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Enhancing Project Management Practices through Risk Management Policies at Finnbox Post Oy

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ABSTRACT :

My thesis aims to improve project management practices through risk management policies at Finnbox Post Oy, a small-scale postal logistics firm based in Seinäjoki, Finland. The research aims to investigate how risk governance frameworks with structure can enhance operational resilience and efficiency in digitally dependent logistics operations. The research develops and implements the Finnbox Lightweight Risk Governance Cycle (FLRGC) as a lightweight, scalable model to tackle persistent issues in small logistics firms.

The operational challenges examined in this thesis consist of software failures during delivery, human errors in sorting, incorrect or delayed shipments, communication breakdowns, and unstructured risk identification procedures. The existing literature provides risk management strategies for large-scale supply chains, yet it lacks sufficient information about adapting these principles to smaller firms operating in resource-constrained environments.

The research adopts a qualitative case study design which combines a systematic literature review with six semi-structured interviews that were conducted through the University of Vaasa's Webropol platform. The research involved delivery drivers, sorting staff and a supervisor who provided comprehensive insights into organizational challenges and response patterns. The research findings are evaluated utilizing PMBOK risk management guidelines along with Contingency Theory and Supply Chain Risk Management (SCRM) models.

The research reveals five thematic risk areas that require strategic interventions that include formalizing risk frameworks, real-time Key Risk Indicators (KRIs) tracking, strengthening training

and SOPs, and implementing feedback loops and sustainable last-mile delivery solutions. The FLRGC model combines these elements into a practical cyclical governance tool that works for small postal/logistics firms.

The research provides both theoretical and practical knowledge for project professionals who are engaged in logistics-intensive service sectors. The research provides a duplicate model for small and medium enterprises (SMEs) to link operational risk control with scalable project management practices for maintaining business continuity and customer satisfaction.

KEYWORDS: Risk Management, Project Management, Logistics, Operational Risks, Policy Integration, Efficiency, Delivery Reliability

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Abbreviations:

AI Artificial Intelligence

CBR Case-Based Reasoning

FLRGC Finnbox Lightweight Risk Governance Cycle

ICT Information and Communication Technology

IoT Internet of Things

IPD Integrated Project Delivery

KRI Key Risk Indicator

OEE Overall Equipment Effectiveness

PBC Performance-Based Contracting

PM Project Management

PMBOK Project Management Body of Knowledge

PPP Public–Private Partnership

PRM Project Risk Management

RBI Risk-Based Inspection

RM Risk Management

SCRM Supply Chain Risk Management

SDG Sustainable Development Goals

SME Small and Medium-sized Enterprise

SOP Standard Operating Procedure

TOPSIS Technique for Order Preference by Similarity to Ideal Solution

UAS Unmanned Aerial Systems

1 Introduction

Logistics services function as a key component to deliver reliable deliveries and operational stability for small and medium-sized enterprises (SMEs) operating in dynamic and resource-constrained environments. The expanding e-commerce market alongside rising customer expectations for precise last-mile delivery requires logistics providers to handle delivery performance alongside internal risks from system failures, human errors, and coordination breakdowns. Risk management functions as a vital component of project management when firms rely on digital tools and lean workflows in their operations. Logistics operations employ project frameworks extensively, yet many small and medium-sized enterprises (SMEs) do not have formalized risk governance strategies which result in frequent service interruptions and diminished stakeholder trust.

This research examines how project management practices can be enhanced through risk-based governance approaches at the Finnish logistics company Finnbox Post Oy. The research identifies operational risks within the company and develops realistic solutions that can be applied to comparable logistics operations. The research combines qualitative interviews with internal data analysis to create a thesis that provides both practical and academic value. The research finding includes a lightweight risk governance model called the Finnbox Lightweight Risk Governance Cycle (FLRGC) which supports delivery reliability process transparency and long-term operational resilience.

1.1 Background of the Study

The logistics services industry requires operational stability alongside delivery reliability to achieve long-term success in its constantly changing environment. Finnbox which operates as a Finland-based logistics service provider encounters recurring operational challenges mainly in their last-mile delivery operations. The distribution workflows experience disruptions because of sorting errors delayed shipments and software system

glitches that persist. The delivery system experiences backlogs throughout publicholidays and the practice of marking undelivered letters as "delivered" in the delivery application creates scheduling challenges and reduces service record reliability.

Technical issues point to fundamental operational challenges that stem from the insufficient connection between project management approaches and risk management frameworks. The reported existence of project management frameworks does not compensate for the absence of official risk management procedures that affect last-mile delivery operations and therefore impact performance and stakeholder confidence. The absence of strategic risk mitigation procedures will continue to cause operational inefficiencies which will damage customer trust and reduce service quality.

1.2 Research Questions and Objectives

The research is guided by two primary questions:

1. What are the key operational risks affecting the logistics processes at Finnbox Post Oy?
2. How can risk management policies be integrated to improve project management practices at Finnbox Post Oy?

Two main research objectives have been formulated to address these research questions:

(1) The research aims to identify major operational risks in logistics performance at Finnbox through actionable risk classification. The analysis will focus on disruptions that occur during last-mile delivery operations including delayed shipments misplaced or incorrectly sorted parcels and system software failures. The research will align identified risks with vulnerabilities in the company's sorting and delivery operations and digital workflow processes.

(2) This research investigates strategies to enhance project management at the company by implementing systematic risk management principles. The research will evaluate the current project management framework at the company through comparison with PMBOK framework principles, Contingency Theory, and Supply Chain Risk Management (SCRM) best practices. The study introduces a customized risk governance model for small logistics businesses called the Finnbox Lightweight Risk Governance Cycle (FLRGC) which includes formal risk identification tools, digital dashboards for KRIs, SOP-based training enhancements, feedback loop structures, and modular delivery strategies. The research will collect qualitative data through staff and supervisor interviews to develop operational interventions that enhance service reliability and operational resilience.

2 Literature Review

2.1 Introduction to Project Management in Postal Logistics

The postal and logistics industries currently employ project management as an essential operational and strategic tool to address digitalization demands, e-commerce expansion, and rising customer expectations. The implementation of project management principles enables postal logistics organizations to more effectively organize initiatives and manage resources while ensuring timely delivery in complex and risky contexts. The success of service providers such as Finnbox relies on integrating project management (PM) principles with risk management (RM) techniques as they operate under diverse operational conditions and client requirements.

Logistics operations have traditionally operated through standard process-based frameworks. Logistics companies implement various initiatives which include sorting systems, automation route optimization, and tracking technology deployment because of rapid technological advancements and service quality expectations. The rapid technological developments and rising service quality demands have led logistics companies to adopt project-like structured approaches for their operations. The projects operate with defined time constraints and restricted financial resources while requiring multiple stakeholders' involvement. Shao (2020) emphasizes that risk assessment frameworks remain essential for logistics initiatives that employ new technology including Unmanned Aerial Systems (UAS) for last-mile delivery. The systematic approach of project management enables enhanced control and responsibility and corporate objective alignment in such environments.

The ISO 21500 guidelines alongside the PMBOK published by the Project Management Institute (PMI) firmly emphasize process-based management which incorporates scope, time, cost, quality, and risk elements (PMI, 2017). The adoption of these frameworks is increasing in logistics operations as they require exact planning and execution to handle delivery times, prevent sorting errors, and integrate digital tools. The adoption of smart

technologies and automation in Logistics 4.0 requires dynamic project capabilities according to Bag, Gupta, and Luo (2020). The implementation of project management frameworks by businesses in their logistics operations contributes to improved operational performance and responsiveness according to their research.

The postal service encounters specific challenges as it relies on both human labor and increasingly complex digital technology. The operational hazards affecting services and decreasing consumer trust include sorting errors along with delayed shipments and delivery software glitches. The author's Fang et al. (2013) emphasize that risk response planning requires to be integrated into project architecture particularly when dealing with large complex systems including logistics networks. The management of these risks at Finnbox and other companies becomes systematic when they treat control system adoption, software updates, and process redesign as formal projects.

Risk-based asset integrity frameworks serve as essential components for logistics operations. Bharadwaj et al. (2012) recommend lifecycle cost and risk analysis to determine when infrastructure should be repaired or replaced. The decision-making process occurs within project portfolios as managing cost, time, and safety represent essential concerns for PM.

The logistics industry experiences a transformation through digitalization while Dallasega et al. (2022) demonstrate that organizations adopting this transition gain substantial advantages from PM tools which provide real-time visibility and adaptability. Postal operators are required to adapt their planning and execution methods as their operations are affected by dynamic conditions including weather disruptions, system crashes and delivery volume fluctuations.

Latupeirissa et al. (2024) state that successful digital transformation is more than just the deployment of technology, it must be guided by inclusive service access, governance alignment, and strategic capability-building. Their review of public sector digitization

highlights the requirement for project-based structures considering human, institutional, and technological readiness challenges that are equally relevant to SME postal firms such as Finnbox. The PM framework becomes essential for Finnbox as technology-driven projects require this structure to avoid setbacks.

A project management culture supports to promote innovative approaches. Project-based thinking has evolved from being an optional alternative into a requirement. According to Barreto, Amaral, and Pereira (2017), Industry 4.0 technologies require structured governance and agile delivery as they introduce complexity to the market. The application of PM methodologies enables organizations to transform complex challenges into specific actions that focus on results. Project teams achieve effective innovation execution through well-defined timelines and clear task ownership and built-in risk monitoring.

The authors Bag, Gupta, and Luo (2020) demonstrate that Logistics 4.0 capabilities such as real-time analytics, adaptive workflows, and digital collaboration become more powerful when supported by structured project management. The combination of these capabilities provides firms with both agility enhancement and the ability to proactively manage service failures, technical issues, and demand shifts. The implementation of PM practices within Finnbox's daily operations strengthens their resistance to external disruptions such as app crashes and subcontractor delays while keeping customer satisfaction high and regulatory requirements satisfied.

The current literature demonstrates that project management functions as an essential enabler for contemporary postal logistics operations. The structured goal-oriented approach enables firms to handle operational complexity and risks while delivering services more effectively. Companies such as Finnbox can achieve substantial improvements in service efficiency, reliability, and adaptability by implementing PM standards and integrating risk considerations during the initial stages (Shao, 2020; Bag et al., 2020; Fang et al., 2013; Dallasega et al., 2022; Bharadwaj et al., 2012).

The research established that proper project management methods are essential for postal logistics operations. Finnbox with other businesses should implement PM concepts to improve operational effectiveness while managing uncertainty through risk mitigation and digital transformation plans. The complexity of postal delivery systems requires a PM culture that supports flexible decision-making and risk awareness.

2.2 Operational Risks in Postal/Logistics Services

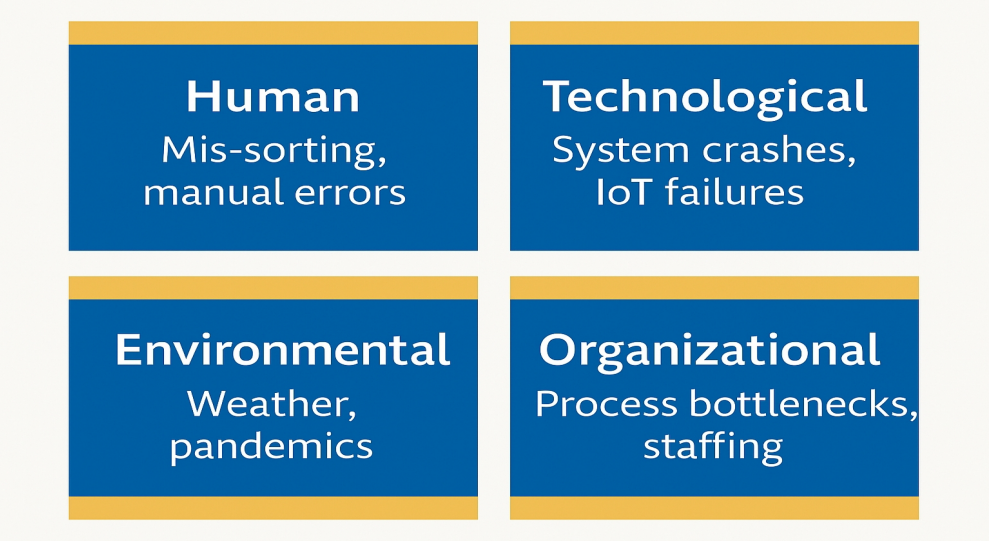

Figure 1: Key operational risk categories in postal and logistics services. Adapted from Dallasega et al. (2022), Mechler (2016), and Njomane & Telukdarie (2022)

The modern postal and logistics industry encounters numerous operational risks that harm service reliability and delivery accuracy and decrease customer satisfaction levels. The risks emerge from multiple origins which include human errors, mechanical failures, IT system failures, sorting errors, severe weather conditions, and third-party logistics

provider dependencies. Mittal et al. (2022) observe that although crowd-shipping platforms offer sustainability and cost-saving benefits for SMEs, they frequently fail to provide consistent service due to high platform fees, insufficient carrier availability, and a lack of responsiveness to SME-specific delivery requirements. These limitations increase operational risk and reduce reliability in logistics networks, particularly in last-mile and long-haul delivery contexts.

The study by Carbone et al. (2017) indicates that crowd logistics offers flexibility and cost efficiency but also increases complexity in service coordination, trust management, and accountability which increases operational risks for logistics providers. The literature emphasizes the requirement to detect operational risks by employing project management alongside risk mitigation approaches for their proper management.

Dallasega et al. (2022) provide fundamental knowledge about operational risk in logistics by illustrating that delivery volume fluctuations with worker shortages and process congestion points create significant operational inefficiencies. The survey conducted by the authors reveals that logistical process risks emerge as one of the essential challenges that impact supply chain responsiveness worldwide. The findings from Finnbox align with real-world experiences as delivery schedule inconsistencies, wrong shipments and recurring software issues regularly degrade customer service quality.

Ejdys and Gulc (2020) emphasize that in technology-driven courier services, trust in technical solutions, not just interpersonal relationships, is a crucial factor in determining perceived service quality and future customer loyalty, especially in e-commerce contexts.

According to Mechler (2016), organized probabilistic techniques are required to evaluate operational risk in delivery logistics. The economic effectiveness of mitigation measures, particularly those involving early warnings and system redundancy, is highlighted in his analysis of disaster risk management frameworks. These could be utilized in postal

services to create scenario planning for network disruptions, real-time tracking alerts, and predictive analytics for delivery failures.

Malhouni and Mabrouki (2024) adapt the MACBETH technique to humanitarian logistics in crisis zones, with a more focused analysis of delivery system weaknesses. By identifying risk groups including inaccurate sorting, customer miscommunication, transit delays, and IT infrastructure failures, their evaluation framework can be modified for civilian postal operations. To prioritize intervention areas, the model assists in visualizing operational risks throughout deployment phases.

The digital transformation of logistics systems produces new operational risks that coexist with the efficiency benefits achieved. The authors Hopkins and Hawking (2018) identify two potential system vulnerabilities that arise from IoT-enabled tracking and data analytics, system crashes and compromised data integrity. The authors propose a dual risk mitigation approach that combines automated detection systems with human oversight to develop robust logistics infrastructure.

Qazi et al. (2017) extend the analysis by developing a Bayesian Belief Network demonstrating how risks propagate across logistics systems. A package mislabeling at the beginning of the process can create subsequent challenges that result in delivery failures, customer service issues, and product return costs. The delivery chain of Finnbox demonstrates how small software errors trigger extensive chain reactions throughout its operational stages.

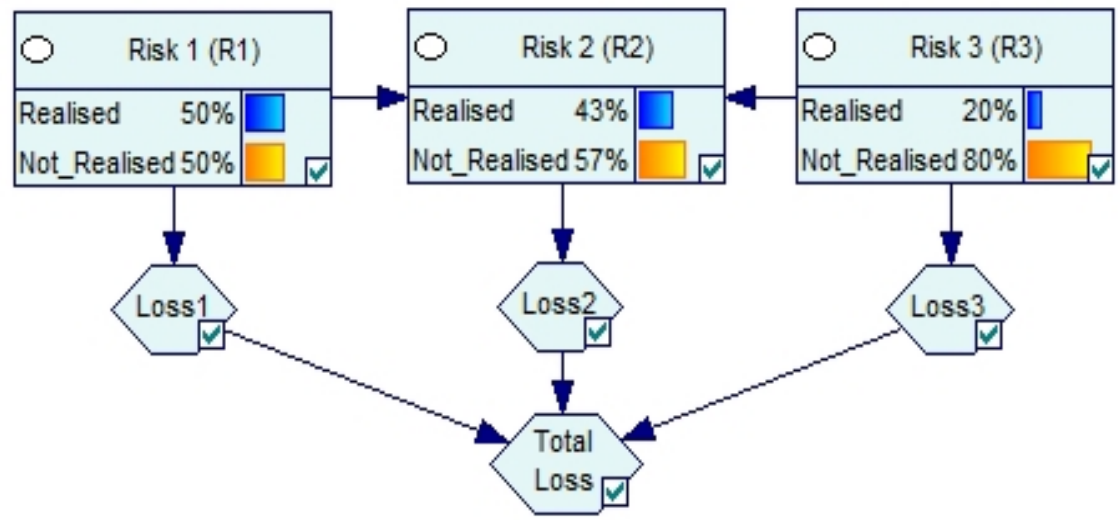

Figure 2: Bayesian Belief Network illustrating cascading risks. Reproduced from Qazi et al. (2017)

The operational risk is influenced by environmental and external factors. Njomane and Telukdarie (2022) in their study on the impact of the pandemic on South African supermarket logistics observed that the inability to quickly adapt to shocks such as lockdowns or staff shortages affected services. The findings are very relevant to postal logistics in Finland where snowstorms or technical issues can lead deliveries to a halt if risks are not managed proactively.

Lagorio et al. (2023) discuss how 5G technology advancements can reduce delays and enhance warehouse-to-delivery point coordination. The study demonstrates that the improvement of network infrastructure leads to a decrease in scanning and data upload delays and real-time routing decisions. The integration of these technologies into project plans by firms such as Finnbox can assist in the prevention of disruptions and enhance operational performance.

The postal and logistics sector encounters operational risks that exist at multiple levels including technical aspects alongside human elements, environmental factors, and

organizational structures. The research demonstrates that proactive structured risk identification and mitigation methods should include project-based planning digital monitoring and flexible operations. Finnbox is required to manage these risks as it ensures business continuity while maintaining service quality and fulfilling changing customer expectations.

2.3 Theoretical Framework

The following section employs four fundamental theories to enhance project risk management practices at Finnbox Post Oy: Risk Management Theory, Project Risk Management (PMBOK), Supply Chain Risk Management (SCRM), and Contingency Theory. The frameworks introduce different yet compatible approaches to understand, predict and control operational risks within intricate logistics systems. The application of these theoretical lenses enables managers to link strategic goals with operational challenges, especially in situations with high uncertainty and variability.

2.3.1Risk Management Theory

Risk Management Theory introduces a systematic method for identifying project risks and their assessment and mitigation to protect project outcomes. Organizations employ this approach to detect potential disruptions early so they can develop resilience and preparedness. Selviaridis and Norrman (2014) highlight that in service supply chains, risk allocation under performance-based contracting (PBC) is complex as providers frequently assume financial risks associated with service failures without having full control over sub-contractor performance or customer inputs.

Wu et al. (2017) demonstrate that artificial intelligence and decision-support tools with Case-Based Reasoning (CBR) improve risk estimation through the analysis of previous project data. This method enables logistics companies to transition from reactive to anticipatory decision-making through adaptive learning capabilities.

Wu, Li, and Bao (2017) illustrate that embedding historical case data into intelligent systems enables the prediction of operational failures and cost overruns. The approach demonstrates value for Finnbox Post Oy's recurring challenges with sorting errors and system crashes. The CBR-based models promote organizational learning through the development of an internal database that tracks previous disruptions and their successful interventions to enhance organizational resilience.

Yazdani et al. (2017) develop a group decision-making support system that integrates fuzzy QFD and TOPSIS methods to support logistics provider selection, illustrating how such tools can prioritize risks and align stakeholder decisions under uncertainty supporting Risk Management Theory's emphasis on structured strategic planning.

Oropallo et al. (2024) state that integrating risk-based inspection (RBI) with decision-support tools improves maintenance prioritization and failure prevention in logistics and industrial systems. The authors demonstrate the effectiveness of combining predictive inspection models with data-driven risk analysis to enhance service reliability in complex environments.

Gupta et al. (2022) employ a Bayesian best–worst method to rank and mitigate barriers to digitalization in supply chain logistics, indicating how structured prioritization models support resilient decision-making and align with Risk Management Theory's focus on anticipatory planning and digital adaptability.

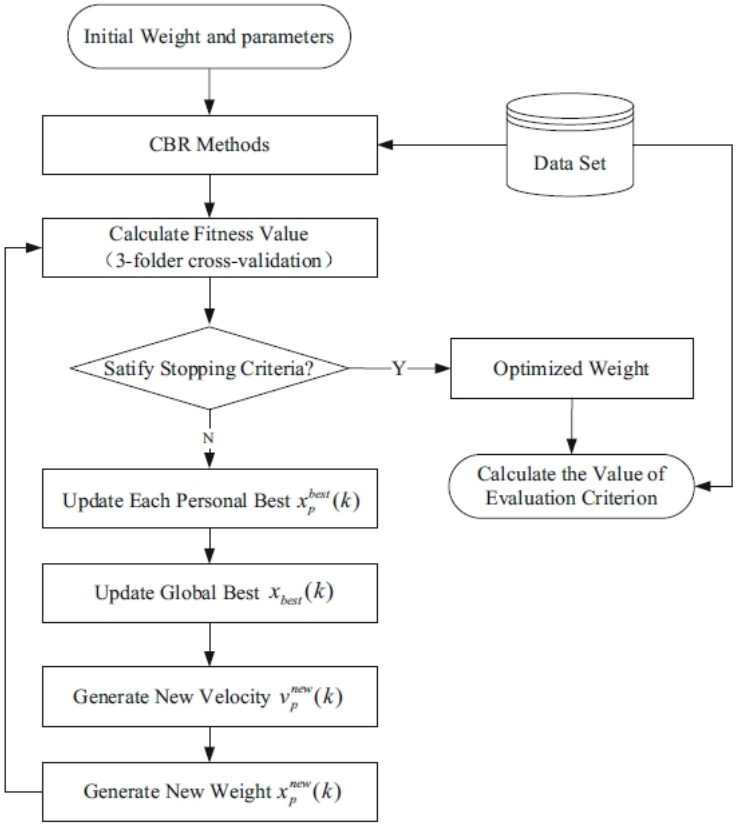

Figure 3: PSO-CBR model for software effort estimation. Reproduced from Wu, Li & Bao (2017)

Tummala and Schoenherr (2011) extend this perspective by describing a detailed risk management process that includes identification, analysis, evaluation, and monitoring. This structured approach enables firms to evaluate both the likelihood and impact of potential risks. In postal logistics, where service disruptions and IT failures can lead to systemic delays and customer dissatisfaction, such a framework ensures early intervention and continuity.

2.3.2Project Risk Management (PMBOK Framework)

The PMBOK framework provides a systematic approach to risk management throughout the project lifecycle by including planning, identification, analysis (qualitative and

quantitative), and response development and monitoring. The method performs well in high-variability environments such as postal logistics as risks evolve rapidly.

García-Arca et al. (2018) recommend a participative framework for improving road transport efficiency by adapting Overall Equipment Effectiveness (OEE) indicators from production contexts. The authors illustrate how transport KPIs, when integrated into a structured evaluation framework, enhance real-time risk detection and continuous improvement in logistics processes, thus supporting the value of PMBOK-style governance in logistics settings.

He et al. (2024) employs the FAHP modeling approach to assess the adaptability of Integrated Project Delivery (IPD) methods in large and medium-scale projects, illustrating how structured decision-support frameworks can enhance alignment with schedule, cost, and risk criteria principles that are equally relevant to PMBOK-based project governance in logistics.

Zhang, Bai, and Goh (2023) demonstrate how PMBOK practices function in postal delivery operations through their example of risk registers and escalation protocols that boost service reliability and timeliness. The framework is more adaptable through continuous risk plan assessments and updates. The documentation of risk triggers alongside specific response ownership assignments through PMBOK leads organizations to adopt a disciplined proactive approach to uncertainty. The study by Adaku et al. (2018) illustrates how lean principles such as SMED and Kanban applied to structured project governance decreased processing time in public sector delivery processes which aligns with PMBOK's risk-informed execution approach.

The research combines Bayesian Belief Networks with risk probability updates that become possible during project execution. The ability to adapt to evolving conditions is essential in mail delivery logistics as small delays can rapidly become major issues. The combination of PMBOK principles with these models produces real-time visibility which enables agile responses for decision-making.

Barreto et al. (2017) highlight that the implementation of Industry 4.0 technologies in logistics, including IoT and cyber-physical systems, increases the complexity and interconnectivity of operations, which requires project risk management frameworks such as PMBOK to evolve towards real-time adaptability, system transparency, and digital resilience.

Rane et al. (2021) propose a Project Risk Management (PRM) framework that utilizes Industry 4.0 technologies such as IoT, system integration, and cloud computing to improve real-time risk tracking and proactive mitigation. Their model is consistent with PMBOK, focusing on early risk identification and decision support in complex project environments such as logistics.

Yu et al. (2021) provide a two-stage optimization-simulation approach for redesigning urban postal networks that combines mathematical modeling with simulation to improve facility placement and demand allocation under real-world uncertainty. The method illustrates how combining structured planning tools with adaptive models supports accessibility and service continuity in high-variability logistics environments.

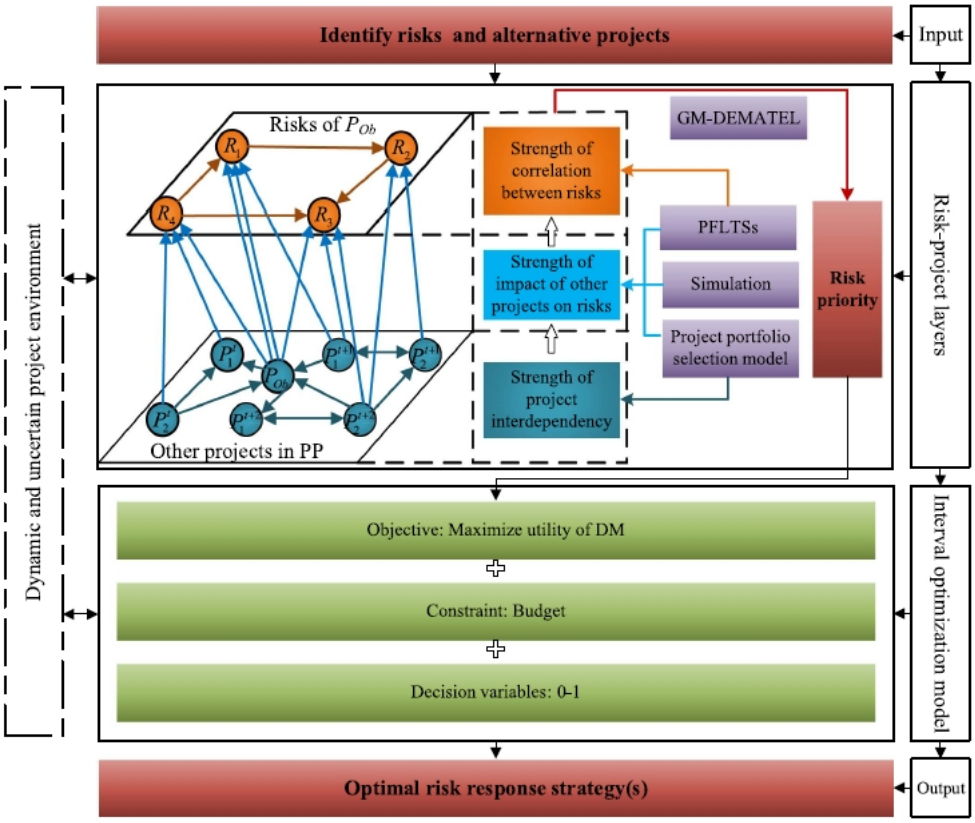

Figure 4: Risk response decision-making framework. Reproduced from Zhang et al. (2023)

2.3.3Supply Chain Risk Management (SCRM)

The main goal of SCRM consists of detecting and resolving risks existing within supply chain networks. The company requires this approach as operational disruptions frequently result from third-party logistics providers and environmental conditions such as extreme weather. The combination of operational and strategic perspectives within SCRM produces an integrated understanding of supply chain vulnerabilities.

Birkie et al. (2017) explain that complex logistics networks create higher exposure to risks. The study demonstrates that network integration enhances operational efficiency

yet leads to fast-spreading systemic risks. Companies require to create supply chains with integrated flexibility and backup systems to handle this situation.

Trucco, Petrenj, and Birkie (2018) propose a multilevel modeling approach to evaluate supply chain vulnerabilities resulting from disruptions in critical infrastructure. Their work highlights the interconnected nature of logistics systems, where a failure in one node, such as customs or distribution hubs, can trigger cascading operational delays. This perspective is consistent with Finnbox's risk environment, where minor disruptions often escalate into system-wide inefficiencies due to process dependencies.

Zhang, Zhao, and Pang (2018) developed a quantitative budget allocation model to score vulnerability levels for supply chain risk mitigation. The approach enables companies to prioritize their budget allocation for maximum impact, so they maximize their risk reduction investments.

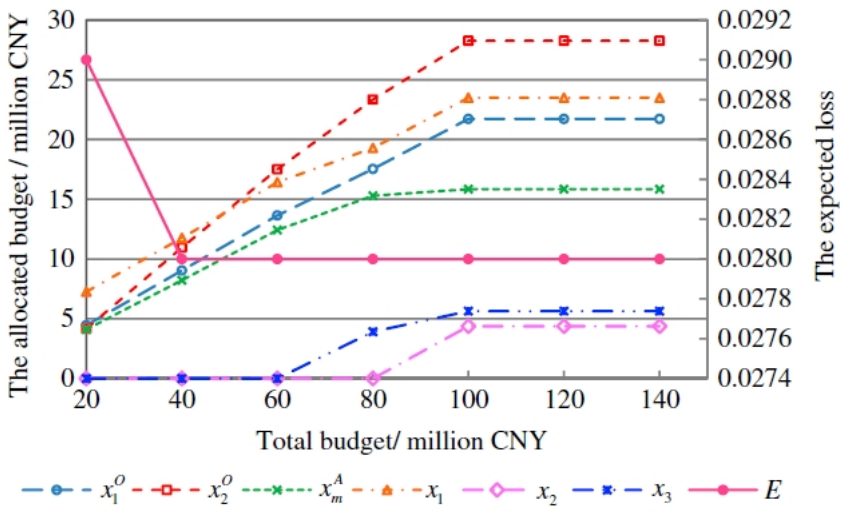

Figure 5: Relationship between the budget and the expected loss under different budgets. Reproduced from Zhang et al. (2018)

2.3.4Contingency Theory

The Contingency Theory requires strategic decision-makers to adapt their approaches according to the current context. Kilfoyle and Richardson (2015) argue that governance mechanisms in international postal networks such as the Universal Postal Union are required to evolve through participatory, adaptive structures where network-level bodies utilize control systems not only for coordination but also to shape institutional behaviors among members, which by contingency theory's emphasis on structure-environment fit.

Risk management strategies are required to be customized based on the unique conditions of each organization according to this approach. The theory holds particular importance for postal logistics operations as daily activities respond to evolving demand patterns and route conditions and staffing limitations.

Geradin (2015) emphasizes that postal network access must be considered in the context of institutional structures, financial sustainability, and competitive balance, and that access regulation should be tailored to local operational and regulatory conditions, which is in alignment with the core principles of contingency theory.

Dlamini et al. (2024) argue that strategic planning in postal institutions is frequently undermined by resistance to transformation, insufficient coordination between organizational levels, and workforce capacity issues highlighting the requirement for strategic adaptation based on internal and contextual constraints, as emphasized by contingency theory.

Mokgohloa et al. (2023) argue that digital transformation in postal systems is influenced by intricate feedback mechanisms between digital culture, operational capability, and adoption maturity. Their system dynamics model suggests a requirement for adaptive, policy-aligned strategies that are tailored to local capabilities and regulatory contexts, which supports contingency theory's emphasis on structure environment fit.

Wang, Ma, and Liu (2020) propose that lifecycle governance efficiency in PPP infrastructure projects can be significantly enhanced by incorporating systematic project oversight, transparent stakeholder coordination, and structured evaluation tools that are aligned with evolving regulatory and contextual demands. Their study supports the contingency perspective that public sector management strategies must be aligned with environmental conditions and stakeholder expectations for successful PPP findings.

Iwan et al. (2024) highlight that sustainable logistics systems require to address barriers in data sharing and knowledge acquisition which aligns with this thesis's emphasis on internal coordination and information application in SME postal settings.

According to Brandon-Jones et al. (2014), important organizational factors that affect the efficiency of risk response includes workforce numbers, network structure, and ICT readiness. They conclude that "one-size-fits-all" approaches are ineffective in dynamic situations and recommend diagnostic tools that will assess the unique vulnerabilities and capacities of an organization.

According to Wu and Chaipiyaphan (2020), risk response tactics vary based on risk patterns and vulnerabilities in their predictive risk model, which includes contingency thinking. Their work emphasizes how crucial it is to match response mechanisms with actual ground circumstances in real-time so that adaptive measures can be deployed in response to evolving logistics demands.

According to Pulignano, Thompson, and Doerflinger (2021), employer strategies in logistics are determined not only by operational goals but also by institutional negotiations that differ across national contexts. The results indicate that each of the three strategies (compliance, avoidance, or exit) is selected based on how effectively it fits with the institutional structures, which supports contingency theory's emphasis on environment-structure fit.

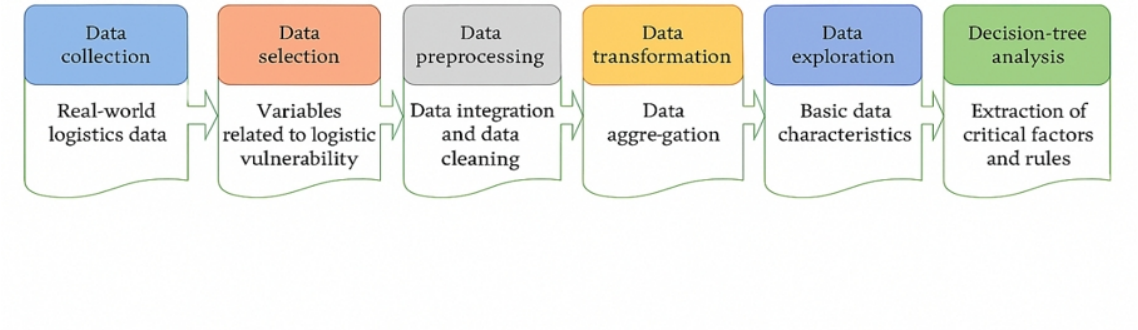

Figure 6: A step-by-step business analytics process for diagnosing logistics vulnerability. Reproduced from Wu & Chaipiyaphan (2020)

The discussed theories provide an effective foundation for identifying and managing project risks that involve logistics. Risk Management Theory, PMBOK, SCRM, and Contingency Theory all demonstrate that flexibility and readiness combined with data-based reactions create the most value. Organizations can evolve their reactive firefighting approach into proactive resilience-building strategies through framework implementation.

2.4 Empirical Studies and Practical Risk Integration in Postal and Logistics Services

Theoretical frameworks establish fundamental principles for managing risks in logistics projects yet empirical studies reveal how these models function during actual project implementation. This section examines real-world risk management strategies applied to postal operations, logistics management, and supply chain management specifically for Finnbox Post Oy's operational environment.

Hermoso-Orzáez et al. (2022) deliver a thorough case study about the Spanish supply chain network implementation of ISO 28000 and ISO 31000 standards. The authors combine ISO compliance with the Analytic Hierarchy Process (AHP) to create a systematic method for operational risk identification, scoring, and prioritization. The model presented in this paper would serve Finnbox as a valuable framework to organize and manage delivery operation risks according to international standards.

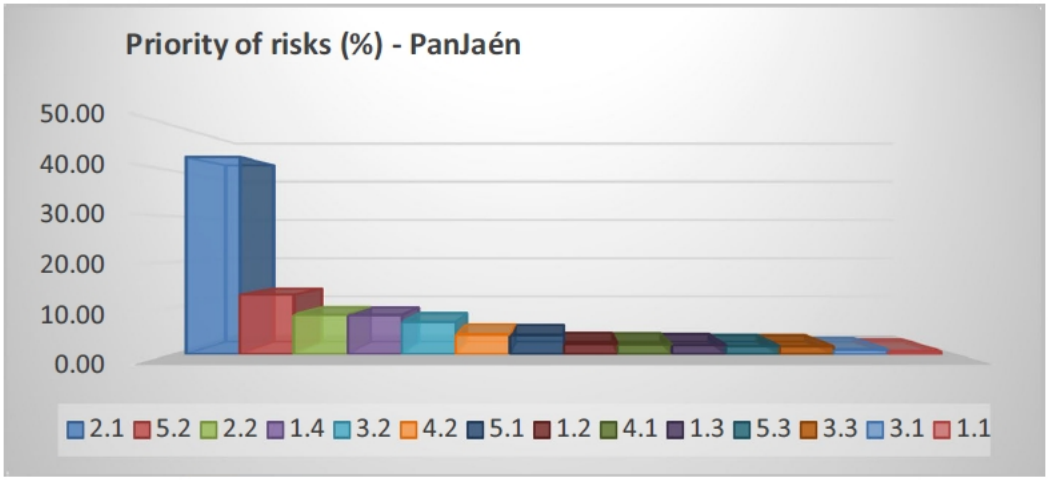

Figure 7: ISO- Based Supply Chain Risk Management Model applied in Jaen, Spain.

Reproduced from Hermoso - Orzaez et al. (2022)

The research by Gabellini et al. (2024) demonstrates a deep learning method to predict supplier delivery delays by employing macroeconomic indicators in the automotive industry. The multivariate LSTM model utilizes historical autocorrelation, and economic trend shifts to enhance delay prediction accuracy. The large-scale industrial logistics approach developed by this method could assist the Finnbox postal firm develop forecasting adaptations to predict disruptions in component or third-party logistics inputs when economic conditions fluctuate.

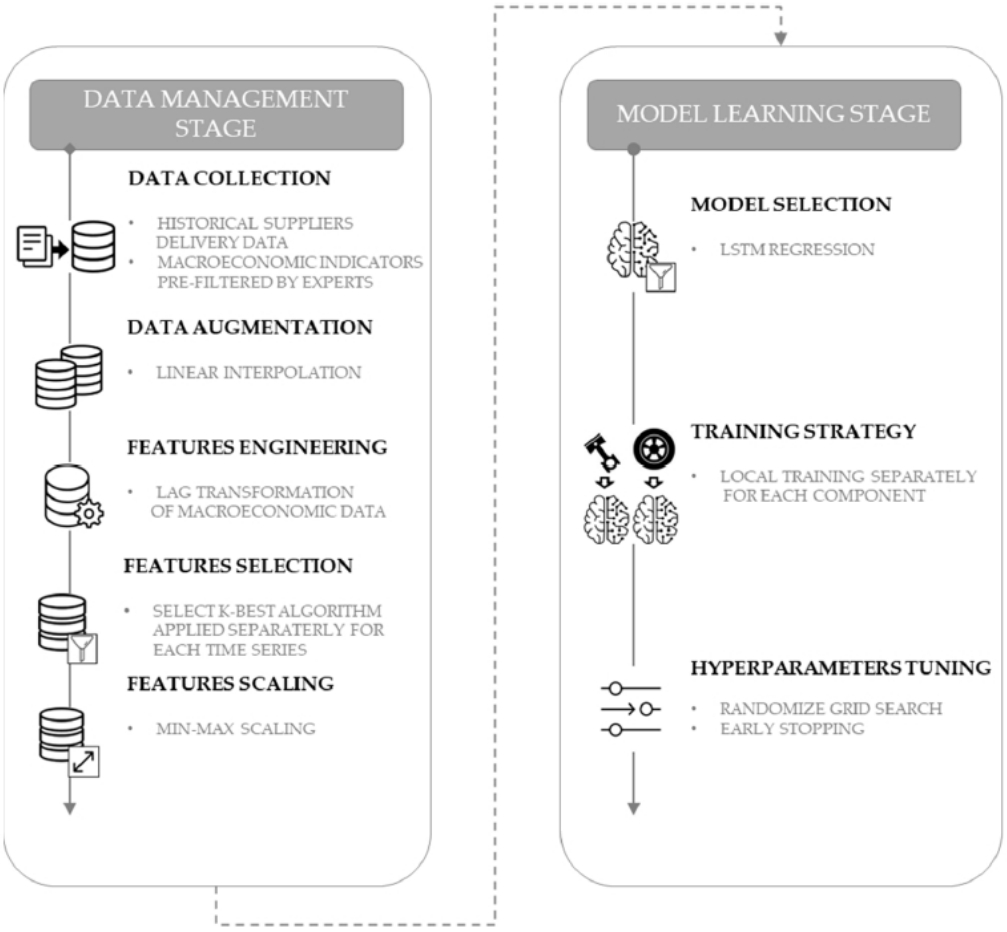

Figure 8: Deep Learning Architecture for Predicting Delivery Delay Risk. Reproduced from Gabellini (2024)

Malhouni et al. (2024) study risk management in humanitarian logistics operations where the environment is characterized by volatility and uncertainty. Their emphasis on

contingency planning, stakeholder coordination, and adaptive routing demonstrates similar relevance to the operational challenges faced by postal firms delivering services in Finnish rural areas with limited infrastructure.

Yuan et al. (2018) examine social risk factors (SRFs) in transportation PPP projects and demonstrate their essential role in achieving long-term sustainability. The confirmatory factor analysis reveals fifteen SRFs that cover social, environmental, and economic aspects. The research findings are highly applicable to organizations such as Finnbox which operate in public-private partnership arrangements as community expectations and stakeholder conflicts and governance gaps affect service reliability. The research supports the implementation of structured social risk management (SRM) strategies within project delivery frameworks to boost resilience and stakeholder trust and social sustainability in postal logistics.

Ispas et al. (2023) state that the implementation of risk-based thinking into management systems has become more important since the revision of ISO 9001:2015 which requires a systematic and preventive approach to managing uncertainties. Their systematic literature review examines how risk is treated in integrated management systems (IMS) across various sectors, identifying a fragmented utilization of risk assessment tools and a lack of standardized models for operational applications. The study does not describe any digital implementation, but it highlights the requirement for the development of automated and digital tools to improve real-time monitoring and decision-making in risk-based systems. These insights support the relevance of digital tools such as dashboards in enhancing operational visibility and responsiveness in logistics environments.

The research studies demonstrate specific recommendations for implementing risk management practices in standard logistics operations. The empirical research demonstrates how hybrid project-risk approaches deliver value to small and mid-sized postal firms through ISO-based frameworks and predictive analytics as well as digital

monitoring tools and contingency strategies. The practical models demonstrate that logistics operations require scalable, cost-effective tools that match organizational size, resource limitations, and strategic goals during digital transformation.

2.5 Technological Innovations and Digital Risk Analytics in Postal Project Management

The increasing complexity of supply chains and postal logistics systems drives companies to implement digital tools for proactive risk management. The current environment demands improved manual risk identification and mitigation methods as it operates under automation and real-time data, and customer expectation increases. Logistics firms now utilize the Internet of Things (IoT), predictive analytics artificial intelligence (AI), and cloud-based platforms to boost their operational resilience and responsiveness.

According to Dubey et al. (2022), the development of an AI-based big data analytics culture enables humanitarian supply chains to become more agile and resilient by simplifying information complexity and improving real-time decision-making. These findings are highly relevant to postal logistics firms such as Finnbox, where timely digital risk responses are critical to operational stability.

Ispas et al. (2023) illustrate the importance of risk-based thinking in the implementation of integrated management systems, especially in ISO-aligned frameworks. The authors, through their systematic literature review, identify a lack of standardized digital tools that support real-time risk analytics, which points to a clear research gap in the development of technologies such as automated dashboards or centralized monitoring platforms. The study does not focus on the postal sector, but its implications are relevant. Adopting such innovations in postal project management

could improve delivery accuracy, enable continuous oversight, and support strategic alignment by integrating digital risk data into daily operations.

Mechler (2016) examines cost-benefit calculations from disaster management systems to offer an economic viewpoint on digital risk management. By measuring efficiency benefits, the analysis supports the utilization of predictive modeling in high-risk situations, even though it is not specifically related to postal operations. This supports the purchase of portable digital instruments that can enhance decision-making and replicate disruption circumstances for small logistics companies.

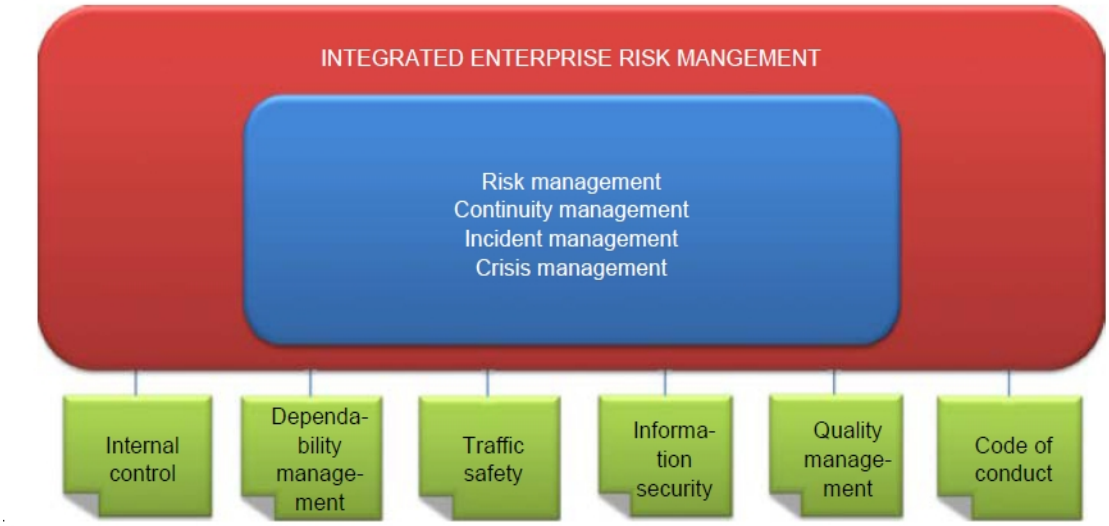

Figure 9: Generic Risk Management Process for Digital Decision-Support Systems. Reproduced from Soderholm and Norrbin (2013)

Metwally and Diab (2024) examine how institutional forces, especially business, governance, and professional logic determine the adoption of risk-based management control systems in developing markets. Their qualitative study indicates that organizations that operate in environments with multiple institutions must modify their internal control systems to fulfill different regulatory, professional, and operational

requirements. The study does not emphasize technology, but its findings provide beneficial analogies for postal firms such as Finnbox that require them to handle various oversight demands while keeping operations efficient with limited team members.

By employing Unmanned Aerial Systems (UAS) to evaluate risk in drone-based logistics, Shao (2020) contributes to the technical narrative. The suggested model highlights the potential benefits of AI-based route optimization by assessing delivery route risks in a variety of traffic and environmental scenarios. Despite being futuristic, this system demonstrates how postal services can develop in Finland's semi-urban areas, where weather and traffic can affect the dependability of routes.

Anes (2022) offers a reputational risk-based selection methodology for collaborative logistics networks. Qualitative risk indicators including service consistency and partner reputation are integrated with operational data in this decision-support system. Logistics companies may reduce indirect risks from third-party relationships by utilizing a multi-criteria analytics platform, Finnbox could benefit a lot from increasing its network of subcontractors.

Almgrashi (2024) discusses how principles for sustainable risk management enable us to conduct digital internal audits more effectively. According to the report, risk-based auditing with analytics incorporated into it guarantees compliance and identifies operational process weaknesses, which is ideal for postal companies that must uphold delivery SLAs and public confidence.

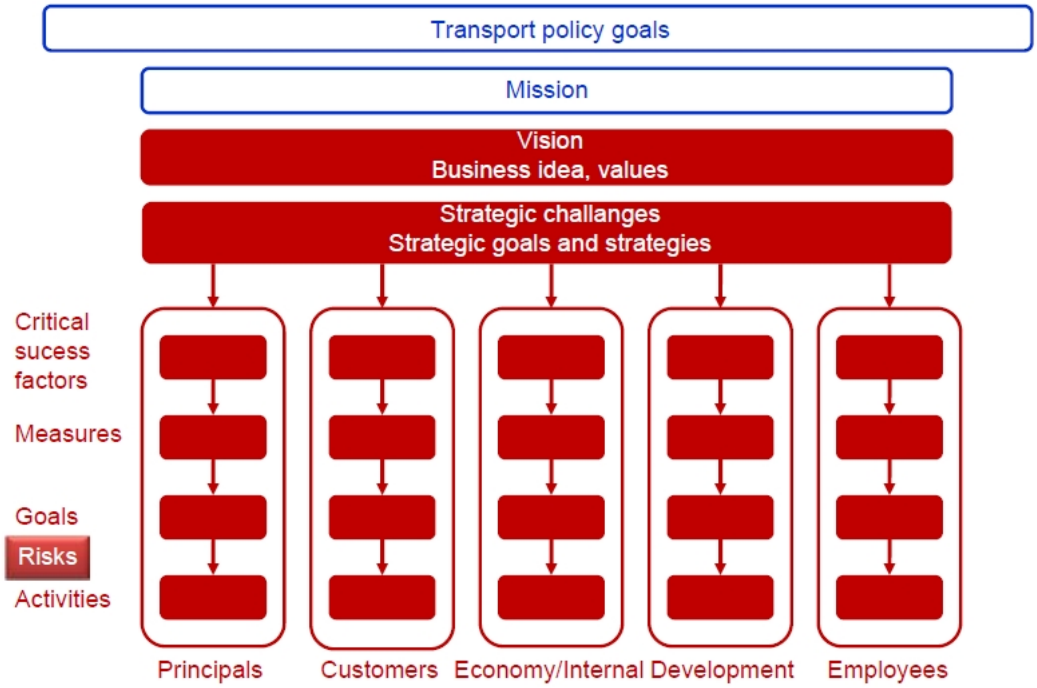

Figure 10: Balanced Scorecard Structure aligned with Risk-Based Logistics Management. Reproduced from Soderholm and Norrbin (2013)

Söderholm and Norrbin (2013) developed a risk-based dependability management model that links maintenance performance to strategic objectives. The Swedish Transport Administration demonstrates through its case study how availability goals and reliability metrics integrated into dashboards enhance organizational-level decision-making. The model supports Finnbox and similar small firms by enabling data-based maintenance planning and risk identification that connect to their balanced scorecard performance framework.

Hermoso-Orzáez et al. (2022) also stress the employment of ISO 28000 and ISO 31000 standards for organizing digital risk controls. The standards provide organizations with a method to identify risks through digitized matrices while enabling automated monitoring and KPI-based project alignment. The authors demonstrate how smaller

postal firms can implement formalized standards to establish risk practices by utilizing their supply chain examples.

The research by Alzahrani and Asghar (2023) and Lagorio et al. (2023) provides regional insights into their respective studies. Alzahrani examines digital transformation obstacles in harsh environments by illustrating the necessity of climate-resistant logistics systems. Lagorio et al. (2023) examine how 5G-enabled systems enhance real-time tracking and coordination through promising applications for route optimization and decision-making under uncertainty. These studies examine large-scale infrastructure but offer adaptable concepts that smaller companies, including Finnbox, can implement.

Digital adoption introduces various advantages, yet it emerges with specific challenges. Zhang et al. (2024) explain that digital transformation resistance emerges from organizational culture infrastructural limitations and technical skill deficiencies. Small and medium enterprises encounter significant obstacles to implementing predictive or real-time systems as they typically lack financial resources and training capabilities.

Digital initiatives require them to overcome their obstacles to achieve lasting success. The research demonstrates how digital technology integration within risk management offers strategic value. The implementation of dashboards and predictive analytics, along with drone-based logistics and auditing systems, enables postal firms to shift their risk-handling approach from reactive to proactive intelligence. Finnbox can utilize these innovative solutions to enhance delivery performance while controlling operational costs and ensuring market sustainability in an environment of growing competition.

2.6 Gaps in Literature and Relevance to Finnbox Post Oy

The current literature about project and risk management in logistics provides a solid theoretical framework but several important gaps appear when this knowledge is applied to small regional and digitally evolving postal firms such as Finnbox Post Oy. This section describes the main research gaps that justify this study.

1. Application Gaps in SME and Regional Postal Firms

Multinational supply chains and extensive logistical networks are significant topics in much literature. Studies by Hermoso-Orzáez et al. (2022), Qazi et al. (2017), and Söderholm and Norrbin (2013) provide comprehensive frameworks for risk-based performance and interdependent supply chain risks. Large public or multinational organizations with sophisticated infrastructure, established project governance frameworks, and high-capacity IT systems are the target audience for these, nevertheless. Such frameworks are rarely utilized by small or mid-sized postal service providers, particularly in Northern European contexts where staff shortages, isolated locations, snow, and other environmental interruptions are major factors.

2. Scalability Challenges of Digital Tools

There is an excessive amount of discussion about digitalization in logistics risk management in publications such as Hopkins and Hawking (2018), Lagorio et al. (2023), and Gabellini (2024). Deep learning models, 5G-capable infrastructure, or enterprise-level IoT platforms are utilized in most installations. Despite their impressiveness, these technologies can occasionally be too expensive and operationally unsustainable for SMEs. The existing research lacks sufficient data about small businesses utilizing cost-efficient digital risk management tools that scale according to their operational limitations. Although it is not well discussed in academic circles, finding practical digital solutions that balance price, and efficiency is crucial for businesses such as Finnbox.

3. Project Management and Risk Practices

The practical implementation of PMBOK-based approaches and risk response mechanisms in small postal environments is typically missing, despite their frequent discussion. Brandon-Jones et al. (2014) and Zhang et al. (2023) suggest that project risk planning can support operational resilience, although this relationship is frequently illustrated in theory rather than fully explored in small logistics settings. The operationalization of project-based risk procedures by frontline employees or their

integration into daily operations in small logistics companies, nevertheless, has not been extensively studied. Since project management cannot be a high-level concept in unpredictable situations such as last-mile postal delivery, it must be translated into task-level execution, offering this a crucial study opportunity.

4. Abstract Treatment of Contingency and Adaptive Frameworks

Adaptive logistics frameworks and contingency theory are discussed in publications such as Malhouni et al. (2024) and Wu and Chaipiyaphan (2020). These are still mostly hypothetical, though, or they concentrate on manufacturing, military, or humanitarian environments. In postal or courier logistics operations, where set delivery times must adjust to changing, risky circumstances, there is little empirical support. The practical implementation of contingency frameworks in operational logistics continues under-researched, particularly in real-world postal environments where fluctuating risks demand adaptability.

5. Underrepresentation of Finnish Postal Logistics

The empirical research on postal logistics in Finland contains a significant contextual gap. Most of the literature is based on logistics environments in the United States, the United Kingdom, or Asia, as in Alzahrani (2022) and Shao (2020). Nonetheless, the operational environment in Finland is distinct due to the country's harsh winters, long-distance rural deliveries, and limited labor pools. A localized study specific to Finland's postal industry is required since the lack of regional or local studies restricts the applicability of global models.

6. Lack of Mixed-Methods Evaluation in Risk Studies

Logistics risk studies typically employ either qualitative interviews or quantitative modeling which represents another methodological gap. There are not many studies that integrate both methods to comprehend risk scale (based on facts) as well as subjective experiences and decision-making processes. The thesis suggests a mixed-methods strategy that bridges this gap by providing both systemic overviews and

operational insights, making the results more comprehensive and beneficial for businesses such as Finnbox.

7. Limited Inclusion of Operational-Level Perspectives

Finally, it is unusual to include the opinions of frontline employees such as delivery drivers, warehouse sorters, and routing assistants in the development or assessment of risk frameworks. Metwally's (2024) and Ispas's (2023) studies focus on organizational-level controls and dashboards, but they ignore how risk is perceived and handled by those doing crucial logistics tasks. These employees are frequently the first to encounter operational disruptions or system failures, thus, it is crucial to include their viewpoints when developing practical, employee-centered risk management plans.

2.7 Summary:

Although a significant amount of research has been done on risk management, digital tools, and project frameworks in logistics, little of it has been applied to small, regionally oriented, and digitally developing postal companies. By addressing gaps in theoretical application, digital scalability, Finnish context, operational perspective, and methodological design, this thesis advances the subject by concentrating on Finnbox. Through this approach, it aims to provide a comprehensive, realistic, and flexible risk management framework for long-term logistics performance.

3 Methodology

This chapter describes the research methods and analytical approach that was utilized to conduct the current study. The purpose of this research is to identify the operational challenges of Finnbox Post Oy, a small logistics firm in Finland, and to explore how risk-based project management practices can be applied to enhance efficiency, service reliability, and organizational resilience. The study examines the recurring internal issues affecting last-mile delivery, such as software disruptions, sorting errors, and

communication gaps, and how project management processes can be improved through structured risk governance frameworks.

Specifically, the thesis aims to identify the key operational risk categories within the organization, evaluate their effects on project outcomes, and recommend practical interventions that align with industry standards such as the PMBOK framework and Contingency Theory. The study also proposes the Finnbox Lightweight Risk Governance Cycle (FLRGC) as a scalable model to enhance risk visibility, improve internal workflows, and support decision-making in small-scale logistics environments.

3.1 Research Design

This study employs a mixed-methods case study approach to explore how risk management policies can enhance project management practices within the logistics operations of Finnbox. The case study design is well-suited for this research, as it enables an in-depth, context-specific exploration of real-world challenges a specific organization encounter.

The mixed-methods strategy integrates qualitative data from semi-structured interviews with quantitative data derived from internal operational records. This dual approach offers a comprehensive understanding of both subjective perceptions and objective patterns of operational risks and their impact on project performance risks (Setyopurnomo et al., 2025).

The overall aim is to bridge the gap between theoretical frameworks in project and risk management and their practical implementation in a small- to medium-sized enterprise (SME), particularly within the logistics sector. The findings are expected to support the development of more structured and risk-aware project management practices at Finnbox Post Oy.

The research by Uriarte-Gallastegi et al. (2024) indicates that AI tools can enhance energy management and emissions monitoring which in turn affect key business metrics such as cost efficiency, delivery times, and operational risk. Their study, which is based on 18 industrial projects, highlights the requirement for multi-source data integration and real-time decision making thus supporting the value of a mixed-method approach that combines digital process metrics with qualitative feedback. This finding supports the current study's approach of combining operational system data with employee feedback to evaluate risk impacts at the firm level.

3.2 Unit of Analysis

The unit of analysis for this research is Finnbox Post Oy, a regional logistics and delivery firm based in Seinäjoki, Finland. The company is engaged in the sorting and distribution of letters, parcels, and magazines often under time-sensitive and technology-reliant conditions (Mokgohloa, 2022). Within the organization, the focus is specifically on operational delivery and sorting workflows, including the utilization of PPP-provided delivery applications, employee routines, and risk-prone activities such as shipment handling, software reliability, and manual sorting.

This case was selected as it depicts the type of operational complexity and risk-intensive environment where the integration of project and risk management practices is not just beneficial but essential. As an SME operating under practical constraints, Finnbox offers valuable insights into how formal frameworks can be adapted for day-to-day resilience.

3.3 Data Collection Methods

The research utilizes a mixed-methods approach which combines qualitative and quantitative data collection methods to fulfill research objectives and respond to study questions about Finnbox Post Oy. The mixed-methods approach provides an extensive understanding of operational risks and project management challenges at the company.

3.3.1 Qualitative Data Collection

The qualitative phase involves semi-structured interviews with Finnbox employees directly involved in logistics and risk-related operations. Purposeful sampling ensures representation from various functional roles in the logistics workflow.

Target participants include:

- 2–3 delivery workers, who frequently utilize the PPP app and encounter risks such as delivery errors, app crashes, and route disruptions.
- 1–2 sorting staff, familiar with manual errors and shipment discrepancies.
- 1 supervisor, overseeing coordination and planning, who can provide insight into risk communication and management practices.

To accommodate participants' schedules and ensure flexibility, interviews were conducted utilizing Webropol, an online survey tool provided by the university. The survey included open-ended questions, enabling participants to elaborate on their experiences while maintaining consistency across responses. Participants were fully informed about the study objectives and procedures, and electronic consent was obtained through the same platform (Ajmal et al., 2022).

Neupane et al. (2022) performed a longitudinal study on older Finnish postal employees to measure sustainable employability utilizing nine indicators across health, well-being, and workplace adaptability. Their approach adopted structured self-report surveys and analysis of demographic variables such as age demonstrates the effectiveness of

combining quantitative indicators with contextual postal-sector realities. This methodological alignment reinforces the design of this study's data collection, where semi-structured surveys were utilized to capture employee perspectives across roles.

3.3.2 Quantitative Data Collection

The research utilized quantitative data obtained from internal records and tracking systems. The analysis focused on the risk-related metrics that Belantová (2019) has identified:

- Frequency and types of sorting errors
- Incidences of software crashes or failures
- Delivery delays and pending shipments
- Discrepancies between logged and actual deliveries

This data was analyzed descriptively to identify recurring patterns and the scale of operational risks. Along with the interviews, these datasets offered a well-rounded view of risk exposure, perception, and response at Finnbox.

3.4 Research Process

The research process is divided into six logical steps to ensure that the research objectives, methodological approach, and expected results are aligned (Hellström, 2021).

Nantee and Sureeyatanapas (2021) designed a validated performance assessment framework to evaluate the sustainability impacts of Logistics 4.0 technologies with a focus on automated warehouse environments. The research approach included expert interviews along with item-objective congruence testing and Q-sort methods to identify and validate operational criteria. The research illustrated that systematic multi-step assessment methods produced reliable results for measuring productivity transitions,

efficiency improvements, environmental effects, and worker safety impacts after digital technology implementation. The research design of this study adopts a stepwise approach to identify operational risk factors and develop responsive project management tools for SME logistics environments.

Step 1: Literature Review

An extensive literature review was conducted to frame the study theoretically. Topics included project risk management, logistics and supply chain risk, contingency theory, and digital transformation in risk control. This step enabled the identification of gaps and informed the interview design and data collection process.

Step 2: Interview Design

Drawing on both theory and workplace observations, a semi-structured interview guide was developed, focusing on themes such as operational risks, employee experiences, and current project practices.

Step 3: Data Collection

Data was collected through:

- Qualitative interviews with delivery staff, sorters, and the supervisor.
- Quantitative operational data on shipment delays, errors, and system reliability

Helo and Thai (2024) illustrate how real-time tracking and tracing through Logistics 4.0 enables predictive operations and supports digital risk control frameworks in logistics environments, which aligns with this study's analytical approach.

Step 4: Data Analysis

- Qualitative data was thematically analyzed to capture patterns and insights from participant narratives.
- Quantitative data was analyzed utilizing descriptive statistics to track the frequency and severity of operational risks.

Step 5: Framework Development

The research guided the development of a tailored project-risk management framework for the company which focuses on functional tools and cost-effectiveness and simple implementation methods appropriate for SME environments. The Finnbox Lightweight Risk Governance Cycle (FLRGC) produces a risk-focused project management framework that addresses the requirements of small logistics companies such as Finnbox Post Oy.

Step 6: Validation and Feedback

The proposed framework will be discussed with Finnbox management for feedback. Their responses will guide final adjustments and ensure practical relevance.

3.5 Tools and Techniques

The research design employs both qualitative and quantitative data analysis tools for this study. Webropol served as the online survey and data collection platform from the University of Vaasa to conduct semi-structured interviews and collect responses for the qualitative component. The platform allowed for streamlined data collection and basic coding of textual responses.

Microsoft Excel served as the tool for quantitative analysis as it provided easy access along with flexible operations and robust data management capabilities. Excel enabled

statistical analysis and data visualization of numerical data to detect risk management practice trends at Finnbox Post Oy.

3.5.1 Qualitative Analysis: Manual Coding in Word

The Webropol survey platform collected interview responses through university-provided credentials. The data was transferred to Microsoft Word for manual thematic analysis. The process involved:

- Tagging similar responses (e.g., app issues, misrouting, planning gaps)
- Grouping into broader themes (e.g., system-related risks, human errors)
- Synthesizing insights related to risk awareness and project management gaps

3.5.2 Quantitative Analysis: Excel

Microsoft Excel performed quantitative analysis of operational data through its implementation. A line graph was created to visualize trends in the occurrence of specific operational risks over time. A pie chart was utilized to illustrate the proportional distribution of the most common risk types identified. The visual tools enabled easy comparison between actual operational data and employee feedback to understand the frequency and relative impact of key risk areas at Finnbox.

3.5.3 Visual Frameworks

Excel's diagramming tools were utilized to illustrate the proposed risk-aware project management model, illustrating how operational risks align with mitigation strategies and workflow improvements.

3.5.4 Triangulation

To ensure reliability, triangulation compares:

- Interview responses (qualitative)
- Operational records (quantitative)

This ensures consistency between perceived and actual risks.

3.6 Validity and Reliability

3.6.1 Validity

- Internal validity is supported through the triangulation of interview and operational data.
- Construct validity is ensured by grounding data collection tools in established theories such as PMBOK, SCRM, and Contingency Theory.
- Interview questions are directly aligned with the research objectives.

3.6.2 Reliability

A standardized interview guide was utilized to ensure consistency in the questions provided to all participants. The operational data obtained from the system is free from human bias thus enhancing objectivity. The qualitative coding process has been thoroughly documented, providing transparency and potential replication in future studies.

3.6.3 Researcher Reflexivity

To reduce potential bias in the research process:

- The interview data received systematic interpretation to achieve consistency.
- Verified all subjective observations through supporting evidence.
- Documented reflexive notes throughout the study to track personal assumptions that enabled in reduction of bias during data interpretation.

3.6.4 Ethical Considerations

Ethical integrity is upheld through:

- Informed consent
- Anonymity
- Confidentiality

These practices support honest participation and strengthen the trustworthiness of the data.

4 Research Findings and Analysis

4.1 Overview

The research findings from six semi-structured interviews with Finnbox Post Oy employees are outlined in this chapter. The participants consist of one Supervisor (S-1), three Delivery Drivers (D1, D2, D3) and two Sorting Operators (SO-1, SO-2). The analysis of interview responses utilized manual coding in Microsoft Word as described in the methodology section. The analysis aimed to detect repeated patterns connected to operational risks, employee experiences, and project management practice effectiveness. A placeholder section for quantitative results based on operational data is included at the end of this chapter.

4.2 Thematic Analysis of Interview Responses

Five main themes emerged from the thematic coding of interview responses.

- System-Related Risks
- Manual Sorting and Human Errors
- Environmental and Delivery Challenges
- Communication and Escalation Gaps
- Absence of Structured Project Planning

The following section provides an in-depth analysis of these themes supported by interview quotes.

4.2.1 System-Related Risks

The delivery staff identified system reliability as their main point of concern. Multiple interviewees reported current challenges with the PPP delivery application which included frequent app crashes, freezing, and server connection issues. The delivery

disruptions caused complications with efficiency and mental stress and resulted in delayed delivery times. The drivers who required real-time app updates demonstrated the most significant frustration because of these technical issues.

"App disconnects sometimes from the server making it unable to access." (D1)
The application disconnection leads to drivers losing their ability to check or mark deliveries resulting in workflow breakdowns.

"It slows down the delivery speed as now I have to stop the car and restart the app multiple times wait for it to respond so that I am able to check and mark everything that I am delivering." (D1)

"Occasionally, the app freezes or crashes unexpectedly, especially when the PPP management generates large reports from the database." (D3)
D3 reported that software freezing, and crashes occurred because of background data load activities that PPP performed. The system failures hindered drivers from continuing their deliveries and created confusion as address entries sometimes froze or became temporarily unresponsive.

"Mobile application crash (a few times). Location mismatch. Multiple entries of address." (D2)

The technical aspect of D2's experience revealed that system bugs occasionally produced wrong address displays and duplicate records for single delivery locations. The process required extra time for both detail verification and supervisor contact to resolve uncertainties. The quantitative data demonstrated only two recorded incidents throughout six months, but interviewees rated these app issues as major risks. The system logs may not capture all instances of these issues, but field staff continue to experience them as severe challenges.

"The most common operational disruption we've identified is items being routed to the wrong terminal initially. This necessitates a postponement and redirection to our Seinäjoki facility." (S-1)

The technical issues result in delays, manual rework, and confusion, increasing operational risk.

4.2.2 Manual Sorting and Human Errors

The interviewees identified manual sorting as a continuous operational risk that affects both sorting staff and delivery drivers. The interviewees explained that errors happen often during busy times including early morning sorting and peak delivery hours. The errors involve placing letters on incorrect shelves designated for different delivery areas, bundling them out of sequence, and utilizing incorrect labels. The accumulation of these small issues results in delays, rework, and driver inefficiencies.

"Sometimes letters or magazines are on the wrong shelves. Or letters sorted to the wrong place." (SO-1)

"Little mistakes I see almost daily." (SO-1)

The quotes demonstrate how these errors occur frequently in standard business operations.

"Sorting mistakes are fairly common, especially when the process is rushed." (SO-2)

Time pressure stands out as the main cause according to this response. The absence of standardized checking procedures and the speed-driven nature of the work make it challenging to detect errors in real-time.

"Occasionally, we also see larger gaps in the sorting sequence due to misplacement, and these need to be minimized as they significantly affect the driver’s efficiency and delivery flow." (SO-2)

The sorting sequence errors create issues for drivers in their daily operations. The drivers are required to spend additional time reorganizing their delivery routes.

"I try to correct them myself before dispatching the mail to the respective driver." (D3)

The results indicate that drivers often require to rectify errors from upstream sorting which increases their work and creates inefficiencies in the field. The results demonstrate that quality checks, training programs, and improved coordination between sorting and delivery teams are essential to reduce human errors and enhance operational flow.

4.2.3 Environmental and Delivery Challenges

The delivery environment was identified as a major risk factor by the delivery drivers. Several respondents reported structural issues with the way delivery routes are configured, especially in residential areas where mailbox placement and vehicle routing create daily inefficiencies. These environmental challenges are further compounded by the Finnish climate, especially during winter months when visibility, snow, and accessibility become additional obstacles.

"One of the most common problems we face during deliveries is when boxes do not have any name or house number. This creates confusion and increases the risk of inaccurate deliveries. It becomes difficult to identify the correct recipient, which leads to delays and additional effort in resolving the issue." (D3)

The lack of proper delivery location labels leads to delivery errors while requiring drivers to waste time confirming addresses particularly when multiple recipients share common buildings or complexes.

"Routes are designed for right-handed delivery vehicles (Here, the private vehicles are left-hand driven)." (D2)
"Boxes on the left side of the road. (Has to drive in the opposite direction to the ongoing traffic)." (D2)

The observations demonstrate structural route planning inefficiencies that lead to delays and create safety risks. The current system requires drivers to take non-optimal routes and sometimes drive against traffic flow raising their risk exposure.

“Another major challenge is the weather. During winter and extreme weather conditions in Finland, completing deliveries on time becomes very difficult.” (D3)

The delivery timeliness and worker safety are affected by seasonal risks which include snowy or icy conditions. Although these conditions are external, they should still be incorporated into delivery planning and risk mitigation strategies.
These quotes collectively underline the importance of considering environmental and infrastructural variables when designing routes or assigning delivery loads. The implementation of improved address labeling systems along with route optimization and weather-adaptive planning would substantially decrease operational delays and risk exposure.

4.2.4 Communication and Escalation Gaps

The operational structure at Finnbox Post Oy revealed communication and escalation mechanisms as their main weakness. The interviewees observed that issues get reported but the company relies on WhatsApp and personal communication instead of formal escalation procedures. The informal system provides quick responses, yet it fails to deliver consistent results and permanent risk documentation and traceability. Multiple interviewees stated that recurring issues do not get properly tracked or escalated through official channels, particularly within the terminal area.

"Yes. I report all errors using the various options provided in the PPP app and if needed I also get in touch with the supervisor using whatsapp group for the drivers the has been set up just for complaints." (D1)

The data indicates that drivers mainly utilize WhatsApp and PPP app features to submit their reports. Although these methods are convenient, they do not ensure documentation or follow-up and may be missed if not systematically logged.

"Yes, I regularly report technical or system-related issues. These are usually reported to the PPP Management and IT Support Team through WhatsApp communication channels." (D3)

The utilization of informal digital tools such as WhatsApp for system-related issues, including software crashes or malfunctions, further confirms the lack of an official error tracking or ticketing system.

"However, I typically do not report sorting errors. Instead, I try to correct them myself before dispatching the mail to the respective driver." (D3)

The quote implies that employees often take charge of small routine issues as they believe reporting them will not result in organizational improvements or preventive measures.

"Inside the terminal, there is no formal system to track, or report repeated issues." (SO-2)
"Most communication happens informally through WhatsApp or verbal updates, which helps address issues quickly but doesn't always support long-term tracking or analysis." (SO-2)

The sorting staff confirmed that while immediate coordination exists, it lacks historical tracking. The absence of formal escalation pathways or logs makes it challenging for management to identify persistent patterns and implement systemic improvements.
These insights suggest the requirement for a centralized communication and escalation platform that would allow all staff -drivers, sorters, and supervisors to document risks, flag recurring errors, and track responses. A formal risk log could enhance organizational learning and contribute to long-term performance improvement.

4.2.5 Absence of Structured Project Planning

The last recurring theme that was identified across roles was the lack of a structured project planning or risk management framework within Finnbox. Employees stated that daily operations are reactive in nature, without standard operating procedures, contingency planning, or proactive strategies to mitigate recurring issues. The absence of formal planning results in repeated disruptions, inconsistent handling of delivery errors, and missed opportunities for process improvement.

"There are no formal written procedures or step-by-step instructions regularly reinforced. Most of the process is learned through experience or informal training from colleagues." (SO-2)

This comment underscores the reliance on informal knowledge transfer in the absence of documented workflows. The lack of structured onboarding or consistent reference materials implies that new or substitute workers may struggle to perform efficiently, especially during high-pressure times.

"Yes, better planning and risk-handling policies would definitely help reduce problems. For example, having a backup procedure in case of software crashes, and setting up proactive checks to identify wrong or delayed shipments in advance, would make the

entire delivery process more reliable. It would also reduce stress and confusion for drivers and sorting staff." (D1)

D1's insight highlights the operational requirement for redundancy planning and preventive systems. Without clear policies or contingency actions, drivers are left to their judgment, which increases the variability in how errors are made.

"Yes, having a more organized way for us to handle risks would likely make our daily delivery tasks in Seinäjoki easier. It could help us stop some problems before they start, make it clearer how we should deal with issues when they happen, and improve how we talk about potential problems within our team." (S-1)

From a supervisory perspective, implementing a risk management framework would enhance both operational efficiency and internal communication and knowledge acquisition. The group responses indicate that project management tools including risk logs, standard response procedures, and process feedback loops are either not utilized or non-existent in current operations. Basic project planning structures would improve organizational efficiency and consistency while boosting employee confidence throughout the organization.

4.2.6 Summary of Qualitative Findings

The thematic analysis of interview responses indicated that operational risks occurred repeatedly across different roles at Finnbox Post Oy. The main challenges stem from system issues in PPP application usage, regular human errors during sorting operations, and environmental challenges resulting from inadequate route planning and harsh weather. The combination of communication breakdowns with unstructured escalation procedures forces workers to handle issues through informal methods that lack documentation and fail to create lasting learning opportunities. All interview participants highlighted that the company lacks formal project planning and risk

assessment procedures and standardized operating procedures which results in a reactive work environment.

The absence of formal planning tools and feedback systems prevents employees from achieving consistency while blocking opportunities for systemic improvement despite their initiative and adaptability. The qualitative findings establish a solid basis to evaluate how structured project risk management practices would solve existing inefficiencies while enhancing operational stability.

4.3 Quantitative Results: Operational Risk Metrics at Finnbox Post Oy

The analysis in this section utilizes statistical methods to examine operational risk data that Finnbox Post Oy recorded from October 2024 through March 2025. The collected data consists of delivery volumes with incident reports, sorting errors, app failures, and rerouting or delay cases. The analysis aims to support qualitative findings through measurable evidence to provide an expanded view of organizational risks that occur repeatedly. Microsoft Excel processed the data through frequency counts, table and chart visualization.

4.3.1 Overview of Dataset

The analysis relies on internal delivery and system performance logs which Finnbox Post Oy maintains. The analysis covers six months from October 2024 through March 2025. The analysis evaluates six performance indicators which include total monthly deliveries and delivery errors (M code), customer complaints (R code), PPP application crashes, sorting errors, and wrong terminal deliveries and items that are usually delayed for a week.

The operational performance indicators in Table 1 provide delivery statistics along with error types and complaint records for six months. The delivery volume reached its peak in January 2025. The M code delivery errors reached their highest point during this time suggesting that increased delivery pressure might have led to more errors. The number of app crashes and sorting errors altered throughout the months with sorting incidents reaching their peak in March 2025. The wrong terminal deliveries and delayed items occurred nearly every month, which indicates that logistical inefficiencies represented continuous risks rather than isolated incidents.

4.3.2 Monthly Overview of Risk Incidents

Table 1: Monthly Overview of Operational Risk Incidents at Finnbox Post Oy (Oct 2024- March 2025)

Month	Deliveries	Delivery Errors	Complaints	App Crashes	Sorting Errors	Wrong Terminal	Delayed Items
October 2024	138,778	0	0	1	2	2	2
November 2024	127,489	7	2	0	1	3	1
December 2024	131,070	4	4	0	5	2	2
January 2025	161,922	20	4	1	1	3	1
February 2025	114,422	13	2	0	2	4	1
March 2025	158,987	12	0	0	10	3	2

Total Deliveries = **832,668**; Total Delivery Errors = **56**; Complaints = **12**

The data indicates that despite the small number of complaints, which was 12 complaints in six months, several operational inefficiencies were observed. Sorting errors and wrong terminal assignments were the most common issues that were observed, and this was not an isolated incident but rather a recurring issue indicating that there were some process-level weaknesses. Delivery errors were the highest in

January 2025 when the delivery volume was also high, which may indicate that the current systems were under pressure during the peak period.

The fact that these issues were observed in several months supports the concerns expressed by the interview participants that these disruptions were not isolated incidents but rather manifestations of systemic vulnerabilities. This alignment between the recorded incidents and the qualitative feedback highlights that the operational risks are still active and that there is a requirement for a more proactive and structured approach to risk identification and mitigation at Finnbox Post Oy.

4.3.3 Error Trends by Category

Table 2: Categorization of Operational Risk Incidents by Error Type (Oct 2024- March 2025)

Error type	Total Count	% of All Errors
Delivery Errors (M Code)	56	53 %
Sorting Errors	21	20 %
Wrong Terminal Delivery	17	16 %
Delayed Items (1week)	9	9 %
App Crashes	2	2 %
Complaints logged	12	External Reporting

The analysis of recorded incidents from October 2024 to March 2025 determined the frequency and distribution of operational risks by error type, enabling a clearer understanding of where the most persistent issues lie. Table 2 illustrates the total count and percentage share of each error relative to all recorded incidents during the six months. Most incidents were attributed to delivery errors (M Code), reflecting recurring challenges in last-mile operations and address accuracy. These were followed by sorting errors and wrong terminal deliveries, which collectively accounted for more than

onethird of all errors and indicated significant inefficiencies in internal logistics and parcel routing.

Although delayed items and app crashes occurred less frequently, comprising 9% and 2% of total errors respectively, their operational impact was nonetheless considerable. Interview participants emphasized that even these less frequent issues could stall delivery workflows, lead to customer dissatisfaction, and require time-consuming manual interventions. The recording of 12 formally logged complaints underlines that only a small portion of these disruptions are externally reported, suggesting a potential underreporting issue and emphasizing the importance of strengthening internal monitoring and escalation mechanisms.

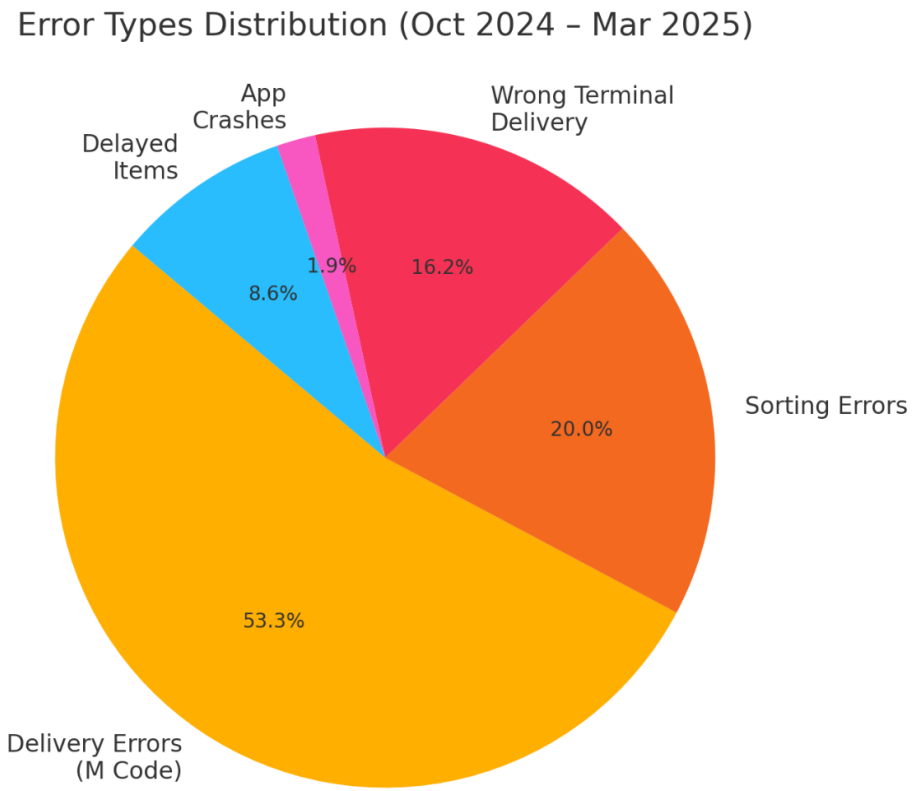

Figure 11: Distribution of Delivery-Related Error Types at Finnbox Post Oy (Oct 2024-March 2025)

Delivery failures (M code) were the most frequent, followed by sorting errors and incorrect terminal deliveries.

The pie chart in Figure 11 provides a visual breakdown of delivery-related error types that occurred during the six months. The results illustrate that delivery failures and sorting-related issues indicate the largest operational disruptions pointing to essential areas that require process improvements. The quantitative data supports employee interview findings illustrating that sorting errors including wrong shelf placement and out-of-sequence bundling and addressing discrepancies emerged as major operational challenges.

The system-generated data illustrated app-related failures occurred infrequently, but interview participants strongly emphasized their impact. The employees explained that

delivery operations would stop temporarily whenever the app experienced any malfunction which required manual interventions to continue operations. The verification process of addresses and re-recording of deliveries during peak hours is increasingly time-consuming and stressful because of these incidents. The alignment between employee feedback and the actual frequency of main error types confirms the study's accuracy while demonstrating why risk management should focus on improving sorting accuracy and app stability.

4.3.4 Monthly Error Rate (as % of Total Deliveries)

The operational performance variations over time were evaluated by calculating monthly error rates which divide recorded incidents by total deliveries per month. The method standardizes disruption assessment to enable a more accurate comparison between delivery periods with different volume levels. Table 3 contains the calculated error rate percentages for each month from October 2024 to March 2025.

Error rates demonstrated an obvious upward trend throughout the winter months, especially during January, February, and March even though delivery volume fluctuated throughout the period. The error rates remained low in October and November at 0.005% and 0.009% respectively but increased steadily from December until reaching 0.017% in February and March. The highest delivery volume of 161,922 in January resulted in the highest error rate of 0.016%.

The research indicates that winter weather conditions with higher holiday parcel volumes probably lead to operational disruptions because of increased workload pressures. The elevated error rates during this period align with the concerns expressed by staff members who described how weather conditions, limited staffing, and rising customer demand created compound issues. The findings demonstrate why organizations require flexible risk mitigation approaches for peak demand periods to preserve service quality and reduce errors.

Table 3: Monthly Error Rates Relative to Total Deliveries (Oct 2024- March 2025)

Month	Total Deliveries	Total Errors (Sum)	Error Rate (%)
October 2024	138,778	7	0.005 %
November 2024	127,489	12	0.009 %
December 2024	131,070	13	0.010 %
January 2025	161,922	26	0.016 %
February 2025	114,422	20	0.017 %
March 2025	158,987	27	0.017 %

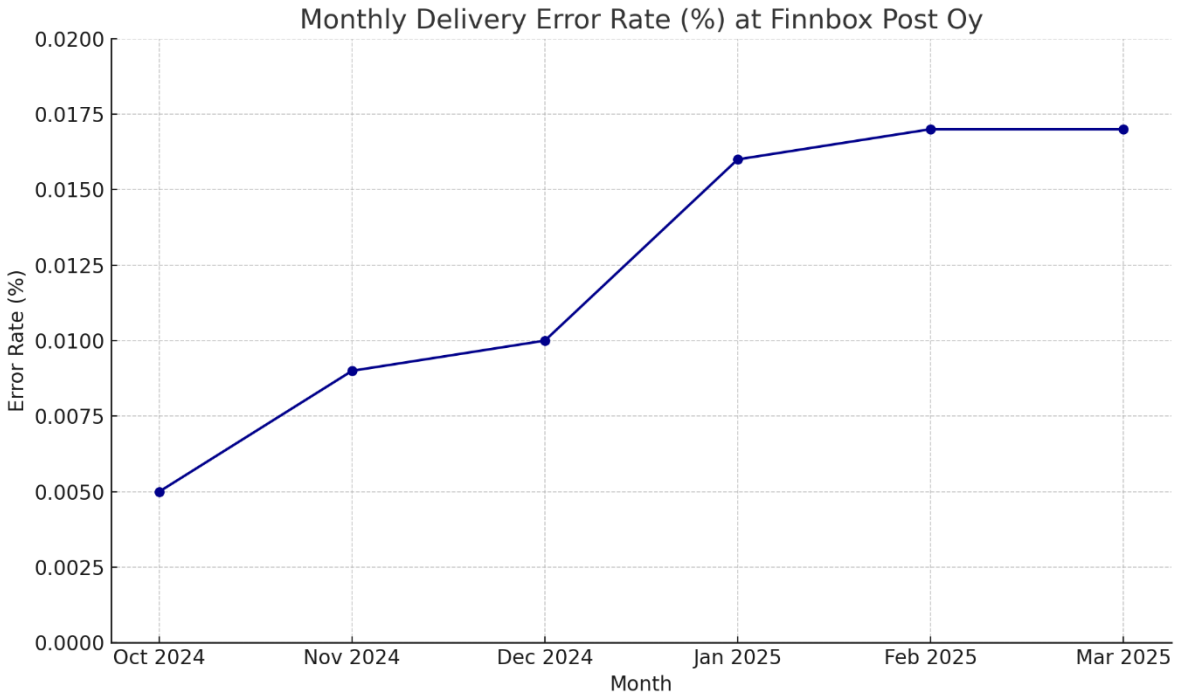

Figure 12 : Monthly delivery error rate at Finnbox Post Oy (Oct 2024- March 2025)

Error rates increased steadily during the winter months, peaking in February and March.

The monthly error rate illustrated in Figure 12 demonstrates consistent operational performance throughout the six-month period as the rate stayed under 0.02% in every observed month. The error rates indicated a noticeable rise throughout the winter months from December to March with February and March reaching their highest rates at 0.017%. The rise in error rates during winter months corresponds with the operational challenges that employees described in their interview testimonies.

Delivery staff reported that severe weather conditions including snow and ice with reduced visibility resulted in delays and incorrect deliveries. The winter delivery volumes increased while manual sorting and navigation became more critical, which both contributed to the error rates. The quantitative error rate data corresponds to the qualitative feedback which demonstrates how seasonal conditions and workload pressures affect delivery precision and operational performance.

4.3.5 Observations and Triangulation with Interviews

Table 4: Triangulated Summary of Key Operational Risks from Interview Insights and Quantitative Data

Risk Theme	Qualitative Insight (Interview Codes)	Quantitative Support
Sorting Errors	Frequent manual errors during rush hours (SO-1, SO-2, D3)	21 cases recorded: highest in March 2025
App/System Issues	App crashes and slowdowns (D1, D3)	2 crashes were recorded (Oct & Jan)
Delivery Delays	Routing issues and winter-related delays (D2, D3, S-1)	9 delayed items, rising error rate in winter
Wrong Terminal Routing	Misdirected shipments causing extra work (S-1)	17 wrong terminal incidents across all months
Communication Gaps	Informal reporting via WhatsApp (SO-2, D3)	Only 12 official complaints recorded

Lack of Planning	No formal procedures or proactive policies (S-1, D1, SO-2)	Fragmented error patterns; no declining trend.

The analysis of interview data along with operational information illustrates that reported risks align with the actual risks recorded in the system. The qualitative analysis results revealed direct evidence for multiple themes that aligned with the patterns observed in quantitative data. The operational records documented sorting errors twenty-one times during March 2025 according to both sorting operators (SO-1, SO-2) and delivery drivers (D3). The system reliability issues that drivers D1 and D3 reported were confirmed through app crash data that occurred in October and January.

The interview discussions about delivery delays and routing challenges appeared throughout multiple months in the wrong terminal delivery and delayed item data. The data confirmed the delivery issues described by D2 and D3 through 17 wrong terminal delivery cases and 9 delays that exceeded one week.

The informal escalation procedures that SO-2 and D3 reported were supported by the low number of recorded complaints. The qualitative data demonstrated that many issues were either resolved informally or went unreported, which indicated limited utilization of formal reporting mechanisms despite only 12 complaints being officially recorded during the six months.

Participants S-1, D1, and SO-2 identified the complete absence of structured planning practices aligning with the scattered distribution of error types throughout the months. The reactive nature of risk management is evident through the absence of preventive trends indicating the requirement for a centralized risk management system. The operational challenges that staff members reported demonstrated both validity and measurable recurrence through this triangulation method.

4.3.6 Summary of Quantitative Findings

The quantitative analysis revealed manual sorting errors and delivery misrouting as the primary operational risks that occur at Finnbox Post Oy. The two categories produced the most recorded incidents during the six-month period from October 2024 to March 2025. Sorting errors rose significantly in March while wrong terminal deliveries occurred every month, which demonstrated their continuous nature.

The recorded incidents demonstrated a steady rise from December to February according to the error rate data which stayed below 0.03% throughout the period. The qualitative employee feedback supported this trend as workers attributed operational inefficiencies to weather-related disruptions and higher winter season workloads**.**

The data patterns validate multiple themes that emerged from the interview data. The sorting personnel (SO-1, SO-2) reported that manual errors occurred frequently, but delivery drivers (D1, D3) encountered challenges with route discrepancies and unresolved delays.
The supervisor (S-1) reported that incorrectly routed shipments kept appearing which required redirection to the Seinäjoki terminal, and this issue was visible in the monthly records.

The quantitative data illustrated that application-related failures occurred infrequently, yet they led to major disruptions to operations. The interview participants confirmed that intermittent app crashes along with PPP connectivity issues led to major delivery delays as they frequently occurred alongside other issues such as incorrect address labels and unofficial communication methods.

5 Discussions

The chapter evaluates the research findings from Finnbox Post Oy through the lens of established literature and theoretical concepts. The research aims to determine how project and risk management principles can enhance operational stability and efficiency in postal logistics. The chapter assesses the implications of these findings for both theoretical and practical applications in logistics risk management.

5.1 Key Observations and Thematic Alignment

The thematic analysis of interviews with Finnbox Post Oy personnel revealed five critical themes:

1. System-related risks
2. Manual sorting and human errors
3. Environmental and delivery challenges
4. Communication and escalation gaps
5. Absence of structured project planning.

The main system-related risks in the PPP delivery application stem from its unstable nature. All three delivery drivers reported app crashes, delayed server responses, and inconsistent data syncing as system-related risks. The system failures led to operational disruptions reducing efficiency levels and resulting in frustration among drivers. D1 explained that restarting the app multiple times during delivery rounds led to delays in his delivery operations. The operational requirements of frontline staff are not aligned with the reliability standards of digital systems leading to these issues.

Liao et al. (2023) states that resilience in multimodal logistics relies on the stability of interconnected systems, where failure at a single node such as customs in TIR-based networks can disrupt the entire supply chain. Their study of sea–road transport in the

post-COVID-19 context indicates how risk can cascade rapidly across layers due to inadequate error handling or regulatory bottlenecks. While their focus is on international freight, similar vulnerability patterns may apply to postal firms such as Finnbox, where a single point of failure such as app downtime can compromise end-to-end delivery reliability.

Manual sorting and human errors were another prominent issue. Sorting operators SO-1 and SO-2 described their frequent errors involving wrong letter placement and sequence errors which occurred during rushed work periods. The delivery drivers experienced delivery speed issues due to these errors requiring them to reorganize mail during their routes. The study by Moslemi et al. (2016) illustrates that logistics service providers and their customers have different perceptions of the types and severity of risks. This difference can lead to operational risk management blind spots when only one perspective is considered, which supports the requirement for inclusive assessments at Finnbox.

The delivery risks have become more severe because of environmental conditions, including harsh weather and challenging winter access points. System and process issues with physical elements formed a delicate logistics system frequently leading to delays and rework and employee frustration.

5.2 Comparison with Existing Literature

The research results aligned with recent studies about logistics risk management and project management in complicated systems. Kubasova et al. (2018) emphasize that logistical risk management requires integration into both project design and operational stages, especially in resource-limited SMEs. Finnbox encounters risks due to the absence of project governance, a limited risk anticipation culture, technical issues, and process errors. The lack of standardized communication and escalation systems results in

Finnbox being vulnerable to recurring risks that could be addressed by cross-functional collaboration.

Supervisor S-1 observed that redirecting shipments from incorrect terminals took too long because the organization lacked systemic feedback mechanisms during reactive decision-making. The findings of Multaharju et al. (2017) support the argument that buyer firms should implement sustainability and risk criteria in logistics relationships, yet smaller logistics firms fail to fulfill these expectations as they lack governance and capacity.

The absence of a project-based thinking structure at Finnbox restricts the organization from extracting valuable lessons from previous disruptions. The findings from PMBOK and contingency theory support the idea that risk resilience improves through structured monitoring, stakeholder alignment, and post-incident reviews.

The study by Wang et al. (2023) illustrates that sustainable last-mile delivery solutions require to balance flexibility with reliability and cost-efficiency for proper evaluation. The ranking model developed by Wang et al. (2023) for developing economies demonstrates how adaptive logistics planning with user input enhances service quality and resilience which Finnbox currently requires to create.

5.3 Theoretical Implications

The research validates the importance of Project Risk Management (PMBOK) and Contingency Theory in logistics environments, especially for small and medium enterprises (SMEs). The absence of risk registers defined risk response protocols, and post-incident reviews at Finnbox demonstrate that contingency planning does not exist within project workflows.

According to Piecyk and Björklund (2015), CSR reporting is still minimal among logistics service providers (LSPs), especially among smaller firms, which supports the

requirement for structured documentation such as the risk framework proposed in this thesis. Risk awareness remains fragmented and reactive without formal mechanisms, which limits the organization's ability to learn from disruptions or anticipate future failures.

Lazarević et al. (2020) emphasize that performance optimization in postal companies requires structured decision-support models due to increasing service complexity and digital transformation demands. In conclusion, they highlight that the A'BA model, combining the Analytic Hierarchy Process (AHP) with SWOT-informed business area mapping effectively guides performance improvement by prioritizing internal weaknesses and aligning them with targeted actions. This supports the rationale for integrating risk awareness into structured planning frameworks such as the one proposed in this thesis for Finnbox.

The theoretical model proposed by Kubasova et al. (2018) supports the integration of risk management throughout the complete resource cycle of logistics planning beyond the operational or execution stages. According to contingency theory, organizations achieve their best performance when their structural design aligns with their environmental conditions. The organization is required to adapt to its structure as customer demands evolve rapidly, and weather conditions and technological disruptions arise frequently. The organization maintains fixed protocols and extensive dependence on personal knowledge opposing contingency alignment principles.

Digital systems that track delivery success rates and app crash frequencies enable managers to shift toward predictive models of risk management. The implementation of forecasting-based disruption predictions would enable proactive adjustments to sorting flows and routing plans.

5.4 Practical Implications for Finnbox Post Oy

Figure 13: Finnbox Lightweight Risk Governance Cycle (FLRGC)

The research results indicate that Finnbox is required to transform its present operational and governance systems to improve its resistance against recurring risks. The company could benefit from project-based solutions guided by industry standards and sustainability objectives because it operates as a small technology-dependent logistics

firm. The following recommendations are proposed as practical interventions to improve both risk visibility and project efficiency:

1. Formalize Risk Identification and Response Frameworks:

Finnbox should implement standardized tools from the PMBOK (Project Management Body of Knowledge) framework to transition from a reactive to a proactive risk culture. The risk management tools include risk registers for documenting operational threats such as app crashes, misrouting, sorting errors, stakeholder matrices for identifying accountability and influence, risk response plans for assigning roles, and trigger points for mitigation. The tools should be reviewed every two weeks to maintain their accuracy and effectiveness. The structured approach enhances transparency while aligning Finnbox's risk management with the industry's best practices and contingency theory, which focuses on situational adaptation.

2. Digitally Track Key Risk Indicators (KRIs):

The digital infrastructure of Finnbox which includes the PPP delivery app, should implement lightweight dashboards to automatically monitor Key Risk Indicators (KRIs). The system tracks four key performance indicators: app system uptime, delivery completion accuracy, missed scan frequencies, and average resolution time of system crashes. The dashboards must be available to operational teams and management staff to enable quick responses to early warnings. Real-time monitoring converts passive data collection into predictive intelligence that minimizes severe disruptions. Liao et al. (2023) emphasize that organizational resilience in logistics requires integrating risk visibility through digital systems.

3. Enhance Training and Standard Operating Procedures:

The evidence indicates that human errors during sorting arise frequently because of ambiguous protocols and time pressure. The morning sorting procedures at Finnbox require redesigning visual guides and standardized parcel labeling formats. The company should implement training modules that teach risk identification, error prevention, and situational response as part of their daily or weekly operations. The training modules should consist of brief team meetings or job-site instruction. A training culture that supports continuous improvement aligns with ISO-based quality assurance principles as Kubasova et al. (2018) state that operational logistics risk requires human and process-centric interventions to be addressed.

4. Feedback Loops and Cross-Functional Coordination:

The research revealed that delivery, sorting, and supervision functions operated as separate units with limited integration within the organization. Finnbox should establish weekly escalation reviews as a solution to this issue by requiring delivery drivers, sorters, and supervisors to convene for operational challenge reflection and corrective action development. The meetings would establish accountability while improving learning between departments and extracting valuable grassroots information that typical top-down governance systems overlook. The research of Multaharju et al. (2017) strongly supports this recommendation as they demonstrate that collaborative logistics governance functions as a key performance and resilience enabler for small firms.

5. Invest in Modular and Sustainable Last-Mile Solutions:

Finnbox should investigate sustainable last-mile delivery models which include parcel lockers, automated delivery kiosks, and local community pick-up points to reduce route congestion and enhance adaptability. The solutions absorb delivery load during peak periods while reducing fuel and labor strain and providing customers with flexible collection options. The models described by Wang et al. (2023) boost operational efficiency while supporting sustainability goals that include carbon reduction and digital

service integration. The company operating in Finland's climate-sensitive region should utilize decentralized modular infrastructure to reduce real-time delivery dependence thereby preventing seasonal disruptions.

The FLRGC framework consists of interconnected components that create a continuous cycle for building resilience through prevention, coordination, and adaptability (see Figure 13).

5.5 Limitations and Future Research

The research study concentrated its analysis on a single SME operating within a Finnish local area. Interview triangulation and thematic coding support the study's validity, but additional research across different regions and company types is required for generalization. Future research could utilize a multi-case analysis framework or investigate AI-based risk detection in real-time delivery systems.

6 Conclusion

This study investigates the impact of structured project management and risk mitigation frameworks on operational performance in small-scale postal logistics firms through Finnbox Post Oy as a case study. The research combines literature analysis with semi-structured interviews and applied theoretical models to successfully answer the initial research questions and objectives.

The main purpose of this thesis investigate whether risk-oriented project management tools including PMBOK-based frameworks and contingency theory principles would stabilize daily operations at Finnbox. The research analysis revealed five major thematic risks which included system reliability issues, manual sorting errors, environmental delivery challenges, communication breakdowns, and the lack of official project governance structures. The research findings provided clear insights into the main research question about existing practice effectiveness and strategic improvement potential.

The research supports theoretical concepts of contingency theory and project risk management while demonstrating their practical application to small postal firms. The frameworks have been extensively studied in large-scale logistics and manufacturing settings yet their implementation at the SME level and especially in digitally dependent service models has received limited attention. The thesis fills this knowledge gap through specific evidence demonstrating that these models are effective for regional firms operating under unpredictable conditions.

The practical findings of this research hold substantial significance. The recommendations developed by this study provide Finnbox and comparable firms with an actionable plan to enhance their operational resilience through structured risk identification, digital KPI tracking, and sustainable last-mile delivery models. The implementation of training programs feedback systems and lightweight dashboards

solves employee-specific issues while fostering an environment of continuous improvement. The research findings provide reference points for logistics providers who experience digital transformation and resource constraints in similar operational settings.

The recommendations from this study are consolidated into a structured framework, the Finnbox Lightweight Risk Governance Cycle (FLRGC) which provides a cyclical approach to operational resilience through risk identification, KPI tracking, feedback systems, training, and sustainable delivery solutions. The Finnbox Lightweight Risk Governance Cycle (FLRGC) consists of five essential pillars that create a continuous improvement process. Risk identification serves as the first step by utilizing frontline experiences and operational incident data to identify vulnerabilities. The second step of KPI tracking employs digital dashboards to monitor system uptime, delivery precision, and failure rates in real time. The feedback systems permit sorters and drivers to deliver direct reports about inefficiencies to their supervisors. Staff members receive targeted training that educates them how to handle recurring issues such as application malfunctions and misplaced packages. The final step of sustainable last-mile strategies enhances delivery route optimization and resource distribution to boost reliability while reducing environmental effects. The cycle functions as a lightweight governance model which works for digitally dependent SMEs.

The research comprises certain limitations which are required to be acknowledged. The case study method provides detailed information, but its findings cannot be generalized in other contexts. The research investigation concentrated exclusively on a Finnish company operating within a particular operational environment. To establish general conclusions, researchers are required to conduct comparative studies involving multiple firms spread across different geographic locations. The study relied mainly on qualitative data while stronger quantitative evidence such as incident logs or service-level KPIs would have enhanced research validity and enabled statistical risk modeling.

Future research should expand these findings through mixed-methods evaluations that examine a wider range of logistics firms. The research should investigate how emerging technologies such as AI predictive routing and autonomous delivery systems work with project-based risk management systems in postal services. Further research into employee participation in risk frameworks would identify essential factors driving both adoption and sustainability.

The research affirms that structured project management and risk policies remain crucial for small regional companies such as Finnbox Post Oy. The research connects academic theory with practical implementation to provide both academic and practical value promoting more resilient logistics operations with better efficiency and strategic alignment.

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