RESEARCH ARTICLE

The Assessment of Risk Management Maturity in Landscape Architecture Project Organisation

Adam Aruldewan S.Muthuveeran[1*], Zahirah Mokhtar Azizi[2], Mohd Firdaus Mustaffa Kamal[3], Izuandi Yin[4], Elly Wididyanty Rasidin[5], Nik Hazwani Nik Hashim[6]

[1]Faculty of Design and Architecture, Universiti Putra Malaysia, Malaysia

[2]Architecture and Built Environment, Northumbria University, United Kingdom

[3]Faculty of Technical and Vocational Sultan Idris Education University, Malaysia

[4]School of Housing Building and Planning, Universiti Sains Malaysia, Malaysia

[5]Limkokwing Graduate School, Limkokwing University of Creative Technology, Malaysia

[6]Department of Urban and Regional Planning, Faculty of Built Environment, Universiti Malaya

*Corresponding author: aruldewan@upm.edu.my

Abstract

This study examines the underutilization of risk management in Malaysian landscape architecture projects, often due to limited awareness of its benefits. Semi-structured interviews with 24 organisations were conducted to assess risk maturity levels using the Risk Management Maturity Model (RMMM). Results show that most organisations remain at the 'Naive' level, reflecting minimal formal practices and a reluctance to adopt structured approaches, influenced by insufficient knowledge, organisational policies, resource allocation, and project types. The findings highlight the pressing need for formal risk management systems to overcome ineffective practices, improve decision-making, and enhance project outcomes. Organisational culture and leadership emerge as critical factors shaping risk practices. The study categorises maturity into four levels: Naive, Novice, Normalised, and Natural, emphasising that understanding an organisation's position is essential before implementing comprehensive frameworks. The lack of structured processes and limited awareness underscores the importance of targeted interventions to strengthen governance. By identifying current practices and gaps, this research provides insights into how risk governance can be advanced in the industry. Overall, the paper contributes by not only identifying shortcomings but also underscoring how structured risk management can support more resilient and successful landscape architecture initiatives in Malaysia.

Keywords: *Risk Management Maturity; Risk Management; Landscape Project; Landscape Architecture Organisation*

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Introduction

The Malaysian construction industry, including landscape architecture projects, is not widely practised or systematically managed attributable to a lack of knowledge and awareness of its benefits (Adnan & Rosman, 2018; Fadzil et al., 2017). This has resulted in a reluctance to adopt risk management (Siang & Ali, 2012; Zhao, 2024). According to Fadzil et al. (2017), risk management is customised to the specific nature of the projects, the allocation of resources, and the company's policies. Instead of administering the project as a comprehensive process, companies typically implement straightforward, rapid, reasonable, and cost-effective strategies

to identify the risk (Adnan & Rosman, 2018; Zhao, 2024). A lack of understanding of risk management applications results in the mismanagement of risk and the failure to adhere to the recommended process. Additionally, the application of risk management is a novel concept in Malaysia, and practitioners are sceptical about the practice as a result of the dearth of awareness of its advantages (Bahamid et al., 2022). A formal risk management application for landscape projects is essential to address the industry's prevailing ineffective practices (Muthuveeran et al., 2022). Its integration into project management is crucial for enhancing decision-making processes, particularly in anticipating and responding to uncertainties. This need became even more evident during the COVID-19 pandemic, where the Movement Control Order (MCO) significantly disrupted project operations, material supply chains, and financial stability (Sapian et al., 2022), highlighting the vulnerabilities of organisations lacking structured risk frameworks. These gaps justify the need for a structured maturity assessment that informs future adoption of formal risk management frameworks. This smoother transition emphasises that the reluctance is not only structural but also cultural, requiring both awareness-raising and institutional support to overcome.

The landscape architect who serves as the main designer for a landscape project is required to effectively manage and control all risks associated with the design work under the conventional procurement direction. In contrast, Williams (2019) asserts that the appropriate management of risks is inconsistent across various organisations and is frequently lacking in structure or format, particularly in the context of managing design-related risk in a landscape architectural practice. Effectively managing project risk necessitates the implementation of an appropriate risk management application, as litigation consequences and project risks are frequent in landscape project scenarios. The significance of a risk management application is that an informal risk management practice will not generate valuable risk information for project management (Farooq et al., 2018; Loosemore & Cheung, 2015; Wang et al., 2024; Willumsen et al., 2019). In addition, the small and medium enterprise (SME) construction organisations in Malaysia frequently fail to implement comprehensive risk management strategies and instead rely on contractual agreements and the transfer of risk to third parties (Fadzil et al., 2017; Omer et al., 2019; Tung et al., 2021). Simply put, risk is avoided by this method. Also, this practice is implemented by certain landscape architectural organisations. The documentation sets of minor organisations should contain the same components as those of large organisations, according to Eh Poon et al. (2022). Early observations suggest that the greatest obstacle to the successful implementation of risk management in Malaysia's landscape projects is the absence of formal risk management guidelines and standards (Muthuveeran et al., 2023). Because of a lack of understanding of risk management and its implementation, as well as a lack of cognisance of its advantages, project risks are frequently not managed with the utmost care and do not adhere to the established procedures.

To incorporate risk management into the project process, it is necessary to first evaluate the maturity of risk management. The current organisational culture and management determine the risk landscape project application. A clear understanding of the organisation's current risk management strategy and its intended destination is essential. Using an acceptable framework, the present risk management maturity and practice capability are benchmarked. This allows the organisation to evaluate its current objectives and establish its risk maturity for the future (Bąk & Jedynak, 2024; Raz & Hillson, 2005). Therefore, this investigation is designed to evaluate the level of risk management maturity within landscape architecture project organisations. The purpose of this is to ascertain the current organisation's risk maturity status before the implementation of a formal risk management system in the future.

This study contributes to bridging a significant research gap by applying the Risk Management Maturity Model specifically to Malaysian landscape architecture firms—a context previously underexplored. It offers insights not only into the theoretical framing of risk maturity but also practical implications for improved governance in project execution.

Risk Management Maturity

Risk management maturity refers to the extent to which an organisation effectively and systematically applies risk management principles throughout its processes. The model suggested four standard levels of risk maturity: Naïve (Level 1), Novice (Level 2), Normalised (Level 3), and Natural (Level 4). While existing models provide clarity and benchmarking standards, they are often criticised for being rigid and less adaptable to local contexts. This study addresses such limitations by contextualising the model to Malaysian landscape architecture organisations.

Table 1: Risk Management Maturity Model

RISK MATURITY LEVEL		ATTRIBUTES
Level I (Naïve)	• Unaware of the need for management of risk. • No structured approach to dealing with uncertainty. • Repetitive & reactive management processes. Little or no attempt to learn from the past or to prepare for the future.	• Culture: Lacks risk awareness and is resistant to change, preferring to stick with existing processes. • Process: No formal processes. • Experience: Lacks understanding of risk principles and terminology. • Application: Lacks structured applications, dedicated resources, and risk tools.
Level 2 (Novice)	• Conducting risk management experiments with a limited number of individuals. There is currently no structured approach that is generic. • Recognises the prospective advantages of risk management; however, the benefits are not fully realised due to ineffective implementation.	• Culture: Risk management is perceived as an unnecessary expense with variable advantages and is thus implemented exclusively on selected projects. • Process: The effectiveness of the process is contingent upon the in-house risk team's talents and the availability of external support, as there are no generic formal processes. Specific methods are employed. • Experience: Risk management is restricted to individuals who have received minimal or no formal training. • Application: Risk management is implemented inconsistently due to changing staff availability and is based on ad hoc collections of tools and methods.
Level 3 (Normalised)	• Routine business processes are integrated with risk management. • The majority of projects, if not all, incorporate risk management. • Processes for formalising genetic risk. Although benefits are comprehended at all levels of the organisation, they are not consistently realised.	• Culture: The organisation has implemented a risk management policy, recognising its advantages, and is prepared to allocate resources to attain anticipated benefits. • Process: Generic processes are implemented across the majority of projects and incorporated into a formal quality system, with active risk management of risk budgets at every level and minimal reliance on outside support. • Expertise: The organisation maintains a core of in-house expertise that is formally instructed and responsible for the development of certain tools and processes. • Application: A consistent and routine application of committed resources is facilitated by an integrated set of tools and methods across all projects.
Level 4 (Natural)	• Risk-aware culture, with a proactive approach to risk management in all aspects of the business. • Active use of risk information to improve business processes and gain a competitive advantage. • Emphasis on opportunity management ("positive risk").	• Culture: Leadership demonstrates a strong commitment to risk management by setting a proactive example and encouraging and rewarding proactive approaches to managing risks • Process: The organisation implements risk-based business processes and a comprehensive "Total Risk Management" approach, ensuring regular updates and refreshing of processes, along with routine risk metrics and continuous feedback for improvement. • Experience: All staff are trained to be risk-aware, utilising basic skills and learning from experience, complemented by regular external training to enhance their risk management capabilities. • Application: The practice of risk management is seamlessly integrated into all activities, relying on state-of-the-art instruments and methods to support risk-based decision-making and reporting.

Adapted from: (Bąk & Jedynak, 2024; Caiado et al., 2016; Hartono et al., 2019; D. Hillson, 2000; D. A. Hillson, 1997; Hoseini et al., 2021; Serpell et al., 2015; Thamhain, 2013)

The maturity of risk management is significantly influenced by the culture of an organisation. Incorporating risk awareness throughout the organisation, a mature risk culture fosters open dialogue about risks and empowers employees to assume responsibility for risk management practices. The prioritisation of risk management communication at the board level has contributed to the establishment of a culture of risk consideration in strategic decision-making (Domańska-Szaruga, 2020). Risk culture also guarantees that risk professionals are following business objectives, which promotes a proactive approach to risk assessment and fosters accountability (De Lorena & Costa, 2024).

While prior models highlight culture as central, their application often underestimates sector-specific dynamics. For instance, landscape architecture projects typically involve SMEs with resource limitations, an aspect rarely addressed in mainstream maturity models. The systematic frameworks for identifying, assessing, and mitigating risks are the foundation of the risk management process. A structured, repeatable methodology is frequently implemented by organisations with mature processes, and it is frequently bolstered by advanced technologies and predictive analytics. Risk managers can efficiently identify and quantify risks with the assistance of these instruments, which improve accuracy and speed. According to the most recent research, there is an increasing tendency to implement both qualitative and quantitative methodologies, with a focus on enhancing the utilisation of data and analytics to facilitate decision-making (Bąk & Jedynak, 2024).

The construction industry's experience with risk management is shaped by the lessons acquired from previous risk events, crises, and near misses (Perrenoud et al., 2021). To continue to enhance their risk management strategies, mature organisations document and analyse these events. Additionally, experience encompasses collaboration with external partners, including insurers and consultants, which reinforces the organisation's risk mitigation strategy and provides supplementary insights (Abdulrahman et al., 2019)they should be committed in managing risk proactively and consistently throughout the project and equally important is the determination of the Risk Management Maturity (RMM. Organisations improve their resilience in uncertain environments by improving their capacity to adapt and respond to emergent threats as they accumulate experience.

According to Abdulrahman et al. (2019), the Application is the degree to which risk management strategies and processes are effectively incorporated into daily business operations. In organisations with a high level of risk management maturity, risk management is integrated into all departments and functions. The increasing utilisation of governance, risk, and compliance integration is a critical application that enables organisations to effectively manage operational risks and complex regulatory environments in real-time (Abed & Rashid, 2023). This application goes beyond compliance to guarantee that risk considerations are integrated into strategic decision-making throughout the organisation.

In summary, risk management maturity is achieved by cultivating a strong risk-aware culture, implementing robust and adaptable processes, embedding risk management into organisational practices, and continuously learning from experience. These components enable organisations to remain agile and resilient in the face of an ever-evolving risk landscape. Risk management maturity models are beneficial for comprehending the extent to which an organisation's risk management application is mature. The project's reliability and efficacy were assessed at each stage of its lifecycle (Bąk & Jedynak, 2024; Hillson, 2000). Additionally, the model is advantageous for organisations that intend to enhance or develop their existing risk management strategy (Chapman, 2012; Heravi & Gholami, 2018). Using the model, landscape architecture organisations can assess their risk capacity in comparison to four levels of maturity standards. This has the potential to quantify their risk management practice to diagnose their current

situation and facilitate the application of specific strategies for future improvement.

Methodology

This study aims to evaluate the risk management maturity of landscape architecture organisations in Malaysia using qualitative analysis. The research design consisted of four stages: preliminary study, data collection, data analysis, and interpretation. The exploratory case analysis was a component of the study methodology. A preliminary study, data acquisition, analysis, and interpretation comprise the four stages of the investigation. First, the researcher conducted a background study to determine the research's history, requirements, gaps, and objectives. Secondly, using semi-structured interviews, twenty-four senior administrators or owners of landscape architecture organisations in the Klang Valley were interviewed. Following the exploratory study, open-ended queries employ an aide-memoire to provide respondents with freedom and flexibility in their responses (McNamara, 2017). The researcher utilised ATLAS.ti 8, a research software that is highly organised and documented, to transcribe the text, record audio recordings, and project documentation. Third, the codes, categories, and topics were identified and described during the content analysis (Mayring, 2022). Furthermore, thematic analysis was implemented to comprehend the data and generate thematic maps that connect diverse themes. Maguire & Delahunt (2017) conducted an analysis that examined the correlations between subject themes and identified the patterns. The current risk management approach in Malaysian landscape architecture project organisations was analysed in this study, which resulted in the identification of mapped and reported interpretations. The study's objective served as the foundation for the conclusion.

Table 2: Interviewees' Information

Interviewees	Interviewees' Position	Interviewees' Background		Interviewees' Organisation Background		
		Education	[a] Years of Experience	[b] Years Established	[c] Headcount Size	[d] Total Ongoing Project
L01	Director	Abroad	Expert	Established	Small	Medium
L02	Proj. Director	Local	Intermediate	Established	Small	Medium
L03	Director	Abroad	Expert	Established	Small	High
L04	Director	Local	Expert	Established	Small	Medium
L05	Principal	Local	Intermediate	New	Small	Low
L06	Director	Local	Expert	Established	Small	Low
L07	Director	Local	Intermediate	New	Micro	Medium
L08	Director	Local	Intermediate	New	Micro	Low
L09	Director	Abroad	Expert	New	Small	Low
L10	Director	Abroad	Expert	Intermediate	Small	Medium
L11	Associates	Local	Intermediate	Established	Small	Medium
L12	H. Contract	Local	Intermediate	New	Small	Medium
L13	Director	Abroad	Expert	Intermediate	Small	Low
L14	Director	Local	Intermediate	New	Small	Medium
L15	Director	Local	Expert	Established	Small	Medium
L16	Director	Local	Intermediate	Intermediate	Micro	Medium
L17	Principal	Local	Intermediate	Intermediate	Small	Medium
L18	Director	Local	Intermediate	New	Micro	Low
L19	P. Director	Abroad	Expert	Established	Small	Medium
L20	Director	Local	Intermediate	New	Small	Medium
L21	Director	Abroad	Expert	Established	Small	Medium
L22	M.D.	Local	Expert	Established	Small	Medium

Interviewees	Interviewees' Position	Interviewees' Background		Interviewees' Organisation Background		
		Education	[a] Years of Experience	[b] Years Established	[c] Headcount Size	[d] Total Ongoing Project
L23	Director	Local	Intermediate	New	Micro	Low
L24	Director	Local	Intermediate	Intermediate	Small	Medium

Notes:
[a] Beginner (< 10 years) / Intermediate (10 < 20 years) / Expert (> 20 years)
[b] New (< 10 years) / Intermediate (10 < 20 years) / Established (> 20 years)
[c] Micro (< 5) / Small (5 < 30) / Medium (30 < 75): Malaysia's Small and Medium Enterprises (SME) classification
[d] Low (< 20) / Medium (20 < 40) / High (> 40)

The landscape planning project was represented by twenty-four interviewees who responded following the predetermined sampling criteria. The interviewees are required to meet the following criteria: (1) Professional landscape architects from landscape architecture organisations; and (2) their current organisation holds managerial and decision-making positions, suggesting that they have an impact on policy and practice. All interviewers had a minimum of ten years of experience in the industry. They have been involved in a variety of project sizes, locations, and scopes throughout a complete cycle of landscape projects in the urban region of Klang Valley, Malaysia. The information of the interviewees is presented in Table 2, and each interviewee was assigned an alphanumerical code (L01 to L24) to facilitate identification.

Findings

Risk Management Culture

The interviewees were requested to provide their perspectives on the importance of risk management awareness and the benefits they will experience when it is implemented in projects and the organisation. A total of 135 significances were coded based on their responses and subsequently categorised into eight categories. The results in Figure 1 suggest that the most frequently mentioned benefit of risk management was improved decision-making (25%), although this does not represent a strict majority. It assists in the accurate and appropriate decision-making process of projects, as well as in performing project profiling. Secondly, risk management is considered to enhance the project's risk identification (24%), as proactive management will eradicate threats and capitalise on opportunities. It will mitigate project uncertainties and convert them into project risks. The likelihood of meeting the project goals will increase with effective risk management. Third, risk management is considered to enhance governance and management while minimising undesirable disruptions, thereby improving project control (21%). The study concluded that the interviewees acknowledged the importance of the risk management application in their projects. The project manager will be more inclined to accept and implement the risk management application if they are fully aware of its importance, as opposed to viewing it as a redundant management system. Therefore, their comprehension of the application's importance can be improved through the acquisition of knowledge and the cultivation of a risk management culture.

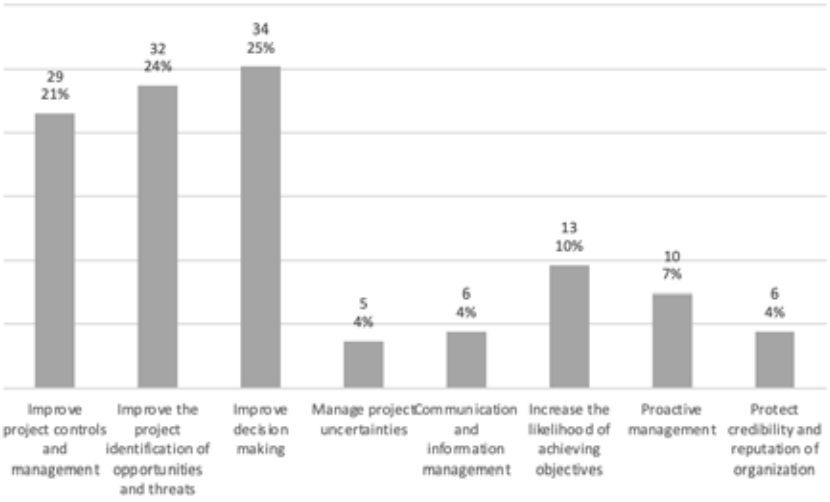

Figure 1: Significance of Risk Management Culture

Conversely, the remaining categories were seen as less significant due to limited exposure, lack of formal training, or perceived irrelevance to immediate project needs. This highlights an overall gap in comprehensive risk awareness across organisations.

Risk Management Process

Where there is no explicit risk context establishment, each risk process practice is summarised, with the majority of them being project management procedures. Meetings, forecasting, analogy, interviews, and expert opinion are employed to identify risks on the spot. Instead of precise data analysis procedures, risks are evaluated using experience and intuition. There was no quantification of risk. The project prioritised proactive therapy through active acceptance, minimisation, transfer, and avoidance. To monitor or evaluate risks, no particular tools or techniques were employed. Lastly, the majority of risks were not communicated or consulted.

The six steps of the risk management process were the focus of this study. There are three categories into which the level of completion is classified: complete, intermediate, and incomplete (Table 3). Figure 10 illustrates that 12 (50%) of the 24 interviewees were classified as “Incomplete,” indicating that they did not completely implement the three critical steps of the core risk identification-analysis-treatment processes. The “Intermediate” group was composed of five interviewees (21%) who implemented all three stages of the main risk identification-analysis-treatment processes. All six stages of the risk management process had been completed by only seven (29%) landscape planning and design organisations that were interviewed. The six stages of the risk management process are found to be deficient in practice. Most of the risk management process actions were improvised and not implemented. In addition, the standard’s broad approach was replaced with low-risk instruments and methods. In practice, rudimentary instruments and procedures with restricted applications were implemented.

This deficiency could stem from limited organizational resources, absence of formalized risk policies, and overreliance on individual experience instead of structured methodologies. The lack of monitoring and communication suggests that risk management is often reactive rather than proactive.

Table 3: Completeness of the Overall Risk Management Process Practice

Interviewees	Establishing Risk Context	Risk Identification	Risk Analysis	Risk Treatment	Monitoring And Review	Communication And Consultation	Overall Risk Management Process Practice
L01		√		√	√		**Incomplete**
L02		√		√			**Incomplete**
L03		√	√	√	√	√	**Intermittent**
L04		√		√	√	√	**Incomplete**
L05	√	√		√			**Incomplete**
L06	√	√	√	√	√	√	**Complete**
L07		√		√			**Incomplete**
L08	√	√		√			**Incomplete**
L09		√	√	√		√	**Intermittent**
L10	√	√	√	√			**Intermittent**
L11	√	√	√	√	√	√	**Complete**
L12	√	√	√	√	√	√	**Complete**
L13		√	√	√		√	**Intermittent**
L14	√	√		√			**Incomplete**
L15	√	√	√	√	√	√	**Complete**
L16		√		√		√	**Incomplete**
L17		√		√	√		**Incomplete**
L18		√		√	√		**Incomplete**
L19		√	√	√	√		**Intermittent**
L20		√		√	√		**Incomplete**
L21	√	√	√	√	√	√	**Complete**
L22	√	√	√	√	√	√	**Complete**
L23		√		√	√		**Incomplete**
L24	√	√	√	√	√	√	**Complete**
Totals	**11**	**24**	**12**	**24**	**15**	**12**	

Note:
Complete: Practised all 6 steps of the risk management process
Intermediate: Practised 3 steps of the core risk management process (Identify-Analyse-Treat)
Incomplete: Missed 1 or 2 steps of the core risk management process (Identify-Analyse-Treat)

Risk Management Experience

The study discovers the risk management experience by investigating their understanding of risk management practice. Their responses were grouped into four categories, as depicted in Table 4. Found 13% of the interviewees indicated that they were not aware of risk management, nor had they ever heard of or come across risk management. They were aware that each project has a risk, but they had no idea that there is a management system to manage it systematically (L07, L08, and L14). L08 further expressed that there are management systems, such as value management and safety management, for managing project risk. Mostly, 50% of the interviewees had heard about risk management but were not familiar with the process involved and had no idea how to apply it. L04 and L19 claimed that they had been exposed to risk management practices by others, mainly from the engineering field. L10, L16, and L17 were aware that risk management had been practised by clients, usually those involving massive projects. L16 further expressed the risk management knowledge attained from the study courses that he pursued. L17 had an experience when their big corporate client hired a risk

management consultant to study their business portfolio for decision-making. Meanwhile, L24 expressed his awareness of risk management benefits but had no idea about the implementation process.

Table 4: Interviewees' Responses on Risk Management Exposure

Interviewees	Interviewees' Feedback	Total	%
L07, L08, & L14	Risk management practice was unheard of	3	13%
L01, L02, L04, L05, L10, L13, L16, L17, L18, L19, L20, & L2	Heard but was unfamiliar with the practice	12	50%
L03, L06, L09, L11, L15, L21, L22, & L23	Familiar but not practising risk management	8	33%
L12	Practising risk management	1	4%

The remaining 33% of the interviewees indicated their familiarity with an essential risk management application but did not apply it to landscape projects. L06 expressed risk management as a process of identifying the risk and producing a mitigation programme to reduce it. L09 experienced the enterprise risk management practice for profiling their clients and projects, which is practised in the UK, merely for the business case. Meanwhile, L15 stated that in ISO 9001, Risk Management is understood as identifying, analysing, and treating the risk. L22 claimed that risk management is similar to the Occupational Health and Safety Management (OSHA) process and expressed that safety management is part of risk management. L23 stated that risk management is to identify project uncertainties, categorise, analyse, and make an action plan to eliminate them. L03, L09, and L21 claimed that they became familiar with risk when they were overseas. Only one interviewee (L12) was actively practising formal risk management in the organisation and showed documented proof to the interviewer. L12 described that the organisation used ISO 9001 Risk Management to analyse potential projects and clients' prospects before deciding to take up a project.

In summary, most of the interviewees had heard of the risk management application but had little knowledge and understanding of the procedure and process to practise it. Some claimed they were familiar with the process but observed they had fundamental knowledge to practice it and were not entirely aware of the benefits of the risk management practice.

Risk Management Application

The necessity of a risk management application is evident in the analysis of the current risk conception, risk process practice, and risk process integration into the project lifecycle. The study further attempted to seek the interviewees' opinions on the risk management application in architecture projects. From the expert interview findings, 18 interviewees responded with their feedback as depicted in Table 5. The remaining six interviewees were unsure and concluded they did not apply any risk management practices.

Table 5: Interviewees' Feedback on Risk Management Application

Interviewee	Expression on Risk Management Application
L02	*"…we don't have a specific management system to manage this risk...we based on the landscape architect experience to make a decision…"* *"We do experience before Value Engineering, that similar to this [risk management]…the principle is almost same…but it mainly focuses on cost…"*
L04	*"…from our work experience, we draw down our very basic guidelines, [if anything goes wrong and what action to be taken]"* *" …but we never put risk management as a part of business objective…but we should"*
L05	*"…identify the risk ad hoc"* *"…will study the whole [project in detail, cost, environment, limitation] …from there, its establish the next direction which is whether we want to go or not with the project"* *"…plant in that culture into all our staffs early, and so that when they start planning the design, putting ink on paper, they started to visualize what would happen next. So would help out to reduce the risks on-site"* *"…took it [project) directly to the clients...[take] accountability and responsibility...design and implementation with the thought of risk [take ownership]… it helps to reduce the risks"*

Interviewee	Expression on Risk Management Application
L06	*"We don't have something systematic like this table you show here. It is mostly based on analysis, and experience and based on that risk forecasting method...It's more of experience verbal communication and more of field than systematic logical process"*
L07	*"…more ad hoc basis [manage risk] … because all the project is considered, case to case basis"* *"We did apply [some], in terms of paperwork, how to manage, how to monitor, we met with that authority personnel, just more towards the documentation and paper works, but we don't impose these kind [risk management]…"*
L08	*"…minimise the risk, the risk will happen, and during different stages have the risk itself, so they are dealing with this and they are right"* *"…rely on project manager experience and know-how to detect and control risk on the spot…"* *"…to manage [risk] from the design stage, so you go in the progress, you can see the whole thing to make sure the project successful. You can manage that, the risk..."*
L09	*"It is on an ad-hoc basis. Most of the project is on an ad-hoc basis. We don't have a structure to it... we would like to have a mechanism [to manage risk] to it"*
L10	*"…at the moment it's really at an ad-hoc base. I won't say we have a system that tackles that... not really systematically"* *"…more on a subconscious level. We don't do charts and everything. It's more of a gut feeling"*
L11	*"to eliminate [risk] whatever the issues that are based on the experience that previously happened"* *"I wouldn't say ad-hoc because you get the brief and you think about it. So it is a thought, but maybe shorter or simpler"* *"have all the techniques in managing risks but it's not in a systematic formal structure"*
L12	*"We used to use ISO audits and we had something about risks"* *"…some issues [risks] have determined and some issues are tackled ad-hoc..."* *"We have [ISO 9000 – risk management]…we have this registrar...this is risk and opportunity review, this one is the formula, the impact and all that, this is project assessment… basic guidelines"*
L13	*"We would do based on experience, analysing, get to know the clients, talk to people…maybe a simple checklist, project do and don't, with the effect of it"*
L14	*"no structured system…. based on judgement"* *"…all of this is based on experience, on knowledge to handle certain things"* *"We have not empathised on risk management. But in practice when we get the project we will think about the risk already. Practically on site, we think about the risk and its safety and the possibility of the damages and what it can cost"*
L15	*"We do have but not as structured as this…we are more hands-on, from our projection, and experience…"* *"We rely on our ISO...we are ISO certified company...we have our procedure of handling things…"* *"…this risk management thing is happening even though now not in a structured manner we still have our unstructured risk management"* *"…we have different clients, they have their risk management...we practised it according to their risk management"*
L16	*"No risk management….depending on ad-hoc… rectify based on experience"*
L17	*"We always face project risk…we act reactively to it…we don't document it properly"*
`L18	*"I already, I have known that risk might happen…have managing system in place but it is very ad-hoc basis and the issues happen and start thinking of the treatment…depending on your experience"*
L20	*"[manage risk] roughly you will know what will happen already…that are some precaution and prevention method we practice..."* *"there no common standard…when it happens then you solve it or you know how to solve it later"*
L24	"On managing risk, internally we don't have the system" "Company principal will scrutinize drawing specification and detailing before releasing to client [to detect potential risk]" "Our management of risk is more toward operational, day-to-day checking. Very traditional way… we constant monitoring and checking as much possible" "…aware what are the potential risk and how to tackle it, it's good enough…rely on experience and gut feeling" "What we have in our tender, we have some contingencies fund, and we allowed 5% to 10% of project cost...we may not know what will happen. At least we have standby…. anything can go wrong, there will be a budget to manage it"

As L05 emphasised, 'when they start planning the design, putting ink on paper, they start to visualise what would happen next.' This quote supports the recommendation to embed risk awareness early in the design process. Similarly, L15 noted that 'risk management is happening even though not in a structured manner,' highlighting the potential for formalising ad hoc practices already in place.

The research revealed that all interviewees, except for L12, had established risk management in practice, but none had specific formal risk management. Risk management was not implemented on a global scale; rather, it was integrated into the daily operations of project management. L09, L11, L14, and L15 asserted

that risk management is an unstructured process that does not adhere to the recommended sequence. The risk is managed in an ad-hoc manner, utilising logical judgement, subconsciousness, experience, and intuitive feeling regarding the project scope (L02, L04, L05, L06, L07, L10, L11, L13, L14, L15, L16, L18, and L24). The risk management of projects was significantly influenced by the project manager's expertise and experience (L08, L14, and L24). The majority of the interviewees would defer to the internal organisation's process and methodology to manage the risk.

When a risk is realised, it is managed proactively. From the inception of the project, there was no clear strategy for risk management. Even though the risk was identified earlier based on experience, it was only addressed after the risk impact had occurred. The project strategy and business objective do not include risk management. The primary objective of risk management is to optimise the profitability of the project, and it is frequently perceived as a financial and time-consuming burden.

Discussion

The study found other emerging factors besides project risk process practice that contribute to effective risk management application. These other factors are in the aspects of the interviewees' organisation's risk maturity. The study analysed the landscape organisation's risk management maturity (Table 6) based on the risk management maturity model adapted from (Hillson, 2000; Hillson, 1997; Serpell et al., 2015) as a basis, with supporting latest input from (Bąk & Jedynak, 2024; Caiado et al., 2016; Hoseini et al., 2021; Thamhain, 2013). These findings echo Hillson's early work that most organisations remain reactive, yet they contrast with Bak & Jedynak's multidimensional model which assumes progressive adoption across industries.

Table 6: Landscape Architecture Organisation's Risk Management Maturity Level

Interviewees	Culture				Process				Experience				Application				**Overall Risk Management Maturity Level**			
	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	**Level 1**	**Level 2**	**Level 3**	**Level 4**
L01	√				√				√				√				√			
L02	√				√				√				√				√			
L03	√				√					√			√				√			
L04	√				√				√					√			√			
L05	√				√				√					√			√			
L06	√					√				√			√				√			
L07	√				√				√				√				√			
L08	√				√				√				√				√			
L09	√				√					√			√				√			
L10	√				√				√				√				√			
L11	√					√				√				√				√		
L12		√					√				√			√				√		
L13	√				√				√				√				√			

Interviewees	Culture				Process				Experience				Application				Overall Risk Management Maturity Level			
	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	**Level 1**	**Level 2**	**Level 3**	**Level 4**
L14	√				√				√				√				√			
L15		√				√				√				√				√		
L16	√				√				√				√				√			
L17	√				√				√				√				√			
L18	√				√				√				√				√			
L19	√				√				√				√				√			
L20	√				√				√				√				√			
L21	√					√				√			√				√			
L22		√				√				√			√					√		
L23	√				√					√			√				√			
L24	√					√			√				√				√			
Totals	21	3	-	-	17	6	1	-	15	8	1	-	19	5	-	-	**20**	**4**	**-**	**-**
%	88	13	-	-	71	25	4	-	63	33	4	-	79	21	-	-	**83**	**17**	**-**	**-**

Note:
Level 1 (Naive): Lack of awareness of the necessity of risk management / Lack of a structured approach to addressing uncertainty / Management processes that are repetitious and reactive. There is minimal or no effort to learn from the past or to prepare for the future.
Level 2 (Novice): Engaging in risk management through a limited number of individuals / Lack of a generic structured approach / Recognised potential benefits of risk management, but ineffective implementation prevents full benefits.
Level 3 (Normalised): Risk management is integrated into regular business processes / Risk management is implemented in the majority of projects / Formalised generic risk processes / Benefits are comprehended at all levels of the organisation, despite not always being consistently realised.
Level 4 (Natural): A proactive approach to risk management in all aspects of the business, characterised by a risk-aware culture. The emphasis is on opportunity management (positive risk) and the active utilisation of risk information to enhance business processes and obtain a competitive advantage.

The study discovered that the majority of interviewees, 20 out of 24 (83%), rated the overall risk maturity level at the lowest level, which is Level 1. It elucidates that landscape architecture organisations are generally oblivious to the necessity of risk management and lack a structured approach to risk management. They behave reactively when managing risk. Additionally, they demonstrate a tendency to neglect the application of past project risk experiences in future projects. At this level, the organisation has a culture of resistance to change, low awareness, and a lack of recognition of the necessity of risk management (Bąk and Jedynak 2024; Hillson 2000). There is no risk management process, no experience with risk management, and no application within the business operation. These results indicate that unlike larger construction firms where gradual maturity is evident, landscape architecture organisations remain at an early stage. This comparison underscores the originality of our findings.

Four of the twenty-four interviewees (17%) scored the overall risk maturity at Level 2. It suggests that landscape project organisations are conducting risk management experiments. Nevertheless, it is restricted to a small number of individuals, and there is no comprehensive, structured risk management strategy in existence. The implementation is ineffective, and the complete benefits are not realised since only a small number of individuals are aware of the potential benefits of risk management. They are not wholly convinced of the advantages of

risk management from the perspective of organisational culture and often regard it as a necessary expense. The efficacy of processes is contingent upon the limited experience of a few key individuals, who may have received little formal training. Processes are somewhat ad hoc. The risk management application is inconsistent and scattered.

Conclusion

The risk maturity of the landscape architecture organisation is the lowest level (Level 1), as determined by the risk management maturity model adaptation, according to the study. In light of this circumstance, it is imperative to elevate the risk maturity level to enhance the risk management application of the landscape architecture organisation. Organisations must revise their risk culture, process, experience, and application to increase their current level of risk maturity. To improve the risk culture, it is recommended that top-down commitment to the risk management application, leadership by example, and proactive practices be implemented. To accelerate the risk process, it is recommended that formal risk management be implemented to implement risk-based project processes, regular updates, and enhancements to the risk process. To improve the risk experience, organisations should execute regular training and learn from past project experiences to increase risk awareness and knowledge. Finally, risk management is pertinent to all project activities, reporting, and decision-making when appropriate tools and techniques are implemented. This study's main contributions lie in extending risk maturity assessment into the underexplored field of landscape architecture, providing both theoretical insights and practical governance recommendations. However, the findings are limited by the qualitative scope and geographic focus on Klang Valley, which future research could expand through larger quantitative surveys and cross-country comparisons.

The risk management maturity study enables landscape architecture organisations to evaluate their risk capacity against the four levels of the maturity standard. Consequently, they can evaluate their risk management practices to diagnose their current state and subsequently implement targeted strategies for future enhancements. It applies to projects due to its reliability and efficacy at each stage of the project lifecycle. The risk maturity of the landscape architecture organisation is substantiated in this section by the limited data available. A comprehensive justification of the risk maturity of landscape architecture organisations is recommended for future research, which should also examine how digital tools, sustainability frameworks, and collaborative governance could accelerate risk maturity progression in the Malaysian context.

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