; Willumsen et al., 2019). Full awareness of the risk management application benefits will lead to affirmative acceptance and practice by the project manager, rather than treating the application as another redundant management system. Hence, knowledge and practice of risk management can enhance their understanding of the significance of the application.

Meanwhile, reviewed lack of stakeholder's support, lack of risk experience, communication barrier and scope definition found to be primary challenges when managing risk. The challenges observed related to human factor reason from project culture, personal perception and poor client-consultant engagement. The mismanaged project risk further implicate effective risk management application. Lack of support, acceptance, resistance to change, poor risk management awareness, lack of knowledge, resources and expertise constrained effective risk management application. Added up to all identified challenges, the most significant risk management application challenges are there is no formal risk management system applied into landscape architecture project. This similar challenges found in Malaysia construction project where risk-managed reactively, ill-structured process and informal practice manner due to unavailable formal risk management application (Abdul-Rahman et al., 2015; Adnan & Rosman, 2018; Fadzil et al., 2017; Goh & Abdul-Rahman, 2013; Kang et al., 2015; Mohamed et al., 2014; Omer et al., 2019; Taofeeq et al., 2020). As a result, the mismanaged project risk and ineffective risk management application challenge subsequently impact the project performances. Beyond the project completion, the hidden project risk that project failed to unanticipated will potentially lead to significant consequences such as litigation implication, environmental degradation, injury, loss of property and socio-culture. Therefore, there is a need to raise the awareness of landscape architect professionals in Malaysia about the benefits of risk management application and employing the appropriate method to manage project risk. The improvement of managing risk practice by enhancing risk mandate and commitment, awareness, integration to the current process, communication and information management.

Thus, recognising the benefits of risk management and facing its application challenges, the formulation of the best strategy was chosen to incorporate risk management into projects of landscape architecture. A risk management system that was integrating risk management processes into project management processes to be built to match the context of landscape architecture. The new structure for risk management will be versatile, standardised and consistent with the context of the organisation. Improvement in risk management practices can be accomplished by strengthening the risk mandate and dedication, building knowledge, incorporating into existing processes, and promoting communication and information management, in addition to system growth. Such measures should ensure the efficacy of the application built for risk management. Creation of the risk management framework development and risk management practice improvement were considered in designing a practical application for risk management, as illustrated in Figure 4.



Fig. 4. An effective risk management application

6.0 Conclusion

This research surmised modest knowledge of risk management benefits to landscape architecture project managers to enhance project outcome. However, due to no formal risk management applied, multiple challenges factor allows for effective application of risk management in a landscape architecture project. Despite the introduction of formal processes of risk management, however, most risk management is practised in an ill-structured method and is usually carried out informally. This research offers relevant and useful insight into a practical knowledge of the real benefits of risk management, application challenges and suggest improvement in the Malaysian landscape architecture project. An extensive strategy to risk management application into landscape architecture project has been devised by recognising specific advantages and defining design problems for the industry. For effective risk management application, recommended the project organisation to have a formal risk management system to landscape architectural context.

Further study devoted to formulating the best strategy for integrating risk management into project management of landscape architecture. This strategy is essential for project manager landscape architecture to manage their risk effectively in order to improve the performance of the project.

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