Framework for Risk Management in Project Management

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Laurea University of Applied Sciences **Abstract**
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This thesis addresses the need for an optimized risk management framework tailored to the specific requirements of Akosis Technologies, an IT company in Abuja. This study aims to identify the risk management practices used in project management at the case company and develop a framework for enhancing it, thereby contributing to its operational efficiency and project success. A comprehensive risk management framework is developed by analyzing existing processes, conducting thematic interviews, and integrating theoretical frameworks such as the PMBOK and ISO 31000 standards.

The development task involves understanding the current risk management state of Akosis Technologies, identifying areas for improvement, and proposing a new risk management framework. The theoretical framework is based on established models such as the PMBOK framework and ISO 31000 standard, providing a solid foundation for the development process. Methods include case study analysis, thematic interviews with project management stakeholders, and qualitative data analysis techniques. The key results include insights into the company's current risk management practices, identifying areas for optimization, and proposing a new risk management framework.

The analysis of the results reveals alignment with existing project management practices, integrating ISO 31000 standards, and introducing a graded approach to risk mitigation planning. The proposed framework offers a structured and cohesive approach to risk management tailored to the specific needs of Akosis Technologies. Conclusions drawn from the analysis suggest that the proposed framework has the potential to enhance the company's risk management practices, improve project outcomes, and foster organizational resilience. Recommendations include the implementation of the proposed framework, ongoing monitoring and evaluation, and continuous improvement efforts.

Keywords: Risk management, Project management, PMBOK framework, ISO 31000, Optimization.

Contents

1 Introduction

Risk management in project management is crucial for project success, especially in today's complex and ever-changing business landscape. It can be the difference between a business's survival and its demise (Panos et al. 2012). Each project is unique, and a skilled project manager considers various internal and external factors to select and adjust the most appropriate project management life cycle (PMLC) framework. Allowing for the timely identification and mitigation of risks, reducing the likelihood of cost overruns and schedule delays (Wysocki 2019). Corinna (2015) emphasizes the need to enhance quality while minimizing time and costs, underscoring the crucial role of risk management in project management.

Technology companies such as Akosis Technologies, the case company of this thesis, face distinctive challenges in risk management due to rapid technological advancements, intense competition, and the need for continuous innovation (Wysocki 2019). Effective risk management demands a systematic, company-tailored approach, often utilizing established risk management frameworks and methodologies. This thesis aims to formulate a comprehensive reference framework that integrates project and risk management aspects, ultimately enhancing Akosis Technologies' risk management practices throughout the project life cycle.

1.1 Problem Statement, Objectives and Scope

This study addresses the need for an effective framework for risk management in project management. It uses a case study of Akosis Technologies, a technology consulting firm. The specific objective of this study is to identify the risk management practices used in project management at the case company and develop a framework for enhancing these practices.

This study focuses on developing a framework for project risk management at Akosis Technologies. By conducting a series of analyses through interviews and a case study of projects done by Akosis Technologies, the study aims to gain comprehensive insights into the application and impact of risk management strategies in real-world projects. The study will be conducted within a specific time frame to ensure data relevance, considering risk management practices can evolve.

1.2 Significance of the Study

This study is significant because it provides a framework for risk management practices in project management. The framework developed in this study applies to various industries and contexts, empowering organizations to improve their risk management practices and achieve project success. Organizations can optimize resource allocation and enhance project outcomes by understanding the strengths and weaknesses of current risk management strategies (Kerzner 2014).

Additionally, this study contributes to the body of knowledge on risk management practices in project management, informing future research in this area. The versatile framework can tailor risk management strategies based on industry needs and challenges. It identifies key performance indicators (KPIs) and metrics that gauge the efficiency and efficacy of risk management processes, leading to reduced project disruptions and better decision-making.

2 Risk Management in Project Management

Project management stands as one of humanity's oldest and most impressive endeavors, yielding remarkable accomplishments like the pyramids, ancient urban marvels, iconic landmarks, space voyages, computers, and the internet – all testifying to how the course of project management has indelibly shaped our progression over time. Amid the evolution of these monumental undertakings, the complexity factor remains constant, steadily magnified by factors such as globalization, emerging technologies, fragmented supply chains, and the pursuit of grander, more costly projects. This evolution prompts a transformation in risk management within project management – a shift from the traditional silo-based approach to an all-encompassing, enterprise-wide approach, seamlessly integrated across all levels of an organization (Leandro, et al. 2019.)

According to Wysocki (2019), projects stem from unmet needs and comprise a sequence of unique, complex, and interconnected activities designed to achieve a singular goal within a specified time, budget, and specifications. While this definition aptly applies to straightforward projects, its adaptability is challenged when faced with greater complexity. The primary limitation of the initial project definition is its minimal emphasis on the core objective – delivering tangible business value to the client and the organization. An alternative perspective offers a more comprehensive view: “A project is a sequence of finite dependent activities whose successful completion results in the delivery of the expected business value that validated doing the project” (Wysocki 2019, 7).

Every project is invariably subject to constraints, and the Iron Triangle, also known as the Triple Constraint, captures the intricate relationship between Time, Cost, and Scope. Should any of these variables change, a corresponding change in at least one other variable is necessary to reinstate equilibrium within the project. Given the inherently dynamic nature of projects, additional constraints, such as resources, quality, and risk, become present. Except for risk, these constraints make up an interconnected set. The five parameters constitute a system that must remain balanced, given their importance to the project's success or failure. Wysocki (2019, 14) shows this relationship in his book on effective project management, as illustrated in Figure 1.

Figure 1: The Scope Triangle (Wycoski 2019, 14)

In technology-centric enterprises like Akosis Technologies, projects are not isolated; diverse projects often run concurrently, sharing available resources. Consequently, establishing a clear definition of the project management landscape becomes crucial for informing the company's choices in project risk management strategies. The vast importance of project management in various business areas emphasizes the need to gather information about the most effective project management methods. Strategic planning in project management offers a clear advantage, as it often shows the need to document and maintain best practices. Adopting best practices adds business value and facilitates superior profit realization and more effective benefits management activities (Kerzner 2014).

2.1 Frameworks for Risk Management

The PMBOK Guide defines risk as: "an uncertain event or condition that, if it occurs, has a positive or a negative effect on a project's objectives" (Project Management Institute 2023). The definition of risk varies for different organizations, with different attitudes to risks. However, this is crucial for organizations as clearly understanding the difference between cause and risk helps maintain clear communication within the project team and the right attitude toward risk (Bissonette & Bissonette 2016; Paul 2018).

Risk management involves the systematic handling of both potential threats (negative impacts) and opportunities (positive impacts) to a project. It includes the identification and effective management of these issues. It is an integral aspect of the overall project management process, consisting of planning, monitoring, and control activities. It is required to anticipate and manage threats and opportunities to ensure the best outcome of the project. With a risk management plan, it is possible to outline how the assessment of the risks associated with a project will be carried out (Association for Project Management 2016.)

Risk management processes are essential to the organic development of project planning and creating a sustainable and versatile project plan. Figure 2 shows the interconnectivity between the risk management processes. The core of the project risk management process is the systematic identification, review, and appropriate handling of project risks. Although the process is divided into separate sequential steps, it is often carried out iteratively and emphasizes identifying alternative approaches. These processes play a crucial role in the viability of the entire project, making risk management an essential part of project planning (Bissonette and Bissonette 2016.)

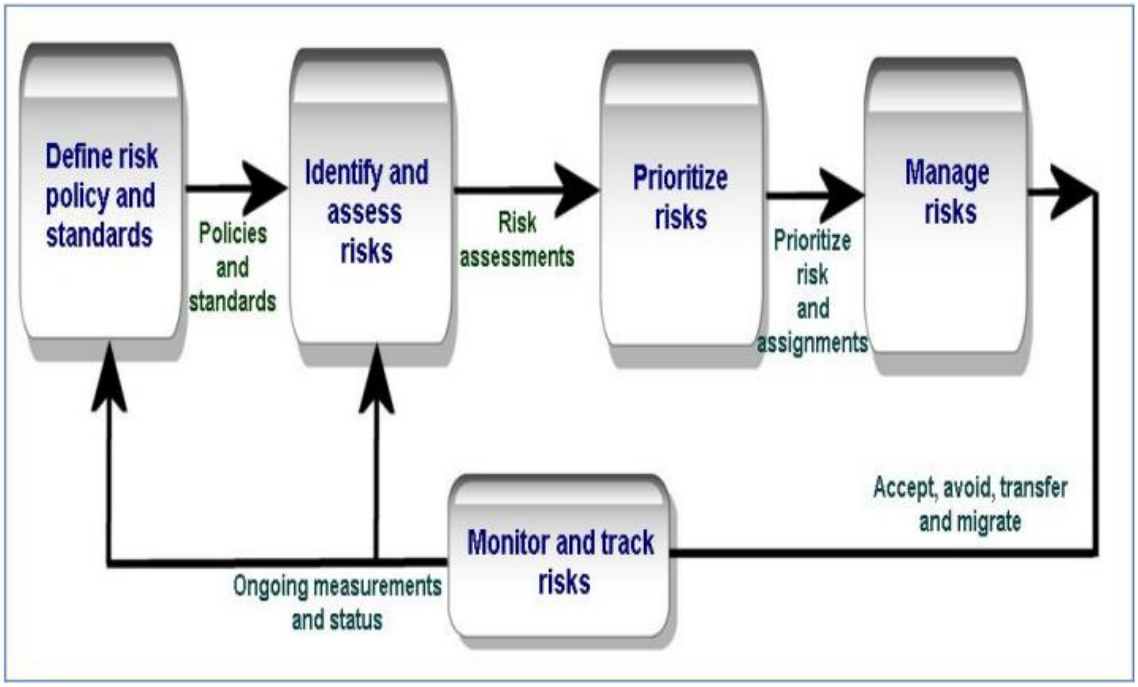

Figure 2: Risk Management Process (Bissonette and Bissonette 2016)

The risk management process should be integrated into an organization's culture and practices, becoming a natural and intrinsic part of decision-making and strategic planning. It must go beyond a mere procedural component, influencing and being influenced by various facets of the organizational structure. To be effective, it should be tailored to align with the organization's specific business processes and objectives, ensuring relevance and direct contribution to overall success. As emphasized by ISO 31000 (2009) in Risk Management – Principles and Guidelines, this comprehensive, embedded approach is crucial for organizations like Akosis Technology, aiming to maintain a proactive and adaptive stance in their risk management process.

Projects can achieve optimal outcomes by anticipating threats and opportunities and proactively managing them. The Association for Project Management (2016) explains that there exists a direct correlation between change and risk: any alterations to the project scope inevitably introduce new threats or opportunities. Moreover, identified threats and opportunities, when coupled with changes in scope, impact the project schedule. The

magnitude of change directly correlates with the level of risk introduced. Thus, a close relationship between change management and risk management is evident, and this synergy should be acknowledged at every project stage. The Association for Project Management vividly depicts the risk management life cycle, outlining the key stages and the tools instrumental in implementing each stage, as illustrated in Figure 3.

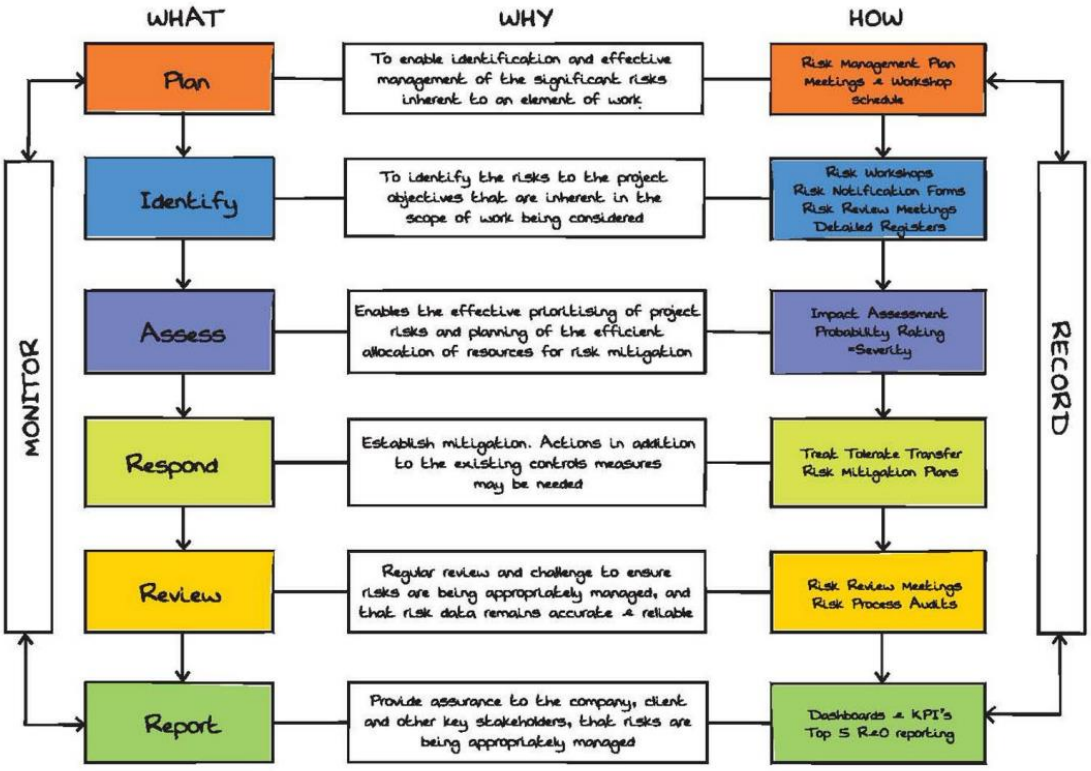

Figure 3: Risk Management Lifecycle (Association for Project Management 2016, 287)

2.1.1 NIST Risk Management Framework

The NIST framework integrates security, privacy, and cyber supply chain risk management activities into the fabric of the system development life cycle. Guided by a risk-based approach, the selection and specification of controls prioritize effectiveness, efficiency, and compliance with pertinent laws, directives, executive orders, policies, standards, or regulations. Its versatility is evident as it seamlessly applies to new and legacy systems, encompassing diverse technologies such as IoT and control systems. It is universally adaptable to organizations of any size or sector (National Institute of Standards and Technology 2023.)

Figure 4 below outlines the sequence of steps in the framework. The NIST Risk Management Framework (RMF) provides a comprehensive, flexible, repeatable, and measurable 7-step process that any organization can use to manage information security and privacy risks for organizations and systems. It links to a suite of NIST standards and guidelines to support implementing risk management programs to meet the requirements of the Federal Information

Security Modernization Act (FISMA) requirements. FISMA focuses on adopting risk-based policies to ensure cost-effective security measures. It emphasizes the need to respond to proportionate security threats and recognizes that the level of protection should be proportionate to perceived risks (National Institute of Standards and Technology 2023.)

The Cybersecurity Framework demonstrates adaptability, providing a flexible and risk-based implementation applicable to various cybersecurity risk management processes. This adaptability enables agencies to concurrently fulfill their obligations to comply with the requirements of FISMA and E.O. 13800. It ensures that the management of system-related security and privacy risks aligns with the mission and business objectives of the organization and its risk management strategy. Despite the sequential presentation of RMF steps in Figure 4, the steps after the Prepare stage can be executed nonsequentially. Throughout agile development in the risk management process, numerous points may necessitate deviation from the sequential order. This divergence could stem from factors such as the type of system, risk decisions, or the need to accommodate iterative cycles between tasks (National Institute of Standards and Technology 2018.)

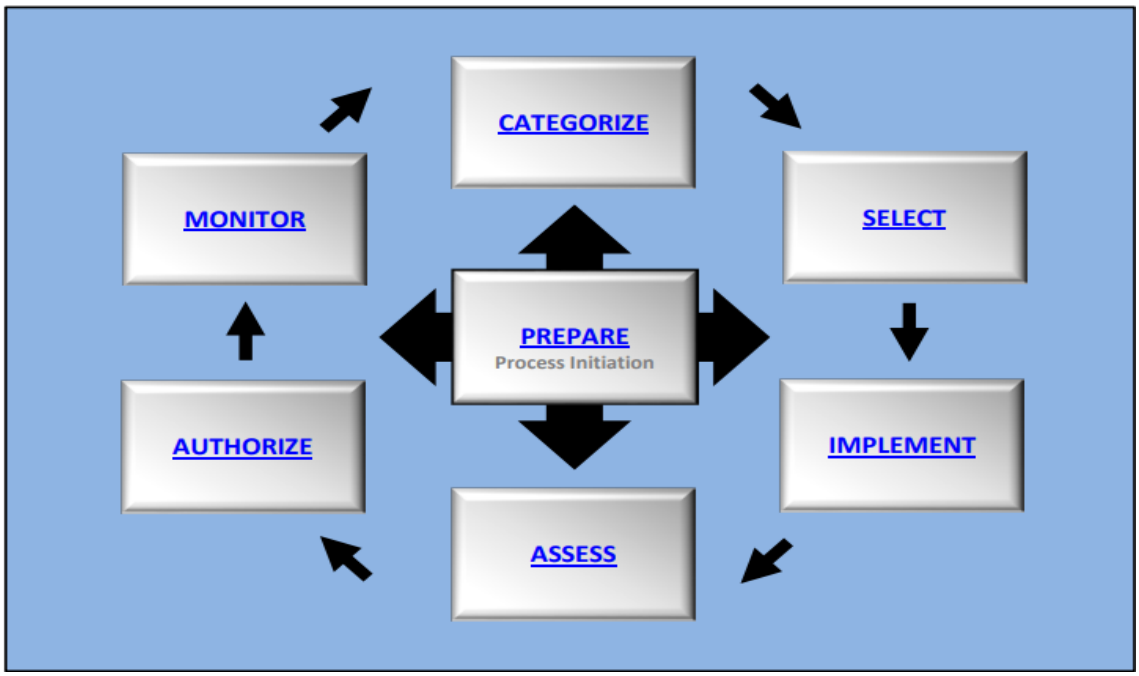

Figure 4: NIST Risk Management Framework (National Institute of Standards and Technology 2018, 9)

2.1.2 Project Management Institute (PMI) Risk Management Framework

The Project Management Institute (PMI) provides guidelines for project management through its Project Management Body of Knowledge (PMBOK) guide, which includes a section on project risk management. PMI's Risk Management Framework is a structured approach to identifying, assessing, and managing risks within a project (Project Management Institute 2023.)

The framework includes several key processes. First, the project team participates in risk management planning, where the method of implementing risk management measures and the roles and responsibilities of team members are defined. Next, the framework includes risk identification, a comprehensive process to identify and document potential risks, including threats and opportunities, that may affect the project (Project Management Institute 2023.)

Qualitative risk analysis is a critical step in the framework and involves assessing the likelihood and impact of identified risks. Qualitative scales are often used in this analysis to prioritize risks based on their potential impact. After that, a quantitative risk analysis is carried out, where the possible effects of the risks are numerically analyzed, and the probability of their occurrence is accessed (Project Management Institute 2023.)

The risk response planning phase focuses on developing strategies that exploit opportunities and effectively reduce threats to project objectives. Finally, the framework includes risk monitoring and control, an ongoing process that involves monitoring and managing identified risks throughout the project life cycle. This step requires adjusting the risk management plan to account for the project's changing dynamics (Project Management Institute 2023.)

2.1.3 PRINCE2 Risk Management Framework

PRINCE2, an acronym for Projects IN Controlled Environments, is a widely recognized project management framework known for its structured methodology. PRINCE2's holistic approach to project management has a comprehensive risk management framework that includes several key components. An essential part of the PRINCE2 risk management framework is creating a risk management strategy during the project initiation phase. This strategy acts as a blueprint that defines the approach to risk management throughout the project's life cycle (Axelos 2023.)

This framework relies heavily on the Risk Register, a vital document that captures all identified risks, their status, and planned responses. The basic information of the risk register includes risk descriptions, probability, impact, proximity, and ownership. PRINCE2 emphasizes continuous risk identification throughout the project life cycle. This proactive approach thoroughly examines internal and external factors affecting the project's defined objectives. Risks are assessed based on their likelihood and impact, which helps prioritize risks and guides risk management activities. PRINCE2 promotes the development of response plans for identified risks, a process that involves formulating specific actions to exploit opportunities or mitigate potential threats (Axelos 2023.)

PRINCE2 recognizes the importance of effective communication and emphasizes the need to report and communicate risk situations to relevant stakeholders regularly. Finally, the framework emphasizes an ongoing risk monitoring and management process, which requires monitoring the status of identified risks, reassessing their likelihood and impact, and ensuring response plans are implemented when necessary. The PRINCE2 risk management framework is

particularly suitable for projects characterized by complexity, uncertainty, and the need to adapt to a dynamic environment (Axelos 2023.)

2.1.4 ISO 31000:2018 Risk Management Standard

ISO 31000:2018 is a globally recognized standard that provides comprehensive guidelines and principles for effective organizational risk management. It defines basic principles, emphasizes the integration of risk management into organizational processes, and recommends a structured and holistic approach. The standard presents a versatile risk management framework suitable for organizations of different sizes, industries, and sectors, designed to suit different contexts (International Organization for Standardization 2018.)

The risk management process described in ISO 31000 covers critical steps, including risk identification, assessment, treatment, monitoring, evaluation, communication, and consultation. This cyclical process allows organizations to tailor their risk management efforts to specific needs. The standard emphasizes effective communication and consultation, stakeholder engagement, and transparent information sharing (International Organization for Standardization 2018.)

Risk management is guided by the principles, framework, and processes defined in the standard, as shown in Figure 5. In addition, ISO 31000 promotes the seamless integration of risk management into an organization's general management, strategic planning, and decision-making processes. This seamless integration aims to make risk management an integral part of the organization's culture. The standard defines several risk management components, including policy and commitment, integration into governance and leadership, continuous improvement, and monitoring and evaluation (International Organization for Standardization 2018.)

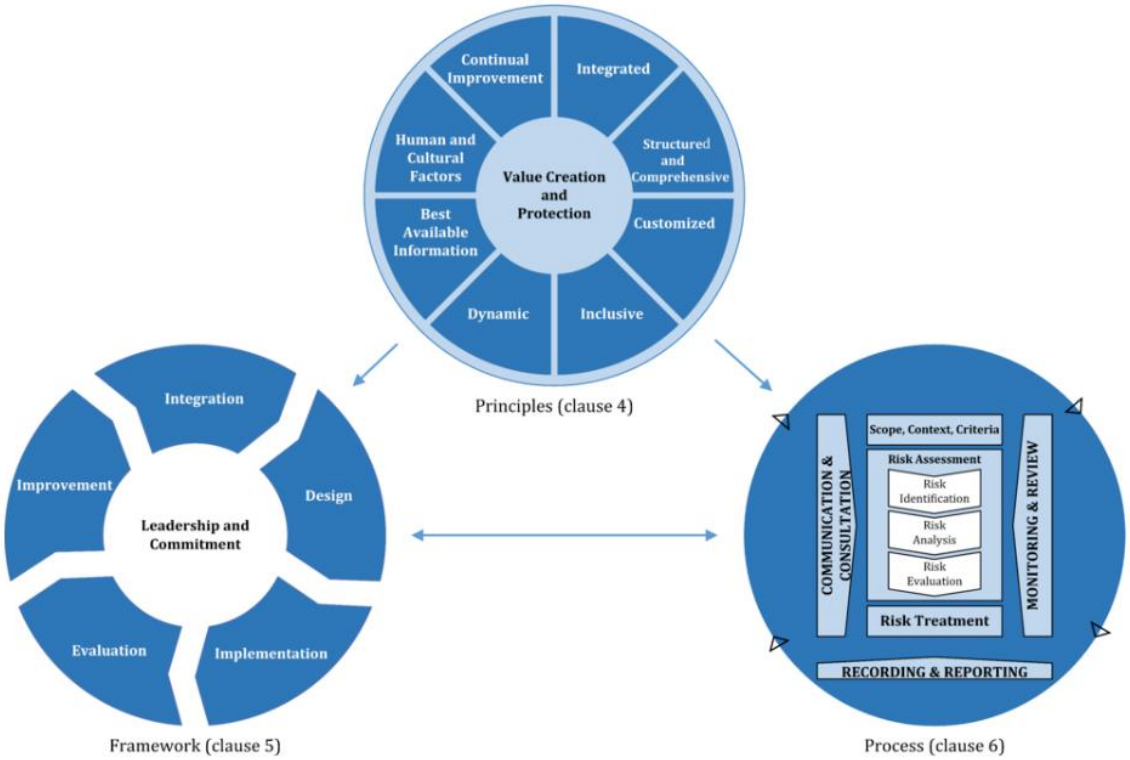

Figure 5: Principles, Framework, and Processes (International Organization for Standardization 2018)

ISO 31000 provides a common language and framework to guide organizations in establishing and developing risk management practices. This standardized approach enables effective risk management across industries and sectors. As organizations deal with complex risks, ISO 31000 provides a valuable tool to improve sustainability and decision-making in an ever-changing business landscape (International Organization for Standardization 2018.)

2.2 Best Practices in Project Risk Management

According to Garikapati (2018), in project management, best practice refers to a technique, method, or process recognized for its superior effectiveness and efficiency in achieving a specific objective compared to alternative approaches under specific circumstances or conditions. The term "best practices" covers a wide range of elements of project management, including guidelines and adherence to international standards.

Project managers often use established best practices to improve project outcomes using proven methods and strategies (Kerzner 2017). In addition, the concept of best practices implies a continuous commitment to continuous improvement and the integration of evolving industry standards, which encourages a dynamic and adaptive approach to project management (Schwalbe 2018).

ISO 31000:2009 defines a fundamental principle that emphasizes the core of project risk management: the core is in risk management. According to Chapman (2019), this core includes a systematic and dynamic approach emphasizing the importance of methodical risk identification, assessment, mitigation, and monitoring throughout the project life cycle. It does not mean simply operating independently but an integrated continuous process that intricately weaves risk management into project planning, execution, and control. This approach ensures that risks are not simply reactive challenges but important aspects that shape the trajectory and success of the project.

2.2.1 Fundamentals and Principles of Project Management

Project management is a dynamic discipline built on fundamental principles supporting successful project delivery. It involves the application of knowledge, skills, tools, and techniques to meet project requirements within predetermined constraints (Project Management Institute 2017). A set of fundamental principles, including clear project objectives and deliverables, is essential to project success. Schwalbe (2018) emphasizes that it is crucial to define the scope, schedule, and budget of the project already at the beginning of the project.

Effective communication stands out as an essential principle in project management. Project Management Institute (2017) emphasizes the importance of the communication skills of project managers to facilitate collaboration between team members and stakeholders. The interconnectedness of project management processes and knowledge is also emphasized by the Project Management Institute (2017), which recommends a holistic approach to project management.

Integrating project management processes is a key principle that ensures smooth coordination between different project components (Meredith & Mantel 2011). This concept is consistent with PMI's emphasis on the interconnection of project management processes and knowledge areas (Project Management Institute 2017). In addition, adherence to quality management principles, including standards and continuous improvement, is critical to the project's success (Schwalbe 2018).

Risk management is integral to project management and aims to identify, assess, and mitigate potential risks that may hinder the project's success (Heagney 2016). Kerzner (2017) acknowledges the importance of proactive risk management and recommends anticipating and responding to potential challenges in project implementation. The foundations and principles of project management are the basis for the effective implementation of the project. These principles, which include clear goal definition, effective communication, process integration, quality management, and proactive risk management, promote project success in various industries.

2.2.2 Project Management Frameworks

Project management frameworks are essential structures that guide project planning, implementation, and completion (Schwalbe 2018). These frameworks provide methodologies, principles, and processes project managers can use to improve project success. This study explores key concepts and principles of project management frameworks, highlighting key approaches such as PMBOK, PRINCE2, Agile, and Waterfall.

The Project Management Body of Knowledge (PMBOK), developed by the Project Management Institute (PMI), is a widely recognized and comprehensive guide to project management. It describes key areas of knowledge, including scope, time, cost, quality, risk, and integration management (Project Management Institute 2017). It serves as a foundational framework for project managers worldwide.

PRINCE2 (Projects IN Controlled Environments) is another prominent project management framework that provides a structured approach to project management. It emphasizes flexibility and scalability, making it suitable for projects of various sizes and complexities. PRINCE2 consists of key components, such as a risk management strategy and a risk register, which provide a holistic approach to risk management (Axelos 2017.)

Agile is an iterative and incremental project management approach emphasizing flexibility and adaptability. An agile framework, especially Scrum, promotes collaboration, transparency, and continuous improvement (Schwaber & Sutherland 2017). Agile is suitable for dynamic environments where project requirements change frequently.

In contrast, the Waterfall framework follows a linear and sequential approach to project management. Each project phase must be completed before moving to the next, making it suitable for projects with well-defined requirements. Waterfall is often used in industries with strict regulatory requirements (Pressman 2014.)

Recognizing the strengths of both Agile and Waterfall, some projects use hybrid approaches. Hybrid frameworks allow organizations to use the flexibility of Agile in certain phases while maintaining the structured approach of Waterfall in other phases. This hybridization helps organizations adapt their project management approach to specific project requirements and organizational needs (Ambler & Lines 2012.)

2.2.3 Benefits of Project Risk Management

Project risk management is integral to project planning and execution and benefits organizations. Systematic identification, analysis, and response to potential risks contribute significantly to the project's success. One significant benefit is better decision-making. A proactive risk management approach gives project managers valuable insights into potential

challenges, enabling them to make informed decisions consistent with project objectives (Mian 2011.)

In addition, project risk management increases the trust of stakeholders. Transparent communication of identified risks and the strategies used to resolve them creates trust between stakeholders. This trust is essential to maintain strong relationships and support throughout the project life cycle (Schwalbe 2018.)

Risk management also plays a crucial role in cost management. Organizations can prevent costly disruptions and overruns by anticipating and mitigating potential risks early in a project. Effective risk management promotes adherence to budget and optimization of resources, ensuring that projects are completed within financial constraints (Hillson & Simon 2012.)

Project risk management also improves project planning. The risk identification and analysis process enable project teams to develop contingency plans and alternative strategies. Such proactive planning minimizes the impact of potential risks on project schedules and outcomes (Kendrick 2015.)

In general, embracing a comprehensive risk management approach benefits Akosis Technology's success in project outcomes. By proactively dealing with uncertainties, the company ensures that informed choices are consistent with the project's objectives, which contributes significantly to the project's overall success.

3 Development Process and Methods

This thesis's development process and methods are adapted to its fundamental concepts and application to the selected case company, Akosis Technologies. This focused approach ensures an understanding of how the core principles outlined in the thesis relate directly to and influence the operations of Akosis Technologies, contributing to its depth and relevance.

Akosis Technologies is a pioneering IT company in Abuja with over ten years of experience. It has distinguished itself as a leading provider of software development, web development, cyber security services, and complete project management solutions. Known for providing quality solutions, the company has built a reputation for excellence among clients, most of whom demand the utmost confidentiality. In addition to core IT services, Akosis Technologies stands out for its commitment to professional development, providing impressive project management training. Focused on security, innovation, and project implementation (Akosis Technologies 2023.)

The development process also includes gaining a deeper understanding of the organizational culture and structure of Akosis Technologies. It aims to show how the company's internal

dynamics facilitate or hinder the effective implementation of risk management frameworks. Understanding these complexities is vital to understanding an organization's risk management practices and aligning them with the broader objectives of the study. The use of case study analysis, supplemented by semi-structured interviews, aims to provide practical insight into implementing different risk management frameworks at Akosis Technologies, providing proper understanding at different levels of the organization and, in turn, enabling the development of a new framework and process flow.

3.1 Development Design and Approach

A comprehensive understanding of existing project risk management frameworks and methodologies lays the foundation for developing the framework discussed in this thesis. At the core of the development process lies the selection of an appropriate methodological basis. It is based on established models, such as the PMI Risk Management Framework, which provides a comprehensive guide to project risk management (Project Management Institute 2017), and other modern approaches, such as the ISO 31000 standard, which provides a broader risk management framework (International Organization for Standardization 2018).

A well-structured project risk management framework ensures seamless integration throughout the project life cycle by matching its strategies to different project phases, as highlighted by Hickson and Owen (2014). The design phase plays a critical role in this adaptation, requiring careful evaluation of how risk management methods can be adapted to meet different projects' unique needs and complexities. This adaptability, highlighted by Hillson and Murray-Webster (2017), is crucial in dealing with the uncertainties inherent in different projects.

3.2 Data Collection Methods

The selection of appropriate data collection methods is vital to this research to ensure that reliable and relevant data is collected. Choosing the appropriate data collection methods guarantees that the thesis objectives are adequately achieved and comprehensively explored. By opting for these specific methodologies, the aim is to gain profound insights into the risk management practices within Akosis Technologies.

Using case study analysis and semi-structured interviews ensures that the thesis objective can be effectively addressed and achieved. The chosen methods are designed to provide a comprehensive understanding of the risk management practices of the case company Akosis Technologies and contribute to the overall quality of the thesis in terms of integrity and depth. The following sub-chapters discuss these two data collection methods and their relevance to the thesis.

3.2.1 Case Study Analysis

The data collection strategy centrally uses case analysis with qualitative research principles. Case studies provide an in-depth exploration of real-world scenarios and are particularly valuable for understanding the complexity of organizational risk management frameworks (Yin 2018). Focusing on Akosis Technologies, this approach allows for examining specific instances and provides a detailed and context-rich view of applying various risk management methods.

In this development thesis, two case studies will be analyzed. These case studies are projects conducted by the case company in recent years. The analysis aims to provide an in-depth perspective and enhance the validity of the captured data. The primary objective is to evaluate the project management processes within these case studies and identify the underlying project management framework utilized in each scenario.

3.2.2 Semi-Structured Interviews

Semi-structured interviews offer a dynamic and flexible way to gather in-depth information from key organizational stakeholders (Denzin & Lincoln 2018). These interviews with people actively involved in project management at Akosis Technologies provide valuable insight into risk management practices. The open nature of the semi-structured interviews allows for deepening individual experiences, observations, and challenges related to implementing risk management frameworks.

After identifying the project management framework applied in each case study, it is essential to understand the processes, process flow, and risk breakdown structure. A semi-structured interview will be used to achieve this. The case study analysis gives the basis for developing the interview questions. From the interview results, I can draw the process flow of risk management and understand areas for process optimization.

3.3 Data Analysis Techniques

Applying accurate data analysis techniques is essential to gaining meaningful insights and drawing valid conclusions from the collected data. This study uses qualitative analysis methods to ensure a comprehensive understanding of Akosis Technologies' risk management processes, showing a commitment to achieving the thesis objectives.

Qualitative data obtained during case study analysis and semi-structured interviews will be subjected to thematic content analysis. It requires identifying, coding, and categorizing themes and patterns in qualitative data (Guest et al. 2012). Qualitative analysis provides a deeper understanding of the nuances and contextual factors influencing the implementation of risk management frameworks at Akosis Technologies.

3.4 Ethical Considerations

Ensuring ethical conduct in research is paramount to maintaining the integrity and credibility of the study. This section outlines the ethical considerations guiding the design and execution of this development thesis at Akosis Technologies. These considerations are applied throughout the entire thesis process.

Before data collection, explicit informed consent will be obtained from all participants involved in the study, both from the organizational and individual perspectives. Participants will be fully informed about the purpose, nature, and potential outcomes of the thesis, and their voluntary participation will be emphasized (Polit & Beck 2017.)

To uphold confidentiality, all data collected through the case study analysis and information obtained through interviews will be anonymized and securely stored. Participants' identities and sensitive information will be protected, and the data will be used exclusively for research purposes (Yin 2018.)

4 Developing the Risk Management Framework

This chapter covers the development of the Risk Management Framework. To develop a new framework successfully, it was essential to understand the case company's current risk management state, the building blocks of its framework, and the processes and process flow. This chapter follows the sequence of analysis of the case study and the interviews. After that, use those insights to develop a risk management framework based on optimization from the case company's existing risk management process flow.

The case study analysis gives insight into the applied risk management framework and standards within projects in the case company. Through the thematic interviews, a deeper dive is done to analyze the case company's project and risk management framework, process flow, and general risk management culture. The goal is to thoroughly understand the case company's risk management state and find ways to optimize its risk management process flow.

4.1 Case Study Analysis

Two case studies were analyzed for this development thesis. To decide on the projects, I had a meeting with the contact person in the case company. The selected projects were custom software development projects conducted in 2018. Due to concerns raised during the meeting, certain details of these projects were treated as confidential. Although this was the case, the primary focus remained to identify the applied project management framework, process groups, and specific process flow within the project risk management. This focused approach

ensured that the thesis remained within its defined scope, providing a clear direction for achieving its objectives.

Several documents were made available to me for the case study analysis. These included the project charter, project management plan, risk management plan, risk register, work breakdown structure (WBS), communication plan, and status reports. I assessed these documents based on completeness, accuracy, and relevance, comparing the principles and processes used in executing both projects with established project risk management frameworks and standards discussed in chapter two of this thesis.

Based on the analysis of the knowledge areas, process groups, and processes extracted from both case studies, it was revealed that Akosis Technologies applied the project management framework of the Project Management Body of Knowledge (PMBOK) to implement the projects. The PMBOK Guide (2017) outlines a comprehensive framework of 10 distinct knowledge areas, five process groups, and 49 individual processes. These knowledge areas include integration management, scope management, schedule management, cost management, quality management, resource management, communication management, **risk management**, procurement management, and stakeholder management (Project Management Institute 2017).

It is worth noting that, according to the analysis, the application of this framework was influenced by various factors, including project team dynamics, organizational culture, project complexity, and specific project requirements. Each project is unique, and project managers often need to tailor the application of the PMBOK framework to suit their specific needs and constraints (Project Management Institute 2017).

Figure 6 provides an overview of the project management knowledge areas and the processes according to the PMBOK framework. This framework guides project managers and teams, helping them plan effectively, execute, monitor, and control projects to achieve their objectives within time, cost, scope, and quality constraints. The framework covers numerous aspects of project management. However, since this thesis is focused on risk management in project management, the risk management component of the framework has been highlighted for emphasis.

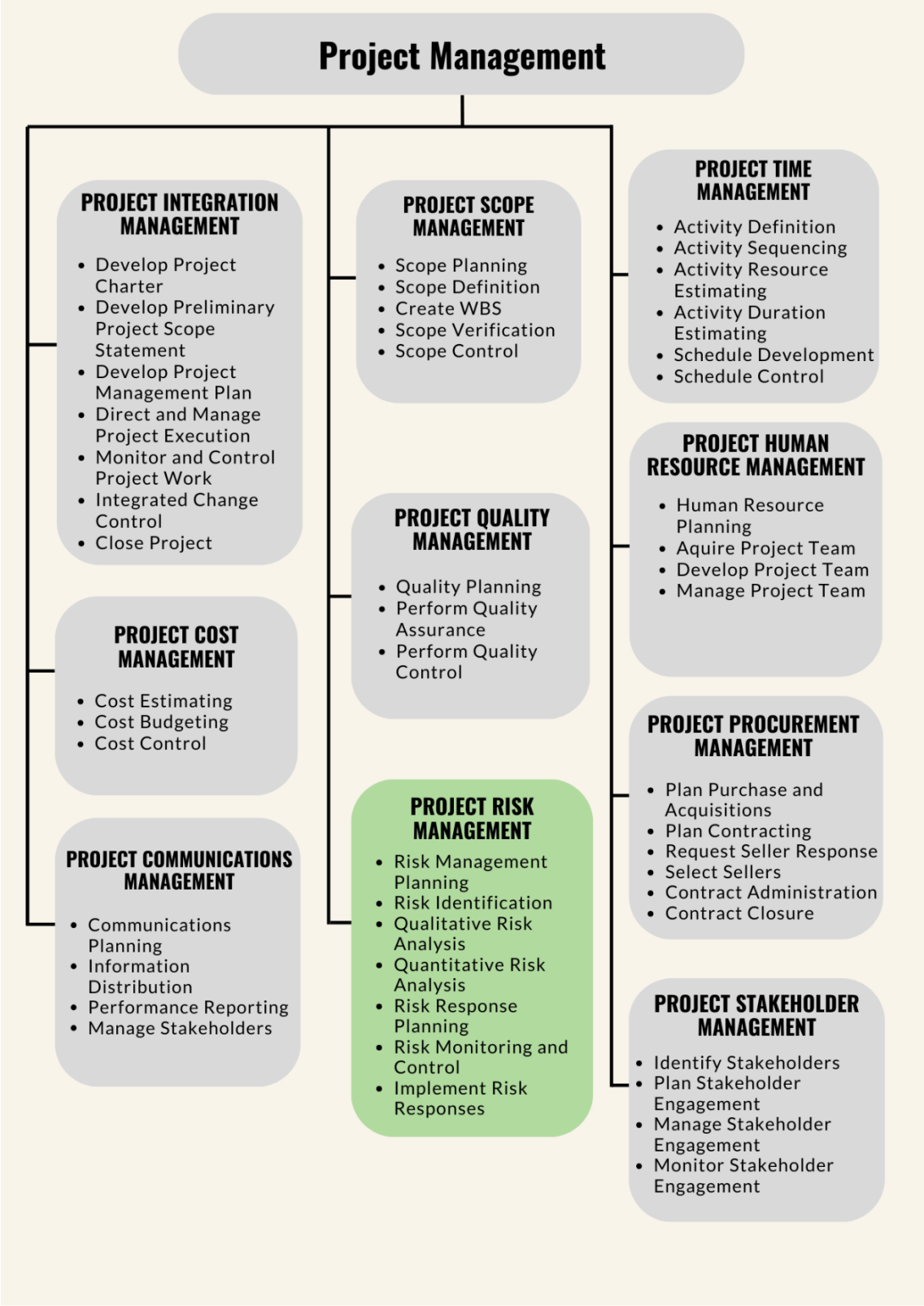

Figure 6: Case Company Project Management Overview adapted from PMBOK 2017

Following the PMBOK framework, both case studies had five process groups that combined processes that often ran concurrently or shared similar inputs and outputs. It is important to note that process groups should be distinct from the concept of a project life cycle. Unlike a life cycle, which explains how a project progresses from start to finish through various stages, process groups represent activities that can occur simultaneously or sequentially at a given stage (Project Management Body of Knowledge 2017).

The analysis showed that at certain stages, the project can go through all process groups or selectively deal with some. The processes in the PMBOK framework outline the specific activities and tasks that are essential for both the project manager and the project team to ensure the successful execution of the project. As seen in Figure 7 below, there are 7 distinct processes in the project risk management knowledge area of the PMBOK framework: Plan Risk Management, Identify Risks, Perform Qualitative Risk Analysis, Perform Quantitative Risk Analysis, Plan Risk Responses, Implement Risk Responses, Control/Monitor Risks. Unique process functions, inputs, and outputs characterize each of these processes. Each process uses different tools and techniques to achieve the desired outputs. It also visually shows the connection of the various processes used in project risk management at the case company, and this breakdown is adapted from the PMBOK guide (2018).

The case study analysis showed that the primary objective of the risk management planning phase was to formulate a comprehensive risk management plan. This phase integrated various project management documents and factors, including the project management plan, project charter, stakeholders register, enterprise environmental factors pertinent to the case company, and their process assets. The risk register is developed through the risk identification process, an important document that guides the entire project risk management process. Both the project management plan and the risk management plan maintain their significance as inputs across different stages of project risk management. These documents were reference points throughout the risk management process, ensuring crucial information retention and continuity across various phases.

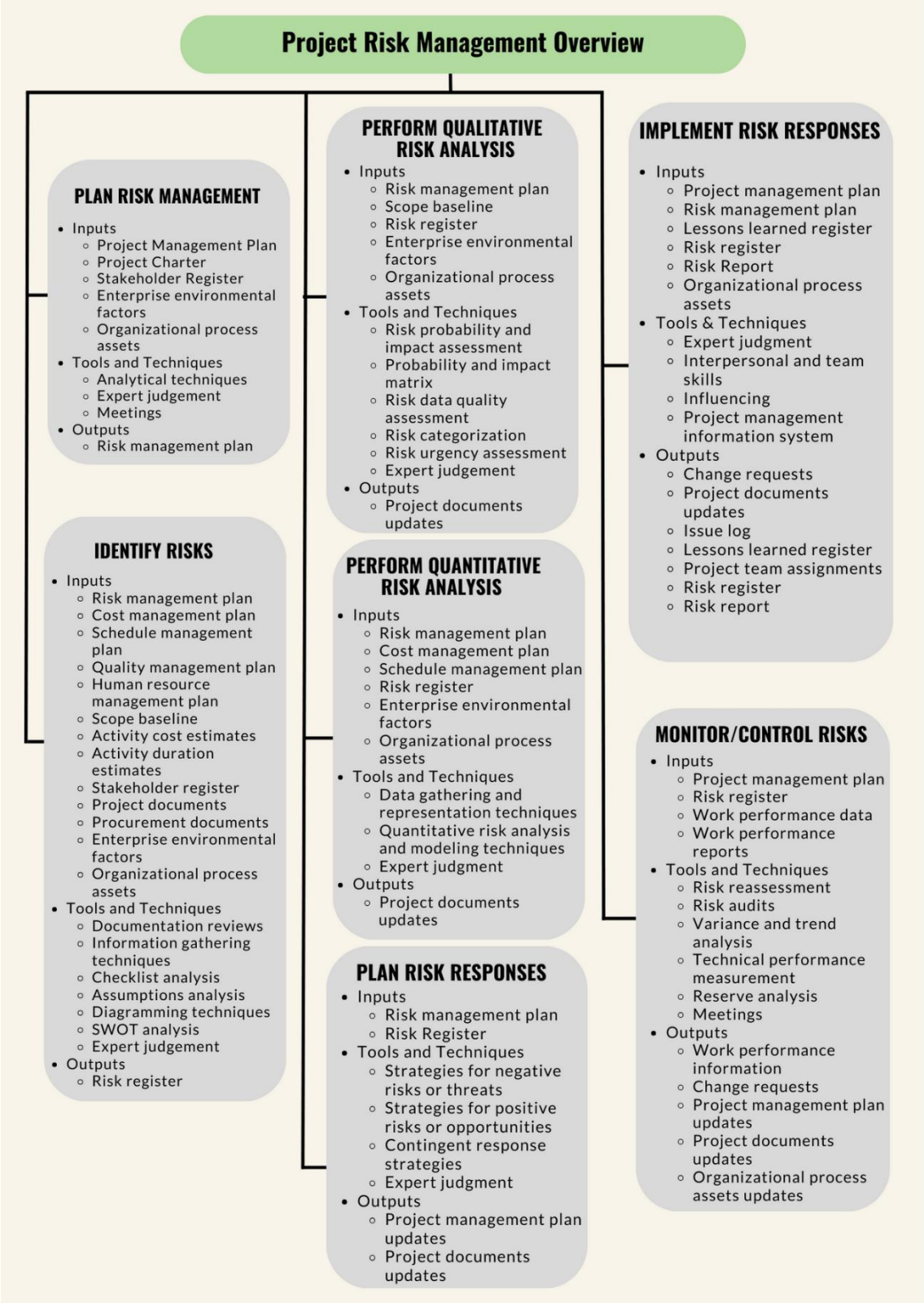

Figure 7: Risk Management Processes adapted from PMBOK 2017

To improve the understanding of the complex relationships between knowledge areas, process groups, and processes from Figure 6, I extensively mapped each group's knowledge areas, process groups, and associated processes. It resulted in a matrix illustrating the correlation of the respective processes (Figure 8). The matrix shows a structured alignment, where each process group is associated with at least two processes, and empty cells mean the absence of processes associated with a particular process group.

A close examination of the matrix reveals a remarkable observation: the initiation of project risk management does not begin in the project initiation stage but in the planning stage, which covers up to five of the earlier outlined risk management processes. This strategic start of the planning phase lays the foundation for sound risk management practices throughout the project life cycle (Kerzner 2017).

I also observed that the initiating process group had only two processes: developing the project charter and identifying stakeholders. This initial phase is crucial as it lays the foundation for the entire project, setting the tone and direction for subsequent activities or processes (Project Management Institute 2017).

Although I was not provided with the stakeholders register due to confidentiality issues, stakeholder identification holds immense significance. It involves identifying individuals or groups with a vested interest in the project and understanding their needs, expectations, and potential impact on project outcomes. Effective stakeholder management is essential to gain support, mitigate conflicts, and foster collaboration throughout the project lifecycle (Gray & Larson 2018).

Risk management processes are extended from the matrix into three distinct process groups: planning, executing, and monitoring. None was included in the closing process group. It highlights the continuity of risk management throughout a project's life cycle, emphasizing the need for proactive risk management practices integrated into project planning, execution, and monitoring to ensure project success and stakeholder satisfaction (Gray & Larson 2018).

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
1. Project Integration Management	1.1 Develop Project Charter	1.2 Develop Project Management Plan	1.3 Direct and Manage Project Work 1.4 Manage Project Knowledge	1.5 Monitor and Control Project Work 1.6 Perform Integrated Change Control	1.7 Close Project or Phase
2. Project Scope Management		2.1 Plan Scope Management 2.2 Collect Requirements 2.3 Define Scope 2.4 Create WBS		2.5 Validate Scope 2.6 Control Space	
3. Project Schedule Management		3.1 Plan Schedule Management 3.2 Define Activities 3.3 Sequence Activities 3.4 Estimate Activity Durations 3.5 Develop Schedule		3.6 Control Schedule	
4. Project Cost Management		4.1 Plan Cost Management 4.2 Estimate Costs 4.3 Determine Budget		4.4 Control Costs	
5. Project Quality Management		5.1 Plan Quality Management	5.2 Manage Quality	5.3 Control Quality	
6. Project Resource Management		6.1 Plan Resource Management 6.2 Estimate Activity Resources	6.3 Acquire Resources 6.4 Develop Team 6.5 Manage Team	6.6 Control Resources	
7. Project Communications Management		7.1 Plan Communications Management	7.2 Manage Communications	7.3 Monitor Communications	
8. Project Risk Management		8.1 Plan Task Management 8.2 Identify Risks 8.3 Perform Quantitative Risk Analysis 8.4 Perform Quantitative Risk Analysis 8.5 Plan Risk Responses	8.6 Implement Risk Responses	8.7 Monitor Risks	
9. Project Procurement Management		9.1 Plan Procurement Management	9.2 Conduct Procurements	9.3 Control Procurements	
10. Project Stakeholder Management	10.1 Identify Stakeholders	10.2 Plan Stakeholder Engagement	10.3 Manage Stakeholder Engagement	10.4 Monitor Stakeholder Engagement	

Figure 8: Knowledge Areas vs Process Groups Matrix

4.2 Thematic Interview Analysis

In the analysis of both project case studies, it became evident that Akosis Technologies has a risk management culture that aligns with the principles of the PMBOK guide. However, integrating the process flow and Risk Breakdown Structure (RBS) remained unclear. Michael and Mike (2016) emphasize the role of a well-designed RBS and Work Breakdown Structure (WBS) in facilitating effective risk management processes.

I conducted online interviews with individuals directly involved in project management activities to gain insights into this integration within the case company. As discussed earlier in Chapter Three, the choice of semi-structured interviews was deliberate due to its dynamic and flexible nature. This approach allows for the exploration of individual experiences and perceptions that are necessary to capture the desired information (Denzin & Lincoln 2018). The interview participants, totaling 15, comprised project managers, project coordinators, and project team members representing diverse genders, educational backgrounds, roles, and varying years of experience in project management. This diversity provided a rich base of knowledge and experience that increased the depth of the information (Creswell & Creswell 2017).

According to Denzin and Lincoln (2018), group interviews allow for exploring diverse perspectives and interactions among participants. To optimize the interview process, I combined group and individual interviews. Individual interviews were conducted with project managers, coordinators, and sponsors, while group interviews were conducted with other interview participants. This process aimed to comprehensively understand the different perspectives while allowing for focused discussions with key persons involved in projects at the case company. Table 1 outlines the interview participants' roles within the project.

Table 1: Interview Participants Roles

ROLES	**NUMBER OF PARTICIPANTS**
Project Manager	2
Project Coordinator	2
Project Sponsor	1
Business and Data Analyst	2
Subject Matter Expert (SME)	1
Risk Manager	1
Technical Lead	2
Other project team members	4
Total	15

The table shows that the interview participants were drawn from various project management roles, including project managers, coordinators, and team members from different departments. This selection ensured representation from various functional areas in project and risk management with varying expertise levels, enriching the insights gathered during the interviews. Additionally, including the project sponsor gives a perspective on project management practices and challenges from a higher organizational level within the case company.

Given the complexity of the subject matter addressed in this development thesis, I adopted a structured approach in formulating the interview questions. These questions were organized into distinct themes, allowing for a systematic exploration of various aspects of the project management processes under investigation. As mentioned in Chapter 3, the interview questions were developed from the findings of the case study analysis. By categorizing questions into themes: Project Management Framework, Risk Management Framework, Risk Management Standard, Risk Management Process Flow, and Organization Risk Culture, the interview process was streamlined and facilitated in-depth discussions on specific topics, ensuring that all relevant areas from the case study analysis were adequately covered and provided a structure for analyzing the interview responses about the research objectives (Guest et al. 2012). The interview questions are provided in Appendix 1 of this thesis.

To analyze the interview responses, I carefully examined the information provided by the interviewees to identify key insights and recurrent patterns. I started with a comprehensive review of the interview recordings, followed by the transcription of each interview session to ensure accuracy. Subsequently, I conducted a detailed analysis of the transcripts, identifying consistent themes and variations in the interviewees' perspectives, experiences, and opinions.

I developed a coding system to categorize the interview responses based on thematic content to facilitate systematic analysis. According to Miles et al. (2019), interview coding and thematic analysis are essential qualitative analysis tools that help provide quality insights into interviewee responses. A code book or sheet is an integral part of the process. The code book I developed for my qualitative data analysis of the interviews to ensure consistency and coherence throughout the analysis is provided in Appendix 2.

As advocated by Matthew B. Miles et al. (2019), using interview coding and thematic analysis methodologies enables the extraction of rich insights from interviewee responses, thereby enhancing the overall quality of the analysis. The qualitative data analysis reveals several key insights regarding the organization's project management and risk management practices. The tables below (tables 2 and 3) show the qualitative data analysis of the themes: Project Management Framework and Risk Management Framework. Data analysis for the other themes (Risk Management Standard, Risk Management Process Flow, Organization Risk Culture) follows a similar approach, identifying key findings and insights within each coded category and are also provided in Appendix 2.

Table 2: Project Management Framework Theme Analysis

CODE	ANALYSIS
OS	Responses indicate a hierarchical structure with a centralized Project Management Office (PMO) overseeing project activities.
FC	The project management framework's key components include the initiation, planning, execution, monitoring, and closure processes.
PL	The project lifecycle is well-defined, with processes for initiating, planning, executing, monitoring, and closing projects.
MA	Various methodologies, such as Agile, Waterfall, and hybrid approaches, indicate flexibility in project management processes.
SC	Project managers employ various communication channels to coordinate with stakeholders throughout the project lifecycle, including regular meetings, status reports, and collaboration tools.
TS	Commonly used tools and software include project management software like Microsoft Project, Jira, and Trello and communication tools like Slack and Microsoft Teams.
RM	Resources are managed efficiently, with processes in place for allocating budgets, timelines, and personnel to projects.
PMOR	The PMO plays a significant role in overseeing project activities, ensuring adherence to project management standards, and providing support and guidance to project managers.
RM	Risk identification, assessment, and management processes are integrated into the project management framework, emphasizing proactive risk mitigation strategies.
FPE	One example indicates that a project failed due to inadequate risk management practices, highlighting the importance of effective risk management within the organization's project management framework.

Table 3: Risk Management Framework Theme Analysis

CODE	ANALYSIS
RI	Risk management is integrated into the organization's overall project management framework, indicating a holistic approach to project risk management.
FE	Key elements of the risk management framework include risk identification, assessment, prioritization, response planning, and monitoring/evaluation processes.
RI	Various methodologies and techniques, including risk registers, brainstorming sessions, and expert judgment, are used to identify and assess project risks.
RCP	Risks are categorized and prioritized based on their potential impact on project objectives, allowing for focused risk management efforts.
RRP	Strategies for developing risk response plans include risk avoidance, mitigation, transfer, and acceptance, tailored to the specific characteristics of identified risks.
ME	Risk mitigation efforts are monitored and evaluated throughout the project lifecycle, with regular assessments to ensure the effectiveness of risk response strategies.
CR	Mechanisms are in place for communicating and reporting project risks to relevant stakeholders, promoting transparency and informed decision-making.
AL	The risk management framework aligns with industry standards and best practices, reflecting a commitment to quality and excellence in risk management.
LL	Lessons learned from past projects are incorporated into the risk management framework, fostering continuous improvement and organizational learning.
TD	Training and development initiatives are implemented to build risk management capabilities within the organization, ensuring that project teams are equipped to manage project risks effectively.

Based on the qualitative data analysis, several key insights emerge regarding the organization's project management and risk management practices: The organization demonstrates a structured approach to project management, with clear processes, roles, and responsibilities outlined within the project management framework. Risk management is integrated into the project management framework, indicating a proactive approach to identifying, assessing, and mitigating project risks. The Project Management Office (PMO) plays a crucial role in overseeing

project activities and ensuring adherence to project management standards, including risk management practices. Effective communication and stakeholder collaboration are emphasized throughout the project lifecycle, contributing to project success and stakeholder satisfaction. The organization values continuous improvement and learning by incorporating lessons learned from past projects into the risk management framework and providing training and development opportunities for project teams.

4.3 Proposed Project Risk Management Framework

As mentioned in the previous subchapter, although the case company has a well-structured approach to its project management processes, the interview analysis also revealed areas for possible improvements. The proposed risk management framework discussed in this thesis seeks to provide an optimized process flow (a graded approach to risk management) focusing on risk rating while maintaining the handling approach the case company already uses in risk management plans: risk acceptance, avoidance, and mitigation. The framework's building blocks in Figure 9 support the standards and processes identified from the case study analysis and interviews.

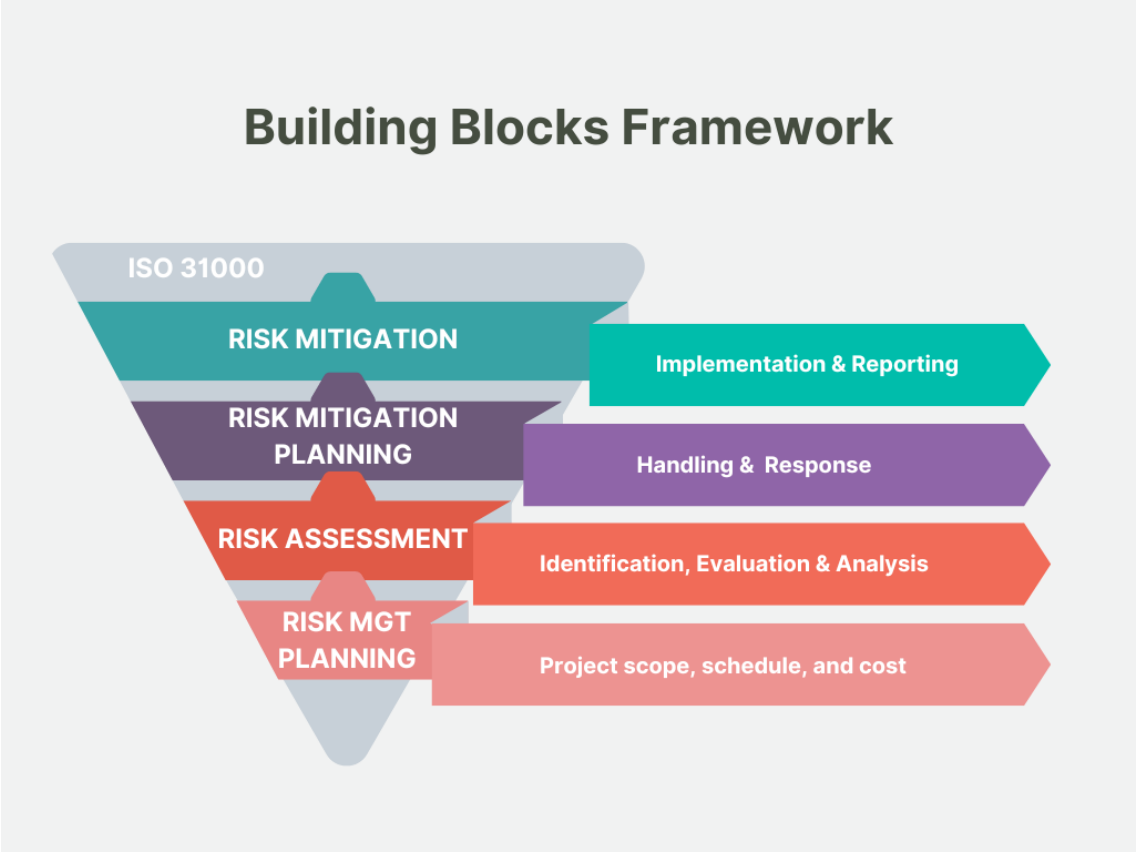

Figure 9: Building Blocks of the Framework

An integrative framework was developed to interconnect the various risk management components and processes. This integration enables the creation of a streamlined and effective system. As illustrated in Figure 9, the risk management processes of the case company are visually depicted in different blocks. It is evident that gaps existed between each block before the incorporation of ISO 31000 standards. Introducing the ISO 31000 block into the system establishes a cohesive and standardized approach, ensuring operational efficiency and consistency throughout the risk management process.

As mentioned earlier, Figure 9 visually represents the risk management processes within the framework. While it offers a broad overview, it is important to note that the steps of risk planning, assessment, and mitigation must be outlined within this visual representation. Instead, Figure 9 is a foundational blueprint upon which every other framework element is built. I chose this developmental approach to ensure clarity and ease of understanding of each process and phase within the broader risk management context and process flow for the framework development. By presenting the fundamental structure of the building blocks of the risk management framework in Figure 9, Akosis technology is provided with a comprehensive visual reference point. This approach also facilitates a systematic and organized interpretation of the framework, enabling stakeholders to discern the interrelationships and dependencies between the process flow's different processes, input, and output.

From the case study analysis at the beginning of Chapter 4, it is evident that Akosis Technologies mainly uses the project management framework by the Project Management Body of Knowledge (PMBOK) in its project implementations. Within the PMBOK framework is a comprehensive risk management process with various sub-processes and steps within each phase. This type of structure shows a connection between project processes and risk management. Figure 10 properly explains the interconnections between each risk management process within the framework.

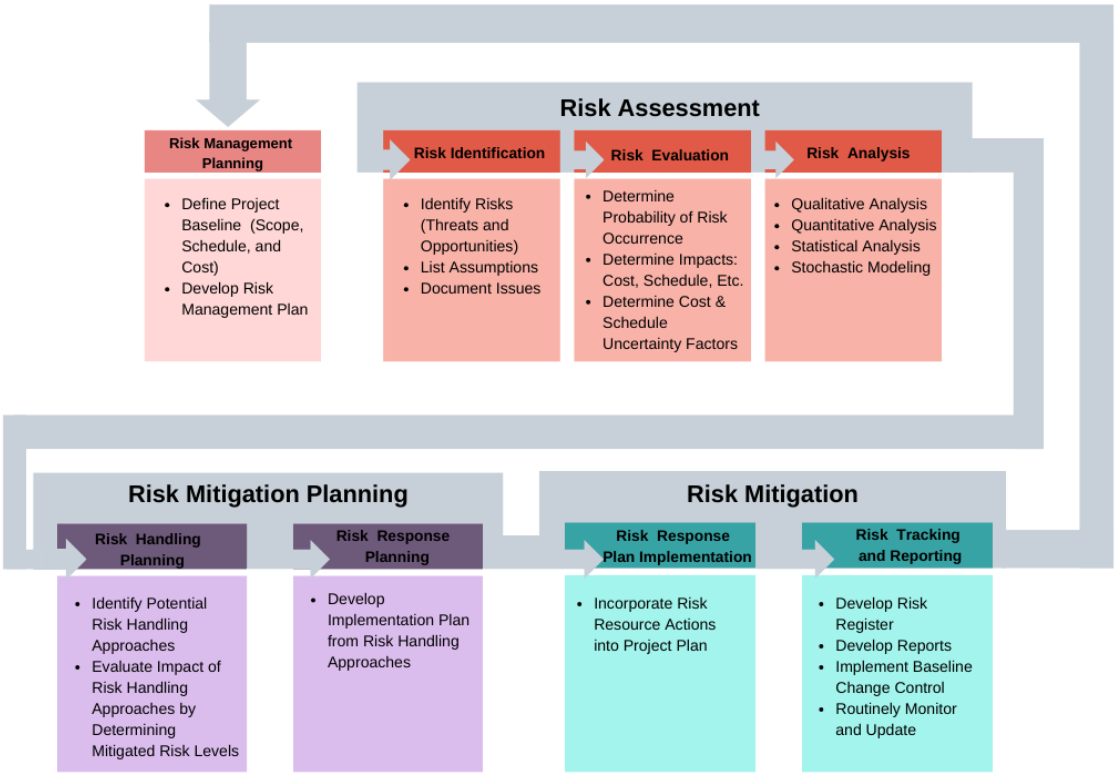

Figure 10: Risk Management Processes Integration

This visual representation carefully shows how each risk management process is interconnected and illustrates how the case company applies these processes by outlining the steps taken within each phase. This clarity supports understanding the practical application of the framework's building blocks. It ensures the reliability of the risk management process flow development within the context of the case company. The case company gains insights into the cohesive integration of its risk management processes within project implementations by visually showing the sequential progression of risk management activities. This visual representation is a more reliable blueprint from which the risk management process flow can be developed and facilitates the identification of potential gaps or areas for improvement within the risk management processes. This critical analysis enables refining the existing process flow and developing proactive measures to mitigate risks using a new graded approach.

In developing the risk management process flow, I used the cross-referencing approach, cross-referencing Figure 7 and Figure 10. This process enabled me to identify the interconnections between the risk management processes and their corresponding functions, inputs, and outputs. This effort is visually represented in Figure 11, which comprehensively depicts the risk management process flow within the organizational context. The visualization in Figure 11 enhances the understanding of the risk management process flow and serves as a valuable reference tool for stakeholders. It enables stakeholders to gain insights into the sequential

progression of risk management activities and facilitates informed decision-making regarding risk identification, assessment, and mitigation planning.

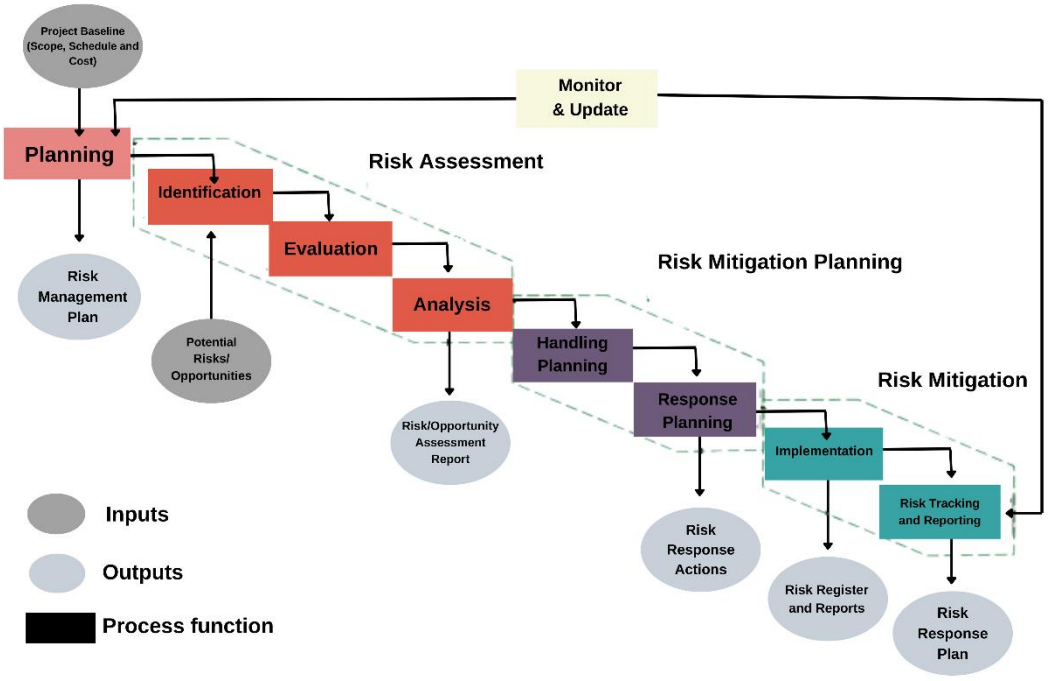

Figure 11: Risk Management Process Flow

Given that the approach to risk management used in the case company focuses on strategies aimed at avoiding, accepting, and reducing risks, the case company uses quantitative and qualitative risk management methods in risk assessment and mitigation planning. With the help of risk assessment, risk levels are identified based on the probability of occurrence and potential impact. The probability of occurrence is measured using the probability categories set by the case company. At the same time, the impact of the risk on the project is also measured based on the set criteria. The overall risk rating is determined using the risk assessment matrix. This thesis does not present the risk assessment details, as the proposed process flow improvement focuses on the risk mitigation design approach.

Risk mitigation planning consists of identifying potential risk management methods, evaluating the effects of potential management methods by assessing the risk level if the risk mitigation method reduces it, and developing a plan to implement the selected risk management methods. A graded approach can be considered during the risk mitigation planning phase of the project. Risk management methods and risk management plans should continuously be developed for high and very high risks and opportunities (Paul 2018). The approach proposed in this thesis focuses on implementing risk responses to mitigate very high and high risks. However, low and medium risks can be accepted with less or no mitigation efforts in line with the risk management system established by the case company.

This approach can be implemented by setting risk mitigation action threshold values. The case company can develop a metric system to accomplish this goal. In the context of metrics, thresholds refer to predefined values used to evaluate the performance of a metric. These thresholds are usually defined based on specific criteria or goals and serve as benchmarks to determine whether a measured value or performance meets, exceeds, or falls below a desired level. The threshold metric can be static - with a fixed value or dynamic - with a percentage range. Figure 12 shows the risk mitigation planning process flow of this proposed approach.

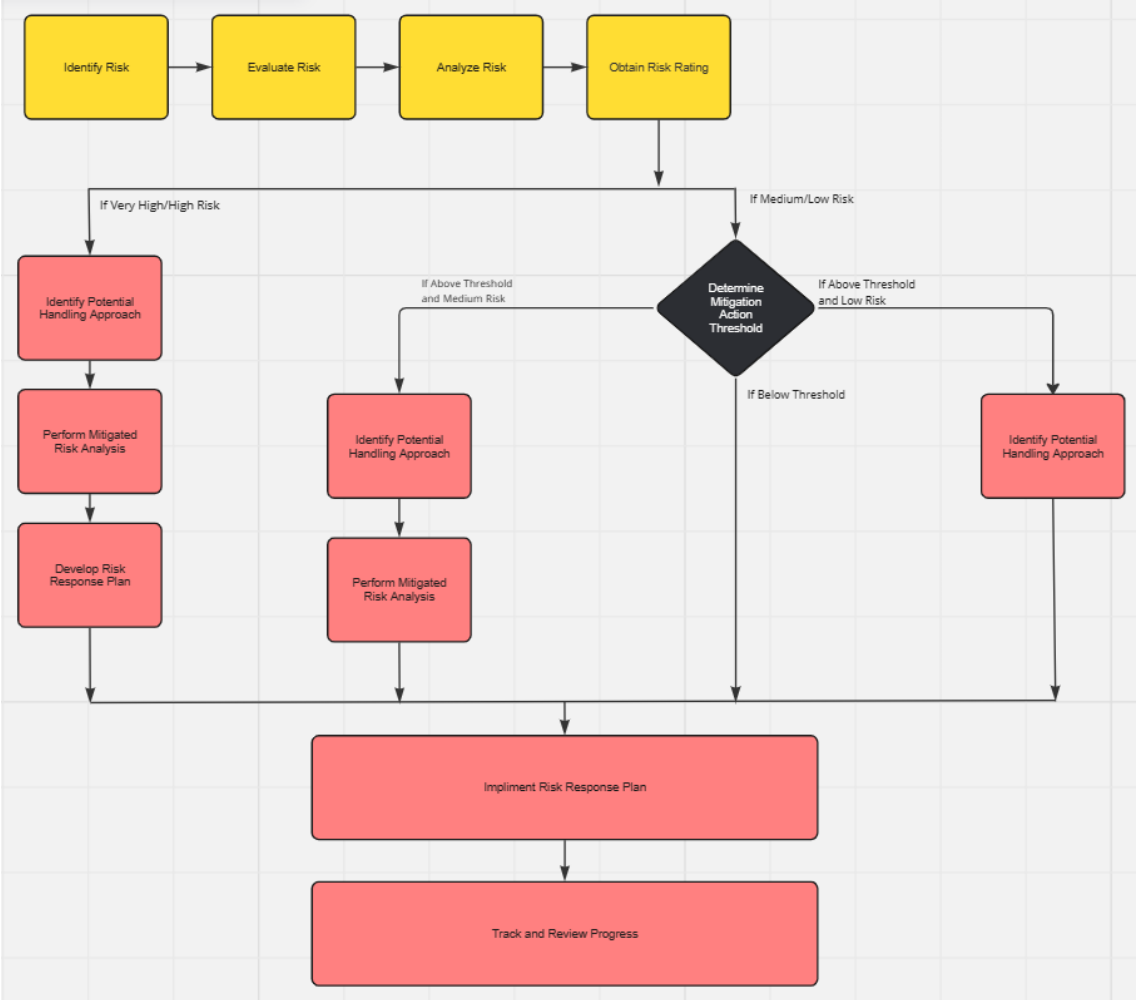

Figure 12: Risk Mitigation Planning

In Figure 12, risk mitigation planning approaches have been specifically tailored for very high, high, medium, and low risks, aiming to mitigate their potential impacts. To apply this strategic mitigation process flow, the case company already determined the risk threshold post-mitigation. This approach considers various risk-handling options for low-level risks that surpass the threshold, opting not to reassess the mitigated risks or develop explicit risk-handling strategies. This strategic choice reflects Akosis Technology's confidence in the effectiveness of its initial mitigation measures. It streamlines the risk management process of the case company and focuses resources where they are most needed.

Additionally, for risks falling below the predetermined threshold limit, the case company leverages its risk tolerance and allocates resources more efficiently. By refraining from taking further action to reduce these risks, Akosis technology strategically accepts them at manageable levels. This allows the company to prioritize efforts on higher-priority risks, balance risk, and reward effectively, ensure optimal resource allocation, and preserve organizational resilience. Based on the case study analysis and interview, the case company has excellent project and risk management expertise. This proposed framework enables the company to leverage its expertise to mitigate potential threats while optimizing resource allocation. It showcases the company's ability to confidently navigate complexities and uncertainties, ultimately positioning it for sustained success and resilience in the face of evolving challenges throughout the project lifecycle.

5 Conclusion

This thesis embarked on a journey to develop and optimize a Risk Management Framework tailored to the specific needs and operations of Akosis Technologies, a pioneering IT company in Abuja. The main objective was to identify the risk management practices used in the case company's project management and develop a framework for enhancing it, thereby contributing to its continued success and resilience in a dynamic business landscape. Several key insights and outcomes have been derived through a structured approach utilizing case study analysis, thematic interviews, and data analysis. This endeavor was also met to bridge the gap between theoretical risk management frameworks and practical implementation within the organizational context of Akosis Technologies. By aligning the development task of the thesis with the company's project management objectives and operations, this thesis aimed to provide tangible benefits to the organization, empowering it to navigate uncertainties effectively and optimize resource allocation for sustainable growth and success within the project and risk management context.

Drawing upon established theoretical frameworks such as the Project Management Body of Knowledge (PMBOK) and ISO 31000 standards, coupled with insights from industry experts and stakeholders within Akosis Technologies, a comprehensive Risk Management Framework has been developed. This framework integrates seamlessly with the company's existing project management processes, ensuring a comprehensive risk identification, assessment, and mitigation approach throughout the project lifecycle. The methods employed in this development thesis, including case study analysis and thematic interviews, have yielded valuable insights into the current risk management practices at Akosis Technologies. Through data collection and analysis, key findings regarding the organization's project management framework, risk management culture, and areas for improvement have been identified.

Key results indicate that Akosis Technologies demonstrates a structured approach to project management, with clear processes, roles, and responsibilities outlined within the project management framework. Risk management is integrated into the organizational processes, emphasizing proactive risk identification and mitigation strategies. The Project Management Office (PMO) plays a pivotal role in overseeing project activities and ensuring adherence to project management standards, including risk management practices. The proposed Risk Management Framework offers a graded approach to risk mitigation, focusing on optimizing resource allocation and prioritizing efforts based on risk severity. By strategically addressing very high and high-risk scenarios while accepting lower-level risks within acceptable thresholds, Akosis Technologies can enhance its risk management efficiency and organizational resilience.

A strong collaboration with the case company was maintained throughout the development process, ensuring the framework was finely tuned to meet the company's needs. This thesis has contributed to enhancing risk management practices at Akosis Technologies by developing a tailored Risk Management Framework aligned with the organization's objectives and operational dynamics. It is important to note that while the framework has been developed following a step-by-step process to ensure reliability, it has yet to be tested in real-world scenarios.

Although the developed Risk Management Framework represents a significant milestone in enhancing risk management practices at Akosis Technologies, its value and effectiveness will be realized through practical application and validation in real-world scenarios. Future validation and testing of the framework will be crucial to assess its effectiveness and applicability in practical settings. It is recommended that the developed framework presented to Akosis Technologies be further refined and validated through pilot testing and implementation in select projects. By embracing a continuous improvement and innovation culture, Akosis Technologies can further strengthen its risk management capabilities and achieve sustained success in a dynamic and competitive business environment.

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Declaration

I acknowledge using ChatGPT to brainstorm initial ideas about the topic and possible structure for the thesis. I used the output as a starting point for initial research and planning.

At the final stage of the thesis, I used Grammarly to review my writing style and check grammar, clarity, sentence structure, and correctness.

Figures

Tables

Appendices

Appendix 1: Interview Themes and Questions

Project Management Framework:

1. How is project management structured within the organization?

2. Can you describe the key components of the project management framework used in the organization?

3. How are projects initiated, planned, executed, monitored, and closed within the organization?

4. What methodologies or approaches are typically employed in project management processes?

5. How do project managers coordinate and communicate with project stakeholders throughout the project lifecycle?

6. What tools or software are utilized to support project management activities?

7. How are project timelines, budgets, and resources managed within the organization?

8. What role does the project management office (PMO) play in overseeing project activities and ensuring adherence to project management standards?

9. How are project risks identified, assessed, and managed within the project management framework?

10. Can you provide one example of a failed project using the organization's project management framework and why you think it failed.

Risk Management Framework:

1. How is risk management integrated into the organization's overall project management framework?

2. Can you describe the key elements of the organization's risk management framework?

3. What methodologies or approaches are used to identify and assess project risks within the organization?

4. How are risks categorized and prioritized within the risk management framework?

5. What strategies or techniques are employed to develop risk response plans?

6. How are risk mitigation efforts monitored and evaluated throughout the project lifecycle?

7. What mechanisms are in place for communicating and reporting project risks to relevant stakeholders?

8. How does the risk management framework align with industry standards and best practices?

9. How are lessons learned from past projects incorporated into the organization's risk management framework?

10. What role does training and development play in building risk management capabilities within the organization?

Risk Management Standard:

1. Is there a formal risk management standard or policy in place within the organization?

2. How does the organization define and document its approach to risk management?

3. What guidelines or requirements are outlined in the risk management standard?

4. How is compliance with the risk management standard monitored and enforced?

5. What measures are taken to ensure that project teams adhere to the risk management standard?

6. How often is the risk management standard reviewed and updated to reflect changes in the organization's risk landscape?

7. What resources or support are provided to help project teams implement the risk management standard effectively?

8. Are there any certifications or accreditations associated with the organization's risk management standard, if yes, does the organization have these certifications¬?

9. How does the risk management standard align with other quality management or governance frameworks used within the organization?

10. Can you provide an example of how the risk management standard has influenced decision-making and project outcomes within the organization?

Risk Management Process Flow:

1. Can you describe the typical flow of the risk management process within the organization?

2. How are project risks identified during the project initiation phase?

3. What methods or techniques are used to assess the likelihood and impact of identified risks?

4. How are risks prioritized and categorized based on their potential impact on project objectives?

5. What factors are considered when developing risk response plans?

6. How are risk response strategies implemented and monitored throughout the project lifecycle?

7. What role do project managers play in overseeing the risk management process?

8. How are changes in risk factors or project conditions communicated and addressed?

9. Are there any formal reviews or audits conducted to evaluate the effectiveness of the risk management process?

10. How does the risk management process contribute to project success and overall organizational performance?

Organization Risk Culture:

1. How would you describe the organization's attitude towards risk management?

2. What level of importance is placed on risk management within the organization's culture?

3. How are employees encouraged to identify and report potential risks within their projects?

4. Are there incentives or rewards in place to promote proactive risk management behaviors?

5. How does leadership demonstrate their commitment to fostering a positive risk culture?

6. How are risk management responsibilities and accountabilities distributed throughout the organization?

7. What measures are taken to build risk management awareness and capabilities among project teams?

8. Can you provide an example of how the organization's risk culture has influenced decision-making and project outcomes?

9. How does the organization learn from past experiences and adapt its risk management practices accordingly?

10. How would you assess the overall maturity of the organization's risk culture, and what areas for improvement exist?

Appendix 2: Codebook and Interview Analysis

Theme: Project Management Framework

1. OS - Organizational Structure
2. FC - Framework Components
3. PL - Project Lifecycle
4. MA - Methodologies/Approaches
5. SC - Stakeholder Communication
6. TS - Tools/Software
7. RM - Resource Management
8. PMOR - PMO Role
9. RM - Risk Management
10. FPE - Failed Project Example

Theme: Risk Management Framework

1. RI - Integration
2. FE - Framework Elements
3. RI - Risk Identification
4. RCP - Risk Categorization/Prioritization
5. RRP - Risk Response Planning
6. ME - Monitoring/Evaluation
7. CR - Communication/Reporting
8. AL - Alignment
9. LL - Lessons Learned
10. TD - Training/Development

Theme: Risk Management Standard

1. FS - Formal Standard
2. AD - Approach Definition
3. GR - Guidelines/Requirements
4. CO - Compliance
5. IM - Implementation
6. RU - Review/Update
7. SR - Support/Resources
8. CA - Certifications/Accreditations
9. AF - Alignment with Other Frameworks
10. IDM - Influence on Decision-Making

Theme: Risk Management Process Flow

1. PD - Process Description
2. RI - Risk Identification
3. LIA - Likelihood/Impact Assessment
4. PRI - Prioritization
5. RRP - Risk Response Planning
6. IM - Implementation/Monitoring
7. PMR - Project Manager Role
8. CAC - Communication/Addressing Changes
9. RA - Reviews/Audits
10. CS - Contribution to Success

Theme: Organization Risk Culture

1. AT - Attitude
2. IMP - Importance
3. EI - Employee Involvement
4. IR - Incentives/Rewards
5. LD - Leadership Demonstration
6. RA - Responsibilities/Accountabilities
7. AC - Awareness/Capabilities
8. IDM - Influence on Decision-Making
9. LA - Learning/Adaptation
10. MA - Maturity Assessment

Interview Qualitative Data Analysis

Risk Management Standard

CODE	ANALYSIS
FS	Responses indicate the presence of a formal risk management standard within the organization. This standard is documented and accessible to all relevant stakeholders, providing a clear framework for managing risks.
AD	The organization's risk management approach is well-defined, detailing the processes, roles, and responsibilities involved in managing project risks.
GR	Comprehensive guidelines and requirements are established to support the risk management standard. These include specific procedures for risk identification, assessment, prioritization, response planning, and monitoring.
CO	Regular compliance checks and audits are performed to ensure adherence to the risk management standard. This ensures that all project teams follow the prescribed risk management processes and procedures.
IM	The implementation of the risk management standard is supported by training and resources. Project teams are provided with the necessary tools and templates to effectively apply the standard in their projects.
RU	The risk management standard is periodically reviewed and updated to incorporate lessons learned, best practices, and changes in the organizational or project environment. This ensures the standard remains relevant and effective.
SR	Adequate support and resources are allocated for the implementation of the risk management standard. This includes access to risk management tools, training programs, and expert guidance.
CA	The organization has obtained relevant certifications and accreditations for its risk management practices, demonstrating a commitment to maintaining high standards and continuous improvement.
AF	The risk management standard is aligned with other industry frameworks and standards, such as ISO 31000 and PMI’s PMBOK Guide.
IDM	The formal risk management standard significantly influences decision-making processes within the organization. Project decisions are made with a clear understanding of potential risks and their implications.

Risk Management Process Flow

CODE	ANALYSIS
PD	The risk management process is thoroughly described, outlining each step from risk identification to monitoring and review. This detailed process description helps ensure that all team members understand and follow the same risk management procedures.
RI	Various techniques are used for risk identification, including brainstorming sessions, expert judgment, and the use of risk registers.
LIA	Risks are assessed in terms of their likelihood and potential impact on project objectives. This assessment helps in prioritizing risks and determining appropriate response strategies.
PRI	Risks are prioritized based on their assessed likelihood and impact. This prioritization allows project teams to focus their efforts on managing the most significant risks.
RRP	Detailed risk response plans are developed for identified risks, including strategies such as risk avoidance, mitigation, transfer, and acceptance.
IM	Risk response plans are implemented, and their effectiveness is monitored throughout the project lifecycle.
PMR	Project managers play a crucial role in the risk management process, from initial risk identification to the implementation of response plans. They are responsible for ensuring that risk management activities are integrated into the overall project management process.
CAC	Effective communication mechanisms are in place to keep stakeholders informed about risks and any changes to risk status. This includes regular risk reports and updates during project meetings.
RA	The risk management process is subject to regular reviews and audits to ensure compliance and identify areas for improvement. These reviews help in maintaining the integrity and effectiveness of the risk management process.
CS	A well-defined risk management process flow contributes significantly to the success of projects by proactively identifying and managing potential risks.

Organization Risk Culture

CODE	ANALYSIS
AT	The organization's attitude towards risk is proactive, with a strong emphasis on the importance of risk management. This positive attitude is reflected in the commitment of both leadership and staff to effective risk management practices.
IMP	Risk management is considered a critical aspect of project management, with its importance emphasized across all levels of the organization.
EI	Employees are actively involved in the risk management process, contributing to risk identification, assessment, and response planning.
IR	Incentives and rewards are in place to encourage proactive risk management behavior. Employees who effectively manage risks and contribute to the success of projects are recognized and rewarded.
LD	Organizational leaders demonstrate strong support for risk management by providing resources, setting expectations, and leading by example.
RA	Clear responsibilities and accountabilities for risk management are defined for all project roles. This clarity ensures that everyone understands their role in the risk management process and contributes effectively.
AC	There is a high level of awareness and capability regarding risk management within the organization. Regular training and development programs are conducted to enhance risk management skills and knowledge.
IDM	The organization's risk culture significantly influences decision-making processes. Decisions are made with a thorough understanding of potential risks and their implications, ensuring informed and balanced decision-making.
LA	The organization fosters a culture of learning and adaptation, incorporating lessons learned from past projects into the risk management framework.
MA	The maturity of the organization's risk culture is regularly assessed to identify strengths and areas for improvement. These assessments help in benchmarking progress and setting goals for further development.