The Role of the Freight Exchange in Knowledge Management of A Logistics Company

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Abstract: The growing importance of digitization of economic processes forces logistics companies to use modern technologies. This is a trend visible throughout the economy which has a significant impact on the logistics industry. The amount of processed information is constantly increasing and managing it is becoming a growing challenge. Freight exchanges are an integral component of the functioning of transport companies dealing with transportation of goods. This primarily applies to road transport, which constitutes the largest share in European transport. The use and role of freight exchanges are constantly growing. These are tools that enable obtaining information about cargo and transport services which is used in planning transport processes of logistics companies. The activities of logistics companies involve constantly acquiring information about potential customers. Transport processes require careful preparation and detailed planning of all activities performed during the transport of cargo. The dynamics of the logistics market do not always allow the full use of cargo space in vehicles, which is associated with a decrease in transport efficiency and thus a reduction in companies' profits. Therefore, the knowledge about additional loads, due to which companies will be able to fill empty cargo spaces or entire empty runs, is necessary. This is of great importance for companies from the SME sector, which often must compete on the market with large entities. Transport exchanges are, by definition, a valuable source of information on the basis of which the internal knowledge base is created, which also requires appropriate management. The authors conducted the research among small and medium-sized transport companies both nationwide and with international reach in Poland. This research was aimed at identifying the features and demonstrating the role of freight exchanges as a source of knowledge for enterprises. The process of planning the transport process was analyzed for the variant with and without the use of the freight exchange. A decision-making algorithm was defined, the task of which is to structure and organize knowledge in the field of the transport process preparation. The importance of digital tools in knowledge management was also emphasized.

Keywords: Transport, Management, Electronic Freight Exchanges, Road Transport, Knowledge Management

1. Introduction

Road transport plays a key role in ensuring the smooth running of logistics processes and the movement of goods and people in the economy. Due to continuous improvements and adaptations to the increasingly demanding market needs, it constitutes a strategic service sector with high popularity. Its significance for enterprises in satisfying transport needs is irreplaceable, which makes it one of the most important branches of transport in the economy (Miller and Nie, 2018). Due to the availability and the most developed infrastructure, it enables direct deliveries. Moreover, it can be used in combination with other branches of transport, which allows for comprehensive and effective supply chain management. Therefore, diverse logistics needs can be satisfied, and better operational results can be achieved (Pyza, 2010). Versatility and flexibility in transport are crucial for the effectiveness of many enterprises. Due to the possibility of delivering goods directly to customers, the company may offer a fast and effective service, which translates into increased competitiveness on the market (Nowakowska-Grunt and Strzelczyk, 2019). The use of freight exchanges is becoming more and more popular among companies since they help effectively manage logistics processes in today's digital world. They enable companies to optimize their transport operations, improve performance and costs, and increase visibility and control over their shipments (Palczewska, Barwiński and Borowiecki, 2015).

2. Literature Overview

2.1 Electronic Freight Exchanges

Information technology-based solutions in the transport industry, such as freight exchanges, have existed for years, but there are still challenges to automate and optimize processes. Electronic platforms provide an opportunity to transmit information about loads and obtain orders, but the process of adaptation of loads to vehicles and transaction finalization still requires the intervention of managers or brokers. There is still potential for further development and improvement in these solutions to ensure more efficient and automated functioning (Miller, Nie and Liu, 2020). Electronic transport platforms allow transport companies to flexibly adapt to changes in demand and provide quick access to offers from all over Europe (Wu, Huang and Chen, 2024).

Cabotage is becoming more and more popular among Polish transport companies, which allows them to generate profits without having to incur costs related to road infrastructure in Poland (Kisielewski and Leśniakiewicz, 2016). It is therefore crucial to use effective and developed transport platforms to maximize benefits for the country's economy (Ajith *et al.*, 2023). Electronic transport platforms, despite their great development in the last decade, remain relatively unknown to many employees of companies in the TSL industry (Grabowska, 2018). However, freight exchanges are gaining popularity among people who want to develop their careers in this industry, which may contribute to increasing the awareness of the possibilities and operating procedures of these platforms (Jenkins, 2024). The implementation of modern information technologies in the transport industry is crucial for the operational efficiency and competitiveness of companies (Norman-López *et al.*, 2023). The possibility of fast and efficient transaction and exchange of transport services contributes to the optimization of logistics processes, cost reduction and an increase in competitiveness on the market. Therefore, enterprises can dynamically respond to changing market conditions and take advantage of new development opportunities (Leończuk, 2013). Freight exchanges are an important component for the effective functioning of the logistics industry, enabling companies to access a variety of carriers and loads and streamlining the exchange of information between transport market participants (Choudary, Van Alstyne and Parker, 2019). Thanks to them, companies can quickly find the best transport solutions, which contributes to the optimization of logistics processes and reduction in transport costs (Witkowski, 2019).

2.2 Knowledge Management in the Transport Company.

Knowledge has become a key component for the organization, enabling it to develop and gain a competitive advantage on the market. Due to proper knowledge management, organizations can quickly respond to changes, innovation, and new challenges, which translates into their success and leadership in the industry. This is especially important in the era of globalization and dynamic changes, where the ability to effectively use knowledge may be decisive for the survival and development of the organization (Asrar-ul-Haq and Anwar, 2016). Modern enterprises increasingly recognize logistics as a key component of creating the company’s value, primarily through flexibility, integration, comprehensiveness, and coordination of processes (Budzik and Cichoń, 2023). Knowledge management (KM) is a key component for organizations due to the possibility of using their knowledge resources to improve strategy, decisions, and effectiveness. Through effective knowledge management, organizations may achieve sustainable commercial benefits, as evidenced by numerous studies and authors in the field of knowledge management. This is important for improving knowledge practices, organizational behavior and achieving better performance (Ngah and Bontis, 2016).

The development of the Transport-Shipping-Logistics (TSL) sector covers a wide range of assets, including knowledge, skills, and organizational processes. The key role in gaining a competitive advantage is played by the appropriate and effective management and use of these resources, such as employee competences, infrastructure, training, knowledge, brand, technologies, and customer service skills. The market success of transport companies depends on a comprehensive approach to the management of available resources and accumulated knowledge, as well as on the improvement in operational processes (Kowalska, 2021).

The use of appropriate IT tools such as telematics systems, logistics project management and knowledge management software is crucial for the efficiency and competitiveness of the company. Thanks to them, it is possible to improve business processes, optimize activities and use resources better, which translates into the company's success and development on the market (Pisz and Łapuńka, 2014). The implementation of modern IT systems, especially integrated logistics systems, plays a key role in the long-term development of enterprises. These tools enable the optimization of both internal and external communication through effective data exchange between various departments of the organization and with contractors. The development of these technologies is a consequence of changes in the approach to economic processes and increased significance of information and knowledge, which allows enterprises to improve their strategies and business models (Misztal and Fajczak-Kowalska, 2020). The approach to practical origins of knowledge indicates that knowledge in organizations has its roots in practices and is closely related to them. Since this knowledge cannot stand alone, there is a need to transfer it through sharing practices. Where practices are shared, knowledge flows, and where they are not, knowledge sticks to the context. Such a model confirms the integral relationship between knowledge and practices in organizations (Chen, 2022). Nowadays, in order to operate effectively, companies from the TSL industry should include the aspect of knowledge management in their business model. A complex knowledge management system (KMS) includes the processes of acquiring, selecting, processing, codifying, transferring, and creating knowledge, as well as sharing it and updating the knowledge base. The concept of knowledge management as a key company resource is based on the resource approach, which treats knowledge

as an important component of the organization's success. This requires the cooperation of five key components, such as importing knowledge from the environment, implementing new tools and technologies, experimenting, joint problem solving and developing key skills of employees. This is a key component that should be considered in the development strategy of companies from the TSL industry (Janczewska, 2018).

3. Research Methodology

The methodology developed for the purposes of this study concerns activities the research objective of which is to determine the share and importance of electronic freight exchanges in enterprise knowledge management. The subsequent stages of the research work are presented in Figure 1.

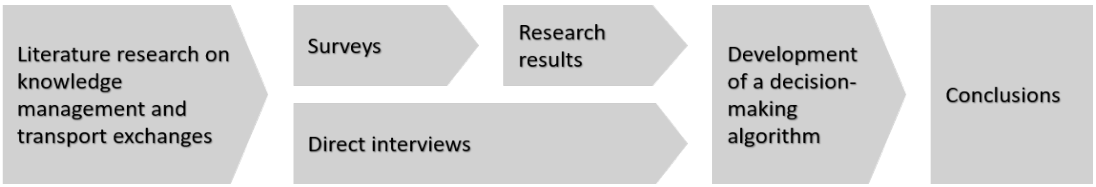

Figure 1: Research methodology diagram

Source: Own study

In order to determine the role of electronic freight exchanges in the activities of enterprises, the survey research method was applied (Nowak, 2024). The research addressed to logistics companies was conducted using a survey questionnaire. The survey form was constructed based on the knowledge of the selected topic and observations of individual practices in this area. The first part of the survey concerned determining the type of the enterprise participating in the study. The aspects considered included the duration of the company's operations on the market, the company's size in terms of employment and the scope of the company's operations. This allowed for specifying what types of enterprises use (or do not use) freight exchanges. The second part of the survey related to only freight exchanges. This part of the survey was completed only by the companies that support their activities using this tool. The issues raised in this part were to specify whether the freight exchange in the company is a relatively new tool and when they started to gain popularity among the respondents. The study was also to determine which freight exchange is the most popular, what purpose they are used for and how high, within the percentage range, companies rate their utility. When considering the results obtained using the survey, an attempt was made to determine the significance of freight exchanges and the following questions were answered:

- What types of companies are most likely to use freight exchanges and which ones prefer other methods of supporting transport?
- When did the freight exchange gain popularity among the respondents?
- Which freight exchange is the most popular among the surveyed enterprises?
- What role do freight exchanges play in individual enterprises?
- To what extent do they support transport processes?
- Is the freight exchange a basic or auxiliary tool?
- Will the activities of freight exchanges be expanded in the future?

Additionally, a decision-making algorithm was developed to structure the transport process. The objective of the actions taken was to isolate individual activities in the process of planning and organizing transport using the freight exchange to support the process. The algorithm was used to isolate the activities carried out, decision-making problems arising in the process and the expected consequences of the activities. The information resources of a medium-sized transport company providing domestic and international transport of goods in the form of full-truck loads and general cargo was used as the research subject.

The examined company is a family company carrying out transport orders in Poland and abroad. It obtains transport orders primarily through constant cooperation with regular customers and those acquired through participation in fairs and trade meetings. Based on the company's transport orders, the research was undertaken in the form of a direct interview, which was aimed at obtaining information for creating a decision-making algorithm for planning and organizing transport using the freight exchange. The following questions were answered:

- What activities does the process of planning and organizing transport consist of?

- What decisions are made during the process?
- What are the consequences of the decisions and actions taken?
- What is the course of the process of acquiring a customer in the execution of a standard order?
- At what stage does the company use the freight exchange in the transport process?
- What is the course of the process of acquiring a customer in the execution of an order using the freight exchange?
- What activities and decisions are made in the transport process using the freight exchange?
- What role does the freight exchange play?

The results of the first part of the research are presented in the form of charts illustrating the structure of the responses along with descriptions. The second part concerns the development of the decision-making algorithm in graphical terms and the characteristics of the role played by freight exchanges in the context of management of planning and organizing transport processes.

4. Research Results

4.1 The Survey

The survey consisted of ten questions, all of which were closed-ended questions. In the set of closed-ended questions, two of them were conjunctive questions in which the respondents could select several options. Completing the survey took approximately 3 minutes. The questionnaire was delivered to the respondents in 100% in an electronic form. The research was conducted for approximately 30 days, and as a result, 108 responses were received. The survey results and the distribution of responses are presented at Figure 2.

The analysis of the data for the first question indicates that most of the surveyed companies have been operating on the market for a relatively short time, from 1 to 5 years, constituting exactly half of the respondents. Only 26.9% of the enterprises have been operating on the market for over 10 years, and the group of companies with operation from 6 to 10 years amounts to 15.7%. The companies operating for less than a year constitute a small group, amounting to only 7.4%. The operations of companies in various scopes of time on the market are diverse and may affect their strategies and experience.

In terms of the analysis of the number of employees in the surveyed enterprises, the largest group was large enterprises hiring 250 or more employees (33.3%), followed by medium-sized logistics companies employing from 50 to 249 people (27.8%), small companies employing from 10 to 49 people (22.2%), and micro-enterprises hiring less than 10 employees (16.7%). Such distributions indicate the diversity of the employment structure in the surveyed companies.

The results of the survey indicate that most companies, since as much as 66.7%, operate internationally, while the remaining ones only domestically. It can be noticed that there is a significant difference between the companies operating locally and those with global presence, which may be related to various business strategies and the scope of activities of these companies.

The next question was to determine what percentage of the respondents use electronic freight exchanges. The confirmatory result was 77.8%, which leads to the conclusion that these tools are commonly used in logistics companies. This is the evidence that demonstrates their significant share in the logistics market and confirms that they are an important solution for the effective management of transportation of goods.

Another issue was to determine how long enterprises have been using electronic freight exchanges.
The dominant group turned out to be the companies that have been using freight exchanges for 1 to 5 years, accounting for 60.2% of all the respondents. 20.4% of the surveyed logistics companies have been using freight exchanges for less than 1 year. The companies that have been using freight exchanges for 6-10 years constitute a slightly smaller group, their percentage share is 13%. Only 6.5% of the respondents declared the use of freight exchanges for more than 10 years. This proves the increasing significance of freight exchanges in the logistics of enterprises and their growing popularity.

In terms of the question regarding the use of specific electronic freight exchanges, the respondents indicated that they most often use the Trans (60.2%) and TimoCom (46.3%) exchanges, which suggests their great popularity among users resulting from the reach and access to contractors. Less popular platforms are CargoGlob (20.4%) and Teleroute (13%). Only 6.5% of the respondents use the Wtransnet exchange and other

unnamed exchanges. When analyzing the answers to the above question, it can be noticed that the Trans and TimoCom exchanges are very popular.

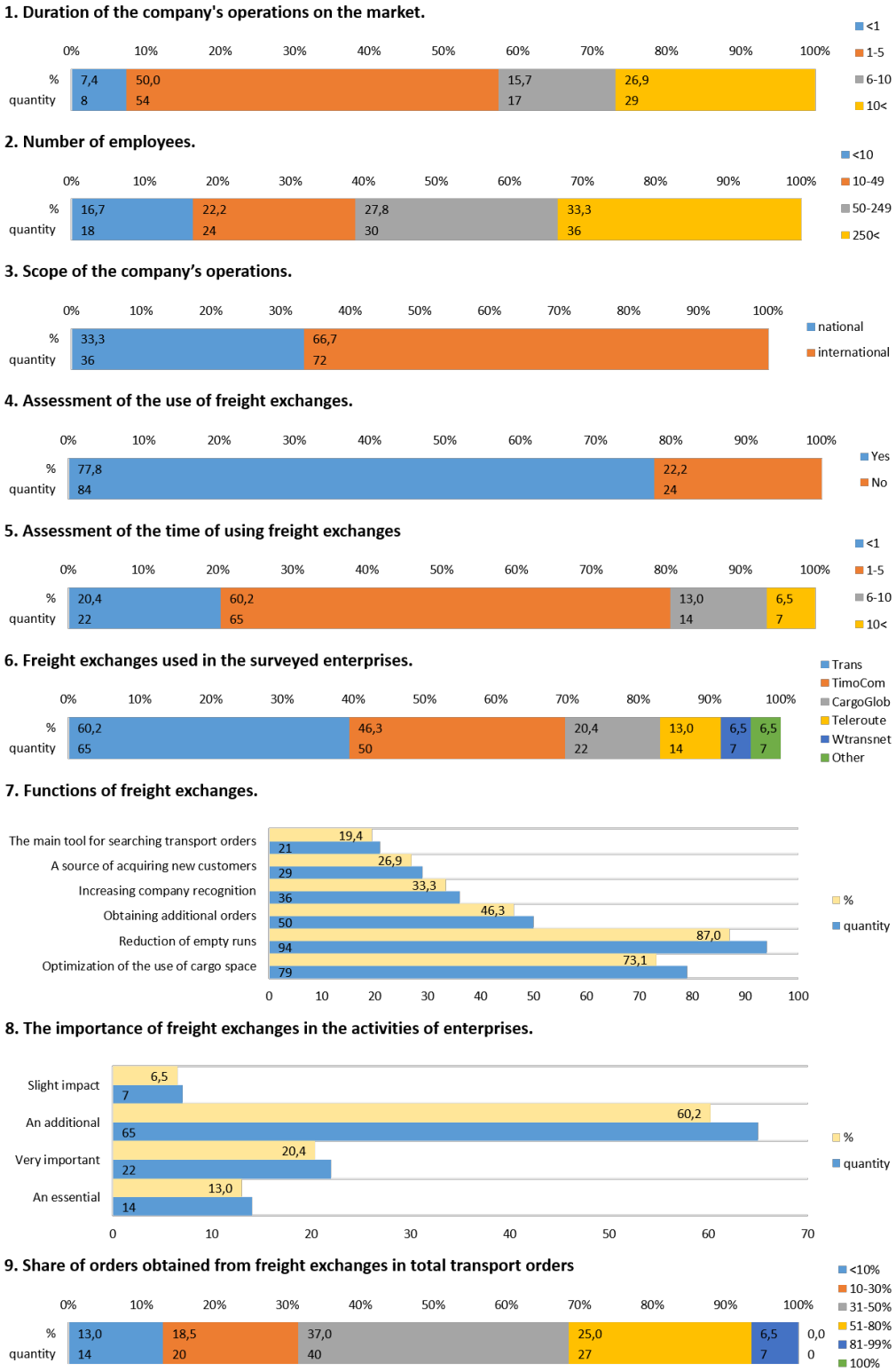

Figure 2: Distribution of responses from a survey conducted in transport companies

Source: Own study

Another important issue concerned the role of the freight exchange in the surveyed logistics companies. In this case, the respondents also had an opportunity to select several possible options. The vast majority of those

questioned (87%) described the role of the freight exchange as a way to reduce empty runs. For 73.1% of the respondents, freight exchanges are used to optimize the use of vehicle cargo space.

Additionally, about half of the respondents (46.3%) obtain additional orders during their runs thanks to freight exchanges. Increasing the company's recognition was declared by 33.3% of those questioned. 26.9% of the respondents describe the role of electronic freight exchanges as a source of acquiring new customers. The smallest group is the companies for which the freight exchange is the main tool for searching for orders - 19.4%.

Another issue was to determine the percentage share of orders obtained from freight exchanges in the total transport performed. Most respondents (37%) declared a percentage share in the range of 31-50% of orders. A quarter of the respondents indicated the range of 51-80%. For 18.5% of those questioned, the percentage of orders obtained from freight exchanges is 10-30%. On the other hand, 13% of the surveyed enterprises marked the range below 10%. Only 6.5% of the companies stated that the percentage of orders was 81-99%, while none of the respondents answered that they obtained 100% of orders from freight exchanges. The use of freight exchanges in searching for orders can be described as effective.

The last question was to determine whether the surveyed companies plan to expand their activities by using freight exchanges in the future. Among the respondents, no one declared this type of activities in the future, which is puzzling due to the increasing digitization of economies.

4.2 Decision-Making Algorithm and Knowledge Management System

The presented decision-making algorithm (Fig.3) illustrates the process of planning and organizing transport in the company specializing in road transport. It also shows the position of the company's knowledge management system in terms of the resources needed to implement the process.

The first stage of the process is to acquire customers. The following methods of acquiring customers in the surveyed company were considered: permanent cooperation; the customer present in the company's database, but not cooperating with the company on a permanent basis; customers acquired by participating in fairs and sales meetings. These are the three main ways of acquiring customers by the surveyed company. In the case of regular customers, the activities aimed at determining their credibility and possibilities of providing transport are omitted during the planning process, since they were inspected when establishing the cooperation. The following activities are not omitted in the case of customers acquired through sales meetings and customers appearing in the company's database. The surveyed company controls the credibility of contractors present in the databases using interviews and previous experience related to the fulfillment of transport orders. The company inspects the following aspects:

- did the customer pay for transportation?
- were they behind on payment?
- did the cooperation go smoothly?

If the answers to the above questions are positive, the company determines the potential contractor as suitable for cooperation. The credibility of customers acquired through sales meetings is determined by examining whether the company actually exists, through searching for customer opinions and conducting an initial interview. Based on the type and weight of the load, the loading location and the target unloading location, it is assessed whether the transport order can be completed for the company. If the customer is assessed as unreliable and/or it is impossible to fulfill the transport order, the offer is rejected. If the potential customer meets the above conditions, the details of the offer are discussed in more detail during the interview. It specifies potential means of transport, the exact route by the carrier, the method of securing goods and the formalities related to the contract and transport documentation. The initial quote for the order, methods and payment date are also determined. If the customer agrees to the transport conditions specified in the contract, the order is accepted and then generated in the system. In the absence of full agreement, the parties will attempt to negotiate a valuation. If, during negotiations the parties fail to find a solution, cooperation is not undertaken. The next stage is the analysis of the exact route by the examined company. It is determined whether the route will require supplementation. If there are no empty runs, the transport documentation is completed. If it is necessary to supplement the route, the company looks for customers using the Trans.eu freight exchange.

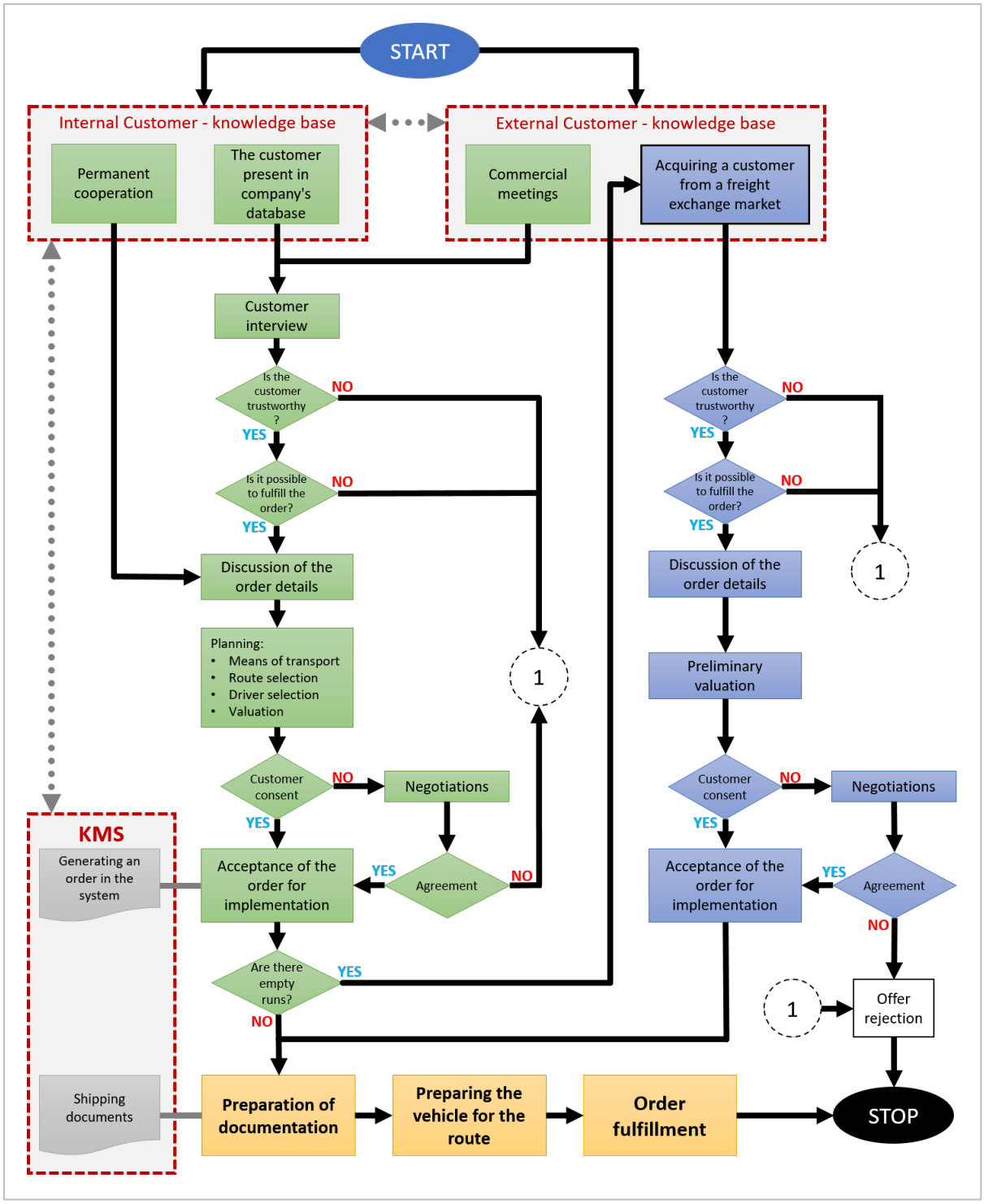

Figure 3:Algorithm for planning and organizing transport and KMS approach.

Source: Own study

The company searches for available goods and publishes its own advertisements. The credibility of the customer acquired by the company through the freight exchange is assessed based on the opinions provided by the freight exchange users who have cooperated with the potential contractor. Through the Trans.eu chat, the parties determine the type and quantity of goods and the date of transport. After obtaining the necessary information, the company determines whether the transport order is feasible. If it is not possible to fulfill the order, the company rejects the offer. If transport is undertaken, its details are discussed, and the rate is proposed. Like in other cases, the order is accepted if the customer agrees to the price, if not - the companies negotiate with each

other. If the negotiations are successful and the companies reach an agreement, transport documentation is prepared. The final stage of the planning and organization process is preparing the vehicle to set off on the road. This activity takes place in a workshop belonging to the company. At this stage, the transport process begins. The role of the freight exchange in the surveyed enterprise is primarily to reduce empty runs. With its help, the company minimizes the costs of providing services and obtains additional earnings resulting from obtaining a new order. The freight exchange improves the transport of goods, both domestically and abroad, and completes the transport process of the surveyed enterprise.

5. Conclusions

The development of the transport industry may not only increase the level of employment and stimulate economic growth, but also correct the economic and industrial structure and contribute to the constant acceleration of the process of integration of the city with the regions. Knowledge management in transport companies is a key component on the way to increasing competitiveness. The research indicated that the use of freight exchanges is a very important part of the company's knowledge management system. The key aspect is the proper placement of electronic exchange systems in the overall knowledge management system to make its use as effective as possible. The study showed that the freight exchange is a tool that plays an important role in planning and organizing transport. They are used to a greater extent by experienced and large enterprises, but they also play an important role in smaller entities. The study indicated that a small group treats them as basic tools. Electronic freight exchanges are primarily an additional tool supporting management and organizational processes. They act as an auxiliary tool that allows companies to minimize their costs by reducing empty runs and optimal use of vehicle cargo space. It also allows for increasing the availability of new orders during transport, which increases their profitability. It is less often used for marketing purposes. Enterprises rely more on direct contracts, which is why freight exchanges will be used on a smaller scale, but their importance in streamlining the company's operations is visible.

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