

SUPPLY CHAIN MANAGEMENT SYSTEM – A KEY TOOL FOR THE DEVELOPMENT OF THE PHARMACEUTICAL INDUSTRY IN UKRAINE

Pavlo Osos¹

Abstract. The subject of this article is the supply chain management system of pharmaceutical industry enterprises in Ukraine. *Methodology.* In the course of the study, the systematic and logical approaches are mainly used. At the same time, during the study the following scientific methods were used: 1) analogy – an effective supply chain management system (hereinafter – SCM system) is defined as important for enterprises of any sector of the national economy of Ukraine; 2) induction – significant attention is paid to the individual components and parameters of the supply chain of the pharmaceutical industry in Ukraine; 3) generalization – it was found that, despite the diversity of views on the definition of SCM system, the basic idea of such a definition is identical; 4) others. *The purpose* of this article is to study the current state of SCM-system of pharmaceutical industry in Ukraine, as a key tool for its development. *The results* of the study show that the spread of coronavirus disease COVID-19 (hereinafter COVID-19) caused changes in the transport components of the SCM system in the enterprises of the pharmaceutical industry in Ukraine. *Conclusion.* The Ukrainian pharmaceutical industry is the most developed among the post-Soviet countries and has a leading position in the production of generic drugs. Thanks to the distribution of COVID-19, the industry today is the guarantor of the protection of life and health of citizens, and pharmaceutical companies receive significant profits. Given today's realities, such companies continue to transform internal business processes related to the SCM system, which must first and foremost be as flexible, fast and sustainable as possible. At the same time, changes associated with the possibility of "online" sales of medicines can have a positive impact on the effectiveness of SCM system parameters in the pharmaceutical industry in Ukraine, which in the long term will lead to an increase in its profitability. However, such sales cannot fully guarantee high quality and safety of pharmaceutical products. Strict domestic legislation related to pharmaceutical industry regulation contributes to unpredictable situations related to the SCM system. Proper identification of key priorities and anticipation of possible obstacles in advance will greatly reduce their occurrence.

Key words: supply chain management system, pharmaceutical industry, business processes, parameters, COVID-19.

JEL Classification: L29, L80, L81

1. Introduction

Any enterprise operating in the system of national economy of Ukraine, seeks to strengthen its position in the domestic and foreign markets, taking into account the rules of a market-oriented economy. Market competition forces companies to work on improving product quality and safety, in particular, to improve their own internal business processes. An essential competitive advantage for most companies is to have a commercial strategy that includes SCM system approaches. Rational use of production capacities promotes the possibility to avoid production of excess production, which always causes additional financial

costs for enterprises. Without SCM system, most enterprises were forced to plan their own production with significant buffer intervals due to the lack of synchronized supply processes between the supplier and the potential buyer and/or consumer. The emergence of modern software for SCM system has significantly increased efficiency in the coordination of business processes, from production to delivery to the end consumer (Smerichevska et al., 2012). SCM systems mainly include the following business processes: purchasing, transportation, inventory planning, forecasting of future sales and other operations. Considering the above, SCM system is a complex

Corresponding author:

¹ National Academy of Management, Ukraine

E-mail: osospavlo@gmail.com

ORCID: <https://orcid.org/0000-0001-7036-3737>



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operation of interdependent business processes, which provide enterprises with maximum proficiency. However, the SCM system may differ depending on the type of products, the type of enterprise and the industry affiliation of such enterprises. The spread of COVID-19 and the resulting use of quarantine restrictions has forced most enterprises to transform their internal business processes related to the SCM system. The application of quarantine restrictions had a negative impact on the national economy of Ukraine in 2020: real gross domestic product declined (-4%); exports of goods and services declined (-5.6%); imports declined (-9.6%) (NBU, 2021). However, despite the negative trend, the pharmaceutical industry was one of the first to adapt to the new negative realities due to the highest share of innovative production compared to other industries. A considerable part of enterprises of pharmaceutical industry (48%) invested 1.5 billion UAH into new equipment, repeated research innovations, etc. (Darnytsia, 2021) At the same time, legislative changes allowing "online" sales of drugs have caused significant changes in supply chain management, particularly in the transportation process, as part of the pharmaceutical industry's SCM system. The importance of an effective supply chain management system in the national economy of Ukraine, in particular in the pharmaceutical industry, has been investigated by the following scientists: Smerichevska S. V., Zhabolenko M. V., Ibrahimkhalilova T. V., Kolodizieva T. O., Dorokhova L. P., Dorokhov O. V. et al. The scientists mentioned above have explored the problems associated with the importance of the SCM system in the context of economic globalization, the role of supply chains in improving the efficiency of the logistics activities of the enterprise in particular, the development of SCM system strategy for pharmaceuticals, etc. Despite minor differences in the areas of research, the above-mentioned scientists agree on the need for effective functioning of the SCM system and its strategic importance in the management of enterprises of the national economy of Ukraine. Despite minor differences in the areas of research, the above-mentioned scientists agree on the need for effective functioning of the SCM system and its strategic importance in the management of enterprises of the national economy of Ukraine. Despite minor differences in areas of research, the above scholars agree on the need for effective functioning of the SCM system and its strategic importance in enterprise management of the national economy of Ukraine.

2. Features of SCM-system in the pharmaceutical industry of Ukraine

The Ukrainian pharmaceutical industry is the most developed among the post-Soviet countries and has

a leading position in the production of generic drugs. Due to the spread of COVID-19, the demand for antibiotics, antivirals and antipyretics, etc. has increased during 2020–2021. At the same time, there was a need for pharmaceutical products designed to prevent the emergence and spread of COVID-19, in particular as defined by the Decree of the Cabinet of Ministers of Ukraine (hereinafter CMU) № 224 of March 20, 2020. According to the CMU Decree, such products must be supplied to the territory of Ukraine without hindrance and delay. Thus, due to the spread of COVID-19, the effective functioning of the pharmaceutical industry of Ukraine is a guarantee of saving the lives and health of citizens. The efficiency of this industry depends on the internal business processes of pharmaceutical companies: planning, forecasting, transportation, etc. The above business processes are part of the SCM system and operate at the micro and macro levels. Domestic pharmaceutical companies were ready to instantly transform internal business processes in accordance with modern developments (Economic truth, 2020).

According to R. Handwild, the SCM system covers the relevant organizations involved in relocation and conversion of products, from the stage of raw materials purchase and to delivery thereof to the end user, taking into account also information traffics. K. Rutkowski sees the SCM system as a physical network that connects the original supplier to the end user (client). According to the standard ISO 28000-2005, SCM system is considered as an interconnected set of resources and processes from the production of raw materials to the delivery of products or services to the consumer through transport systems (Kolodizieva, 2015). Although the above definitions differ somewhat, the general idea is the process of moving a product from its place of production to the final consumer, taking into account product characteristics and a particular supply strategy of individual industrial enterprises.

Although the above definitions differ slightly, the general idea is to move the product from its production process to the end consumer, taking into account the characteristics of the product and a certain supply strategy by individual companies in the industry.

Given the realities of modern life, with the proliferation of COVID-19, the SCM system must be as flexible, fast and resilient to failure as possible. At the same time, the strategy for the SCM system must ensure the need to reduce costs, given the current global instability (Deloitte, 2021). As of the end of April 2020, the production of pharmaceutical products increased by 22%, in particular, the number of manufacturing companies increased by 600%. This result was certainly influenced by the CMU's positive decision to allow the "online" sale of drugs and medical supplies, subject to appropriate transportation

conditions. "Online" sales services in Ukraine have shown significant demand. During the period from April 10 to May 10, 2020 (the first month of the service), the Ukrainian company Nova Poshta, which provides express delivery services, made 32,000 orders for shipments of medicines: 24% (villages and settlements); 36% (for urban residents); 40% (Kyiv and regional centers). At the same time, the domestic state enterprise "Ukrainian Railways" JSC, which provides the transportation services (grain, ore, and metal), reported about a decrease of traffic volumes by about 9% in the first half of 2020 (CAR, et al., 2020).

Thus, enterprises providing express delivery services create indirect competition for traditional transportation companies. For example, an increase in the volume of online sales of pharmaceutical products from the manufacturer to the end consumer will affect the reduction in the supply of such drugs to wholesalers and retailers (pharmacies) through traditional transport operators (logistics). In the future, logistics as part of the SCM system in the pharmaceutical industry will be defined in terms of transportation services by traditional transportation companies and companies providing express delivery services.

3. Parameters of SCM system efficiency in the enterprises of pharmaceutical industry in Ukraine

The effectiveness of the SCM system directly affects the cost of pharmaceutical products. The variable manifestations of the growth of COVID-19 infections force governments to tighten or lower quarantine restrictions depending on the epidemiological situation. Such "merry-go-rounds" jeopardize the functioning of the pharmaceutical industry.

The chaotic situation in the SCM system of the pharmaceutical industry and not only directly affects production processes, international trade and domestic distribution. Today there are many indicators that reflect the effectiveness of SCM system in the industry. A large part of them is aimed at the study of customer satisfaction, because it has a direct impact on the demand for products. Thus, pharmaceutical companies, based on the assessment of the level of satisfaction of their customers and their needs, form a unique strategy of SCM system and determine its possible risks. Parameters of SCM system are the main indicators to assess their effectiveness.

The overall effectiveness of the entire SCM system can be judged only after a detailed evaluation of each parameter of such a system. Only high values of all the above parameters can guarantee the productivity of the entire SCM system. For example, high speed parameters alone will not have a positive effect on the overall supply chain in the case of excessive raw material and/or final product inventories, indicating a low flexibility parameter. At the same time, the SCM system cannot be considered effective only due to high parameters of flexibility, speed and reliability, in particular, without taking into account the low level of cost optimization. Thus, the basis for determining the state of performance of SCM system at the enterprises of national economy of Ukraine, in particular, the pharmaceutical industry, is the planning process. The efficiency of supply chain management parameters depends on their deviation from the planned parameters. In the case of consistently low performance of one or more parameters, it is necessary to examine in detail the factors that may influence the negative result. For example, there may be cases where an unreasonably high target rate parameter can lead to an overestimation of supply chain costs (cost parameter). At the same time, incorrect forecasting of product demand can

Table 1
Parameters for assessing the effectiveness of the SCM system

| Parameter Name | Parameter definition |
|----------------|---|
| Flexibility | The company's ability to adjust its supply chain in a timely manner in response to changes in customer needs. A positive indicator of flexibility is the absence of excessive stocks of raw active pharmaceutical ingredients at manufacturing plants, in particular stocks of finished products in warehouses of wholesale companies, as well as the stable availability of pharmaceutical products in retail chains. |
| Rate | And the period of time from the purchase of raw materials to the receipt of the final product by the consumer. The speed of the supply chain is often called its length and is measured in days. Enterprises constantly take into account possible risks on the timing of delivery associated with various delays at customs, force majeure, in particular, when they occur, with the implementation of alternative measures. |
| Reliability | And the guarantee of meeting established delivery deadlines. Receipt of active pharmaceutical ingredient raw material producers and wholesalers and retailers of finished products in a clearly defined time frame is a positive criterion for reliability in the pharmaceutical industry. A reliable supply chain prevents companies from incurring additional financial losses. |
| Costs | The total cost of supply chain operation, which covers the significant business processes of the company (purchasing, transportation, inventory write-offs, warehouse management, etc.). The efficiency of this parameter is measured by the company's ability to optimize costs at each stage of the supply chain. |

Source: added by the author according to (Kolodizieva, 2016)

lead to an excess or shortage of raw materials and/or final products in warehouses (flexibility parameter). Lack of raw materials and/or final products in stock may result in non-compliance with delivery conditions (reliability parameter). At the same time, the excess of raw materials and/or products in warehouses indicates the additional costs of enterprises. Considering the above, it can be assumed that the system of SCM system efficiency evaluation has cyclicity. The evaluation of the effectiveness of the SCM system parameters is determined only by taking into account the correct planned execution. At the same time, the establishment of planned indicators takes place only taking into account the evaluation of the effectiveness of the SCM system parameters, in particular the factors that may negatively affect the final result of such parameters.

The implementation of an effective SCM system in the pharmaceutical industry is necessary not only for the pharmaceutical industry, but also for the state. A large mass of the added value of pharmaceutical products is formed at all stages of supply. It is beneficial for the business environment to work on reducing costs at all stages of the supply chain at the expense of revenue growth. The state is interested in increasing the revenues of pharmaceutical companies, as budget expenditures will increase at the expense of the tax system.

4. Possible consequences of an ineffective SCM system

A stable and flexible SCM system is the key to the success of the pharmaceutical industry. With the onset of quarantine measures caused by the COVID-19 pandemic, logistics processes are in a state of uncertainty and chaos. For example, China was one of the first countries to experience the severe consequences of the pandemic. Japan is close to deciding to move its own production facilities out of China. The trend of global corporations, particularly pharmaceutical corporations, to move their production facilities existed even before the COVID-19 pandemic due to the increased costs associated with workers' compensation. Many multinational corporations are moving their production facilities to the European continent for a more flexible and predictable process of product delivery to consumers. Ukrainian businesses are avoiding long-term warehouse lease offers due to the contingency of the SCM system sector related to the application of quarantine measures. This approach allows companies to respond much faster to new challenges (Trans.EU, 2020).

Due to the strict domestic legislation on the regulation of the pharmaceutical industry, companies repeatedly face unpredictable situations, largely related to the SCM system. To overcome such obstacles, it is necessary to properly identify the main priorities and

model possible situations in advance. This approach will allow pharmaceutical companies to control possible contingencies (Dorokhova et al., 2020). Significant failures and incorrect forecasts in the SCM system can have negative financial consequences for manufacturing, wholesale and retail businesses. Depending on the characteristics of possible problems in SCM system, such consequences can be: reduction of production, excess of final products in warehouses, increase in transportation costs, etc. To avoid negative consequences, it is necessary to implement SCM system taking into account the effectiveness of the above-mentioned parameters.

5. Research methodology

Theoretical and methodological basis of the study is the SCM system as a major component of the pharmaceutical industry in Ukraine. The results of the study are based on scientific works of leading domestic scientists, public and state organizations and others. At the same time, modern research mainly uses systemic, process and logical approaches. In this regard, the following scientific methods were used in the re-study: 1) analogy – an effective supply chain management system (hereinafter – SCM system) is defined as important for enterprises of any sector of the national economy of Ukraine; 2) induction – significant attention is paid to the individual components and parameters of the supply chain of the pharmaceutical industry in Ukraine; 3) generalization – it was found that, despite the diversity of views on the definition of SCM system, the basic idea of such a definition is identical; 4) others.

6. Conclusions

Having a commercial strategy that provides SCM system approaches is a significant advantage for most businesses. Commercial strategy and SCM system management strategy are interrelated, as SCM system also provides research and forecasting of demand for products. Modern software for SCM systems has helped to improve the efficiency of coordination of business processes, from the production of goods to their delivery to the end consumer. The spread of the COVID-19 pandemic has forced most businesses to transform their own supply chain business processes. Today the pharmaceutical industry of Ukraine is the guarantor of preservation of life and health of citizens. For further development of this industry, pharmaceutical companies need to implement SCM systems in accordance with modern realities and taking into account the effectiveness of parameters (flexibility, speed, reliability, costs). The overall effectiveness of the entire SCM system can be judged only after a detailed evaluation of each parameter

of such a system. Only high values of all the above parameters can guarantee the performance of the entire SCM system. Changes related to the possibility of online sales of medicines may have a positive impact on the efficiency of supply chain management system of pharmaceutical industry in Ukraine, which will further increase its profitability. Nevertheless, such sales cannot fully guarantee high quality and product safety.

At the same time, it can be assumed that the performance evaluation system for the SCM system is cyclical. An effective SCM system of the pharmaceutical industry has a positive impact on the state

budget. Rigid domestic legislation on the regulation of the pharmaceutical industry greatly contributes to the occurrence of unpredictable situations in relation to the SCM system. Correctly defined main priorities of SCM system, in particular, the possible negative situations modeled in advance are a guarantee of overcoming any obstacles. Despite the large number of definitions relating to SCM system, the general idea is the process of moving goods from the process of production to the end consumer, taking into account the characteristics of the product and certain supply strategy of individual industry enterprises.

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