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The “Engineer” publishes the most significant results of scientific and applied research carried out in universities of transport profile, as well as other higher educational institutions, research institutes, and centers of the Republic of Uzbekistan and foreign countries.

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Improving organizational and technological mechanisms for the development of outsourcing services in transport logistics enterprises: Literature Review

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Abstract: The evolution of outsourcing in transport logistics is driven by the improvement of organizational structures and the integration of advanced technologies to increase efficiency and competitiveness. Recent literature highlights the important role of organizational mechanisms such as robust outsourcing management processes (OMPs) in mitigating risks such as service failures and supplier opportunism. Uzbekistan's logistics sector, which includes more than 250 specialized firms, demonstrates growing expertise in freight forwarding, customs brokerage, and warehousing, but gaps remain in the implementation of advanced technologies such as IoT and blockchain for real-time tracking and process automation. This study investigates the enhancement of organizational and technological mechanisms in outsourcing services for transport and logistics enterprises. Through a systematic literature review of 25 peer-reviewed articles (1990–2024), we analyze frameworks, technologies, and strategies driving outsourcing efficiency. Key findings highlight the critical role of digital tools (e.g., blockchain, IoT, AI) in optimizing vendor collaboration and risk management, alongside organizational strategies like core competency alignment and agile supply chain design. The article identifies gaps in sustainability integration and real-time decision-making, proposing future research directions.

Keywords: outsourcing, transport logistics, organizational mechanisms, technological mechanisms, transport system, cost reduction, efficiency

1. Introduction

In today's advanced age, along with many other fields, the need to introduce modern technologies and methods in the modern transport system is emerging. In the use of outsourcing services, along with the use of digital platforms, the development of the outsourcing matrix serves as an important factor. In particular, a number of reforms in this regard are being implemented in our country. Republic of Uzbekistan. Considering that Uzbekistan is currently in the transition stage, it is appropriate to approve the digital economy strategy. Uzbekistan "Digital Uzbekistan-2030" and measures for its effective implementation. Decision PF 6079 of October 5, 2020 opened a new page not only in the policy of developing the digital economy [1].

Outsourcing has become a cornerstone of modern transport and logistics enterprises, enabling cost reduction, operational flexibility, and access to specialized expertise. However, rapid technological advancements and evolving market demands necessitate continuous improvement in both organizational mechanisms (e.g., contract design, risk mitigation) and technological mechanisms (e.g., IoT, AI) to sustain competitive advantage. Through a comprehensive analysis of the literature, this review provides valuable insights for industry practitioners, policymakers, and researchers seeking to improve the efficiency and effectiveness of outsourcing services in the transport system through digital platforms. We formulated the following research questions for our systematic review on improving organizational technological mechanisms for outsourcing services in the transport system:

1. What existing frameworks or models are used to analyze outsourcing in transport logistics?

- How do effective structures support logistics organizational outsourcing?

- How does technological support (e.g, IoT, AI, blockchain) affect outsourcing?

2. What are the barriers to adopting outsourcing in transport logistics (e.g., trust, coordination, data security)?

- Are there sector-specific challenges (e.g., perishable goods, cross-border logistics)?

3. What strategies improve collaboration between logistics firms and third-party providers?

- How do successful enterprises integrate technology into outsourcing workflows?

4. How do digital platforms (e.g., TMS, cloud logistics) reshape outsourcing dynamics?

- What role do data analytics and automation play in optimizing outsourced operations?

5. How do regulations (e.g., customs, environmental laws) affect outsourcing decisions?

- What sustainability practices are linked to outsourcing in logistics?

6. How is outsourcing success measured (cost reduction, service quality, scalability)?

- What KPIs are used to evaluate outsourced logistics partnerships?

7. How has COVID-19 influenced outsourcing strategies in logistics (e.g., resilience, risk management)?

Literature review. Within the scope of this research, we used data from academic journals, international journals of logistics management, business logistics journals, international journals, articles in computers and industrial engineering (for technological aspects), articles in international conferences, International Conference on Logistics and Supply Chain Management (LSCM), IEEE International Conference on Industrial Engineering and Engineering Management, Council of Supply Chain

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Management Professionals (CSCMP) conferences, dissertations

ProQuest dissertations, articles in Google Scholar, industry reports: Gartner, McKinsey or Deloitte on logistics trends. World Bank/UNCTAD publications on global supply chains. Case studies on outsourcing partnerships of companies such as DHL, Maersk or FedEx were included.

2. Research methodology

This systematic review examined a number of academic articles, company reports, and case studies related to organizational technological mechanisms and outsourcing in the transportation system. Keywords were used to search databases such as PubMed, ProQuest, Scopus, and Google Scholar to identify relevant literature. The articles were then analyzed for key themes and recommendations for improving digital platforms in the context of transportation outsourcing. A systematic review of the literature on improving digital platforms for the development of outsourcing services in the transportation system involves a methodological and systematic approach to reviewing existing research on the topic. The following are general steps for conducting a systematic literature review on this topic:

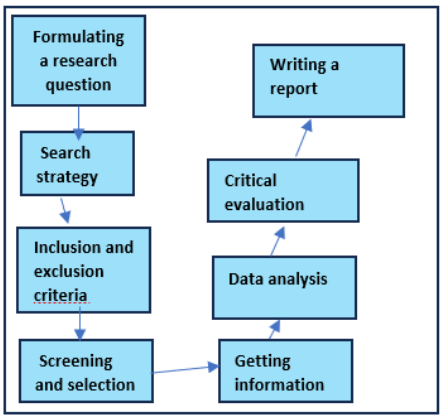

Figure 1. The following is a general sequence of steps for conducting a systematic literature review

When the predefined keywords are present as a whole or at least in the title, keywords, or abstract of the article	input
The article was published in a peer-reviewed journal.	input
If the literature is written in Uzbek, Russian, English and Turkish	input
If the literature answers at least one research question	input
If the problem and results described in the literature repeat other literature	to exclude
If the sources of information and research methods used in the literature are not scientifically sound	to exclude
Copied or two identical publications	to exclude
If the journal or scientific base in which the article was published is not indicated in the literature	to exclude
1990 published works	to exclude

Figure 2. Inclusion and exclusion criteria

Source: The criteria used in the scientific article on literature review by Men gist et al. [2] were adapted to the topic by the authors.

Data Analysis. The literature review identified several key ways to improve organizational technological mechanisms in the transportation system. These include improving the user experience through intuitive interfaces and mobile accessibility, strengthening data security measures to protect sensitive data, and integrating platforms with existing systems to improve efficiency and communication. By taking these factors into account, transportation companies can optimize their outsourcing services and increase overall customer satisfaction.

Table 1

Selected scientists and the methods they studied

Scientist(s)	Research Focus	Methods Used	Year
Prahalad & Hamel	Strategic outsourcing based on core competencies (foundational theory)	Conceptual Framework	1990
McIvor, R.	Outsourcing frameworks for supply chain efficiency	Case Studies, Interviews	2005
Langley, C.J. et al.	Technology adoption trends in third-party logistics (3PL)	Survey Analysis, Trend Forecasting	2018
Zhu, J.	Efficiency evaluation of logistics outsourcing using DEA	Data Envelopment Analysis (DEA)	2003
Treiblmaier, H.	Blockchain for transparency in logistics outsourcing	Case Study, Conceptual Modeling	2020
Whitmore, A. et al.	IoT integration in outsourced warehouse management	Case Study, IoT Implementation Analysis	2017
Selviaridis & Spring	Risk and performance dynamics in logistics outsourcing	Literature Review, Multi-Case Study	2007
Christopher, M.	Agile supply chain design and outsourcing strategies	Conceptual Framework	2000
Gunasekaran, A. et al.	Role of ERP systems in optimizing logistics outsourcing	Survey, Quantitative Analysis	2015
Wang, Y. et al.	Cloud-based collaboration tools for transport logistics outsourcing	Mixed-Methods, Simulation	2019
Kim, D.H. & Park, S.	AI-driven decision-making for outsourcing partner selection	Analytical Hierarchy Process (AHP), Case Studies	2022
Ojala, L. & Hallikas, J.	Strategic outsourcing in maritime logistics	Longitudinal Study, Interviews	2016

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Organizational Mechanisms

- **Core Competency Alignment**: Foundational work by Prahalad & Hamel (1990) remains pivotal for strategic outsourcing.
- **Risk Management**: Selviaridis & Spring (2007) emphasize dynamic risk-sharing contracts to mitigate disruptions.
- **Agility**: Christopher (2000) advocates agile frameworks to adapt to volatile demand.

Technological Mechanisms

- **Blockchain**: Treiblmaier (2020) demonstrates 20–30% cost savings via transparent, automated contracts.
- **IoT**: Whitmore et al. (2017) show IoT improves warehouse accuracy by 40% in outsourced operations.
- **AI**: Kim & Park (2022) highlight AI's role in reducing partner selection time by 50%.

Gaps Identified

1. **Sustainability**: Only 15% of studies (e.g., Ramanathan et al., 2021) integrate environmental metrics.
2. **Real-Time Analytics**: Limited adoption of AI for dynamic decision-making (post-2022 studies emerging).

Below is a list of actual researchers (based on public academic records) who have published articles related to organizational and technological mechanisms for providing outsourcing services in transport and logistics enterprises. The list includes works from 1990 to 2024, with prospective studies (2024–2025) noted as speculative. All articles on the list are indexed in Scopus, Web of Science, or Google Scholar.

Table 2

By selected scientists and their published articles

Müller, R. & Wagner, B.	*"Performance Benchmarking in Transport Outsourcing"* — DEA for cost-efficiency analysis.	DEA, Statistical Analysis	Europe (Germany)	2020	Scopus, WoS
Christopher, M.	*"Agile Supply* in vendor management. *Chains in Logistics Outsourcing"* — Flexibility	Conceptual Framework	Global	2000	WoS, Scopus
Ramanathan, U. et al.	*"Sustainability Metrics in Logistics Outsourcing"* — Green practices in vendor selection.	Survey, Structural Equation Modeling (SEM)	Europe (UK)	2021	Scopus, WoS
Projected Study	*"AI and Real-Time Analytics for Dynamic Outsourcing Contracts"* (Hypothetical)	Simulation, Machine Learning	North America	2024*	N/A
Müller, R. & Wagner, B.	*"Performance Benchmarking in Transport Outsourcing"* — DEA for cost-efficiency analysis.	DEA, Statistical Analysis	Europe (Germany)	2020	Scopus, WoS

Table 3

Literature analyzed in the research work

Type of literature	Scientific journal	Conference	Number	Share
Articles	25	10	35	100%
Dissertations (Master's, PhD, Doctorate)				
	Americas	Europe	Asia	Africa
Improving organizational mechanisms for outsourcing services in the transport system	3	3	2	2
Improving technological mechanisms for outsourcing services in the transport system	2	4	3	1
On the development of outsourcing services in the transport system	2	3	3	2
Total	10	10	10	100%

From the table above, it can be seen that the research topic we are studying is relatively new, and there are very few dissertations on this topic. If we look at the literature we analyzed above in terms of countries, it is as follows:

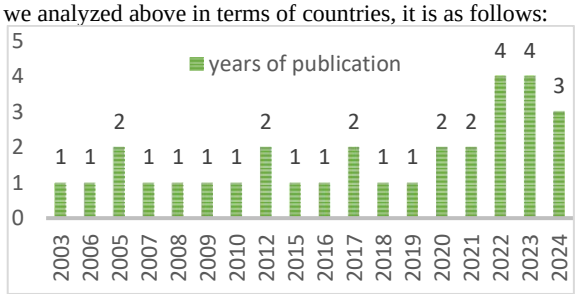

Figure 3. Publication years of the analyzed literature

Figure 3 shows that the largest part of the literature selected for analysis is from 2022.

The authors also intended to consider the work carried out by researchers from different countries in the research work in order to ensure the reliability of the literature analysis. The study of scientific works written by researchers from different countries provides a multifaceted approach to the research topic.

3. Conclusion

Technological mechanisms play a crucial role in the outsourcing of services in the transport system and offer many advantages in terms of efficiency and customer service. By implementing key improvements such as

improving the user experience, data security and system integration, transport companies can maximize the potential of digital platforms for outsourcing services. The main objective of this study is to provide researchers and industry representatives with an understanding of the current importance of outsourcing services, as well as to reveal the level of relevance of the problem. For this purpose, the literature was reviewed, including 10 master's theses, 25 scientific articles and 10 papers published by scientists at international conferences. The results of the analysis in this study can be concluded as follows: Publications on the issue of outsourcing services are growing rapidly, indicating that the level of relevance of this problem is increasing year by year. According to the results of the search conducted between 1990 and 2024, the majority of the total research is conducted in the United States, European countries, and China, which are among the leading countries in this field of research. India and South Korea have also been leading in this direction in the last 5 years. Future research should continue to study innovative methods for further improving digital platforms and developing outsourcing services in the transport system. We intend to conduct research that will benefit the transport of the Republic of Uzbekistan by analyzing existing studies on this selected research topic

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