THE IMPACT OF RISK ASSESSMENT STRATEGIES ON RESEARCH AND DEVELOPMENT PROJECTS OF THE DEFENCE SECTOR IN PAKISTAN

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Abstract

This research investigates the impact of risk assessment strategies on research and development (R&D) projects in the defence sector. The researchers performed comprehensive analyses of risk management frameworks and practices employed by leading defence organisations globally, including the US Department of Defence, UK Ministry of Defence, Canadian Department of National Defence, and India's Innovation for Defence Excellence and critically analysed the key risk assessment factors and best risk management practices. This research developed a tailored risk assessment framework specific to Pakistan's defence R&D projects through extensive case study analyses and fifty semi-structured interviews with people working with defence organisations. The proposed framework comprises seven essential steps, from work breakdown structure development to continuous risk monitoring. This research aimed to provide a systematic and unified approach to risk management by addressing the gaps and investigating international and regional approaches.

Keywords: Risk Assessment, Research and Development Projects, Defence Sector, Risk Assessment Framework

Introduction

Countries spend billions of dollars and utilise significant resources for large-scale defense system projects. Research and Development (R&D) is a critical dimension of a national defense strategy, and compromised performance in R&D can disrupt the entire strategic framework.[1] Many publications highlight that large-scale defense systems are among the most complex and risk-oriented projects.[2] The growing interest in the globalisation of industrial activities and the market economy has raised significant concern regarding improving R&D projects, prompting efforts in the marketplace to advance these projects.

Defense organisations have evolved into either knowledge creators or buyers of market-available products, which are the results of R&D activities. For example, NATO established the €1 billion Defense Innovation Accelerator for the North Atlantic in 2021 to promote innovation in the sector. Meanwhile, Europe launched the €7.9 billion European Defense Fund (EDF) to support collaborative military R&D programs across member states. The success of these R&D projects offers considerable competitive advantages to companies.

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NATO allies have demonstrated a strong willingness to invest in R&D programs to develop novel defense applications.[3] Pakistan allocated $6.27 billion to the defense sector for the fiscal year 2023-24 (Finance Division, Govt.[4] of Pakistan), while India increased its defense budget to $72.6 billion[5] (Ministry of Defence India 2023). The United States leads the list with a national security budget of $895 billion (U.S. Senate Committee on Armed Services).[6] According to the *Lowy Institute Asia Power Index 2023*, Pakistan ranked 15th out of 26 countries for comprehensive power, with India in fourth place, Bangladesh in 19th, and the United States at the top, followed by China. Given the regional hostility among South Asian countries, the role of R&D projects in the defense sector cannot be overlooked.

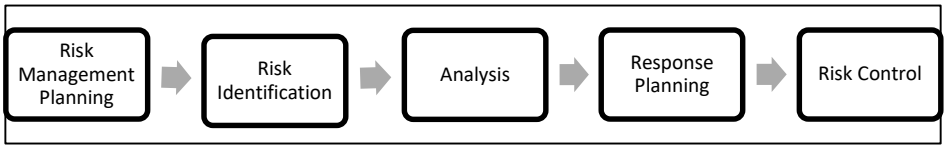
Pakistan established its Research and Development Establishment (RDE) under the Ministry of Defence Production (MoDP) as a hub for collaborative R&D. The RDE is committed to self-reliance through the indigenisation of defense-related equipment, products, vehicles, bridges, track ways, weapons, ammunition, simulators, and other needs, providing indigenous solutions to the Tri-services (Army, Air Force, Navy), defense production establishments, law enforcement agencies, and civil government entities, as well as friendly countries. This is done through partnerships with the public and private sectors, academia, and R&D setups domestically and internationally. Due to technological advancements, social and economic changes, and a constantly evolving security environment, the defence sector faces increased uncertainty and risks in its project plans. Without the application of risk management, it is impossible to assess the risks posed by disruptive developments in R&D activities, which could ultimately compromise the security apparatus of a nation.

Thus, this paper comprehensively analyses the risk assessment processes suggested by the U.S. Department of Defense, the U.K. Ministry of Defence, and the Canadian Department of National Defence (DND) regarding R&D defense projects. It compares these risk management processes with current practices in Pakistan and India. Through detailed case study analysis, the researchers have developed a risk assessment framework specific to Pakistan's defense sector to reduce the likelihood of adverse outcomes that could deviate projects from favorable outcomes.

Literature Review

Risk is a potential threat to achieving predefined project objectives within defined cost, schedule, and technical constraints (Risk Management Guide for US Department of Defense (DoD) Acquisition 2002, 47).[7] Risk management is a key process in project management, including steps for risk management planning, identification, analysis, response planning, and risk control.[8] The appropriate implementation of risk management increases the likelihood of positive outcomes.[9]

Figure 1: Risk Management Process (PMBOK 2020)



Source: Project Management Institute. 2020. A Guide to the Project Management Body of Knowledge (PMBOK® Guide). 7th ed. Newtown Square, PA: Project Management Institute

Many researchers describe the process of risk management. Fairley (1994)[10] presented a six-step risk management process: identification of risk factors, assessment of risk probabilities, development of risk-mitigating strategies, implementation of contingency plans, managing the crisis, and a recovery plan.[11] This process is categorised into two main phases: risk assessment, which includes risk analysis and prioritisation, and risk control, which provides risk management, monitoring, tracking, and controlling. The *International Organization for Standardization* (ISO 31000) suggests that risk management increases the likelihood of favorable outcomes under uncertain conditions faced by projects.

Teng et al. (2013) broke down the risk management structure (in line with ISO 31000) into risk management activities, identification of events, cause and effect analysis, risk evaluation, and treatment. Many risk analysts have presented a classification of risk types, which aligns with the classification scheme established by the German Government's Advisory Council on Global Change (WBGU). These include delay effects and the discrepancy between those who bear the risk and those who enjoy the benefits of the risk (Vinnem & Kristensen, 2006). Risk management strategies are defined against each risk type: risk-informed, cautionary/precautionary, and discursive (Aven & Cox, 2015). The risk-informed strategy deals with the treatment of risk, the cautionary/precautionary strategy emphasises resilience through containment, substitute strategies, and safety factors. In contrast, the discursive strategy aims to reduce uncertainties and build trustworthiness within the system (SRA 2015b). This literature indicates that the risk management increases the probability of favorable outcomes and success.

a. **Risk Management Frameworks in Defence R&D Projects**
   Many researchers suggest that project management applications are field-specific; therefore, the strategies and techniques of risk management in one field may not be relevant to another industry sector. According to Naaman (2016), uncertainty is one of the main factors in the risk management process for defense R&D projects.

The response to dangerous events in defense R&D projects is stringent, rigorous, and demanding, such as plane crashes, engine failures, or take-off problems. The PMBOK distinguishes risk from uncertainty: a risk is an unplanned event that can affect one or more project outcomes, while uncertainty refers to unpredictable events. The management of defense projects is highly demanding due to their complex nature and their high risks. Raz, Shenhar, and Dvir (2002) suggested that the goals of defense R&D projects are challenging and ambitious. Since such projects do not have defined processes, proper planning is impossible at the initiation phase, and the success outcomes of such projects are also not specified. Teller and Kock (2013) highlighted the significant challenges faced by R&D projects in terms of planning, resource allocation, and task scheduling. Defense analysts suggest that such projects adopt flexible planning to cope with the risks. Naaman (2016) suggested five stages of the risk management process in defense projects: brainstorming the potential risks, analysing the level of each risk (including the probability of occurrence and severity assessment), analysing risk factors and developing contingency plans, informing the authority about potential risks, and continuously monitoring potential risks. The PMBOK suggests six steps to cope with highly complex projects: risk surveys to reach an agreement on potential risk levels, pre-emption measures to minimise risk occurrence, risk mitigation plans to immediately address the risk and minimise damage, transferring risk responsibility to a third party, and corrective intends to return to the pre-risk state and resume the remaining project activities.

Risks in defense projects are commonly associated with uncertainty, complexity, lack of knowledge, lack of resources, and a dynamic environment. While avoiding risks entirely in defense projects is impossible, it is essential to prepare for them by introducing proper risk management processes, including risk identification, backup plans, and risk-mitigating strategies (Kordova, Katz, and Frank 2018). They implemented risk management processes on complex defense projects, such as ammunition and armaments, radars and electronic warfare, missiles, drones, UAVs, and air defense systems. They claimed that systematic risk management is needed to reduce disruptions. Thus, risk management in defense projects is an integral part that spans from project definition, risk identification, and control strategies, until project completion.

Defense projects differ from other industrial projects in at least two important ways: first, defense projects are usually large, complex, and interdisciplinary, and second, they employ R&D themes to achieve the desired operational performance, entailing more significant technological

risks (Cserháti & Szabó, 2014). According to the Association for Project Management (APM), R&D projects are risky because of their uniqueness and limited knowledge base. Therefore, risk management must be aligned throughout the project lifecycle, from planning to implementation. Proper risk assessment is a three-step process that includes risk identification of unwanted events, the probability of their occurrence, and their impact on key success factors such as scope, time, and cost (Teller & Kock, 2013). Bai, Dai, and Zhu (2014) proposed a two-phase risk management framework that divides risk assessment into two phases: risk evaluation at the initiation phase of a project and risk identification after implementing mitigation strategies post-initiation. This approach offers continuous reassessment of new risks and their mitigation strategies throughout the project lifecycle. Kwak and Smith (2009) identified organisational practices, including employing risk assessment experts and using analytical tools for decision-making, as necessary in increasing the probability of positive outcomes in R&D projects. They further analysed how organisational environment and leadership style influence risk management practices in R&D projects.

Wageman (2004) suggested using checklists and templates and employing risk experts to facilitate the risk management process but warned that different opinions of project managers and risk experts might lead to inconsistencies. Keizer and Halman (2007) analysed various types of risks typical in R&D projects. They identified two main categories: "unambiguous risks," associated with customer acceptance, and "ambiguous risks," arising from differences of opinion within the organisation and project management. They suggested that project managers pay serious attention to ambiguous risks because they can threaten the entire project's success.

Park (2010) suggested two main types of risks after an extensive literature review on R&D projects: internal risks, originating from organisational, operational, and technological aspects, and external risks, associated with the market and supplier aspects. He stressed the importance of developing and implementing contingency plans once risks are identified.

Table 1: Risk Assessment Frameworks

Researchers/Authors	Risk Assessment Frameworks
Kordova, Katz, and Frank, (2018)	This framework analyses the risk assessment process in three phases; risk identification, backup plan, and risk mitigating strategies if something goes awry.
Teller and Kock (2013)	This framework emphasizes on risk identification of an unwanted event, the probability of its occurrence, and impact evaluation on scope, time, and cost.
Bai, Dai, and Zhu (2014)	This framework includes two step risk assessment: Risk evaluation; and risk identification after implementing the mitigation strategies after the initiation phase.
Park (2010)	This risk assessment process includes Internal risks, originating from the organizational, operational, and technological aspects, and external risk
Kwak and Smith (2009)	This risk assessment process emphasizes the employment of risk assessment experts and the use of analytical tools for the decision making process on risks
Keizer and Halman (2007)	This framework identified two main risk categories; –unambiguous risks associated with customer acceptance; and ambiguous risks due to differences of opinion within the organization

Source: I generated this table from my literature review part

b. **Risk Assessment Strategies**

Kim and Wilemon (2008) say early risk identification significantly improves project outcomes.[12] Kwak and Smith (2009) found that early risk assessment allows project managers to develop contingency plans to minimise the impact on project success.[13] They also identified that cross-functional collaboration during risk assessment prevents potential disruptions. For instance, integrating perspectives from technical, managerial, and operational teams enables organisations to address uncertainties more effectively. This approach is especially relevant in **defense** R&D projects, where the complexity of innovation demands a high degree of interdisciplinary collaboration. Successful practices in global defense organisations, such as the US Department of Defense (DoD) and the UK Ministry of Defense (MoD), emphasise cross-functional teams' role in mitigating risks while developing sophisticated defense technologies. Teng et al. (2013) highlighted that cross-functional collaboration fosters a shared understanding of risks, enabling the project teams to anticipate cascading effects.[14]

Similarly, Raz, Shenhar, and Dvir (2002) found that proactive risk assessment significantly improves project **success** rates by systematically evaluating potential threats before they escalate.[15]

Bai, Dai, and Zhu (2014) identified proactive risk assessment as iterative evaluations that allow organisations to refine their risk management strategies throughout a project's lifecycle.[16] Their findings underscore the importance of integrating risk evaluation into every stage of project development to ensure long-term success. Park (2010) suggested continuous monitoring ensures that risk mitigation strategies align with project objectives.[17] Regular updates to risk assessments enable organisations to address new vulnerabilities promptly and minimise the likelihood of adverse outcomes.

These findings suggest that early risk identification, stakeholder alignment, cross-functional collaboration, proactive risk assessment, and continuous monitoring are essential components of a robust risk mitigation strategy.

Method

This research adopted a quantitative approach to study the impact of risk management practices on R&D defence projects. The case study approach was adopted to compare and contrast the risk management practices in the US Department of Defence (DOD), the UK Ministry of Defence (MOD), and the Canadian Defence Department (DND). For this research, we collected fifty responses from professionals who worked for defence-related organisations. The respondents were asked about the importance of the risk assessment process in R&D activities and the risk management frameworks they adopted during unplanned events. After summarising the responses, content analysis was performed to better understand ongoing risk management practices in the defence sector of Pakistan, particularly in comparison with international risk assessment practices.

Data Analysis

The researchers adopted a comprehensive case study analysis, reviewing the risk management guides of three developed Western countries — the USA, the UK, and Canada — and comparing their risk assessment practices with those of regional countries, India and Pakistan.

a. **Risk Assessment Framework: US Department of Defence (DoD)**
The potential inability to achieve project objectives within scope, time, and cost is a risk. There are two essential phases: the probability of failing an objective and the impact of failing to achieve that objective on the overall project.[18]

The *Risk Management Guide for US DoD Acquisition* (2002) defines risk management as dealing with risk that includes — risk planning, risk assessment, risk mitigation strategies, risk monitoring to determine how risk has changed, and documentation of the risk management process. The US DoD provides updated information and a series of successful risk management practices that may be used in R&D projects and systems engineering in general. Several practices support the risk management, including planning, assessment, monitoring, and documentation. Although several tools support this process, no single tool covers all the facets of risk management (US Department of Defence, 2002).

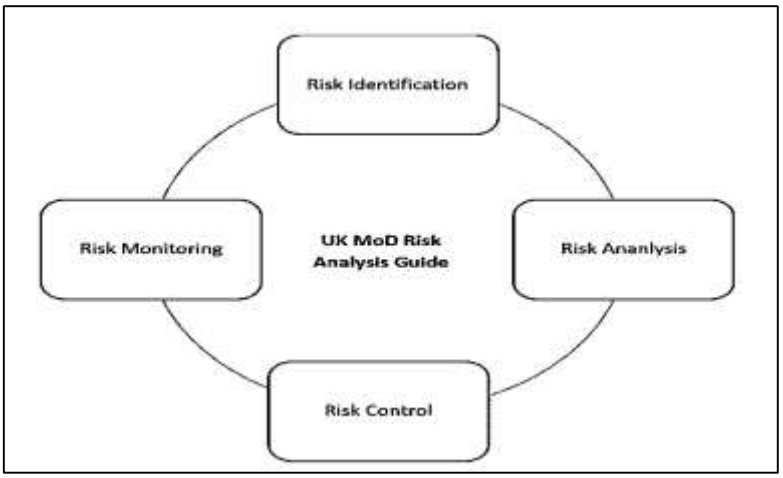
Figure 2: US Department of Defence Risk Management Guide (2002)

Source: U.S. Department of Defense. 2002. Risk Management Guide for DoD Acquisition. Department of Defense. https://www.acq.osd.mil (Accessed December 23, 2024).

b. **Risk Assessment Framework: UK Ministry of Defence (MoD)** According to the British Standard, risk management is a response system to known risks and includes mitigating strategies. Timely implementation of these strategies reduces the unfavorable impact on defense projects. The UK Ministry of Defence (MoD) documentation defines risk management as a four-step process: Identification, Risk analysis, control, and continuous risk monitoring. The MoD further categorises R&D project-related risks into strategic (political, economic, social, technological, legislative, and environmental) and operational (finances, human capital, and contractual).

The British Standard Guide further explains the identification process, determining the risk scale associated with the hazard, the likelihood of the risk occurrence, and the severity of the risk. An effective risk management process is a win-win situation for all stakeholders, improving strategic, operational, financial, and customer management. The process is cyclical, including strategy development, implementation, and review, with SMART objectives (Specific, [19] Measurable, Action-oriented, Realistic, and Time-bound).[20]

Figure - 3: UK Ministry of Defence Risk Analysis Guide (2001)

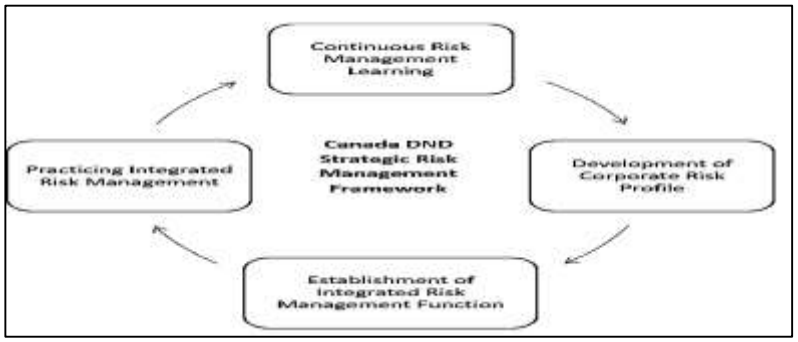


Source: UK Ministry of Defence. 2001. Risk Management: A British Standard Guide. British Standards Institution.

c. **Risk Assessment Framework: Canadian Department of National Defence (DND)**

The Director of Strategic Planning Coordination at the Canadian Department of National Defence (DND) suggested an Integrated Strategic Risk Management approach in April 2001. This framework underscores four elements: development of the corporate risk profile, establishment of an integrated risk management function, integrated risk management practices, and continuous risk management learning.[21] The document categorises risks into two groups: direct and decisive risks (e.g., deviation from Canadian defense culture, operation failures, and reliability issues in information systems) and indirect and partial risks (e.g., changes in government policy, dynamic risk-sharing in defense and security matters).

Figure-4: Canada Department of National Defence Strategic Risk Management Framework



Source: Canadian Department of National Defence. 2001. Integrated Strategic Risk Management Approach. Department of National Defence, April 2001.

d. **Risk Assessment Framework: Innovation for Defence Excellence (iDEX), India**

IDEX (Innovation for Defence Excellence) India suggests that the creation process of R&D defence projects must be well aligned and well synchronised with the objective milestones, and validation of risk factors helps deliver defence products. The Nodal Agency requires that the technical feasibility of defence projects meet the military's functional requirements. The iDEX guide provides a six-phase risk assessment framework, including risk assessment, vulnerability assessment, capability to handle vulnerabilities, risk impact analysis, risk mitigation strategies development, and continual assessment and adoption of risk handling processes.[22]

Figure-5: iDEX India Risk Assessment Framework

Source: Ministry of Defence, Government of India. 2021. Innovation for Defence Excellence (iDEX) Risk Assessment Framework. Ministry of Defence.

e. **Interviews**

We collected data from 50 individuals employed across various defense organisations to gather information on risk assessment procedures in R&D projects. Each interviewee had a unique perspective based on their role, experiences, and the nature of projects they deal with in the defense sector. Through these interviews, the research aimed to understand the current practices, challenges, and strategies in managing risks associated with defense-related research and development projects. The diverse backgrounds and expertise of the interviewees provided valuable feedback regarding the nature of risk assessment within the defense industry, which helped develop a risk assessment framework.

f. **Responses to Interview Questions:**

- *How does the risk assessment process enhance R&D activities?* Interviewees emphasised that risk assessment should be conducted early in the process. However, continuous monitoring is essential to avoid potential threats. They stressed that a structured approach would significantly impact risk factor analysis and help craft effective risk mitigation strategies

- *Do you think we follow a risk management process?* Due to classified information, most interviewees did not share their organisational risk aversion practices. However, most confirmed that they strictly observe protocols within their organisation for risk assessment, though no standard document could be followed. Risk-handling processes are sometimes outsourced to third parties for efficiency.

- *How do you describe the best risk assessment practices?* Interviewees emphasized the importance of long-term risk management processes for sustainable R&D projects and the need for an R&D-related risk assessment framework that can address potential risks, their severity level, and their impact on defense projects over extended periods of time.

g. **Risk Assessment Policies: Pakistan Research and Development Establishment (RDE)**

- The Research and Development Establishment (RDE) in Pakistan operates under the Ministry of Defence Production (MoDP) and serves as a hub for collaborative R&D activities for the defense sector.

RDE Pakistan acknowledges the need for risk assessment policies for defense-related projects, including equipment, products, vehicles, weapons, ammunition, and simulators (Research and Development Establishment 2020).

Findings

For this research, a linear regression model is used. This model assesses the influence of independent variables on the dependent variable and provides valuable insights for decision-making.[23] The linear regression equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

- Y is the dependent variable (the outcome we are trying to predict),
- β_0 is the intercept term (the value of Y when all independent variables are zero),
- $\beta_1, \beta_2, \beta_3, \beta_4$ are the coefficients of the independent variables X_1, X_2, X_3, X_4 (which represent the change in Y for a one-unit change in each corresponding independent variable),
- X_1, X_2, X_3, X_4 are the independent variables (predictors or features),
- ϵ is the error term (captures the unexplained variation or noise in the data).

Research findings suggest that early risk identification with $\beta = 2.300$, $p < 0.002$ strongly affects the projects' positive outcomes. Continuous monitoring is another factor that averts potential disruption, with $\beta = 2.100$, $p < 0.002$. According to our respondents, these factors significantly contribute to R&D projects' success. Risk mitigation strategies with $\beta = 1.800$, $p < 0.001$ strongly affect project success rates.

Table -2: Linear Regression Analysis

Variable	Coefficient (β)	Standard Error	t-Statistic	p-Value	95% Confidence Interval
Constant	48.000	4.500	10.67	0.000	[39.00, 57.00]
Early Risk Identification	2.300	0.700	3.29	0.002	[0.90, 3.70]
Cross-Functional Collaboration	1.700	0.600	2.83	0.007	[0.50, 2.90]
Iterative Risk Assessment	1.200	0.650	1.85	0.070	[-0.10, 2.50]
Proactive Mitigation Strategies	1.800	0.500	3.60	0.001	[0.80, 2.80]
Continuous Monitoring	2.100	0.650	3.23	0.002	[0.80, 3.40]

Source: These are results of my research data

The Proposed Risk Management Framework

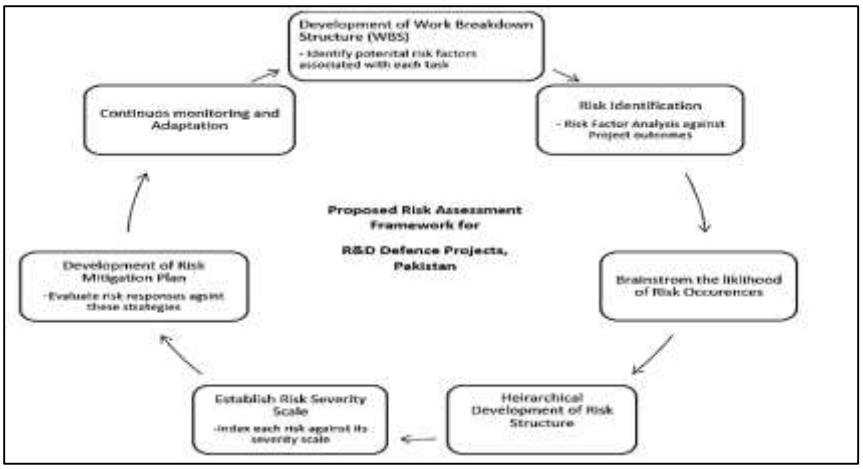
Research proposed a risk management framework tailored explicitly for Pakistan's R&D projects in the defense sector. This framework has been developed after comprehensively analysing the different risk assessment guides produced by the US Department of Defense (DoD), UK Ministry of Defense (MoD), Canadian Department of National Defense (DND), and Innovation for Defense Excellence India (IDEX). The proposed model further incorporated the research findings as well. Despite the use of risk assessment protocols and procedures within the defense organisations in Pakistan, a standard guide available for risk assessment strategies or frameworks at the national level has not yet been introduced.

Recognising this gap, the researchers endeavored to address the need by developing a comprehensive set of guidelines and procedures for the risk assessment process. This would facilitate the defense sector with one common risk assessment approach, following in the footsteps of military giants. Through this guide, the defense sector can adopt a unified approach to assess potential risks that might hinder project success. By standardising the procedures, defense entities can navigate potential risks more effectively and efficiently and ensure the success of R&D projects crucial to national security.

The proposed research risk assessment framework consists of seven steps: the development of a work breakdown structure to identify potential risk factors associated with each task; the identification of those risk factors that directly impact

project outcomes in terms of time, cost, and scope; the development of a hierarchical risk structure with consideration of which risk factors have the higher potential to affect the entire project; brainstorming the likelihood of risk occurrences; developing a severity scale and indexing each risk according to its severity level; creating a risk mitigation plan; evaluating risk responses against these strategies; and continuous monitoring of risk aversion strategies.

Figure - 6: Proposed Risk Assessment Framework for R&D Defence Projects, Pakistan



Source: Compiled by authors

The proposed risk assessment framework has seven steps. The first step is to create a work breakdown structure where the risk factors linked to each task are identified. This stage provides a comprehensive understanding of the project's components and potential weaknesses. The second step is to identify the risk factors that may directly impact the project's outcome, such as time, cost, and scope. The third step is to create a hierarchical risk structure in which risk factors that affect the project as a whole and those that impact other aspects of risk factor management are placed distinctly. Thus, the framework systematically considers risks across various project implementation stages. Moreover, the framework involves brainstorming to determine the chances of risk occurring and decide on the most appropriate mitigation measure.

Conclusion

In conclusion, this research comprehensively analysed risk management and risk assessment within research and development (R&D) projects in the defence sector, emphasising its importance in project success. Given the security situation on

both the eastern and western borders, Pakistan regularly needs to upgrade its defence technology, making risk assessment strategies essential to safeguard national security interests. Defence R&D projects require significant investments of resources and hold strategic importance for nations worldwide; therefore, effective risk management practices emerge as powerful tools in risk mitigation and achieving favourable outcomes. This research critically analysed influential global defence organisations such as the US Department of Defence, the UK Ministry of Defence, the Canadian Department of National Defence, and India's Innovation for Defence Excellence to draw inspiration from their risk assessment policies and procedures. The study provided an in-depth analysis of risk management frameworks and practices by examining risk management principles for developing a contextually relevant risk assessment framework.

This research adopted a case study analysis with semi-structured interviews to bridge the gap between international best practices regarding risk assessment strategies and regional realities, focusing on Pakistan's defence sector. Through comprehensive analysis of official documents from the US DOD, UK MoD, Canada DND, and India IDEX, the research proposed a standard risk assessment framework to provide an initial guide on assessing and mitigating risks in defence R&D projects. The risk assessment framework carefully included expert opinions and suggestions from interviewees, aligning precisely with Pakistan's defence landscape's unique needs and dynamics.

The proposed risk assessment framework comprises seven essential steps, each designed to address key aspects of risk identification, analysis, mitigation, and monitoring. It begins with developing a work breakdown structure to analyse potential risk factors against each task. The framework further includes risk factor identification, risk severity assessment, and the formulation of proactive risk-mitigating strategies. It emphasises the importance of continuous monitoring and adaptation to ensure that risk management remains an iterative and dynamic process, responsive to evolving project dynamics and external influences.

Furthermore, this research highlights the critical role of risk management in enhancing Pakistan's defence sector's resilience, agility, and competitiveness. Around the world, superpowers including the US, UK, Canada, India, and Pakistan allocate significant investments to defence budgets and R&D initiatives. With high investments, the stakes are also high, as the success of defence projects directly impacts national security and strategic objectives. Therefore, by adopting a systematic and unified approach to risk assessment, defence entities can navigate the

complex landscape of uncertainties more effectively, reducing disruptions and optimising resource allocation.

Moreover, the findings of this research carry broader implications for Pakistan's defence organisations due to the analysis of proactive risk management practices in a highly volatile defence environment. Rapid technological advancements, Pakistan's geographical landscapes, and emerging security threats necessitate robust risk assessment frameworks to ensure the successful execution of critical R&D projects. Through comparative analysis of best risk assessment practices by different world powers, defence organisations in Pakistan can strengthen their risk management capabilities and reinforce their resilience in the face of unpredictability and adversity on both the eastern and western borders. By introducing a culture of risk awareness and proactive risk management practices, Pakistan's defence organisations can align themselves with the modern security landscape with confidence and resilience, contributing towards regional and global security and stability.

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