

RESEARCH ARTICLE

ANALYSIS AND IDENTIFICATION OF THE SHORTCOMINGS IN TRANSPORTATION MANAGEMENT

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Abstract: The management of transportation systems is a critical facet of modern society, influencing economic activities, societal mobility, and environmental sustainability. This research presents an overview of the analysis conducted on various aspects of transportation management to identify deficiencies and propose potential solutions. Through qualitative methods this research aims to assess the impact of identified deficiencies on diverse elements of transportation. This includes evaluating the repercussions on efficiency, costs, environmental sustainability, and overall system resilience. The findings of this analysis aim to contribute to the advancement of transportation management practices. By identifying key deficiencies and proposing potential solutions, this research intends to provide actionable insights for policymakers, transportation authorities, and industry stakeholders. The ultimate goal is to foster more efficient, sustainable, and resilient transportation systems that cater to the evolving needs of society while mitigating the identified deficiencies.

Keyword: Analysis, Evaluation, Management, Shortcomings, Transportation.

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INTRODUCTION

The issue of transport management has been widely researched by scientists. One of the primary cost components of the enterprise's logistics system is transportation. Infractions against the transportation system's operation can lead to financial ruin for businesses. Transport is the primary means through which logistics, regardless of its scope, is expressed in daily life.

It is not merely one of the components of logistics. Managing material flows from the point of generation to the destination along the entire length of the logistics channels is the main duty of transport logistics. Promoting material flows to consumers strictly in accordance with the schedule at a predetermined time, with the least amount of expense to all parties involved in the movement of goods, is the goal of transport logistics.

Furthermore, the application of the concept of transport logistics itself aids in the current and future development of logical solutions to challenging socioeconomic issues. Transportation management plays a pivotal role in facilitating the movement of goods,

people, and services within and across regions, serving as a cornerstone for economic development, societal connectivity, and environmental sustainability. Effective transportation management ensures the smooth operation of various transportation modes, infrastructure, and logistics networks. However, it is a multifaceted domain facing several challenges and deficiencies that require careful analysis and strategic intervention (Moslem *et. al.*, 2023).

The contemporary landscape of transportation management is marked by a myriad of complexities. Rapid urbanization, burgeoning global trade, technological advancements, environmental concerns, and evolving consumer expectations have created a dynamic and demanding environment for transportation systems worldwide. While these systems are instrumental in supporting economic growth and societal connectivity, they are concurrently beset by deficiencies that impede their optimal functioning (Petrović *et. al.*, 2018).

This introduction sets the stage for an in-depth exploration and analysis of the

shortcomings within transportation management. It aims to outline the key areas of focus for this study, emphasizing the critical aspects that will be examined, such as infrastructure challenges, operational inefficiencies, environmental impacts, and regulatory hurdles prevalent in transportation systems.

REVIEW OF LITERATURE

According to (Okdinawati *et. al.*, 2022) Transportation management faces numerous challenges across different industries and sectors. Some common problems include:

Inefficient Route Planning

Inaccurate or suboptimal route planning can lead to increased fuel consumption, longer delivery times, and higher operational costs. Inefficient routes also contribute to vehicle wear and tear. Inefficient route planning refers to the process of selecting or designing transportation routes that are not optimal in terms of time, cost, or resources utilized. This problem often arises when routes are inaccurately mapped or when planners fail to consider various factors that can impact the efficiency of transportation operations.

Consequences

- **Increased Fuel Consumption:** Inefficient routes can involve unnecessary detours, longer distances, or routes with heavy traffic congestion. These factors lead to increased fuel consumption as vehicles spend more time on the road, consuming fuel inefficiently. This not only escalates operational costs but also contributes to environmental pollution due to higher carbon emissions.
- **Longer Delivery Times:** Suboptimal route planning results in longer delivery times as vehicles take longer routes or get stuck in traffic jams. Delays in reaching the destination can affect customer satisfaction, disrupt supply chains, and impact overall operational efficiency.
- **Higher Operational Costs:** The increased fuel consumption, longer travel times, and potential delays associated with inefficient routes lead to higher operational costs for the transportation department. These costs encompass fuel expenses, vehicle maintenance, labor costs, and possibly penalties due to delayed deliveries.

- **Vehicle Wear and Tear:** Inefficient routes often involve roads that may not be optimized for the type of vehicles used or routes that subject vehicles to harsh terrain or frequent stops and starts. This results in increased wear and tear on the vehicles, leading to higher maintenance costs and decreased vehicle longevity.

According to (Iwan, 2022) addressing inefficient route planning requires careful consideration of various factors, including traffic patterns, road conditions, delivery schedules, vehicle capacity, and fuel efficiency.

Advanced route planning software and technologies leverage real-time data to optimize routes, considering factors such as traffic congestion, weather conditions, and road closures, thus minimizing fuel consumption, reducing delivery times, and lowering operational costs. By implementing more efficient route planning strategies, organizations can enhance overall transportation efficiency, improve customer satisfaction, and reduce environmental impact.

Poor Asset Utilization: Inadequate utilization of transportation assets, such as vehicles and equipment, can lead to underutilization or overloading. This inefficiency results in increased expenses and decreases overall productivity. Poor asset utilization in transportation management refers to the ineffective or inefficient use of transportation assets, including vehicles, equipment, and resources. This problem occurs when these assets are not optimally utilized, leading to various drawbacks for the organization

- **Underutilization:** When transportation assets, such as vehicles, are underutilized, they are not being used to their full capacity or potential. This might involve vehicles running below their capacity in terms of load or not being scheduled for deliveries frequently enough. Underutilization leads to increased costs per unit of output or service provided.
- **Overloading:** On the other hand, poor asset utilization can also manifest as overloading, where vehicles or equipment are loaded beyond their optimal capacity. Overloading can result in increased wear and tear on the vehicles, potentially leading

to safety hazards, reduced vehicle efficiency, and higher maintenance costs.

- **Increased Expenses:** Inadequate utilization of transportation assets leads to higher operating expenses. Underutilized assets incur fixed costs such as maintenance, insurance, and depreciation without generating the expected returns. Overloaded assets can result in increased fuel consumption, higher maintenance, and repair costs due to excessive strain on the equipment.
- **Decreased Overall Productivity:** When assets are not efficiently used, the overall productivity of the transportation operations decreases. This inefficiency impacts the ability to fulfill orders promptly, meet delivery schedules, and respond to fluctuating demands effectively, ultimately affecting the organization's competitiveness and customer satisfaction.

Addressing poor asset utilization involves optimizing asset allocation and scheduling to ensure that vehicles and resources are used effectively. This includes implementing better routing and scheduling strategies, considering factors such as vehicle capacity, load optimization, and balancing workloads to utilize assets efficiently.

Investing in technology that provides real-time asset tracking and monitoring helps in identifying underutilized assets, enabling better allocation and utilization. Regular maintenance and adherence to load capacity guidelines are also essential to prevent overloading and maintain vehicle efficiency and safety (Lindholm and Behrends, 2023).

By improving asset utilization in transportation management, organizations can reduce operational costs, improve efficiency, extend the lifespan of assets, and enhance overall productivity and customer service.

Traffic Congestion and Delays: External factors like traffic congestion, road closures, or unexpected events can significantly impact transportation schedules, causing delays and disruptions in delivery times. Traffic congestion and delays represent significant challenges in transportation management, impacting the efficiency and reliability of delivery schedules. Several factors contribute to this problem.

- **Traffic Congestion:** Heavy traffic on roads, especially during peak hours or in densely populated areas, leads to congestion. This congestion slows down the movement of vehicles, causing delays in reaching their destinations. Congestion often results from a combination of factors such as high vehicle volume, inadequate infrastructure, road design flaws, and accidents.
- **Road Closures and Incidents:** Unexpected events like road closures due to construction, accidents, weather conditions, or other emergencies can disrupt planned routes. Detours or alternative routes might be required, leading to delays and longer travel times.
- **Unforeseen Events:** Events beyond typical traffic patterns, such as public gatherings, protests, parades, or sporting events, can unexpectedly impact traffic flow. These events can lead to road closures, traffic diversions, or increased congestion, affecting transportation schedules.
- **Impact on Delivery Times:** Traffic congestion and unexpected delays directly affect delivery schedules. Vehicles take longer to reach their destinations, causing delays in delivering goods or services. This can result in customer dissatisfaction, supply chain disruptions, and additional costs for the transportation provider [6].

Lack of Visibility and Tracking

Limited visibility into the location and status of shipments can hinder effective transportation management. Lack of real-time tracking systems can lead to uncertainties regarding delivery times and inventory management. Lack of visibility and tracking in transportation management refers to the absence of inadequacy of systems that provide real-time information about the location, status, and movement of shipments or vehicles. This lack of visibility can create several challenges.

- **Uncertainty in Delivery Times:** Without real-time tracking systems, transportation managers and customers might lack accurate information about the exact whereabouts of shipments. This uncertainty can lead to difficulties in estimating arrival times, causing inconvenience and potential disruptions in operations or customer satisfaction.

- **Inefficient Inventory Management:** Limited visibility into the movement of goods or raw materials can lead to challenges in inventory management. It becomes challenging to accurately track inventory levels, predict restocking needs, or manage stockouts effectively, potentially affecting production schedules or customer order fulfillment.
- **Inability to Respond to Issues:** When there is no visibility or tracking, transportation managers might not promptly identify or respond to issues such as delays, route deviations, or vehicle breakdowns. This lack of awareness can lead to ineffective problem-solving, ultimately impacting service reliability.
- **Ineffective Planning:** Absence of real-time data on shipment locations and statuses can hinder effective planning and decision-making. Transportation managers may face difficulties in optimizing routes, allocating resources efficiently, or adjusting schedules based on live information [7].

RESEARCH METHODOLOGY

Aim and Objectives of the Study

The main aim of this research is to analyze and identify the shortcomings in Transportation Management as highlighted in various literatures pertaining to the subject. Research Objectives is to identify the shortcomings of transportation management and identify the solutions for overcoming the shortcomings of transportation management. Research Questions is what are the shortcomings of transportation management? And what are the possible solutions for overcoming the shortcomings of transportation management?

Method

This section presents a description of the research process followed in this research and how the data was collected to identify papers relevant for this study. As the first step the research questions addressed by this study are:

RQ1. What are the shortcomings of transportation management?

RQ2. What are the possible solutions for overcoming the shortcomings of transportation management?

The followed step was to define the inclusion/exclusion criteria: (1) Search limitations to papers, (2) considering only papers written in English language, and (3) Exclusion of papers not accessible as full text.

For the next step, data collection, the keywords used were defined as: Analysis, Evaluation, Management, Shortcomings, Transportation. Then used to search them in online journals databases and scholarly databases like Google Scholar. The keywords should be found in the paper title, paper keywords and/or paper abstracts. Then the papers were read to assess their relevance and contribution to the present study, and as a final step the discussion of the findings for the future work.

FINDINGS AND DISCUSSION

In the analysis and evaluation of the shortcomings in transportation management, several key areas of improvement and challenges have been identified:

Inefficient Route Planning: Shortcomings in route planning and optimization may lead to increased fuel consumption, longer delivery times, and higher operational costs. This inefficiency could be due to inadequate route optimization tools or reliance on outdated planning methods.

Poor Inventory Management and Coordination: Inaccurate inventory forecasting and insufficient coordination between transportation and inventory management can result in stockouts, excess inventory, or improper storage. This shortfall might be attributed to inadequate communication between departments or the absence of robust inventory tracking systems.

High Operational Costs: Rising fuel prices, maintenance expenses, labor costs, and compliance with regulations contribute to increased operational costs. These challenges might stem from a lack of efficiency in maintenance schedules, suboptimal fuel consumption strategies, or inadequate negotiation with suppliers.

Environmental Impact: Transportation operations contribute significantly to carbon emissions and environmental pollution. The failure to adopt sustainable practices and eco-friendly transportation solutions could

result in negative environmental consequences.

Supply Chain Disruptions: Global events, natural disasters, or geopolitical issues can cause disruptions in transportation logistics, leading to delays, shortages, or increased costs. Insufficient risk management strategies or over-reliance on single suppliers or routes could contribute to vulnerability in the face of disruptions.

Technology Integration Challenges: Implementing and integrating new transportation technologies, such as GPS tracking or autonomous vehicles, might face obstacles related to costs, training, compatibility, or system adaptation.

Based on the analysis and evaluation of the identified shortcomings in transportation management, here are several recommendations to address these challenges:

Implement Advanced Route Optimization Tools: Invest in state-of-the-art route planning software and GPS technologies to optimize transportation routes. This will help minimize fuel consumption, reduce delivery times, and lower operational costs.

Enhance Inventory Management Systems: Upgrade inventory forecasting methods by utilizing advanced analytics and demand forecasting techniques. Integration of efficient inventory management systems will improve coordination between transportation and inventory, reducing stockouts and excess inventory.

Cost Reduction Strategies: Explore opportunities to reduce operational costs by negotiating favorable terms with suppliers, implementing fuel-efficient driving techniques, and adopting maintenance practices that prolong vehicle lifespan.

Adopt Sustainable Transportation Practices: Transition to alternative fuel vehicles, promote eco-friendly transportation modes, and implement green logistics practices to minimize environmental impact and comply with sustainability goals.

Develop Resilient Supply Chain Strategies: Diversify suppliers, establish backup transportation routes, and create contingency

plans to mitigate the impact of supply chain disruptions caused by unforeseen events.

Address Technology Integration Challenges: Prioritize training programs for employees to effectively use and integrate new transportation technologies. Collaborate with technology vendors for seamless integration and ensure compatibility with existing systems.

Continuous Improvement and Monitoring: Establish a culture of continuous improvement by regularly evaluating transportation operations, monitoring key performance indicators, and implementing feedback mechanisms to identify and address shortcomings promptly.

Invest in Innovation and Research: Stay updated on emerging transportation technologies, trends, and best practices within the industry. Invest in research and development to adapt and integrate innovative solutions that enhance transportation efficiency.

Employee Engagement and Skill Development: Encourage employee involvement in process improvement initiatives, provide ongoing training, and empower them to contribute ideas for optimizing transportation management.

Strategic Partnerships and Collaboration: Foster strategic partnerships with suppliers, logistics service providers, and industry experts to share best practices, knowledge, and innovative solutions for improving transportation management.

By implementing these recommendations, organizations can significantly improve transportation management, address existing shortcomings, and pave the way for a more efficient, sustainable, and resilient logistics system. Regular evaluation and adaptation of strategies based on changing industry trends and business needs are essential for continuous improvement in transportation management.

CONCLUSION

In conclusion, addressing these shortcomings in transportation management requires a multi-faceted approach involving technological advancements, process improvements, strategic planning, and stakeholder collaboration.

Solutions involving better route optimization, improved inventory management systems, cost-saving measures, sustainability initiatives, robust risk management, and careful technology integration can collectively address these challenges and enhance transportation management efficiency. Regular evaluation, continuous improvement, and a proactive approach to addressing these shortcomings are vital for achieving a more optimized and sustainable transportation management system.

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