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Economic Efficiency of Using Logistics Information Systems in Enterprises

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Abstract: This study examines the impact of logistics information systems on the operational efficiency of manufacturing enterprises in the context of digital transformation. The research analyzes the role of logistics information systems in optimizing material, financial, and information flows within enterprises. Particular attention is given to the implementation of Enterprise Resource Planning (ERP), Supply Chain Management (SCM), and digital logistics technologies in improving production efficiency and reducing operational costs. The study employs qualitative and analytical research methods based on a systematic review of scientific literature, comparative analysis, and the evaluation of logistics management practices in manufacturing enterprises. The findings indicate that the implementation of logistics information systems significantly improves information exchange, accelerates managerial decision-making, reduces logistics-related costs, and enhances enterprise competitiveness. Furthermore, the research identifies the major challenges affecting the digital transformation of logistics systems, including insufficient technological infrastructure, limited financial resources, and the shortage of qualified specialists. The study concludes that the effective integration of digital logistics technologies contributes to sustainable enterprise development and strengthens the adaptability of enterprises to rapidly changing market conditions.

Keywords: Logistics, Information Systems, Digital Transformation, Supply Chain Management, ERP Systems, Operational Efficiency, Manufacturing Enterprises, Logistics Management

1. Introduction

The rapid development of digital technologies has significantly transformed modern production and management systems worldwide [1]. In the global economy, enterprises are increasingly adopting digital tools to improve operational efficiency, reduce costs, and strengthen competitiveness [2], [3]. Under these conditions, logistics activities have become one of the most important components of enterprise management [4].

The effective management of material, financial, and information flows directly affects the productivity and sustainability of manufacturing enterprises [5]. In particular, logistics information systems play a critical role in coordinating production, transportation, warehousing, and distribution processes through digital technologies [6], [7].

Today, many enterprises implement Enterprise Resource Planning (ERP), Supply Chain Management (SCM), and Customer Relationship Management (CRM) systems to automate logistics operations and improve management efficiency [8], [9]. These systems

enable enterprises to process information quickly, optimize logistics activities, and respond effectively to changing market conditions [10].

In the context of digital transformation, logistics information systems are considered strategic tools for improving enterprise performance [11], [12]. They contribute to reducing operational costs, accelerating information exchange, improving customer service quality, and increasing enterprise competitiveness [3], [14].

However, despite the growing importance of logistics information systems, limited attention has been paid to evaluating their economic efficiency and their role in the digital transformation of manufacturing enterprises in developing economies [9], [10]. In particular, there is insufficient research on the practical impact of logistics information systems on enterprise efficiency under transitional economic conditions [11].

Therefore, the purpose of this study is to analyze the economic efficiency of logistics information systems and evaluate their role in improving operational performance and digital transformation in manufacturing enterprises [2], [4], [5].

2. Materials and Methods

This study is based on qualitative and analytical research methods. Scientific literature related to logistics information systems, digital transformation, and supply chain management was systematically analyzed [15]. Comparative analysis and theoretical evaluation methods were applied to assess the economic efficiency of logistics information systems in manufacturing enterprises.

The research examines the practical impact of ERP and SCM technologies on enterprise performance indicators such as operational costs, order fulfillment speed, inventory management efficiency, and information exchange processes.

Secondary data obtained from scientific publications, international reports, and logistics management studies were used in the research process. In addition, comparative analysis was conducted to evaluate the advantages of implementing logistics information systems in manufacturing enterprises.

3. Results and Discussion

The Economic Essence and Importance of Logistics Information Systems

Logistics information systems are integrated digital systems designed to manage material, financial, and information flows within enterprises. These systems facilitate information exchange between different organizational departments and ensure the continuity of production processes.

In addition to collecting and processing data, logistics information systems provide opportunities for strategic enterprise management. Through these systems, production, supply, transportation, warehousing, and sales activities are managed as an integrated mechanism.

The main functions of logistics information systems include:

- Management of enterprise information flows;
- Order processing and monitoring;
- Control of material resource movements;
- Optimization of inventory management;
- Reduction of logistics-related costs;
- Improvement of managerial decision-making efficiency.

The implementation of these systems contributes to improving production efficiency through better resource utilization, reduced operational delays, and faster management processes.

Modern enterprises widely use logistics technologies such as ERP, CRM, and SCM systems. These technologies enable enterprises to integrate internal and external logistics activities through unified digital platforms.

Efficiency of Implementing Logistics Information Systems

Evaluating the economic efficiency of logistics information systems is a complex process because their effectiveness is reflected not only in financial outcomes but also in improvements in management quality and enterprise competitiveness.

The implementation of logistics information systems provides enterprises with the following opportunities:

- Increasing the speed of information exchange;
- Automation of production processes;
- Optimization of document management;
- Real-time monitoring of material resources;
- Reduction of order fulfillment time;
- Reduction of logistics costs.

Research findings show that enterprises implementing logistics information systems achieve significant improvements in operational efficiency. This is mainly due to improved integration between departments and accelerated managerial decision-making processes.

Furthermore, logistics information systems strengthen internal control mechanisms within enterprises. As a result, inefficient resource utilization, operational errors, and excessive costs are significantly reduced.

The effectiveness of logistics information systems is commonly assessed using the following indicators:

- Product delivery speed;
- Order fulfillment rate;
- Logistics costs;
- Inventory levels;
- Production cycle duration;
- Customer service quality.

The strategic implementation of logistics information systems ensures long-term economic efficiency and sustainable enterprise development.

Organization of Logistics Information Systems in Manufacturing Enterprises

The organization of logistics information systems in manufacturing enterprises is based on the integration of production resources, technological tools, and management mechanisms. These systems enable the management of enterprise processes through a unified information database.

The main components of logistics information systems include:

- Computer software;
- Information and communication technologies;
- Databases;
- Technical equipment;
- Management mechanisms;
- Logistics infrastructure.

When organizing logistics information systems in manufacturing enterprises, particular attention should be paid to the following factors:

- Clear definition of operational objectives;

- Effective organization of information flows;
- Integration of vertical and horizontal management processes;
- Monitoring of material and financial flows;
- Automation of warehouse and transport systems;
- Improvement of employees' digital competencies.

Through these systems, enterprises significantly improve resource utilization efficiency. Real-time monitoring of production processes enables rapid and effective managerial decision-making.

Additionally, logistics information systems increase enterprise flexibility under conditions of changing market demand and increasing competition.

Management of Information Flows in Logistics Information Systems

One of the key components of logistics information systems is the management of information flows. Information flows are closely interconnected with material and financial flows and ensure the continuity of enterprise operations.

Effective management of information flows provides several advantages:

- Rapid control of production processes;
- Monitoring of order fulfillment;
- Control over product movement;
- Reduction of logistics costs;
- Effective customer communication.

Within logistics information systems, information flows can be integrated, processed, and transmitted in real time. This enables enterprises to improve operational coordination and management efficiency.

The management of information flows is based on the following principles:

- Accuracy of information;
- Speed;
- Continuity;
- Reliability;
- Security.

Logistics information systems organized on the basis of these principles significantly improve overall enterprise performance.

Logistics Information Systems and Digital Transformation

In the context of the digital economy, logistics information systems are considered one of the key factors in the modernization of enterprises. Digital transformation refers to the restructuring of enterprise activities based on advanced technologies.

The digital transformation of logistics information systems covers the following areas:

- Automation of production processes;
- Use of artificial intelligence technologies;
- Implementation of cloud technologies;
- Analysis of big data;
- Development of electronic document management systems;
- Creation of digital management platforms.

Digital transformation increases the flexibility of production processes in enterprises. At the same time, it enables the optimization of logistics operations and the reduction of operational costs.

According to research findings, the digitalization of logistics information systems enhances the competitiveness of enterprises and allows them to adapt quickly to changing market demands.

Factors Hindering Digital Transformation

Despite its advantages, the implementation of logistics information systems in manufacturing enterprises is associated with certain challenges that negatively affect the efficiency of the digital transformation process.

The main challenges include:

- Shortage of qualified specialists in digital technologies;
- Limited financial resources;
- Underdeveloped technological infrastructure;
- Resistance to the adoption of new technologies;
- Insufficient managerial support.

To overcome these challenges, it is necessary to develop a digital transformation strategy within enterprises. In addition, improving employee qualifications and increasing investment in modern technologies are of crucial importance.

Prospects for the Development of Logistics Information Systems

In the future, the development of logistics information systems will play a key role in improving the efficiency of manufacturing enterprises. The widespread implementation of digital technologies, artificial intelligence, and automated management systems will ensure the sustainable development of enterprises.

4. Conclusion

In conclusion, the results of this study demonstrate that logistics information systems represent a critical determinant of operational efficiency in modern manufacturing enterprises. Their effective implementation not only optimizes production and logistics processes but also significantly enhances the quality, speed, and accuracy of managerial decision-making through improved integration of information flows across organizational units.

Furthermore, the findings confirm that logistics information systems contribute to a more efficient allocation of production resources by reducing operational redundancies, minimizing unnecessary expenditures, and shortening order fulfillment cycles. These improvements collectively lead to measurable gains in overall enterprise performance and economic efficiency.

From a strategic perspective, the study also highlights that in the context of ongoing digital transformation, logistics information systems play a key role in strengthening organizational adaptability and resilience. Enterprises with advanced digital logistics capabilities are better positioned to respond to dynamic market conditions, manage uncertainty, and sustain long-term competitive advantage.

Overall, it can be concluded that the integration of logistics information systems is not merely an operational improvement tool but a strategic necessity for ensuring sustainable development and competitiveness in contemporary manufacturing environments.

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