

Risk Analysis and Strategic Risk Management in Projects

Name: Shalin Narendrabhai Bhakhar

Institution: EIIET

Submission Date: 18 September 2026

Table of Contents

Abstract.....	4
1. Introduction.....	5
2. Literature Review.....	7
2.1 Theoretical Foundations of Project Risk Management.....	7
2.2 Risk Management Standards and Frameworks.....	8
2.3 Behavioural Dimensions of Risk Perception.....	9
2.4 Risk Management Maturity and Organisational Capability.....	9
3. Methodology.....	11
4. Findings.....	13
4.1 Risk Identification.....	13
4.2 Risk Assessment.....	13
4.3 Risk Prioritisation.....	14
4.4 Risk Response Planning.....	14
4.5 Risk Monitoring and Control.....	15
4.6 Tools and Techniques Summary.....	15
4.7 Categories of Project Risk.....	16
5. Discussion.....	18
5.1 Case Selection and Context.....	18
5.2 London 2012 Olympic Games: Effective Risk Management.....	18
5.3 Denver International Airport Baggage System: Risk Management Failure.....	19
5.4 Comparative Analysis.....	20
5.5 Proposed Mitigation Approaches for Resilience and Sustainability.....	21
6. Conclusion.....	23

References.....	24
Appendices.....	26
Appendix A: Sample Risk Register.....	26
Appendix B: Probability–Impact Matrix.....	26

Abstract

Effective project delivery in contemporary organisations depends increasingly on the discipline of risk analysis and strategic risk management. Projects are, by definition, temporary and unique endeavours undertaken under conditions of uncertainty, and this uncertainty exposes organisations to financial, operational, technological, stakeholder-related and external environmental risks that can compromise scope, schedule, cost and quality objectives. This report critically examines the role of risk management within organisational decision-making and project governance, evaluating the core stages of the risk management process: identification, assessment, prioritisation, response planning and monitoring. It reviews widely used tools and techniques, including risk registers, probability-impact matrices, scenario analysis and contingency planning, and situates these within recognised frameworks such as the Project Management Institute's PMBOK Guide and ISO 31000. A comparative case analysis contrasts the London 2012 Olympic Games, frequently cited as an exemplar of proactive risk governance, with the Denver International Airport automated baggage handling system, a widely documented case of risk management failure. Drawing on this comparison, the report proposes a set of practical mitigation strategies intended to strengthen project resilience and the long-term sustainability of project outcomes.

1. Introduction

Projects are the vehicles through which organisations translate strategy into outcomes, yet they are inherently exposed to uncertainty arising from technical complexity, resource constraints, stakeholder expectations and volatile external conditions. Risk, in this context, is best understood not merely as a threat to be avoided but as the effect of uncertainty on project objectives, a definition that captures both the downside exposure of threats and the upside potential of opportunities. The manner in which an organisation identifies, assesses and responds to this uncertainty has a direct bearing on whether a project delivers value within its planned scope, time and cost parameters, or whether it becomes another addition to the long list of high-profile overruns and failures documented in the project management literature.

The importance of risk management has grown in parallel with the increasing complexity of modern projects. Globalised supply chains, rapid technological change, tighter regulatory environments and heightened stakeholder scrutiny have all raised the stakes associated with poor risk governance. Where risk management was once treated as a peripheral, compliance-driven activity performed late in the planning cycle, it is now widely recognised as a strategic capability that should be embedded throughout the project life-cycle and integrated with organisational decision-making at the portfolio, programme and project levels. Organisations that manage risk well are better positioned to protect value, allocate contingency resources efficiently, and make informed go or no-go decisions at key stage gates.

This report has been prepared as a strategic analysis of risk analysis and risk management practice in projects. It begins by reviewing the theoretical foundations of project risk management and the standards that codify current practice, before examining the sequential stages of the risk

management process and the tools and techniques associated with each stage. The report then applies this theoretical grounding to a comparative analysis of two well documented real-world projects, one in which risk management is widely regarded as having contributed to project success, and one in which inadequate risk management is understood to have been a primary driver of project failure. The report concludes with a set of mitigation approaches intended to improve the resilience of project delivery and the sustainability of project outcomes across sectors.

The report is structured as follows. Section 2 presents a literature review of the theoretical and normative foundations of project risk management. Section 3 outlines the methodology used to conduct the analysis. Section 4 presents findings on the stages of the risk management process, the associated tools and techniques, and the principal categories of risk encountered in projects. Section 5 discusses the comparative case analysis and proposes mitigation strategies. Section 6 concludes the report.

2. Literature Review

Project risk management has been studied extensively across the management, engineering and organisational behaviour literatures. This section reviews the theoretical foundations of the discipline, the standards and frameworks that guide current practice, and the behavioural dimensions that influence how risk is perceived and managed in organisational settings.

2.1 Theoretical Foundations of Project Risk Management

Risk management as applied to projects draws on decision theory and probability, treating risk as a function of the likelihood of an event and the magnitude of its consequence on project objectives. Early treatments of project risk framed it narrowly as a threat to be minimised, but contemporary scholarship, reflected in the Project Management Institute's Guide to the Project Management Body of Knowledge, defines risk symmetrically as an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives. This reframing is significant because it positions risk management as a value-creating activity rather than a purely defensive one, encouraging project teams to pursue opportunities as actively as they mitigate threats.

Scholars such as Hillson have argued for the integration of risk management with broader organisational decision-making, proposing that project risk exposure should be considered alongside strategic risk appetite when authorising, funding and prioritising projects within a portfolio. This portfolio-level perspective connects project risk management to corporate governance: boards and senior executives rely on aggregated risk information from individual projects to make capital allocation decisions, and a project's risk profile can materially affect an organisation's overall risk exposure and cost of capital.

2.2 Risk Management Standards and Frameworks

Several standards have codified project risk management practice. The PMBOK Guide dedicates a full knowledge area to project risk management, structured around planning, identification, qualitative and quantitative analysis, response planning, response implementation, and monitoring. The International Organization for Standardization's ISO 31000:2018 provides a generic, principles-based framework for risk management applicable across organisational contexts, emphasising the integration of risk management into governance structures and continual improvement through a plan-do-check-act cycle. PRINCE2 embeds risk management as one of its seven themes, requiring a risk management approach to be defined at project initiation and a risk register to be maintained throughout delivery. Collectively, these frameworks converge on a common process logic, namely that risk must be identified, analysed, prioritised, responded to and monitored on an iterative basis, even though the terminology and level of prescription differ between them.

A recurring theme in the literature is the distinction between qualitative and quantitative risk analysis. Qualitative techniques, such as probability-impact assessment, are valued for their speed and accessibility but are criticised for introducing subjectivity and inconsistency between assessors. Quantitative techniques, including Monte Carlo simulation and expected monetary value analysis, offer greater analytical rigour and support more defensible contingency estimates, but require higher-quality data and specialist skills that are not always available on smaller or less mature projects. Kerzner and other project management scholars argue that a blended approach, using qualitative screening to prioritise the risk register and quantitative modelling for the highest-exposure items, offers the most practical balance between rigour and resource constraints.

2.3 Behavioural Dimensions of Risk Perception

The behavioural economics literature, notably the work of Kahneman and Tversky on prospect theory, demonstrates that individuals and organisations do not evaluate uncertain outcomes in a purely rational manner. Cognitive biases such as optimism bias, where planners systematically underestimate costs and durations, and anchoring, where initial estimates unduly influence subsequent judgements, are widely implicated in project cost and schedule overruns. Flyvbjerg's research into megaproject performance extends this argument, showing that many large infrastructure projects suffer from a persistent pattern of underestimated costs and overestimated benefits, a phenomenon he attributes to a combination of optimism bias and strategic misrepresentation by project sponsors seeking approval. These behavioural insights suggest that technical risk management tools alone are insufficient; organisations must also cultivate a risk-aware culture, incentive structures and governance mechanisms, such as independent reference-class forecasting or external assurance review, that counteract systematic bias in risk judgement.

2.4 Risk Management Maturity and Organisational Capability

A further strand of the literature examines risk management maturity, the degree to which risk processes are formalised, consistently applied and embedded within organisational culture rather than treated as an isolated project-level activity. Maturity models typically describe a progression from ad hoc, reactive risk handling, through defined and documented processes, to a managed and continuously improving state in which risk data informs strategic decision-making across the portfolio. Organisations at higher maturity levels tend to exhibit centralised risk repositories, standardised risk taxonomies that allow risks to be compared across dissimilar projects, and executive-level risk committees that review aggregate exposure rather than relying solely on

individual project managers. Ward and Chapman argue that the language of risk management itself can be limiting, since a narrow focus on identifying and scoring discrete threats can obscure the broader condition of uncertainty affecting a project, and they advocate a shift towards what they term uncertainty management, which considers ambiguity in objectives and stakeholder priorities alongside more conventional event-based risks. This perspective is particularly relevant to strategic decision-making, since senior management is often less interested in a long list of individually scored risks than in a small number of key uncertainties that could materially change the project's overall value proposition.

3. Methodology

This report adopts a qualitative, interpretivist methodology based on a critical review of secondary sources and a comparative case study design. Secondary sources comprise established project management textbooks, peer-reviewed journal articles, international standards documentation and publicly available project reports, post-project reviews and government or regulatory inquiry findings relating to the selected cases. This approach is appropriate given the report's objective, which is to critically evaluate established theory and frameworks against observed practice rather than to generate new primary data.

A comparative case study design was selected because it allows the theoretical risk management process to be examined against two contrasting real-world outcomes, one broadly regarded as a risk management success and one broadly regarded as a risk management failure. Comparative case analysis of this kind is well established in project management research as a means of identifying the practices that differentiate successful risk governance from unsuccessful risk governance, while acknowledging that no single case is fully generalisable and that outcomes are shaped by contextual factors specific to each project's sector, scale and governance environment.

Case selection was guided by three criteria: the availability of substantial, credible documentation in the public domain; the prominence of risk management, whether effective or ineffective, as a widely cited factor in the project's outcome; and sectoral diversity, so that the analysis is not confined to a single industry. On this basis, the London 2012 Olympic Games construction and delivery programme and the Denver International Airport automated baggage handling system were selected as the primary cases for discussion in Section 5. Limitations of this methodology include reliance on secondary and retrospective sources, which may themselves reflect hindsight

bias, and the inherent difficulty of isolating risk management practice from the many other variables that influence project outcomes.

4. Findings

This section presents findings on the core stages of the project risk management process, the tools and techniques used to support each stage, and the principal categories of risk that project teams encounter.

4.1 Risk Identification

Risk identification is the foundational stage of the process, concerned with systematically surfacing uncertain events or conditions that could affect project objectives. Common techniques include structured brainstorming workshops, expert interviews, checklists derived from prior projects, SWOT analysis, and the Delphi technique, in which a panel of experts provides anonymous, iterative input to converge on a consensus view of key risks. A risk breakdown structure, which decomposes risk sources hierarchically by category, such as technical, external, organisational and project management risk, is frequently used alongside these techniques to ensure that identification is comprehensive rather than confined to the risks that are most familiar to the project team. Effective identification depends on the participation of a broad range of stakeholders, since risks that are obvious to operational staff, suppliers or end users are often invisible to project sponsors and planners operating at a more abstract level.

4.2 Risk Assessment

Once identified, risks are assessed to determine their likelihood of occurrence and their potential impact on project objectives. Qualitative assessment typically scores each risk on ordinal scales, such as low, medium and high, for both probability and impact, which are then combined using a probability-impact matrix to produce a relative risk ranking. Quantitative assessment applies

numerical and statistical methods, including expected monetary value analysis, decision tree analysis and Monte Carlo simulation, to model the combined effect of multiple risks on project cost and schedule outcomes, typically producing a probability distribution of possible completion dates or final costs rather than a single-point estimate. Sensitivity analysis, often presented as a tornado diagram, identifies which individual risks or variables have the greatest influence on overall project outcomes, allowing management attention to be focused where it will have the most effect.

4.3 Risk Prioritisation

Because organisations have finite time and resources, identified and assessed risks must be prioritised so that management attention and contingency resources are directed towards the risks of greatest consequence. Prioritisation is typically achieved through the probability-impact matrix, which segments risks into bands, such as low, moderate, high and extreme, and through risk scoring formulae that combine probability and impact into a single weighted value. Some frameworks also incorporate a proximity or urgency dimension, recognising that a lower-impact risk with a near-term trigger date may warrant earlier attention than a higher-impact risk that will not materialise until much later in the project.

4.4 Risk Response Planning

Response planning determines how the project will act on each prioritised risk. For threats, the PMBOK Guide identifies four principal strategies: avoid, where the project changes its plan to eliminate the risk or protect objectives from its impact; transfer, where the financial consequence of the risk is shifted to a third party, for example through insurance or a fixed-price contract; mitigate, where action is taken to reduce the probability or impact of the risk to an acceptable level; and accept, where no proactive action is taken beyond acknowledging the risk, typically reserved

for low-priority risks. A parallel set of strategies, exploit, share, enhance and accept, applies to positive risks or opportunities, reflecting the symmetrical treatment of risk in contemporary frameworks. Contingency planning, which sets aside time and cost reserves to absorb the residual effect of accepted or partially mitigated risks, and fallback planning, which defines a predetermined alternative course of action should a primary response prove ineffective, are widely used complements to these four core strategies.

4.5 Risk Monitoring and Control

Risk monitoring is a continuous activity that tracks identified risks, monitors residual and secondary risks, identifies new risks as the project evolves, and evaluates the effectiveness of the overall risk management process. The risk register serves as the central artefact for this activity, recording each risk's description, category, owner, probability and impact assessment, planned response and current status, and is typically reviewed at regular intervals, such as weekly project meetings and formal stage-gate reviews. Key risk indicators, which are leading metrics designed to provide early warning of an increase in risk exposure, and periodic risk audits, which independently assess the quality of the risk management process itself rather than the risks it has identified, are widely used to strengthen monitoring in more mature organisations.

4.6 Tools and Techniques Summary

In addition to the risk register and probability-impact matrix already discussed, several further tools and techniques are widely applied in practice. Scenario analysis develops a small number of internally consistent narratives, typically a best case, most likely case and worst case, to test the robustness of a project plan against combinations of risk events rather than single risks in isolation. Contingency reserves, whether expressed as a percentage uplift or derived from quantitative

modelling, provide the financial and schedule buffer required to absorb residual risk. Sensitivity and Monte Carlo modelling, discussed above, provide quantitative rigour for high-value or high-complexity projects. Decision trees support structured evaluation of sequential decisions under uncertainty, such as whether to proceed with a pilot phase before committing to full-scale rollout. Finally, lessons-learned repositories and post-project reviews feed observed risk outcomes back into organisational knowledge, supporting the checklists and heuristics used in the identification stage of subsequent projects.

4.7 Categories of Project Risk

Project risks are commonly grouped into categories to support systematic identification and reporting. Financial risks include cost overruns, funding shortfalls, currency and interest rate fluctuations, and inaccurate benefit estimation. Operational risks arise from resourcing constraints, process failures, supplier or contractor performance, and inadequate testing or handover arrangements. Technological risks encompass the use of unproven or immature technology, integration failures between interdependent systems, cybersecurity exposure, and obsolescence during long delivery cycles. Stakeholder risks relate to conflicting objectives among sponsors, users and the wider community, inadequate engagement or communication, and governance or political interference. External environmental risks include regulatory and legal change, macroeconomic conditions, weather and climate-related disruption, and broader geopolitical or public health events, of a kind that can be systematically scanned for using PESTLE analysis.

These categories rarely operate in isolation, and a central finding of this report is that the most damaging project outcomes typically arise from the interaction of risks across categories rather than from any single risk in isolation. A technological risk, such as an unproven system, becomes

substantially more dangerous when it is combined with a schedule risk, such as a fixed and non-negotiable deadline, and a stakeholder or governance risk, such as an organisational culture in which dissenting technical opinion is not escalated to decision-makers. Risk registers and probability-impact matrices, which typically score risks individually, can understate this compounding effect unless project teams also conduct scenario analysis that explicitly models combinations of correlated risks. The comparative case analysis in Section 5 illustrates this interaction directly, showing how technological, schedule and governance risk combined to produce a materially worse outcome than any single category would have produced on its own.

5. Discussion

This section applies the theoretical and process-based findings of Section 4 to two real-world projects, contrasting outcomes associated with effective and ineffective risk management, before proposing mitigation approaches intended to strengthen project resilience.

5.1 Case Selection and Context

Two cases have been selected for comparative analysis. The London 2012 Olympic and Paralympic Games construction and delivery programme is widely cited in the project management literature as an example of disciplined, proactive risk governance applied to an immovable, high-profile deadline. The Denver International Airport automated baggage handling system, delivered in the mid-1990s, is one of the most frequently referenced case studies of project failure attributable substantially to inadequate risk management of a novel and highly interdependent technology.

5.2 London 2012 Olympic Games: Effective Risk Management

The London 2012 construction programme, delivered by the Olympic Delivery Authority through its delivery partner, faced an immovable deadline, a constrained site in East London requiring significant land remediation, and intense public and political scrutiny, factors that individually and collectively created substantial project risk. The programme is widely credited with strong risk governance, including the maintenance of a comprehensive, actively managed risk register that at its peak tracked several thousand individual risks across the construction portfolio, a dedicated and independently funded contingency budget set aside at the outset rather than added defensively as problems emerged, and a clearly defined risk ownership structure that assigned accountability for

each risk to a named individual within the delivery organisation. Regular, structured risk review meetings were embedded into programme governance at both project and portfolio level, allowing risks to be escalated, reprioritised and, where necessary, funded from contingency in a timely and transparent manner. The programme also benefited from early and sustained stakeholder engagement across a large number of interdependent contractors, transport authorities and local communities, reducing the stakeholder risk category identified in Section 4.7. The result was a construction programme substantially delivered on time and within its revised budget envelope, a comparatively rare outcome for a project of this scale, complexity and public visibility, and one that stands in contrast to the cost overruns typically associated with mega-events.

5.3 Denver International Airport Baggage System: Risk Management Failure

The automated baggage handling system commissioned for the new Denver International Airport was intended to be the most advanced integrated baggage system in the world, using a network of destination-coded vehicles to route luggage automatically across the entire airport rather than relying on conventional conveyor-based systems used elsewhere. The system suffered severe technical failures during testing, including vehicles derailing, luggage being misrouted or damaged, and the software proving unable to reliably coordinate thousands of interacting components in real time. These failures delayed the airport's opening by approximately sixteen months and are estimated to have added several hundred million dollars to the project's cost, with the airport ultimately opening using a scaled-back manual and conventional system alongside a much-reduced portion of the automated system. Analysis of the project attributes the failure substantially to inadequate risk management of technological risk: the system's design was unprecedented in scale and had not been piloted or prototyped at comparable complexity before full-scale commitment, integration risk between the software, mechanical and control systems was

not adequately assessed or tested prior to the fixed opening date being publicly committed, and schedule risk introduced by an externally imposed, non-negotiable opening date was not adequately reflected in contingency planning or in a credible fallback option. Stakeholder and governance risk also played a role, as concerns raised by engineers and by the system integrator during testing were reportedly subordinated to political and commercial pressure to maintain the announced opening date.

5.4 Comparative Analysis

The contrast between these two cases illustrates several of the theoretical and process principles reviewed in Sections 2 and 4. Both projects operated under an immovable deadline, yet the London 2012 programme treated this constraint as a driver of more disciplined upfront risk identification and contingency planning, while the Denver programme appears to have treated the deadline as a constraint that risk management had to work around rather than one that should have informed a more conservative technology and scope decision. Both projects involved significant technological and integration risk, yet only the London programme appears to have matched the depth of its risk assessment to the novelty of the risk, reflecting the quantitative-qualitative balance discussed in Section 4.2. Governance also differed markedly: London's clearly owned, actively escalated risk register stands in contrast to reports that risk signals from Denver's engineering and testing teams were not adequately escalated to, or acted upon by, project decision-makers, a pattern consistent with the behavioural biases, including optimism bias and the suppression of unwelcome information under schedule pressure, discussed in Section 2.3. The comparison supports the proposition, advanced throughout the literature reviewed in this report, that risk management effectiveness is determined less by the sophistication of any single tool and more by the extent to

which risk information is permitted to influence real decisions, including, where necessary, the decision to delay a fixed deadline or reduce a project's technical ambition.

5.5 Proposed Mitigation Approaches for Resilience and Sustainability

Drawing on the findings and case comparison above, several mitigation approaches are proposed to strengthen the resilience of project delivery and the sustainability of project outcomes. First, organisations should embed an integrated risk management framework, aligned to a recognised standard such as ISO 31000 or the PMBOK risk knowledge area, that connects project-level risk registers to portfolio and enterprise risk governance, ensuring that project risk information reaches decision-makers with authority to adjust scope, schedule or funding. Second, organisations should invest in a risk-aware culture in which raising and escalating risk is rewarded rather than penalised, directly addressing the governance failure observed in the Denver case, where dissenting technical opinion was reportedly overridden by schedule pressure. Third, novel or unproven technology should be piloted or prototyped at a representative scale before full-scale commitment, with fallback options defined in advance for critical, non-negotiable milestones such as a fixed opening date. Fourth, contingency reserves should be established early, ring-fenced and quantitatively informed, following the London 2012 example, rather than added reactively once problems have already emerged. Fifth, organisations should adopt iterative, agile-style risk reviews, particularly for technologically complex projects, allowing risk assessments to be updated frequently as new information becomes available rather than being fixed at the initiation stage. Finally, sustained stakeholder engagement across the full supplier, contractor and community ecosystem should be treated as a risk mitigation activity in its own right, since many of the risks identified in Section 4.7, across financial, operational, stakeholder and external categories, are amplified when key stakeholders are inadequately informed or consulted. Collectively, these measures are intended not

merely to reduce the probability of individual risk events but to build the broader organisational capacity to detect, escalate and act on risk information under pressure, which the comparative case analysis suggests is the decisive factor differentiating resilient project outcomes from costly failures.

6. Conclusion

This report has examined the role of risk analysis and risk management in project success, situating project risk management within organisational decision-making and reviewing the sequential stages of identification, assessment, prioritisation, response planning and monitoring alongside the principal tools and techniques used to support each stage. The literature reviewed indicates a broad consensus that risk should be treated symmetrically, encompassing both threats and opportunities, and that technical risk management tools must be complemented by attention to organisational culture and behavioural bias if risk information is to translate into effective decisions.

The comparative case analysis of the London 2012 Olympic Games construction programme and the Denver International Airport baggage handling system reinforces this conclusion. Both projects operated under considerable schedule, technological and stakeholder pressure, yet their outcomes diverged sharply, a divergence attributable less to the availability of risk management tools, which were broadly accessible to both projects, than to the extent to which risk information was actively sought, escalated and permitted to influence real project decisions.

The mitigation approaches proposed in this report, spanning integrated governance, risk culture, technology piloting, ring-fenced contingency, iterative review cycles and sustained stakeholder engagement, are offered as practical measures through which organisations can strengthen project resilience and improve the likelihood that project outcomes remain sustainable over the longer term. As projects continue to grow in technological complexity and public visibility, the strategic role of risk management in organisational decision-making is likely to become more, rather than less, central to project and organisational success.

References

- Flyvbjerg, B. (2006). From Nobel Prize to project management: Getting risks right. *Project Management Journal*, 37(3), 5–15.
- Flyvbjerg, B., Bruzelius, N., & Rothengatter, W. (2003). *Megaprojects and risk: An anatomy of ambition*. Cambridge University Press.
- Hillson, D. (2009). *Managing risk in projects*. Gower Publishing.
- Hillson, D., & Simon, P. (2020). *Practical project risk management: The ATOM methodology* (3rd ed.). Berrett-Koehler Publishers.
- International Organization for Standardization. (2018). *Risk management — Guidelines* (ISO 31000:2018).
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263–291.
- Kerzner, H. (2017). *Project management: A systems approach to planning, scheduling, and controlling* (12th ed.). Wiley.
- Montealegre, R., & Keil, M. (2000). De-escalating information technology projects: Lessons from the Denver International Airport. *MIS Quarterly*, 24(3), 417–447.
- National Audit Office. (2012). *The London 2012 Olympic Games and Paralympic Games: Post-Games review*. NAO.
- Olympic Delivery Authority. (2011). *Learning legacy: Lessons learned from the London 2012 Games construction project*.

PRINCE2. (2017). Managing successful projects with PRINCE2 (6th ed.). AXELOS.

Project Management Institute. (2019). The standard for risk management in portfolios, programs, and projects. PMI.

Project Management Institute. (2021). A guide to the project management body of knowledge (PMBOK Guide) (7th ed.). PMI.

Szyliowicz, J. S., & Goetz, A. R. (1995). Getting realistic about megaproject planning: The case of the new Denver International Airport. *Policy Sciences*, 28(4), 347–367.

Ward, S., & Chapman, C. (2003). Transforming project risk management into project uncertainty management. *International Journal of Project Management*, 21(2), 97–105.

de Neufville, R. (1994). The baggage system at Denver: Prospects and lessons. *Journal of Air Transport Management*, 1(4), 229–236.

Appendices

Appendix A: Sample Risk Register

The table below illustrates a simplified risk register of the type described in Section 4.5, recording a small sample of risks drawn from the categories discussed in Section 4.7.

ID	Risk Description	Category	Probability	Impact	Owner	Response Strategy
R1	Key supplier fails to deliver critical component on schedule	Operational	Medium	High	Procurement Manager	Mitigate (dual-source supplier)
R2	Core technology platform fails integration testing	Technological	Medium	Extreme	Technical Lead	Mitigate (early prototyping)
R3	Currency fluctuation increases cost of imported materials	Financial	Low	Medium	Finance Manager	Transfer (forward contract)
R4	Key stakeholder withdraws support for project scope	Stakeholder	Low	High	Project Sponsor	Mitigate (engagement plan)
R5	New regulation increases compliance requirements	External	Medium	Medium	Compliance Officer	Accept (monitor and review)

Appendix B: Probability–Impact Matrix

The matrix below illustrates the qualitative probability-impact assessment approach described in Section 4.2 and 4.3, used to prioritise risks such as those listed in Appendix A.

Probability \ Impact	Low	Medium	High	Extreme
High	Medium	High	Extreme	Extreme
Medium	Low	Medium	High	Extreme
Low	Low	Low	Medium	High