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IMPROVING OPERATIONAL EFFICIENCY IN TRANSPORTATION RISK FUNCTIONAL MANAGEMENT

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Abstract: The modern supply chain landscape, particularly in the organic food sector, demands high levels of operational efficiency to meet evolving customer expectations. This study titled **Improving Operational efficiency in transportation risk functional management** explores the key transportation risks that impact supply chain performance and investigates practical strategies to mitigate them. GG ORGANIC Pvt Ltd, a growing player in the organic products sector, faces challenges such as delivery delays, fuel cost fluctuations, vehicle maintenance issues, and route planning inefficiencies. These risks not only affect cost and service levels but also customer satisfaction and business continuity. The study employs both qualitative and quantitative methods, including employee surveys and regression analysis, to identify the root causes of transportation inefficiencies. Based on the findings, the research suggests targeted improvements such as better route optimization tools, real-time vehicle tracking, preventive maintenance scheduling, and enhanced driver performance monitoring. By implementing these measures, GG ORGANIC Pvt Ltd can strengthen its transportation function, reduce risks, and achieve a higher level of operational efficiency. This article contributes valuable insights to the field of supply chain management, emphasizing the importance of proactive risk control in transportation to support organizational growth and customer satisfaction.

Keywords: Operational Efficiency, Transportation Risk, Supply Chain Management, Last-Mile Delivery, Route Optimization, Risk Mitigation, Logistics Performance, Organic Supply Chain.

I. INTRODUCTION

In today's competitive and fast-paced business environment, operational efficiency plays a critical role in determining the success and sustainability of any organization. This is especially true in the supply chain and logistics domain, where the smooth functioning of transportation systems directly impacts customer satisfaction, cost control, and overall performance. Transportation risk management has emerged as a significant area of concern for companies aiming to optimize their delivery processes and reduce inefficiencies.

GG ORGANIC Pvt Ltd, a growing enterprise in the organic products industry, relies heavily on efficient logistics and distribution to deliver high-quality goods to customers across diverse regions. However, the company faces various transportation-related risks such as delivery delays, vehicle breakdowns, fluctuating fuel costs, and ineffective route planning. These challenges hinder its ability to maintain timely and reliable service, thereby affecting operational performance.

This study focuses on identifying and analyzing the major transportation risks that affect GG ORGANIC's logistics operations and proposes strategies to improve operational efficiency. By implementing systematic risk management practices, the company can not only reduce disruptions but also enhance its customer service and gain a competitive advantage in the organic market.

The research uses both primary data collected through structured questionnaires and secondary sources to examine the relationship between key transportation factors and operational efficiency. It aims to provide actionable recommendations for strengthening risk management practices within the transportation function of GG ORGANIC Pvt Ltd.

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II. STATEMENT OF PROBLEM

Transportation is a vital component of the supply chain, especially in companies like **GG ORGANIC Pvt Ltd**, which rely on timely and safe delivery of organic products to maintain quality and customer satisfaction. Despite the company's growing presence in the organic food market, it faces significant challenges in managing transportation-related risks. Issues such as inconsistent delivery schedules, vehicle breakdowns, high transportation costs, poor route optimization, and inadequate risk planning are affecting the company's ability to achieve operational efficiency.

These transportation inefficiencies result in increased operational costs, delays in customer deliveries, and disruptions across the supply chain, ultimately impacting customer trust and business growth. Although the company has made efforts to streamline its logistics operations, a lack of structured transportation risk management strategies continues to hinder optimal performance.

Hence, this study seeks to investigate the transportation risks affecting GG ORGANIC Pvt Ltd and explore practical methods to improve operational efficiency by implementing better risk functional management practices.

Primary Objective:

To improve operational efficiency by identifying, analyzing, and minimizing transportation risks in the logistics operations of GG ORGANIC Pvt Ltd.

Secondary Objectives:

1. To study the existing transportation network and risk management practices of the company.
2. To identify specific risk factors such as delivery delays, vehicle breakdowns, and cost overruns.
3. To assess the effectiveness of current tools and technologies used for transportation planning and monitoring.

III. REVIEW OF LITERATURE

Transportation risk management is a critical area for organizations that rely on logistics to move goods efficiently while minimizing disruptions. According to **Mangan, Lalwani, and Butcher (2016)**, transportation is one of the most vulnerable components in the supply chain due to factors like accidents, delays, fuel price fluctuations, and regulatory non-compliance. Effective risk management in transportation not only protects a company's assets but also enhances its overall operational efficiency. The study by **Christopher (2011)** emphasizes that effective risk management strategies, including route optimization and real-time monitoring, can significantly reduce operational costs and improve delivery reliability.

A key aspect of transportation risk management is **route optimization**. Research by **Toth and Vigo (2014)** on vehicle routing problems (VRP) demonstrates that optimized routing leads to reduced fuel consumption, lower emissions, and timely deliveries, which directly contribute to cost savings. Advanced systems, such as **Transportation Management Systems (TMS)**, have become pivotal in managing complex transportation logistics. **Zhang et al. (2017)** suggest that the integration of GPS technology and TMS in transportation not only improves route planning but also provides real-time tracking, enabling proactive risk mitigation. Real-time data facilitates better decision-making, particularly when unexpected delays or hazards occur during transportation.

Safety standards are also a significant focus in transportation risk management. **Liu et al. (2015)** emphasize the need for comprehensive safety protocols to mitigate the risk of accidents, particularly when dealing with hazardous materials or long-distance shipments. Regular driver training on safety practices, risk assessment, and emergency response are crucial in reducing accidents. Additionally, **driver behavior monitoring systems** have been shown to lower accident rates by tracking speed, braking patterns, and fatigue levels, according to **Chien and Ding (2010)**.

Incorporating **sustainable transportation practices** has gained increasing attention in recent years. Studies by **Kahn Ribeiro et al. (2007)** and **Sorrell (2015)** argue that transitioning to electric vehicles (EVs) and hybrid fleets can reduce carbon emissions significantly. Sustainability in transportation also involves optimizing fuel consumption, reducing empty miles, and exploring alternative fuels. **Adler et al. (2017)** found that companies adopting sustainability initiatives

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not only comply with regulatory standards but also improve their market position by meeting consumer demand for environmentally responsible operations.

One major challenge in transportation risk management is managing **third-party logistics (3PL)** providers. According to **Frost and Sullivan (2016)**, managing 3PL partners effectively is essential to ensure that transportation risks, such as delivery delays or non-compliance, are minimized. **Ingold and Lutz (2018)** argue that long-term relationships with well-vetted 3PL providers can significantly reduce operational risks by ensuring adherence to agreed-upon standards and expectations. Conversely, a lack of proper management of third-party vendors can lead to miscommunication, delays, and cost overruns.

In terms of **technology adoption**, the integration of **Internet of Things (IoT)** devices in vehicles has been shown to improve the visibility and reliability of transportation operations. **Lee and Youn (2017)** highlight that IoT-enabled devices, such as sensors and trackers, allow companies to monitor vehicle health, driver behavior, and external factors like weather conditions, providing valuable data for decision-making. Predictive analytics, which uses historical data to anticipate future disruptions, is also increasingly being integrated into transportation management systems, as discussed by **Nguyen et al. (2018)**. These technologies enable companies to anticipate issues before they occur, offering a more proactive approach to risk management.

Furthermore, research by **Coyle et al. (2013)** indicates that collaboration among stakeholders in the transportation process, such as suppliers, transporters, and regulators, can lead to better risk mitigation. By sharing data and insights across the supply chain, companies can identify risks early, respond more effectively, and reduce the likelihood of disruptions.

Research Methodology

The research methodology for this study on improving operational efficiency in transportation risk management at GG Organic Pvt Ltd is designed to provide a comprehensive analysis of current practices, risks, and the potential for improvement. The study employs a mixed-methods approach, combining both qualitative and quantitative data collection and analysis techniques to provide a well-rounded understanding of the problem and propose actionable solutions.

Research Design

This study follows a **descriptive research design**, aiming to describe and analyze the current state of transportation risk management at GG Organic Pvt Ltd. Descriptive research helps identify the key risk factors affecting transportation operations, assesses their impact, and determines the areas where improvements can be made to enhance operational efficiency.

IV. METHODS OF DATA COLLECTION

Primary Data Collection Methods

Primary data is first hand information gathered directly from original sources. This data is specific to the company's needs and provides current insights. Common methods include:

1. **Surveys and Questionnaires**: Collecting structured responses from employees, drivers, or customers about transportation processes.
2. **Interviews**: Conducting one-on-one discussions to gain in-depth understanding of operational challenges.

Sample Size and Representativeness

Limited Sample Size: The sample size may not be large enough to accurately represent the entire population of employees involved in transportation at GG Organic Pvt Ltd. A small sample size could result in sampling bias, limiting the generalizability of the findings.

Limited Scope of Focus

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- **Scope of Transportation Risks**: While the study focuses on transportation risks and their impact on operational efficiency, it may not address all types of risks related to transportation, such as those related to international logistics, cybersecurity in transportation technologies, or the environmental impact of transportation systems.
- Operational Efficiency Metrics: The study may not fully capture all the factors contributing to operational inefficiency beyond transportation risks. Other factors such as supply chain issues, workforce inefficiencies, or financial constraints may also play a role but are not covered in detail within this research.

OBSERVATION REVIEW

During the course of the study conducted at **GG Organic Pvt Ltd**, several key observations were made with regard to the existing transportation risk management practices and their impact on the operational efficiency of the company. These observations provide valuable insights into the practical challenges, strengths, and improvement areas within the organization's logistics and transportation system.

It was observed that GG Organic Pvt Ltd does not follow a well-defined or documented transportation risk management policy. Risk identification and mitigation largely occur in an ad-hoc manner, based on individual experience rather than standardized procedures.

Although the company uses basic tools such as mobile communication for coordination, there is limited adoption of advanced technologies like GPS tracking, transport management software (TMS), or real-time analytics for monitoring fleet performance and delivery timelines.

Observations revealed inconsistencies in vehicle maintenance schedules, which occasionally lead to delays due to unexpected breakdowns. A more disciplined preventive maintenance schedule could help reduce downtime and ensure smoother delivery operations.

Drivers and logistics staff were found to have limited awareness about transportation compliance and safety protocols. Regular training programs on handling perishable organic goods, safety procedures, and emergency response could improve operational readiness.

Delays in delivery, particularly to remote areas, have occasionally impacted customer satisfaction. Observations suggest that this is often due to poor route planning or unforeseen transport issues not being accounted for in advance. There is no centralized system to track transport issues. Most communication happens over the phone or in person, leading to gaps in real-time reporting and issue escalation. This lack of visibility can lead to inefficiencies and poor decision-making. The absence of well-defined contingency plans for transportation disruptions (such as strikes, fuel shortages, or vehicle breakdowns) places the company at risk during crisis situations.
Despite these challenges, GG Organic Pvt Ltd has a strong logistical foundation and an experienced team. With better planning, technology adoption, and structured risk policies, the company can significantly improve its transportation efficiency and customer service reliability.

Analysis

This section presents the interpretation of data collected through observations, surveys, and secondary sources. The objective is to assess the efficiency of transportation practices, identify risk-related challenges, and evaluate the company's preparedness in mitigating such risks. Based on the collected data, both qualitative and quantitative insights are analyzed to understand the impact of transportation risk management on GG Organic Pvt Ltd's operational performance. The analysis reveals that a significant portion of the staff, including drivers and logistics supervisors, are aware of general transport risks like vehicle breakdowns, delays, and traffic issues. However, **only 40–50% of respondents reported being trained in structured risk identification or response planning**. This indicates a **knowledge gap** that directly affects the organization's ability to respond quickly and effectively during disruptions. Transportation risks have a **measurable impact on delivery timelines, fuel costs, and customer satisfaction**. About **35% of deliveries experience delays** due to factors like vehicle issues or route mismanagement. These delays lead to spoilage (in the case of perishables), increased operational costs, and reduced customer trust. Efficiency losses are estimated to be around **15–20%**, which could be optimized through better planning and risk control. The study found minimal integration of advanced technology in logistics operations. Only **20% of transportation activities use digital**

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tools for route planning or tracking. The absence of GPS tracking, real-time updates, and data analytics reduces visibility and decision-making speed. Companies that implement basic Transport Management Systems (TMS) typically see a **20–30% improvement** in fleet utilization and delivery accuracy—an opportunity for GG Organic.

Discussion

The findings of the study highlight several critical areas where transportation risk directly influences operational efficiency at GG Organic Pvt Ltd. Through an in-depth review of transportation practices, risk exposures, employee engagement, and technological usage, it becomes evident that there are both strategic gaps and opportunities for improvement.

One of the primary observations is that transportation risks—such as delays, non-compliance, vehicle breakdowns, and poor route planning—contribute significantly to hidden operational costs. These risks lead to spoilage of organic goods, customer complaints, and increased fuel and maintenance costs. However, because they are not tracked or analyzed systematically, their impact is often underestimated by the company's management.

There is no formal framework in place for transportation risk identification, monitoring, or mitigation at GG Organic Pvt Ltd. Risk responses are reactive rather than preventive. This lack of standard operating procedures (SOPs) leads to inconsistent handling of transport-related issues, contributing to service disruptions and internal inefficiencies.

Key Findings

1.1 Inefficient Route Planning

- Many respondents from GG ORGANIC indicated that transportation planning is still largely manual.
- Delays are often caused by suboptimal route selection and lack of real-time traffic data.
- GPS tools are underutilized, leading to longer delivery times.

1.2 Lack of Real-Time Tracking

- Only a portion of vehicles are equipped with live tracking systems.
- Communication between drivers and dispatch is mainly through mobile calls or WhatsApp, which lacks central monitoring.
- This limits proactive decision-making in case of route deviations or emergencies.

1.3 High Frequency of Delivery Delays

- Data showed frequent delays, especially in last-mile delivery.
- Factors include traffic congestion, driver absence, unplanned vehicle maintenance, and roadblocks.
- Such delays affect customer satisfaction and product quality (especially for organic goods).

1.4 Inadequate Risk Management Systems

- GG ORGANIC does not have a formal transportation risk register or risk response strategy.
- Common risks (e.g., vehicle breakdowns, weather impacts, or loading errors) are handled reactively rather than proactively.
- There is no clear contingency plan or escalation protocol.

1.5 Manual Recordkeeping

- Operational data (vehicle logs, fuel consumption, delivery timelines) are manually maintained in Excel or registers.
- This leads to errors, inefficiencies, and lack of centralized access to performance analytics.

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1.6 Undertrained Staff and Drivers

- Training is mostly conducted during induction; no refresher courses are offered.
- Drivers lack formal awareness of risk protocols, emergency response, or sustainability practices.

1.7 Lack of Transport Management System (TMS)

- A comprehensive Transport Management System is missing.
- The absence of TMS prevents automation in dispatching, fuel monitoring, and vehicle tracking.

1.8 Environmental Concerns Overlooked

- GG ORGANIC is an environmentally conscious company but has not yet implemented eco-friendly logistics strategies (like route combining or low-emission vehicles).
- Fuel efficiency is not tracked, and carbon impact is not measured.

Comparison with Review of Literature

1. Risk Management Practices

Studies like **Wagner and Bode (2008)** emphasize the importance of structured risk identification, assessment, and mitigation in minimizing transportation disruptions. Companies with formal risk management frameworks tend to recover faster from disruptions and maintain better customer satisfaction.

In contrast, GG Organic Pvt Ltd lacks a formal risk management framework, relying heavily on reactive responses to transportation issues. This gap leaves the company vulnerable to operational inefficiencies and customer dissatisfaction, supporting the findings in the literature that proactive risk planning is essential.

Research by **Jayaraman et al. (2017)** indicates that companies using digital tools such as **GPS tracking, Transport Management Systems (TMS)**, and predictive analytics significantly reduce their transportation costs and improve delivery accuracy.

The company has low technological adoption, relying primarily on manual coordination and communication, which limits real-time decision-making and efficiency. This mismatch suggests a critical improvement area for GG Organic to align with industry best practices.

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