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ASSESSMENT & PRIORITIZATION OF THIRD-PARTY LOGISTICS (3PL)

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ABSTRACT

This research investigates the risks Third-party logistics go through. Through a comprehensive literature review, we identified different types of risk manual handling, machinery operation, transportation activities, and warehouse working conditions emerge as prominent areas of concern. By preparing a questionnaire and doing a survey (ratings) from 5 people from third-party logistics. Failure Mode And Effect Analysis (FMEA) we evaluate the results. Results show that Capacity constraints and Supply chain risk disruptions are extreme risk levels and failure of contract and Lack of warehousing tools and techniques are low-level risks. By enhancing awareness and providing practical strategies for risk assessment and prioritization, this research contributes to the advancement of practices within the 3PL sector, ultimately promoting safer working environments for employees and stakeholders alike.

KEYWORDS

Third-party logistics (3PL), Risk assessment, FMEA (failure mode and effect analysis), Risk Mitigation

INTRODUCTION

As companies look to streamline their supply chains and focus on center competencies, numerous turn to Third-Party coordination (3PL) suppliers to outsource different perspectives of their coordination capacities. Uncovered companies to a heap of dangers that can have significant suggestions for their supply chain execution and generally commerce victory. This term paper points to investigating and analyzing the multifaceted scene of dangers related to Third-Party Coordination (3PL) operations. By diving into the complexities of 3PL connections, this ponder looks for to recognize the different sorts of dangers that companies confront when outsourcing their coordination capacities to outside benefit suppliers. Moreover, it examines the basic variables contributing to these dangers and proposes techniques for successfully overseeing and relieving them. They introduce a range of risks that companies must explore to guarantee the smooth stream of products and data inside their supply chains. These Risks can show different shapes, including operational disturbances, budgetary vulnerabilities, administrative compliance issues, and geopolitical insecurities. From transportation delays and stock fumble to information breaches and provider

liquidations, the potential pitfalls of 3PL associations are assorted and far-reaching. In light of these considerations, this research paper seeks to contribute to a deeper understanding of third-party risks (3PL).

LITERATURE REVIEW

Zeng et al. (2021) This paper aims to use FMEA to identify potential failure modes, determine their effects, and develop actions for mitigating risks from the perspectives of Occupational Health And Safety (OHS), environment, and quality in construction. Ultimately, a methodology designed for integrating risk management in the pursuit of continuous improvement is targeted.

Tsang et al. (2016) said that safety measures should be taken according to the working conditions. it is hard to monitor the actual health status of workers who may be dangerous when working too long in cold storage facilities. In addition, there is a lack of prompt signals to managers and first aid teams for instant treatment when workers get cold injuries or illnesses. Therefore, real-time health monitoring and positioning of the workers are needed. Nowadays, the Internet of Things (IoT) is a mean of real-time interconnection system in which target objects are equipped with identifying and sensing technologies. This paper presents an IoT-based occupational safety management system (IoT-OSMS) by using identifying and sensing techniques to locate workers' positions and to guarantee occupational safety. Bluetooth Low Energy (BLE), a kind of Radio Frequency Identification (RFID) solution, is used to locate and collect the information of the workers inside the cold storage facilities.

An Investigation into critical challenges for multinational third-party logistics providers operating in China. Rahman et al. (2019) identified and prioritized the challenges for the strategic importance of multi-national 3PLs (MN3PL) operating in China. The Results indicate that the most critical challenges confronted are guanxi meaning having connections used to open doors for business and facilitate deals, government regulations, price pressure, and transportation costs. To remain competitive, they must build guanxi networks with key stakeholders and minimize the cost of delivery.

Reyes et al. (2022) studied the effect of a pandemic on the logistics industry since some industries are required to perform their respective work in a face-to-face setting. Meaning the workers have a high chance of being exposed to the virus. The study aims to identify whether workers from various logistics companies have experienced any risks during the pandemic regarding the physical, chemical, ergonomic, and biological extent. Moreover, surveying 250 logistics workers found that most have been experiencing ergonomic risk factors, which has made them perceive their health and safety risks as mild, given the current situation. The study aims to identify whether workers from various logistics companies have experienced any risks during the pandemic regarding the physical, chemical, ergonomic, and biological extent.

Macdonald et al. (2013) studied that Clearer insights are needed surrounding the following issues: factors influencing the recovery process, how those factors interact to play a role in managerial decision-making, and the company's actual ability to recover. While it is possible to determine basic recovery process factors, a more complete picture of disruption management can be built from analysis of data collected through qualitative in-depth interviews. This research delivers insights into the interactions and relationships among factors, providing the foundation for a set of propositions useful for further investigation in the following areas: discovery of the disruption event, causes of the event, and recovery performance. One finding indicates that while internal disruptions are faster to recover from, they are more likely to lead to negative perceptions about the recovery performance outcome

Walt et al. (2021) Risk information sharing (RIS) cannot be effectively carried out unless these relationships are based on more than just transactional information sharing. Therefore, a better understanding is needed of how

personal relationships influence RIS among these partners. The purpose of this study was to explore the role of personal relationships in supply chain RIS from the perspective of buyers and suppliers in 3PL services in South Africa. The study provides insight into the role of personal relationships in supply chain RIS, the behavioral attributes required for RIS, and the challenges associated with RIS when a personal relationship is present. The study is, arguably, among the first empirical studies in the South African logistics services context to investigate the role of personal relationships in supply chain RIS.

Particularly challenged by the constant evolution of their development and manufacturing processes. Outsourcing logistics becomes then an attractive option for firms to focus on their core competencies. However, alongside the numerous benefits of outsourcing, various risks arise with the implementation of this option. This paper contributes to the literature by presenting a decision model that takes into consideration the risk of outsourcing logistics (Mokrini et al., 2016).

Various factors affect the development of supply chain finance and identifying its transmission path. It is proposed to strengthen legal control, credit control, proficiency, supply chain management, and supply chain operations, and find out and understand the things and links that are highly related to supply chain finance.; create a stable supply chain financial market environment and ensure market efficiency and other preventive measures. In this paper, the DEMATEL-AIM method is innovatively applied to identify and analyze supply chain financial risks, and the complex supply chain financial system is systematically analyzed (Han et al., 2022).

For MN3PL service providers major human resource challenges are identified as lack of expertise, inadequate training and education, and cultural differences. The shortage of managers with relevant logistics education and training on both practical and strategic levels hinders the efficiency of the 3PL sector in China. Cultural conflicts often result in changed orders, unexpected costs, and sometimes a negative impact on relationships. To overcome such a problem, multinational companies rely on training, development, and mentoring to build necessary local skills, rather than hiring expatriates with high costs. This study contributes to 3PL literature by identifying critical challenges for MN3PLs operating in China. (Rahman et al. 2019).

Demircan et al. (2021) studied the warehouse location selection of third-party cold chain logistics suppliers. The importance of keeping perishable products under the right conditions increased since it was realized that cold chain warehousing and transportation prevent the product from spoiling. Organizations can save their funds and time by having effective cold chain management. This study's main scope is to give a new scientific perspective to warehouse selection in cold chain logistics.

3PL Risk Identified from Literature Review

S. NO.	Risks	Authors
1	Poor Manual Handling of goods	Zeng et al. (2021)
2	Capacity Constraints	Tsang et al. (2016)
3	Compatibility of Information technology	Rahman et al. (2019)
4	Infectious diseases/injury	Reyes et al. (2022)

5	Supply chain risk disruption	Macdonald et al. (2013)
6	Information Leakages	Walt et al. (2021)
7	Border Delays	Mokrini et al., 2016
8	Faillure of contract	Han et al. (2022)
9	Inadequate education & training	Rahman et al. (2019)
10	Lack of warehousing tools & techniques	Demircan et al. (2021)

RESEARCH METHODOLOGY

Failure mode effect analysis (FMEA) is a structured way to discover potential failure that may exist within the design of a product or process. Failure modes are a way in which processes fail. Failure modes are how a process can fail. Effects are the ways that these failures can lead to waste, defects, or harmful outcomes for the customer. Failure Mode and Effects Analysis is designed to identify, prioritize, and limit these failure modes.

RPN (Risk Priority Number) is a multiplication of several factors that aim to assess the risk of a failure mode escaping and potentially presenting to the customer as a defect.

RPN = O*S*D
where;
O: Probability of occurrence
S: Severity of event
D: Probability of detection

DATA COLLECTION

We have taken 5 responses from the survey the questionnaire was made from the risks identified from the literature review. We took a DHL as a third-party logistics company. DHL is a German logistics company providing courier, package delivery, and express mail service, delivering over 1.7 billion parcels per year. A subsidiary of the German logistics firm DHL Group, its express mail service DHL Express is one of the market leaders for parcel services in Europe and Germany's main courier and parcel service.

The linguistic scale is to be used for the subjective rating of risk by respondents.

Linguistic Rating Scale for Probability of Occurrence (O)

and severity of impact (S) of risk

Linguistic scale	Scale
Very low (VL)	1
Low(L)	2
Medium (M)	3
High (H)	4
Very high (VH)	5

Linguistic Rating Scale for Probability of detection of risk

Linguistic Scale	Scale
Very low	5
Low	4
Medium	3
High	2
Very high	1

For a sample one respondent's response is given below

Ratings of Supply Chain Risk by Respondent 1

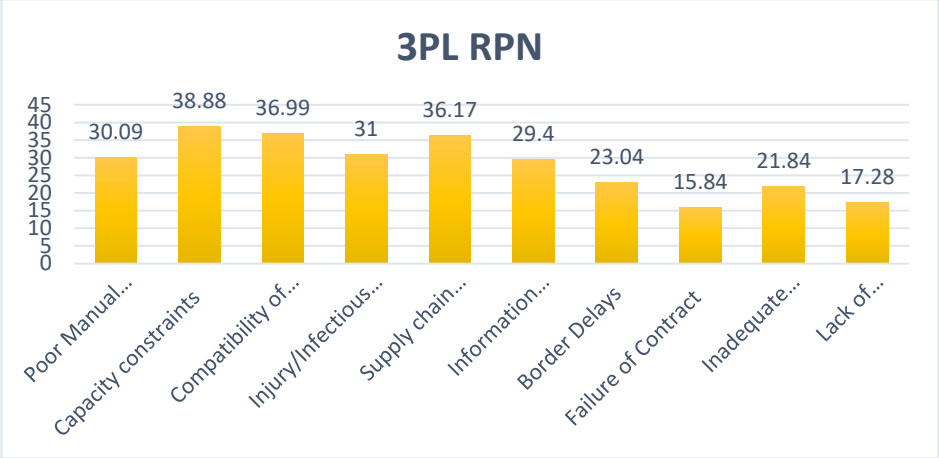
Risk	3PL risk	O	S	D
R1	Poor Manual Handling of goods	5	3	4
R2	Capacity Constraints	4	4	4
R3	Compatibility of information technology	3	2	3
R4	Infectious disease/Injury	4	3	3
R5	Supply chain risk disruption	4	4	3
R6	Information Leakages	3	3	3
R7	Border Delays	3	3	2
R8	Failure of contract	4	5	4
R9	Inadequate education & training	3	2	3
R10	Lack of warehousing tools & techniques	3	4	3

DATA ANALYSIS

The data collected is analyzed. An aggregated matrix is obtained by taking the mean rating of the four respondents and RPM is calculated as shown.

Aggregate Rating and RPN Calculation

Risk	3PL Risk	O	S	D	RPN
1	Poor Manual Handling of Goods	3.8	3.6	2.2	30.09
2	Capacity constraints	3.6	3.6	3	38.88
3	Compatibility of Information technology	3.4	3.2	3.4	36.99
4	Injury/Infectious Disease	3.4	3.8	2.4	31.00
5	Supply chain disruption risk	3.4	3.8	2.8	36.17
6	Information leakages	2.8	3.5	3	29.4
7	Border Delays	2.4	3	3.2	23.04
8	Failure of Contract	2.2	3	2.4	15.84
9	Inadequate education & training	3	2.6	2.8	21.84
10	Lack of warehousing tools & techniques	3	3.2	1.8	17.28



- 3PL Risk categorization

Risk	3PL Risk	Risk Level
R1	Poor Manual Handling of Goods	High
R2	Capacity constraints	Extreme
R3	Compatibility of Information technology	Very high
R4	Injury/Infectious Disease	High
R5	Supply chain disruption risk	Extreme
R6	Information leakages	High
R7	Border Delays	Medium
R8	Failure of Contract	Low
R9	Inadequate education & training	Medium
R10	Lack of warehousing tools & techniques	Low

Very low level of risk needs no action, low level risk means some action may take place. Medium and High-level risk means corrective action will take place and extreme/ Critical level risk means corrective actions will take place and extensive changes are required in the process or product. According to our research study capacity constraints and supply chain disruptions in Third-party logistics are extreme whereas low-level risk is in failure of contract and lack of warehousing tools and techniques.

RESEARCH MITIGATION STRATEGIES

Contractual Agreement

Characterize key execution markers (KPIs) and benefit level assertions (SLAs) in contracts. Indicate punishments for disappointment to meet agreed-upon execution measures and motivating forces for surpassing them. Incorporate clauses for debate determination, end conditions, and secrecy understandings.

Risk Assessment & Management

Frequently conduct chance appraisals to distinguish vulnerabilities and potential disturbances. Create hazard moderation plans custom-fitted to address distinguished dangers, such as supply chain mapping, situation arranging, and commerce affecting the investigation. Execute chance observing frameworks to track key hazard markers and trigger proactive reactions.

Comprehensive Vendor Selection

Conduct exhaustive foundation checks and due constancy on potential 3PL accomplices. Utilize scorecards or assessment criteria to compare and select the foremost reasonable supplier. Consider location visits to evaluate offices, foundations, and operational capabilities firsthand.

CONCLUSION

In conclusion, third-party coordination (3PL) plays a significant part in cutting-edge supply chain administration, advertising companies the adaptability, mastery, and assets to streamline operations and upgrade effectiveness. Be that as it may, with the benefits of 3PL come inborn dangers and challenges, extending from benefit disturbances to administrative compliance issues. Through fastidious inquiry about and examination, this paper has distinguished a comprehensive set of moderation methodologies pointed to attending to these challenges viably. We have used the Failure mode and effect analysis (FMEA) method to identify potential failure modes in a system and their cause and effects. The Supply chain disruptions inside the domain of third-party coordination (3PL) can show in heap shapes, showing critical challenges to the smooth stream of products and administrations. Characteristic catastrophes such as tropical storms, or surges can wreak devastation on transportation courses and foundations, causing delays and disturbances in conveyances that can hinder operations by disturbing supply chains and creating security concerns. Additionally, provider issues such as generation delays, quality surrenders, or money-related precariousness can resound all through the supply chain, affecting 3PL operations and benefit levels. Cybersecurity breaches pose another basic risk, and disturb coordination frameworks, leading to operational downtime and misfortune of belief among accomplices. To moderate these dangers, proactive measures such as possibility arranging, and enhancement of providers and transportation modes are basic. By cultivating nimbleness, flexibility, and a proactive approach to hazard administration.

Capacity constraints pose noteworthy challenges inside the domain of third-party coordination (3PL), affecting the effective development of products and administrations through supply chains. These imperatives can emerge from different variables, including restricted distribution center space, transportation, and labor deficiencies. Distribution center capacity limitations may result from the expanded request for capacity space, regular variances, or confinements in the foundation. This will lead to blockage, longer lead times, and troubles in overseeing stock levels successfully. Essentially, transportation capacity limitations, such as constrained accessibility of trucks, drivers can block the convenient conveyance of products, particularly amid top seasons or periods of tall requests. Labor

deficiencies inside 3PL operations, whether in distribution center operations, arrange fulfillment, or advance worsen capacity limitations, leading to delays and operational wasteful aspects. To address these challenges, 3PL suppliers must receive techniques to optimize asset allotment, progress utilization of existing capacity, and contribute to innovation and computerization arrangements to improve proficiency and versatility. Moreover, collaboration with clients and accomplices to estimate requests, streamline forms, and distinguish elective capacity sources can offer assistance to relieve the effect of capacity imperatives and guarantee the smooth working of coordination operations.

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