**ISYS5001 Business Project Management**

# 

**Project Management: Assessing Risk Encroachment and Control for Project Success**

**Adam Yuflindra Patmawidjaja #19014854**

**Curtin University**

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# **Executive Summary**

This research report aims to provide a detailed literature review on project risks and risk management based on theories from numerous sources and author’s own testimonials.

Addressing the research analysis by primarily describing project management (PM) and the risks involved. PM and project risk in general are defined by responding to many aspects such as agriculture, architecture, transport, business, and information systems. A range of factors involved within a project that contribute to and generate risk are addressed to get a surface-to-root level review on project risk. In acknowledgement of recent advancements, risk management and prevention will be explored in several perspectives, essentially on contemporary product development and information systems projects. Various tools are utilised for risk management from traditional to the modern tools that are used today. Risk management comes with their significance, but it is necessary to outline the cost that comes with them. An overall review will be conducted in a discussion and recommendation space provided in sections. Discussion space will be reflected upon literature standpoints in response to a particular theory discussed per section. Recommendation will reflect upon the author’s view regarding standpoints from discussion and the background topic at hand.

This report also highlights all the literature involved to define the scope of review and their importance regarding the authors. Also, it is important to acknowledge that this paper carries itself some limitations which are highlighted by the scope of review section. Furthermore, an additional section for reflection is also provided to give readers a personal view on significance and challenges that the author has experienced throughout the report writing process. Overall, this paper aims to prospect elements of risk management for projects in general for the readers including the components, disparities, processes, significance, limitations, and relationships.

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# **1. Introduction**

Conceptually, the basics of achieving, obtaining, or creating something through an intended plan of action can be referred to a project ([Manjo 2021](#_ENREF_6)). Plainly, any kind of undertaking carried out with a plan can simply be a project. There is almost no definite global consensus on the term ‘project,’ but undeniably it can be established that it must encompass the following factors: (1) a set of quantitative and qualitative objectives, (2) a unique set of activities so complex dictating a managerial ultimatum, and (3) has a beginning and an end ([Tereso et al. 2019](#_ENREF_16)). Thereby, introducing PM, a process encompassing wide range of initiatives, from simple library projects to complex construction or information systems undertakings.

Although, the initial implications of its solitary-focused characteristics barely cover the beginning as the real world covers a much bigger scope on multiple projects that are “multidisciplinary and not pre-defined,” referring to significant factors, risk components including control and conflict ([Tereso et al. 2019, 8](#_ENREF_16)). On that note, the need for a standardisation is realised which resulted in the founding of Project Management Institute or PMI in 1969, a not-for-profit organisation aiming to promote and expand knowledge in the PM field ([PMI 2021](#_ENREF_13)). Spearheading the international PM knowledge expansion, PMI benchmarked the global standards for PM in their book known as the Project Management Body of Knowledge or PMBOK.

Given the multifaceted nature of real-world projects and the increasingly complex modern business environments, effective risk management becomes a critical component of a successful project ([Olga and Serhiy 2023, 46](#_ENREF_9)). While the PMBOK provides an insight on PM and its framework in depth, the term ‘risk’ is subsequently associated by the guideline in many aspects and phases of a project to which recognising it as vital ([PMI 2021](#_ENREF_13)). By understanding and proactively addressing potential risks, project managers can enhance outcomes, minimise disruptions, and achieve project success ([Olga and Serhiy 2023](#_ENREF_9)). Thus, the following sections will explore key risk management principles, tools, and strategies as well as its traditional and modern real world applications.

# **2. Scope of Literature Review**

This section aims to provision various points representing the objectives, prospect, and scope of this paper. Points followed will also provision a table which encompass the databases and articles that were accounted for in this research report in respect to the theories and standpoints of each literature’s author(s).

## **2.1. Scope Enhanced**

This paper is written for the purpose of prospecting the following points in the pursuit of understanding risk management for projects in general:

* What are the risks involved in traditional and modern PM? This paper will explore six distinct types of project risks across various industries, including private organisations, construction, academic libraries, healthcare services, and the emerging challenges of information systems and new product development.
* How to prevent and manage risk in general, especially in Information Systems and New Product Development projects? Explain relevant traditional and modern methods and tools.
* Explore the benefits and drawbacks of risk management in PM.

The review encompasses research articles published within the last 5 years and books within the last 10 years to be in conjunction with the recent developments in technology and job market. To that extent, a comparative review can be achieved. Primary focus of the review will be drawn on theories from researchers around the world and appropriately based on unique projects such as academic libraries, construction, businesses, information systems, and product development. Therefore, this paper may or may not be able to provide the most ideal rationale for risk management in general due to the following limitations:

* Literature review is limited to a specific word count which limits the basis for exploration behind some ideologies of project and risk management.
* The author’s recommendations are limited to only base towards up to twenty literatures of unique areas and industries
* The paper is primarily focused on risk management in general, despite the need to specifically address the IT and product development sectors.

To provide an expectation of what to bring out of this research, provided in [section 2.2](#_2.2._Table_for) will be a table that list down all the literatures and books that were gathered to craft this report. The table is provided by the author and embedded alongside will be both the Journal Titles and the Databases in which the research was mostly gathered from.

## **2.2. Table for Scope of Literature Review – prepared by Adam Patmawidjaja**

|  |  |  |
| --- | --- | --- |
| **Keywords** | **Databases** | **Journal Name** |
| Project Management | ResearchGate, ScienceDirect | The Journal of Academic Librarianship |
| Project Management Journal |
| International Journal of Social Science Research and Review |
| Private Organisation Project Risk | SAGE Journals | Project Management Journal |
| Academic Libraries Project Risk | Science Direct | The Journal to Academic Librarianship |
| Academic Libraries Project Risk | ScienceDirect | The Journal to Academic Librarianship |
| Chat-GPT PM and RM | ScienceDirect | Engineering, Construction, and Architectural Management |
| Project Risks | ResearchGate | Visegrad Journal on Human Rights |
| Construction Project Risk | Indian Journal of Applied Research |
| Healthcare Services Project Risk | Journal of Law and Sustainable Development |
| Large-scale IS Project Risk | EAI Endorsed Transactions on Scalable Information Systems |
| IS Project Risk Management | EAI Endorsed Transactions on Scalable Information Systems |
| NPD Project Risk and Management | Technology Analysis and Strategic Management |
| Scientific Programming |
| Risk Management | journal of Project Management |
| Engineering Management in Production and Services |
| Goal Analysis | Journal of Law and Sustainable Development |
| Modern RM Tool and Proactive Anticipation | Visegrad Journal on Human Rights |
| RM Value Generation | Sustainability |
| Human Fallacies of RM | Cutter IT Journal |

# **3. Project Management: Risk Management**

To effectively grasp the relationship between risk and project, we must first establish a solid foundation in the core elements of Project Management (PM) and Risk Management (RM). Later, followed by the assessment of real world applications, cost-benefit, and prospects of risk management, this section will spearhead the basis of RM’s importance in PM.

## **3.1 What is Project Management?**

There are many components behind the concept of the project, and these are barely controllable without any measures of management, especially other factors involved. Thus, the following sections will first explore the idea of projects and why effective management is required.

#### **3.1.1 Project Management Retrospective**

Formally defined as Project Management (PM) provides the knowledge, skills, tools, and techniques to govern over a variety of projects in the pursuit of achieving the undertakings ([Prosser 2024](#_ENREF_14)). By a variety of projects, PM is used in diverse industries, including construction, manufacturing, software, and product development, or even farming. These are sectors where most complex undertakings are involved, and the utilisation of project management have proven to result in more efficient work and cost-savings ([Prosser 2024](#_ENREF_14)). Nevertheless, these are still problematic due to many other factors surrounding project management itself such as people, expectations, and even the process itself ([Tereso et al. 2019](#_ENREF_16)).

#### **3.1.2 Project Management Phased**

Thence, the ‘best practices’ discipline to PM was published by the PMI in the United States which became a benchmark towards the global PM processes ([Tereso et al. 2019](#_ENREF_16)). In the pursuit of satisfying the three components of project, PMI classifies PM processes into five phases: 1) Initiation, 2) planning, 3) execution, 4) controlling, and 5) closing processes ([PMI 2021](#_ENREF_13)). These are phases that occur throughout a beginning and an end of a project by order, reinforcing the fundamental concept in which these processes operate in a closed loop ([M.G and M.L 2024](#_ENREF_4)). The planning phase after a project is initiated provides a conceptual framework for the execution to be carried out, and eventually requires some form of quality assurance to successfully achieve targets as it closes ([M.G and M.L 2024](#_ENREF_4)).

#### **3.1.3 Project Management in Distinct and Risk**

PM is unique towards the sectors that it is applied in, nonetheless it is not the processes that characterise their uniqueness, but the risks presented in each of these sectors ([Prosser 2024](#_ENREF_14)). Explored by six different literatures in [subsections 3.2.2](#_3.2.2._Risk_in), cost-budget in construction, human resources in library projects, ever-evolving structure in healthcare services, cybersecurity in information systems, or unfair competition in product development. Meanwhile, regardless of the risks involved in each sector, the PM processes are within the baseline of PMBOK theories and guidelines. Thence, it is necessary to identify the clarity behind these risks and the processes which shaped these unique PM processes.

## **3.2. Project Risk and Risk Management**

Described in [section 3.1.3](#_3.1.3_Project_Management), risk is inherent. An unavoidable essence which defines its importance towards PM in the sense that it contributes towards another form of management. Hence, by examining this nature of risk, its potential forms, and its crucial role in project success, this section aims to provide a comprehensive understanding of RM principles and techniques.

### **3.2.1. Risk in Projects**

Naturally, risks are uniquely present in all organisations, and these are usually referred to the uncertainty or condition that when occurred, would result in either a positive or negative effect towards one or more objectives as it generates ambiguity ([PMI 2019](#_ENREF_12)). Thence, it is recognised that one main factor to determine risks is ambiguity where the lower the ambiguity, the more information is available to which allows the identification of risks ([PMI 2019](#_ENREF_12)). Given the severity in their impact towards objectives, these risk factors served as primary drivers for RM initiatives ([PMI 2019](#_ENREF_12)). These initiatives focused on establishing optimal PM phases, determining the frequency of iterations, and defining the interdependencies among various PM processes ([PMI 2019](#_ENREF_12)). While projects may encounter different risks at various stages, the specific strategies needed for effective risk mitigation can differ significantly based on project factors ([Olga and Serhiy 2023, 46](#_ENREF_9)). Hence, [section 3.2.2](#_3.2.2._Risk_in) enlightens this disparity.

### **3.2.2. Risk in Projects in Depth**

To support [section 3.2.1](#_3.2.1._Risk_in), it is bound to explore various sectors of industries that pose unique risks which are represented by the ambiguity over their operational focuses.

#### **3.2.2.1. Risk in Private Organisations**

Unlike technical or medical sectors, private organisations usually rely heavily on its people for daily operations, making project and RM a core process for its robustness ([Tereso et al. 2019](#_ENREF_16)). Hence, it is likely for labour-associated complications to arise, specifically resembling culture ([Tereso et al. 2019](#_ENREF_16)). In that extent, without any form of management to properly address this risk, it is unlikely that any projects would be effectively executed.

#### **3.2.2.2. Risk in Construction Projects**

The construction industry relies heavily on heavy machineries and special resources which usually total to more than millions of dollars ([Malek 2013](#_ENREF_5)). In addition, there are other uncertainties relevant to its operations which also cost as much such as weather or even something as complex as technical feasibility ([Malek 2013](#_ENREF_5)). Malek ([2013](#_ENREF_5)) presented a cost-budgetary analysis which showed how cost-budgeting have a positive relationship to confidence level in construction projects. This implies the more cost is induced in construction PM, the lesser the risk, and vice versa.

#### **3.2.2.3. Risk in Library Projects**

It was believed that something as simple as academic libraries does not have the need to apply PM techniques ([Prosser 2024](#_ENREF_14)). However, its resource limitations say otherwise as most librarians are hardly professionally trained nor offered with any advanced tools to perform in their tasks ([Prosser 2024](#_ENREF_14)). Ergo, unprepared for any larger scale operations such as database amplification or something as complex as tracing borrowed books at massive scale ([Prosser 2024](#_ENREF_14)). Even such a simple factor shows an ambiguity in which to represent risk, proving that risk and PM is ubiquitous in academic libraries.

#### **3.2.2.4. Risk in Healthcare Services**

The healthcare sector is one of the most complex out there as they must go in parallel with the population’s well-being, progressive technological advancement, and ever-changing policies ([Misirlioglu and Murt 2024](#_ENREF_7)). Thus, the success of its PM requires more proactive strategies and careful evaluations as compared to other sectors in the pursuit of keeping these challenges at bay by balancing the ambiguity ([Misirlioglu and Murt 2024](#_ENREF_7)). It would be unfeasible to have the luxury of a one-handed and straightforward process in the healthcare sector as both regulations and people’s lives are involved ([Misirlioglu and Murt 2024](#_ENREF_7)). Through a careful goal analysis, it is bound for healthcare services to go through intensive and sophisticated RM that is catered to both the problem and stakeholders ([Misirlioglu and Murt 2024](#_ENREF_7)).

#### **3.2.2.5. Modern Risk: Information Systems**

Information systems projects are heavily linked to both physical and cybersecurity-related problems such as cyber-attacks, infrastructure damages, and limited resources ([Castillo-Ñopo et al. 2023](#_ENREF_1)). Simultaneously, there are different phases towards systems development defined as the Systems Development Life Cycle (SDLC) representing processes that essentially carries through in parallel with the different phases of PM ([Castillo-Ñopo et al. 2023](#_ENREF_1)). Considering the complexity in trying to counterbalance both elements, RM takes a preeminent role to generate successful outcomes through careful goal-risk analysis ([Castillo-Ñopo et al. 2023](#_ENREF_1)). Proactive RM practices, coupled with ongoing goal evaluation, can significantly enhance the feasibility and success of information systems projects.

#### **3.2.2.6. Modern Risk: New Product Developments (NPD)**

In developmental areas where uncertainty becomes the core driving force behind its success, risk becomes the key indicator towards its performance. This is seen from how New Product Development takes a positive outlook on uncertainty which represents constant opportunities based on a regression analysis by Peljhan and Marc ([2021](#_ENREF_11)). Regression analysis shows how risk and development success based on many variables obeys a positive relationship ([Peljhan and Marca 2021](#_ENREF_11)). This signifies that the more the risk, the more likely it is to be successful, hence implying the prerequisite for effective RM procedures ([Peljhan and Marca 2021](#_ENREF_11)). It is realised that new product development relies heavily on uncertainty as project success goes in parallel with risk tolerance, thus

### **3.2.3. Risk Management**

Emphasising on the [subsections of 3.2.2](#_3.2.2._Risk_in), RM is a substantial aspect for PM success regardless of the risk composition. The disparity of sectors and industries do separate the ambiguity representing their risks as their processes differ. Nonetheless, RM in all sectors and industries share the same definition, a concept involving risk mitigation, detection, identification, analysis, and conclusion in the pursuit of achieving project’s success. Overall, RM ‘in general’ is rather widespread since when there is ambiguity, regardless how insignificant, there are risks required to be managed thoroughly.

Moreover, by observing the previously discussed [subsections 3.2.2](#_3.2.2._Risk_in) regarding risks in widespread projects, it is bound to spot various methods utilised in determining risk factors and variables. Effective RM typically involves a structured eight-step approach to mitigate risks for project’s success ([Selvakumar et al. 2024](#_ENREF_15)):

1. Identify potential risks
2. Assess the significance of risk management (RM)
3. Develop a risk plan
4. Monitor and adjust mitigation measures
5. Evaluate the impact of mitigation measures
6. Consult stakeholders regarding risk tolerance
7. Implement risk control measures
8. Ensure effective implementation of procedures

Project’s success is defined with not just the result and stakeholder’s satisfaction, but also the preparedness ahead of the future (Urbański, Haque, and Oino 2019). As project risk is associated with all phases of PM, RM becomes inevitable in the pursuit of project success, facing the uncertain future (Urbański, Haque, and Oino 2019). Nonetheless, as risk disparity persists in different projects, it is bound for the process to be conducted by tools developed for specific occasions in support of the [subsections 3.2.2](#_3.2.2._Risk_in).

## **3.3. Risk Management Tools**

[Section 3.2](#_3.2._Project_Risk) has explored how RM is obligatory in PM in the pursuit of project’s success. It is a task that should not be done separately, but in parallel with other PM functions ([Olga and Serhiy 2023](#_ENREF_9)). [Subsections 3.2.2](#_3.2.2._Risk_in) highlighted while risk management approaches may vary across different projects, the underlying definitions and procedures remain consistent. However, the specific tools used often differ based on project factors and stakeholder expectations. This section will explore some commonly used risk management tools.

### **3.3.1. Traditional Approach: Goal Analysis**

Goals represent the desired outcomes or achievements we aim to attain by the conclusion of a given endeavour ([Misirlioglu and Murt 2024](#_ENREF_7)). According to the PMBOK guidelines, every project must have a purpose, essentially a goal to be achieved throughout the start and the end ([PMI 2021](#_ENREF_13)). However, each phase inhabits different risks, requiring a methodological approach to identify these uncertainties and strategise the appropriate resolution to reach a desired future outcome ([Misirlioglu and Murt 2024, 13](#_ENREF_7)). Then, goal analysis is established in PM for turning these negative uncertainties directly from the existing risks into positive achievements ([Misirlioglu and Murt 2024](#_ENREF_7)). There are three steps to be considered to achieve this purpose ([Misirlioglu and Murt 2024, 13-14](#_ENREF_7)):

1. Defining the state expected to be achieved in the future.
2. Determine, prioritise, and assess whether the goals are attainable considering the problems at hand.
3. Conclude the Means-Ends relationship; a means must derive a goal directly.

Its definition reflects the phase of risk identification, but there are also occasions in which this tool is leveraged in other phases by looking at [subsections 3.2.2](#_3.2.2._Risk_in). [Section 3.2.2.5](#_3.2.2.5_Modern_Risk) highlighted the systematic application of goal analysis in the IS project to ensure alignment throughout the project's lifecycle, encompassing PM phases and levels of complexity. This comprehensive approach effectively addressed RM at every stage, including identification, analysis, assessment, and control.

### **3.3.2. A More Futuristic Approach in New Product Development**

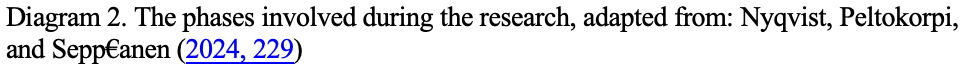
Previous subsections have briefly explored through some tools that have been traditionally used in both project and RM activities. Nonetheless, considering the rapidly innovating landscape, the question of cost efficiency, development, implementation, and success of projects becomes more crucial ([Olga and Serhiy 2023, 45](#_ENREF_9)). Consequently, more recent developments on risk components followed through such as insurance, risk financing, or diversification in all aspects, elevating the complexity already attached ([Olga and Serhiy 2023, 45](#_ENREF_9)). Subsequently, more intricate tools are developed such as Artificial Intelligence (AI), VR, and something as complex as BlockChain ([Nyqvist, Peltokorpi, and Sepp€anen 2024](#_ENREF_8)). To maintain focus, this research will concentrate on the innovative application of the AI, ChatGPT, as a representative example of contemporary trends in new product development ([Nyqvist, Peltokorpi, and Sepp€anen 2024](#_ENREF_8)).

Considering these challenges, the emergence of artificial intelligence has brought upon a new light to PM ([Nyqvist, Peltokorpi, and Sepp€anen 2024](#_ENREF_8)). A pivotal aspect of PM, RM, becomes more accessible regardless of data complexity, quality, or risk factors, as AI can assume the following responsibilities ([Nyqvist, Peltokorpi, and Sepp€anen 2024, 234](#_ENREF_8)):

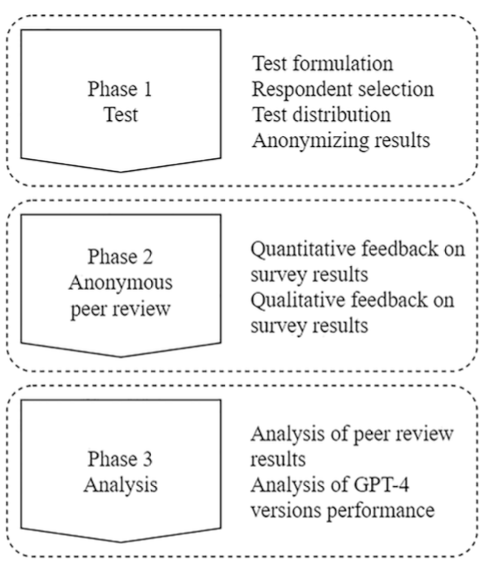
* Risk management (RM)
* Quantitative and qualitative analysis
* Quality feedback on results
* Conclude solutions and improvements

The points represent the function of one of the most successful emerging AI tools used out there by the public, Chat-GPT. This was a case study done by Nyqvist, Peltokorpi, and Sepp€anen ([2024](#_ENREF_8)) on Chat-GPT when applied to RM in construction projects. Based on a comparative analysis between the AI tool and humans, it was found that Chat-GPT was able to provide a more accurate result in the overall RM process, shown in diagram 1.

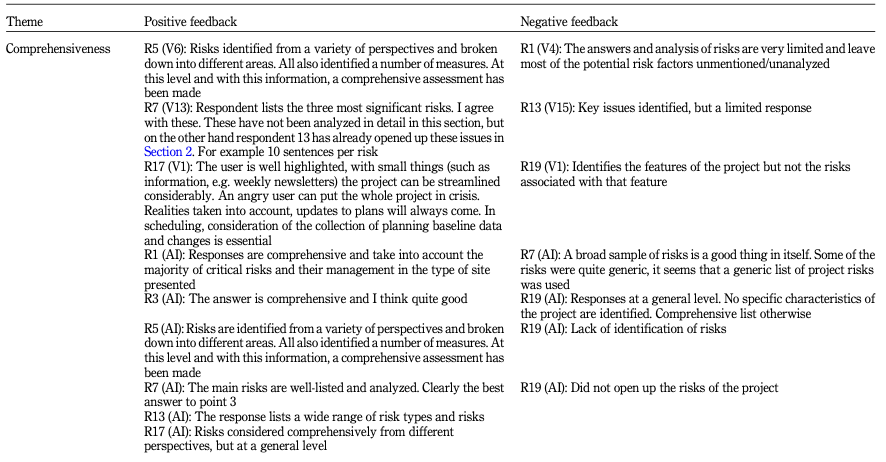
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In the effort to assess how Chat-GPT works in project RM and the thought process behind the AI implementation, diagram 2 will acknowledge the phases involved in the research by Nyqvist, Peltokorpi, and Sepp€anen ([2024](#_ENREF_8)). Additionally, showing results in diagram 3 which Chat-GPT was employed for qualitative analysis.

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Diagrams 1, 2, and 3 provided a brief contextual information of how Chat-GPT could be applicable in sophisticated RM. This tool could prove an effective solution to contest this nature and promote more effective and efficient new product developments.

## **3.4. Risk Management Supremacy**

RM is purely generated in response towards risks, creating some of the tools listed in [section 3.3](#_3.4._Risk_Management), necessary to carry out this process. Hence, naturally it carries its own advantages. Sections [3.2](#_3.2._Project_Risk) and [3.3](#_3.4._Risk_Management) have investigated the justification of RM as an essential component for projects and projects’ success. These justifications naturally carry some common advantages shared amongst the disparity of projects which will be discussed in the following subsections.

### **3.4.1. Proactive Anticipation Against Uncertainties**

In this prospect, [subsections 3.2.2](#_3.2.2._Risk_in) have provided some common examples of how RM can be proven significant for projects in general. Traditionally, healthcare service projects employ RM for responding to the endless development of technology, policies, and well-being as well as construction projects with their costs. Then, looking at the more modern such as information systems and newer product development projects, risks have become more sophisticated to the point that compensatory supports are compulsory. Thus, the need of tools such as the use of AI arises in which functions have been explored by [section 3.3.2](#_3.3.2._A_More). Signifying that RM plays an integral part in many aspects of PM including planning, development, and implementation through its corrective measures on forecasted factors ([Olga and Serhiy 2023, 49](#_ENREF_9)).

### **3.4.2. A Cost-effective Function of Project Management**

[Subsections 3.2.2](#_3.2.2._Risk_in) presented various projects, each equipped with their own risk management applications. Risk management is exorbitant as risk is a collection of problems, stakeholder expectations, and uncertainties, but irrespectively value generated will outweigh the costs ([Testorelli, Tiso, and Verbano 2024](#_ENREF_17)). Testorelli, Tiso, and Verbano ([2024](#_ENREF_17)) created a holistic framework emphasising the significance of RM in critical aspects of PM including customer, company, project itself, business ecosystem, and the society. Contextually, risk management will always be costly in project management considering the previously mentioned aspects to be considered ([Testorelli, Tiso, and Verbano 2024](#_ENREF_17)). However, systematically, it will forever be a relevant best practice in project management through both economic and intangible benefits as the empirical analysis by Testorelli, Tiso, and Verbano ([2024](#_ENREF_17)) expressed how RM was able to effectively satisfy most aspects of PM. RM may be a luxury, but it is certainly indispensable for an effective PM.

## **3.5. Risk Management Pitfalls**

However, there are times when managers decide to either ignore or fail to respond to these risks entirely throughout PM, referring to the theory of human fallibility ([Kutsch and Ward 2012, 34](#_ENREF_3)). Additionally, briefly explored by [subsections 3.2.2](#_3.2.2._Risk_in), despite its importance, cost can be a considerable burden in RM, contributing to its limitations of fallacies.

### **3.5.1. Fallacies of Modern Risk Management**

Kutsch and Ward ([2023, 34](#_ENREF_1)) identified three reasons behind the fallacies of RM in the modern age: 1) fallacy of fiction, 2) fallacy of control, and 3) fallacy of taboo. Behind these fallacies, there are RM standards already inhabited, although as humans are the control factor, these fallacies tend to arise naturally ([Kutsch and Ward 2012](#_ENREF_3)). The idea of fiction refers to something that has not happened yet, reflecting the idea of negligence based on false confidence as risk has yet occurred ([Kutsch and Ward 2012](#_ENREF_3)). On the contrary, sometimes there are times when limited resources become not just the risk itself, but also a contributor towards these fallacies, could be referred to library projects in [section 3.2.2.3](#_3.2.2.3._Risk_in). The fallacy of control takes over when managers believe that a particular risk has gone out of control, thus ignoring any prospect of RM ([Kutsch and Ward 2012](#_ENREF_3)). Lastly, humans naturally inhabit an egoistic nature which tends to take control, reflected in the fallacy of taboo ([Kutsch and Ward 2012](#_ENREF_3)). When a particular RM procedure becomes too overpowering in a company’s culture, this could prevent them from proactively acknowledging newer risks due to ‘taboo’, rendering the procedure redundant ([Kutsch and Ward 2012](#_ENREF_3)). RM is truly crucial, but upon ineffective control and response, creating fallacies, it would just be redundant towards PM success.

### **3.5.2. A Cost-inefficient Function of Project Management**

Risk management can be costly, especially in sophisticated sectors such as construction, healthcare, and information systems explored by [subsections 3.2.2](#_3.2.2._Risk_in). This ongoing nature of risk management can also contribute to increased expenses over time which can be proven in another sector similar to construction such as residential projects ([Patel et al. 2024](#_ENREF_10)). Based on an analysis by Patel et al. ([2023](#_ENREF_1)), cost-overruns takes over the third position in risk index, alongside life-threatening risk and stakeholders’ expectations. Then, similarly to IS projects, IT projects must monitor their physical threats, along with cyber-attacks and investor demands. ([Selvakumar et al. 2024](#_ENREF_15)). While risk management can be a valuable tool, it's important to consider its potential impact on revenue generation. As risks evolve and become more complex, organizations may need to allocate additional resources to effectively manage them.

## **3.6. Risk Management in Action**

In the pursuit of answering one of the points of prospect outlined by [section 2.1](#_2.1._Scope_Enhanced), it is almost a certainty that a further expansion on [section 3.2.2.5](#_3.2.2.5_Risk_in) and [3.2.2.6](#_3.2.2.6_Risk_in) is mandatory. While it was acknowledged by section [3.2.2](#_3.2.2._Risk_in) and [3.2.3](#_3.2.3._Risk_Management) that RM is essential in many projects, we need to consider the continuously developing social economy and technology relevant to present-day circumstances. Thence, allowing the following sections to theoretically and practically expand more on NPD and IT projects, specifically on RM.

### **3.6.1.** **Risk Management in Information Systems Projects**

[Section 3.2.2.5](#_3.2.2.5_Risk_in) has shown how RM is necessary for information systems (IS) projects. In this ever-developing environment, IS projects have ever so slightly become more relevant in respect to the digital transformation age ([Choquehuanca-Sánchez et al. 2024](#_ENREF_2)). Moreover, as operations become more sophisticated, in the effort of mitigating scepticism, automation takes over in various aspects, especially PM ([Choquehuanca-Sánchez et al. 2024](#_ENREF_2)). Hence, various modern tools are utilised to complement these sophisticated responsibilities, such as predictive analysis and virtual assistants for regular IT-IS projects, or automation and machine learning for large-scale IS projects ([Choquehuanca-Sánchez et al. 2024](#_ENREF_2); [Castillo-Ñopo et al. 2023](#_ENREF_1)). Yet, despite these reforms, uncertainties will constantly change and develop to no end, posing a question of whether RM will ever remain relevant.

### **3.6.2. Risk Management in NPD**

With the constant development of the social economy, the innovation in information transmissions and mobile terminal technology have spawned many business opportunities in the market ([Zheng 2021, 1](#_ENREF_19)). As a result, increasingly sophisticated issues arises on top of the already limited resource problem such as quality control, predatory pricing, and many more ([Zheng 2021](#_ENREF_19)). Taking an example of new cosmetic product development research by Zheng ([2023](#_ENREF_1)), RM took the form of scientific computing as its quantitative analysis tool. A tool similar to machine learning, but optimised for scientific substances such as fragrances, is capable of doing complex calculations which humans can barely do within a short-time ([Zheng 2021](#_ENREF_19)). While this phenomenon is currently observed within the cosmetics industry, it is likely that even more sophisticated tools are being employed in more complex sectors, marking the need for rapid and ongoing development to address increasingly intricate challenges.

# **4. Discussion**

The following discussion will delve deeper into the key themes explored in the background section, reinforcing the significance of RM in project management. This section will primarily highlight the core findings and insights derived from the literature reviewed for this report.

## **4.1. Project and Management Examined**

Primarily, the paper sought to explore the basis behind projects and effective management in [section 3.1](#_3.1_What_is). Further bolstered by [section 3.1.1](#_3.1.1_Project_Management), projects require effective management, especially as they vary among different sectors, and it involved many factors including risk, conflict, or stakeholders. This is necessary as there are many other factors that exist in PM that are just as important as risks. It is found in [section 3.1.2](#_3.1.2_Project_Management) that PM goes through different phases, then implications of risks as crucial factors began to emerge in [3.1.3](#_3.1.3_Project_Management).

## **4.2. Project and Risks Relationship**

It became evident that risk factors are crucial towards PM approaching [sections 3.2.1](#_3.2.1._Risk_in) and [3.2.2](#_3.2.2._Risk_in). Six examples of different projects were shown by [subsections 3.2.2](#_3.2.2._Risk_in) to reinforce the importance of risk in PM and its complexity. In respect to the complexity of risk, the paper introduced the basis behind risks and effective management throughout PM in [section 3.2.3](#_3.2.3._Risk_Management). To fully comprehend the complexity of this process, it is essential to explore the traditional and modern approaches to the effective RM compound.

## **4.3. Project and Effective Management**

Thence, [section 3.3](#_3.4._Risk_Management) elevates the discussion through analysis and assessment of various tools utilised for real world RM practices. In the effort to encompass the scope of this paper, there were two approaches discussed in the subsections. [Section 3.3.1](#_3.3.1._Traditional_Approach:) mainly observed some common tools used in customary RM, essentially the standard methods such as goal analysis and cost-benefit analysis. Then, to gauge relevance, [section 3.3.2](#_3.3.2._A_More) highlighted some of the contemporary and upcoming tools, specifically AI such as Chat-GPT. Essentially, as we explored through a myriad of RM functions, it would be natural to reinforce its significance.

## **4.4. Risk Management is Exorbitant, yet Important**

RM is a valuable tool for project success, but not without its challenges. Under the suggestions of [subsections 3.4](#_3.4._Risk_Management_1) and [3.5](#_3.5._Risk_Management), while it can help identify and mitigate potential threats effectively, it may also require significant resources and can be costly. Additionally, human factors such as fallacies can hinder effective RM. To maximise the benefits of RM, organisations should be aware of these potential drawbacks and take steps to address them.

## **4.5. Contemporary and Future Projects**

Ultimately, it is bound to discuss risk in the present-day in which [section 3.6](#_3.6._Risk_Management) suggests that RM has ever so slightly become more sophisticated. By observing two noteworthy sectors, IS and NPD projects, we encountered real-world applications of modern risk and effective management. Empowering subsection 3.5 in the application of modern tool in present-day’s RM.

## **4.6. Project Risk Management: Unexpected Findings**

While project management is quite standard as most projects referred to the PMBOK guidelines, I find it surprising that there are projects whose success relies on risks and those who rely on how much they can invest in mitigation. As a data analytics scholar, I believe in the idea that ambiguity produces uncertainty as discussed in [section 3.2.1](#_3.2.1._Risk_in). Thus, this was one of the most outrageous findings throughout my research.

Additionally, the knowledge I have gained in how AI can be implemented for PM is quite astonishing. Even though it may be ineffective for qualitative methods, it is a superb addition to quantitative methods of RM. This complementary feature is something that needs to constantly be spotlighted.

# **5. Recommendations**

So far, this paper has explored some key terms and theories which were gathered based on research articles gathered from various databases. The literature was specifically gathered by the author in the pursuit of crafting a storyline that has generated this research report. Nonetheless, it is bound to have a section that empowers the author’s own opinions and perspective regarding some of the theories written in this report. The following subsections will list some points of recommendation based on the author's opinions and perspective regarding some sections of the paper.

## **5.1. Project Risk Management**

Sections 3.1 to 3.3 were mainly developed to achieve the following goals:

* Reinforce the need for effective management in projects
* Realise the relationship between risk and projects
* Brief evidence of risks and risk management (RM)
* Addressing essential customary and contemporary tools

By satisfying those points, section 3.4 and 3.5 is fully backed up and readily appraised. Even though RM is very costly and inefficient, it is actually very effective in the long-term in both cost and operational elements. Once a proactive RM approach is established, organisations can often rely on existing systems to address challenges effectively, minimising the need for additional mitigation investments.

## **5.2. Risk Management in Modern Sectors**

It is important to understand the relationship between project and risks in present-day circumstances. Purposefully, the scope of this paper must cover information systems and new product development projects where more up-to-date and sophisticated risks exist.

Most products and services nowadays require some form of information systems. However, they do have their own life cycle in which each are also subject to different risks. It was introduced in [section 3.3](#_3.4._Risk_Management) about modern tools that are adopted in response to this complexity.

## **5.3. Approach Future Uncertainties? Or Ignore Them?**

While [subsections 3.6](#_3.6._Risk_Management) explored contemporary and prospective real-world applications, it is prudent to question the enduring relevance of risk management. Given its dynamic nature, it is possible that risk could become excessively burdensome due to factors such as cost or resource constraints. The complexity of risk management systems, particularly in IS and NPD, suggests that it may eventually surpass our capacity to effectively manage. However, as demonstrated throughout [section 3](#_3._Project_Management:), neglecting risks, regardless of their perceived cost or difficulty, is a dangerous proposition. Even seemingly minor risks can have significant consequences, potentially impacting lives or leading to innovative approaches to future risk management.

# **6. Conclusion**

Project management (PM) is a structured process that involves various stages, from beginning to end. Effective management is essential throughout these phases to ensure project success. However, the complexity of PM is significant, as it involves numerous components and functions. One of the most critical factors influencing project success is risk management (RM).

RM is a proactive approach to identifying, assessing, and mitigating potential threats that can jeopardise project outcomes. By effectively managing risks, organisations can enhance project success, minimise disruptions, and achieve their desired objectives. Key considerations for effective RM include proactive identification and assessment of potential risks, tailored risk mitigation strategies, utilisation of appropriate tools and techniques, and continuous monitoring and adjustment of RM plans.

While RM offers numerous benefits, it also has potential drawbacks, such as modern human fallacies and its exorbitant nature. However, the potential benefits of effective RM often outweigh the drawbacks, as it can enhance project success through improved decision-making, planned mitigation, and effectively build overall confidence.

In today's rapidly evolving landscape, RM plays an increasingly complex role in new product development. While modern tools like AI can assist in this process, the uncertainty is likely to continue evolving. As it persists, the importance of RM may fluctuate, but it remains a core function in many sectors.

# **7. Reflection**

Overall, this was a very delightful, yet challenging assignment which enabled students to test their knowledge in both writing and researching. In one aspect, it allowed students to have more freedom in deciding the flow of their report’s story through the headings that they have created based on the professor's expectations. As a story-based format is also expected, students also could improve on their grammar and writing skills as they must relate each of the sections and subsections together instead of answering individual questions.

## **7.1. Bright Personal Experience**

Reinforcing based on my own experience as the writer, I get to express my thoughts freely through a story-based format as I get to craft my own story based entirely on the research I have collected. This assignment allowed me to test and improve my knowledge in report-building skill which I believe would not just be useful in the professional field, but also educational and daily basis, if for instance I were to write my own wedding plan report. Overall, I believe that this assignment was one of those which have easily ticked the boxes from what I have expected from a master’s course.

Moreover, there were also many forms of support provided to me as the writer for this assignment. The professor, Dr. Tomayess, has helped me throughout the structuration of this paper. In addition, Dr. Tomayess had the time to invite Dr. Mahnaz to help us in figuring out the expectations to be set for this assignment. Without these two key supporting components, this assignment would have been like drawing a piece of art out of a blank canvas, but without any topic in hand.

## **7.2. Unexpected Challenges**

Although, there are some challenges which are either visible or not visible within the report itself in terms of quality control due to some circumstances. These challenges which could have been handled through effective ‘RM’ have somehow impacted my thought process throughout the assignment which caused some downturn in quality control. There were three major points:

* There was another assignment unexpectedly to be submitted almost at the same week with a ‘lesser’ duration than this assignment. Whilst I had to also take care of my mother who has come overseas for a visit, planned before submission dates were released while working part-time.
* The word limit of 4,500 and its 10% acceptable limit puts a lot of pressure throughout the writing process of this paper. As I am eager to explore many aspects of PM and RM, this was proven to be a huge challenge towards completing this report swiftly and efficiently.
* I have a high expectation put upon myself to achieve a High-Distinction mark despite the first point being considered which has put a lot of pressure throughout. Although, I believe that I could achieve at least a Distinction mark considering how the professors, Dr. Tomayess and Dr. Mahnaz have helped me throughout the planning phase. Therefore, I shall not be disappointed with the result. God Bless You.

Henceforth, there were many tools that I have used to optimise my writing and thought process throughout the report writing. I employed some AI tools to tailor some words and phrases into a more educationally acceptable format. I have also used google docs to track some grammar and wording problems since Word Docs does not support grammar correction features.

Ultimately, thank you very much for the support throughout this assignment, Dr. Tomayess.

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# **9. Appendix**

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| **Acronyms/Jargons** | **Abbreviations** |
| AI | Artificial Intelligence |
| IS | Information Systems |
| ISO | Internation Standards for Information Security |
| IT | Information Technology |
| NPD | New Product Development |
| PMBOK | Project Management Book of Knowledge |
| PM | Project Management |
| PMI | Project Management Institute |
| RM | Risk Management |
| VR | Virtual Reality |