
Logistics Systems of Warehousing and Materials Handling

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Abstract:

The article covers prospects for the development of innovations in the systems of product distribution, warehousing and materials handling.

The warehouse logistics market in the South of Russia is characterized by effective solutions and innovative imperatives of distribution systems.

The study proposes a new type of development at regional level.

Keywords: *Logistics systems, warehousing, regional development.*

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1. Introduction

The volume of the logistics services market on a global scale increases every year in a progression, conditions and determinants of distribution activity are adjusted, innovative technologies are introduced and new players appear. But international trade leads to the improvement of the service component, which causes some companies to leave the market irretrievably. The development of information technology has predetermined and defined the growth of electronic commerce and the increase in traditional transactions. The expansion of technical and technological support provides better opportunities for both customers and sellers, but at the same time, the parties are faced with the need to select consistently reliable logistics companies – partners and guarantors of stable long-term functioning. Russian reality, unfortunately, is such that not all potential customers represent the capabilities and efficiency of the full range of logistics services to increase the profitability of their own business. Customers in their turn having such an idea are not satisfied with the quality of logistics services, their basic indicators of value, safety of goods and comprehensive service (Bondarenko *et al.*, 2017).

In the context of stopping global external threats, the Russian economy, which in recent years has received substantial incentives for a balanced development of the architecture of production and sales processes, seeks to form even more effective solutions and innovative imperatives of rapid growth. Each region of Russia, using its geopolitical potential and existing specialization, gets an opportunity to initiate competitive industries and spheres of economic activity, expanding existing opportunities and performance categories (Frank *et al.*, 2016; Marwa *et al.*, 2017).

The volumes of agro-industrial and agricultural production are growing, the turnover of industrial enterprises is increasing in the south of the country, numerous research projects are becoming more active. But in the current socio-economic situation the primary opportunity, namely the development of logistics transit of multidisciplinary material and associated flows from Asia to Europe, is not used.

The transit potential of the Russian Federation is not used to its full extent, and the limited capacity of regional markets affects the possibilities for its activation, transport deficiencies and logistics efficiency in the distribution system as a whole. Globally, this issue affects the development of intermodal and multimodal logistics operations, is updated in the format of organization of management cycles and is transformed into restrictions. The infrastructure, including transport and distribution parameters, the construction of warehouse complexes, is in the need of development. But the primary task is to develop logistics services. The region and the state as a whole are capable of receiving enormous benefits from logistic transit operations, providing service support for streaming processes at the global level.

The geographical length of Russia and many other economic factors predetermine the construction of a product distribution system based on the principles of regional

outsourcing to develop transit functionality as a way to deliver finished products directly to regional distribution centers as an alternative to a centralized distribution system.

Analyzing the existing system of warehousing and cargo handling suggests that to effectively develop infrastructure in the federal districts of Russia, modern warehouse facilities equipped with storage infrastructure and information and software are needed, as well as the process of cargo storage and handling, which ensures effective interaction between all subsystems of the logistics chain of distribution and product distribution.

2. Theoretical, informational, empirical and methodological grounds

Enterprises, which form a logistic system at any level of an organization in their interaction, have the highest potential of functioning in the framework of given economic and mathematical parameters. Their activity acts as the most coordinated, ensuring the emergence of the minimum number of risk-forming factors. The logistic distribution system created as a result of cooperation and interaction is a kind of guarantee of successful operation in the format of import replacement and reinforcement of production and distribution systems of the domestic market. These are such complexes that can provide financial opportunities to achieve the level of logistics services in the 4PL format, as well as the systematic transition of the best of them to the service of 5PL level.

At the present stage of development of economic systems, logistics acts as a universal tool and catalyst for the organization of commercial activity. This tool most fully meets the demands of the modern market, closely integrating all areas of the enterprise's activity in any branch of business to achieve the ultimate goal of restructuring regional logistics distribution centers in the distribution system both by geographical location and the range and quality level of service. The currently formed infrastructure elements of the product distribution system must meet international requirements in this area, be accompanied by compliance with economic, organizational, environmental and legal requirements. It implies the integration of process and information and analytical support, the definition and specification of ways to minimize risks and optimize costs in organizing and implementing the warehouse process in the regional distribution complexes in the framework of the intellectualization system of organizational management and information logistics system of interaction between state, business and society.

It is now that the rapidly changing market of logistics services has the greatest opportunities to be activated in accordance with customer requests, forming new subsegments. Only those companies that can use innovative IT content to achieve growth in turnover in warehousing, cargo handling, and possible transportation to final consumption points can become logistics providers. The Southern Federal District (SFD) with its considerable potential predetermined by its territorial location

is a link between Europe and Asia, a kind of “expeditionary and distribution” or “transport” centre (Albekov *et al.*, 2017).

The use of the principles of green logistics, which is gaining momentum in recent years, is based on the concept of minimizing the burden on the environment and preserving the planet for future generations. According to the usual definition, all measures to minimize the impact on the environment are expensive, and if they are implemented, it is not because of the material benefits of minimizing production costs, but in the name of social responsibility to future generations and reducing the negative impact of technological factors on the living generation, but practice shows the opposite.

Considering the federal level of organization of the warehouse system, it is necessary to note the presence of strategically important aspects in the maintenance of commodity flows. It is at this level from the point of view of logistics integration methodology that common standards are considered and the structures of common transport subsystems of the country’s regions are introduced. These structures are responsible for the stable and reliable supply of consumers within the vast territory of the Russian Federation. At the regional level, the importance of an efficient system of warehousing and cargo handling is most visible, which indicates the need to provide the population of a certain territory with goods, including basic necessities. At the local level, warehouse operations affect the overall performance indicators of local, localized markets for goods of services.

Indeed, the study of logistics costs in supply chains takes into account several reasons, according to which local and regional markets are most in demand in terms of development intensification. But at the same time global solutions and the most efficient mechanisms are easily transformed to the federal level.

3. Results

According to the opinion of leading Russian and foreign experts, the efficiency of the warehousing and handling systems in modern economic realities directly depends on the activation of the innovation component, the qualitative change in the warehousing processes in the technical and technological aspect.

Innovations in each direction of industry specialization are determined by the resources of investment activity in the region, the level of financial security and fundamental planning and government support playing the key role. The energy intensity of warehousing and cargo handling processes directly affects their efficiency, forming trends for increasing efficiency indicators, implementing the innovation component and developing warehousing logistics in the long term, ensuring a steady increase in the territory’s transit potential based on logistic management of transaction flows.

As part of the analysis of the level and potential of innovative development of warehousing and cargo handling systems in the SFD, it should be noted that the relative concentration of existing storage facilities and logistics providers participating in the process of product distribution in southern Russia and in the SFD is mainly concentrated in 3 federal entities: Krasnodar Krai, Volgograd and Rostov regions. Analysis of the presented data shows that a significant part of the existing logistics providers operates with a standard package of logistics services, which includes responsible storage and transportation. This volume of services does not always correspond to the international classification and is characterized by high quality. Some companies are gradually expanding the range of services and naturally meet a higher level of service at the expense of additional services for partial in-depth processing.

At the same time, the positioning of a number of companies in the 3-4 PL format has mostly an advertising nature and is not confirmed either by the full range of services provided or by independent certification. A small number of operators on the market actually corresponds to the level of 3PL (both in terms of the spectrum and the quality of the services provided).

The warehouse logistics market in the South of Russia is represented by large enterprises operating in the sphere of internal production processes, agricultural production, and services for the supply of spare parts. Logistics operators do not provide services to third parties and do not participate in the chain of regional distribution of goods.

The study of factual information allows concluding that the studied region in the sphere of the existing potential of organizing goods distribution has the leading positions due to distribution centers. The concept of restructuring regional distribution centers in the distribution system in the SFD that is considered in this study can be introduced by example of Rostov region.

It is natural and sound to consider infrastructure contrasts in regional development as the main element hindering the processes of innovative development of warehousing and cargo processing systems, for example, as part of the development of the transit potential of the SFD. This primarily refers to infrastructural constraints. In our opinion, limiting the demand for innovations and shortcomings in the system of organizational and legal support of the investment development process can become an institutional barrier.

The formation of a program of comprehensive actions aimed at the development of the economic potential of the SFD as the central link of the warehouse logistics of a region with transit potential is an objective condition for effective development. At the same time, at this stage of development, the logistic and organizational and economic mechanisms of the SFD warehousing and cargo handling systems are not fully used.

Logistics and logistics management imply an increase in integration trends in the regional economy, require the search for operational and functional market mechanisms that ensure the effective functioning of the distribution complex of our country. Part of the complex can be realized by enhancing the transit potential of southern Russia.

4. Conclusions and recommendations

It should be borne in mind that the general trends in the development of the market go against the build-up of significant storage space. Unfortunately, it should be noted that the theoretical and methodological platform of many logistics solutions in relation to warehousing and cargo handling has not yet been fully adapted to Russian realities. We are talking now about the trend that serves as the basis for motivating the turnover of flows in warehousing, contrary to the requirements for increasing the area. In fact, it is one of the new trends in warehousing logistics, relatively new, since these technologies are being fully implemented in European countries today. But in this respect, it should be noted that not all solutions in logistics storage and handling systems can be adequately oriented to their use in any country in the world. In our opinion, the modern warehouse should focus on the following conditions, a competent combination of which will allow minimizing costs and increasing profits in the long-term perspective:

- focusing on meeting the needs of consumers, adjustment of the product profile;
- correlation of the ratio of supply and demand in a specific market space;
- increasing market coverage within the organization of the distribution system;
- developing logistics service and flexibility when working with clients.

The organization of effective supply chains, the provision of high-quality logistics services is a prerequisite for the introduction and development of international business standards in the Russian Federation. This process is hampered by the underdevelopment of the logistics distribution network, the extremely insufficient number of companies offering logistics services in the 3-4 PL format, as well as a number of other reasons. In our opinion, this stage of development of logistics at the federal and regional level can be stimulated by synergistic measures.

Southern Russia has significant potential for the development of the agro-industrial complex. Every year, the SFD is increasing its yield, but at the same time, the problem of logistical support for product distribution processes is growing. That is why the development of distribution logistics in the agriculture of the region is vital and very effective in solving the problem.

At the regional level, discussing the development of the agro-industrial complex and agriculture, the significance of warehouses is great due to the development and creation of new territorial and industrial complexes, in which it is advisable to create large joint storage bases for types of industrial and technical products (for supplying production

capacities of enterprises) and types of consumer goods (to supply the population). At the local level of warehouse infrastructure, the placement and operation of warehouses significantly affects the freight traffic and transport of industrial areas and hubs, and the overall efficiency of industrial enterprises and transport.

The development of a logistics model for the effective reorganization of the storage capacity of the agro-industrial complex of the study area serves as an actual market tool for modernizing the economy of the region and the country as a whole, given that modern logistics is a combination and close relationship of material and information flows. There is one of the most significant problems in the agro-industrial complex of the region at this stage – the yield is high, but the distribution system is extremely inefficient. The fact is that the losses of the already grown crop are high, which appear due to inefficient logistics. That is why, it is advisable to develop efficient logistics in agriculture in the framework of import substitution and development of the transit potential of the region.

The use of innovative process technologies helps enterprises (both product owners and logistics service providers) to remain profitable even during periods of economic instability, develop successfully, ensure high social protection of workers, pay taxes to budgets of different levels, thereby contributing to the formation of the regional economy and filling budgets.

The logistic restructuring of the agro-industrial complex warehouse in the region and the innovativeness of such a complex of services lies in the fact that the logistics operator fully assumes the functions of managing and, if necessary, optimizing the process of product movement, which allows manufacturing companies and suppliers of products to stabilize their business processes, form the flow of goods from producer to consumer which would be not only unimpeded, but mutually beneficial, as well as concentrating its forces on development and attaching strengths and competitive advantages of the region.

Even a separate enterprise that has introduced innovative technologies becomes their distributor, and as a result, the economy of the region that encourages innovative enterprises receives a multiplicative effect of modernization and development in the form of:

- dissemination of logistic innovation and modernization experience;
- demonstration of the economic effect of innovation by example of specific enterprises;
- generalizing and formulating issues to the legislative and executive authorities, their solution, on the one hand, contributing to the removal of barriers to the development of innovations, on the other hand, economically encouraging and motivating enterprises to innovate.

The strategic goal is to bring Russia to a fundamentally new level of development and prove that the result of innovation will be an increase in the standard of living and well-being of each employee of the company and their families, society as a whole and, as a result, the sustainable socio-economic development of the country as a whole.

The problem is that modern logistics operators involved in services cannot avoid certain types of costs, so they often show bad faith, increasing the results in terms of pricing. At the moment, only companies that successfully keep up with the time can foresee the appearance of criteria for system failure. If companies offering business process outsourcing services temporary do not have one or more of the most important resources (financial, material, market coverage), it jeopardizes the reputation of manufacturers who are forced to abandon outsourcing in favor of developing their own capacities, but not all companies can afford it.

The results of research and surveys in different regions of the Russian Federation were certain customer complaints regarding: the opacity of the pricing system, respectively, the growth of the previously agreed selling price, the lack of territorial coverage and the need for investment in logistics development. Many logistics service providers do not have enough resources to adapt to the current situation, and they significantly increase the cost of services, showing “non-transparency in pricing”, trying to disguise it. But at the same time, consumers undoubtedly view that they need to avoid unnecessary costs. From the point of view of applied and effective modern logistical tools in its research format, all this goes against the requirements of the end link.

Participants of the study from different regions of Russia could not call business process outsourcing fully effective. After that, from a logistical point of view, which implies a general optimization of streaming processes, these companies do not look confident at all, but it does not imply all the logos on the whole.

At the same time, it should be noted that the conducted research revealed that the companies that failed to cope with their outsourcing function are much more than the efficient companies. From 70 to 90% of consumers of this type of logistics services considered them ineffective. As mentioned above, there are a lot of problems in this area, but this contradicts the very essence of outsourcing, because the logistics service, on the contrary, implies an increase in the effectiveness of business processes.

Another problem, in our opinion, is the significant lag in technological innovation processes and management decisions in Russian logistics. Warehouse real estate objects need investments, which are rather difficult to find, but the market provides new conditions and opportunities for those who are building objects from scratch today. The fact is that the existing warehouse assets inherited from the former USSR can serve for many more years without ensuring proper efficiency, since they are

outdated morally and physically, materially substantially. Therefore, in this context, it is necessary to take into account one more task – to abandon old technologies and switch to more advanced ones, or to substantially correct the existing ones.

We believe that it is now a rapidly changing market of logistics services that has the greatest opportunities to be activated in accordance with customer requests, forming new subsegments. At the same time, the opportunity of being logistic providers is only given to those companies that will be able to use innovative IT-content, achieve growth in turnover in the processes of warehousing, cargo handling, and possible transportation to final consumption points.

Being able to use personal infrastructure (if the company owns a warehouse), it is possible to increase the speed of processing orders, stocking by introducing innovative e-commerce technologies, minimizing and optimizing costs and implementing the most efficient logistics technologies, improving processes and optimizing efficiency criteria. As a result, it is necessary to revise, make pricing more transparent in the warehouse logistics services market. In accordance with these requirements, the client can be included directly in the process of forming the final cost of services. It is these enterprises that will be able to efficiently serve transit flows.

It should be noted that these measures are not unclaimed or unreasonable as one of the major drawbacks is the uncontrolled increase in the price of logistics services. In certain regions, including in the SFD, the respondents noted that logistics operators increase the cost of services without constant customer participation in the process of practical service implementation. At the same time, outsourcing implies the lack of client employment in the process of selling products. Many processes in the logistics of Russian regions acquired a twofold essence in the context of a crisis, but still it should be noted that the logistics service, its types, level and performance directly affect the final results of the logistics services business.

Theoretical and methodological support of modern logistic knowledge presupposes guaranteed success to those market players who meet the requirements of the end link, whether they are consumers or contractors. Therefore, in modern conditions, new players can get a significant chance of success. We cannot confidently assert that all expectations can be fulfilled in the framework of compliance:

- categories of financial independence,
- availability of wide market coverage,
- transparency of organizational and functional processes.

The above conditions are not always correctly combined in the framework of Russian reality. Planning, organizing and controlling logistics activities in the management of material flows, as well as related information, financial and other flows, is an effective solution in terms of optimizing the value build-up in the supply

chain. At the same time, far from all regional logistics providers can operate on fundamentally new technologies and standards. This level is more correlated with the federal level, although systemically important players (there may be some of them) will be able to express themselves without limiting their activities to regional coverage.

It should be noted that the SFD is one of the cities that need high-quality warehouse space. At the same time, it is necessary to consider the concept of a logistics broker, a specialist who is able to adequately respond to the demands of consumers in the district in high-quality warehousing facilities.

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