MARKETING AND LOGISTICS: INNOVATIONS STRATEGIES SOCIETY

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MARKETING AND LOGISTICS: INNOVATIONS, STRATEGIES, SOCIETY

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MARKETING AND LOGISTICS: Innovations, Strategies, Society. Monograph. Edited by Nazar HLYNSKYY

Monograph highlights key aspects of the transformation in marketing and logistics processes under the contemporary conditions of globalization, digitalization, and social change**.** The first section explores innovations and digital technologies shaping new management models. The second section focuses on the impact of geopolitical challenges, including military conflicts, on business and logistics, emphasizing the adaptation of strategies in crisis conditions. The third section examines corporate social responsibility, the role of environmental initiatives, and socially oriented marketing. The monograph provides theoretical foundations and practical recommendations for integrating economic, social, and environmental aspects into enterprise activities.

This monograph will be valuable for researchers, practitioners, and students interested in management, digital technologies, and socio-economic transformations.

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TRANSFORMATION OF THE SUPPLY CHAIN MANAGEMENT SYSTEM: THEORETICAL AND PRACTICAL ASPECTS OF THE CASE STUDY

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Logistics activities are gradually strengthening their position within the enterprise management system because logistics management, tools, and methods are utilised across various business sectors. The logistics department at a business entity has become a necessary element of the organisational structure of an effective enterprise. The field of competence for specialists working in logistics requires knowledge in managing various areas of activity – from information and personnel to finance and marketing. Accordingly, logistics is divided into procurement, warehousing and inventory, transport, production, marketing, and supply chain logistics (supply chain management).

As a result, enterprises that incorporate logistics into their activities should create an integrated supply chain management system that provides control over the "supplier-consumer" chain. This will directly impact the optimisation of goods movement, information flow, and finances, thereby achieving cost efficiency with the resources available to the enterprise. Simultaneously, such technology requires the enterprise to be appropriately informatized and to enhance the level of relationship development between organisations, particularly in systems and processes of the supply chain.

The practical implementation of this task depends on many factors: the size and capacity of the enterprise, the specifics of the industry, the level of development of marketing information systems, and existing problems and needs. Consequently, logistics is continuously developing and integrating modern management solutions into various supply chains, and studying international experience in this context is crucial

for the development of logistics in Ukraine. Therefore, for domestic enterprises, the supply chain management system remains a promising area of research. Primarily, this involves organising a unified information space within the enterprise, automating relevant processes, and accumulating and analysing the received information.

A significant number of scientific works are devoted to conceptual principles and scientific-methodical approaches to increasing the efficiency of management of logistics activities of enterprises of various sectoral orientations. As the analysis of scientific sources on logistics shows, prominent foreign (A. K. C. Beresford, S. J. Pettit, W. Whittaker (2005) [1]; P. Blaik (2010) [2]; D. J. Bowersox (2007) [3]; H. Dźwigoł (2019) [4]; A. Gunasekaran (2005) [5]; L. Huemer (2006) [6]; Kotler P., Keller K.L. (2014) [7]; D. M. Lambert, J. R. Stock, and L. M. Ellram (1998) [8]; J.-J. Lambin (2012) [9]; P. R. Murphy Jr., D. F. Wood (2014)) [10] and Ukrainian scientists (B. V. Burkynskyi, V. M. Lysyuk (2018) [11]; M. Hrygorak, V. Kulyk, L. Kostyuchenko (2013) [12]; O. Garafonova (2015) [13]; Ye. V. Krykavskyi, N. M. Vasyltsiv, V. A. Falovich (2015) [14]; V. Rudyka (2012)) [15] pay special attention to the justification and development of the logistic model; concepts, optimization models and supply chain management strategies; methodological approaches to determining the optimal volume of the delivery batch; measures to improve the level of customer service and logistics service.

D. J. Bowersox (2007) and some other scientists and experts in the field of logistics are of the opinion that the concepts of logistics and supply chain management are synonymous, identical in content [3].

O. V. Horbenko (2012), considering the terminological apparatus of logistics, notes that the concepts of "logistics" and "supply chain management" are also often equated in domestic literature, since both of them are to some extent related to the process of transformation of material resources and related processes [16, p. 423]. In this interpretation, logistics is given a very broad meaning – more for the management of flows of material resources. However, logistics is only one part of supply chain management. The researcher considers the flow of material resources as an object of logistics, and the management of supply chains – financial, informational, etc.

The National Physical Distribution Management Council (USA) defined logistics as “a broad range of activities related to the efficient movement of finished products from the end of the production line to the consumer, in some cases including the movement of raw materials to the source of supply to the beginning of the production line. Such activities include transportation, warehousing, processing of materials, protective packaging, inventory control, selection of production and warehouse locations, orders for production, demand forecasting, marketing and customer service"; The American Society of Logistics Engineers suggested that logistics should be understood as "the art and science of management, engineering and technological

activities that involve the planning, supply and use of means of movement for the implementation of planned operations in order to achieve a set goal".

The range of problems related to logistics is large. It includes aspects characteristic of various stages of commodity flow management. This determines the time and place of inclusion in the movement of goods of various types of logistics. The goals of the respective stages determine which area of logistics they belong to.

The literature on the problems of modern logistics shows different approaches to defining the essence of logistics. This is evidence that logistics has not yet fully become an educational, let alone a scientific discipline. To become such, it must possess a clear and consistent system of theoretical, methodological and practical knowledge.

The study follows the process proposed by Aria and Cuccurullo (2017), which includes bibliometric analysis, systematic literature review (SLR) [17, p. 969]. This methodology for the purposes of this study is supplemented by the case study method.

The process begins with the selection of data for research, including keywords and database selection. At the second stage, data collection takes place, and at the third stage, SLR and bibliometric analysis are carried out. After the systematization of the main concepts and the theoretical background, at the last stage of the research, the study of a specific example is carried out by the master of the case study.

For the bibliometric analysis, data were obtained from the Web of Science (WoS) and Scopus databases, which are leading sources of bibliometric data (J. Baas et al., 2020 [18, p. 380]; O. Ellegaard and J. A. Wallin, 2015 [19, p. 1823]). The study examines research articles on supply chain management and digitalization of logistics in different countries. All articles are from peer-reviewed journals covering a period of more than 20 years, from 2000 to 2024.

The research papers were classified based on the study period, sample data, sample country, methodology, research design and findings. The criteria for inclusion in the study were as follows:

1. Focus on peer-reviewed journals, excluding textbooks, dissertations, and working papers.

2. Inclusion of mostly empirical studies with some key qualitative studies.

3. Practical experience of international logistics providers using open data sources.

The SLR included three steps for selecting data sources and articles. Initially, databases such as ABI/INFORM, EBSCO, Elsevier's Science Direct, and Web of Science were searched using keywords such as "logistics," "logistics system," "environmental supply chain management," and "digital logistics solutions." The second step limited the research to the period from 2000 to 2024, focusing on authoritative journals in the fields of logistics, management, and marketing. The study also conducted a bibliometric literature review to confirm the SLR results.

The practical experience of international logistics providers using open data sources was studied by the case study method. Using the case study method involves a detailed study of a specific case or phenomenon in order to gain a deep understanding of its essence and context. At the first stage, a specific case or phenomenon to be investigated is selected. In this study, the main approaches to the management of the logistics support of the enterprise are studied on the basis of the projects of the enterprise "Witron Logistik + Informatik GmbH", in particular the project of transformation of the system of logistics support of economic activity for the E. Leclerc corporation, which was recognized as the best European logistics project of 2022. The method is based on real data and facts, which makes its results reliable and trustworthy.

The second stage involves collecting information from various sources, such as interviews, observations, documents and other materials. At the third stage, a detailed analysis of the collected data is carried out to identify key factors and patterns. Next, the results obtained are interpreted and conclusions are formulated, which are presented later in this study.

1. Theoretical aspects of the logistics management system.

Logistics as an economic concept emerged in the second half of the 20th century. "The foundations of commercial logistics were laid in the late 1970s – early 1980s by American management specialists in the development of the EDIFACT system, an electronic system for exchanging data (information) on the financial situation, management, commerce (marketing), and transport maintenance of the company's activities in a competitive market" (V. Yu. Bozanova et. al., 2017) [20, p. 113].

The need to optimise the movement of goods became evident. "The possibility of end-to-end monitoring of all stages of the movement of raw materials, parts, and finished products made it possible to clearly see the huge losses inherent in traditional material flow management schemes. The clear economic gain from using logistics in the economy led partners to cooperate in the field of product promotion" (V. Yu. Bozanova et. al, 2017) [20, p. 119].

Table 1

Stages of the evolution of the concept of logistics

Stage	Period	Essence
AND stage	20-30s of the XX century.	the period of "fragmentation" of logistics, when there is a constant awareness of the importance of logistics for the economic life of the economic sectors; the prerequisites of the logistics concept are being formed: the growth of transport tariffs, the emergence and rapid development of the marketing concept, the growth of stocks and transport costs, etc. The appearance of logistics in business is connected with the sales and consumer (market) marketing concepts formed at this time, which are oriented towards the needs of consumers and solving their problems.
	50s of the XX century	subordinating production, trade and other activities of enterprises to the requirements of the market and consumers, creating and maintaining

		consumer satisfaction, which the enterprise has the opportunity to make a profit.
II stage	50s of the XX century.	the period of conceptualization of logistics is characterized by a wide distribution of marketing; the emergence of the concept of total costs, the meaning of which was that it is possible to regroup distribution costs so that the overall level of costs for the promotion of goods from the producer to the consumer is reduced; rapid development of computer technologies; changes in stock formation strategies; special attention to the issue of cost reduction; by increasing the production of transport and storage equipment, new types of containers, modern automated warehouse complexes.
	60s of the XX century.	the concept of business logistics arises, which considers logistics as the management of all types of activities that contribute to the movement and coordination of supply and demand for goods in a certain place and at a given time.
	70s of the XX century.	the fundamental principles of business logistics were formed: dynamism, complexity, flexibility, synergy, principle.
III stage	80-90s of the XX century.	the period of the integral concept of logistics (according to D. J. Bowersox, (2007) [3], the period of the "logistics renaissance") is characterized by a revolution in information technologies, which led to an understanding of the need to manage not only material, but also information flows. It was the progressive development of information technologies that transformed the approach to logistics, which, in addition to the process of planning, management and control of the effective flow of stocks of raw materials, materials, goods, services, requires the mandatory availability of accompanying information support on the way from the origin of the flow to the place of its consumption in order to satisfy consumer needs (Ye. V. Krykavskii, 2005) [21, p. 337].
IV stage	95s of the XX century. – until now	the latest stage of development of logistics is the stage of globalization (V. Omelchenko, 2008) [22, p. 223]. It was intense globalization that influenced further changes in the theory and practice of logistics. This contributed to the creation of national and international specialized logistics unions and associations, which, in addition to units engaged in the promotion of flows, have research centers, consulting departments, information banks, training centers, etc. Global trends in business made it possible to expand the list of logistics services (postponement, transshipment, mass production of products to order, direct delivery, seller's inventory management, synchronized movement of materials), reduce the number of suppliers and form long-term cooperation with logistics intermediaries, improve methods of managing logistics processes.

Source: built by authors

In the integrated strategy of distribution logistics, two fundamental aspects can be distinguished. In a simplified form, they can be presented, firstly, as a study of market needs, which is what marketing actually does, and secondly, as methods and methods of the most complete satisfaction of these needs through a more efficient organization of transport and forwarding services.

The development of logistics is inseparable from the development of related industries – transport, warehousing and equipment, procurement systems and

distribution of other elements that ensure the performance of one of the most important functions of marketing – the movement of goods.

In our opinion, it is a mistake to talk about logistics as the management of material flows, forgetting that material flows occur beyond the will of people (river flow, floods, avalanches, sunlight, mudflows and other natural phenomena). In real economic reality, especially in the conditions of commodity-money relations, no material, product, product will begin to move until it turns into a commodity, that is, until someone buys it and someone sells it.

So, let's give the following definition of logistics: logistics is a system of theoretical, methodological and practical knowledge about the management of commodity flows and related information and financial flows from the source and place of their origin to the intermediate or final destination (consumer, customer).

The most important goal pursued by the company when organizing a logistics service or setting tasks that are solved with its help is "economy of costs related to consumption, production and distribution of products" (O. V. Horbenko, 2012) [16, p. 426]. It is an important tool in the competitive struggle. The more favorable market positioning of the enterprise in comparison with competitors is greatly facilitated by the timely supply of goods in the optimal quantity and agreed nomenclature, at the required time, which is important and sometimes decisive for the consumer.

Undoubtedly, competition is the "engine" of production and trade. At the same time, the consumer always benefits from active competition between enterprises, and the enterprises themselves often go bankrupt and stop their business, due to the lower level of profitability or the inability to deal with the inefficiency of certain processes in the production or sale of products. Such inefficient processes often include the processes of transportation and movement of materials" (N. M. Vasyltsiv, 2010) [23, p. 270].

An enterprise that does not pay attention to logistics will certainly face the inevitable consequences of this:

1. A decrease in the profitability of production and an increase in the cost of production; high costs of non-production labor and all associated costs of operations.

2. Inconsistency of commodity stocks with production needs (symptoms are either too high or too low a level of stocks. The result is either idle production or sales due to a lack of stocks, or funds frozen in excessive stocks).

3. Low-quality customer service (the result is the loss of customers and, therefore, market share).

4. Increasing costs for equipment operation.

5. Large expenditure of time on cargo processing. Inefficient organization of material flows.

The overall result: due to the increase in the cost of production, the company loses its competitiveness, market share, and profit.

When developing models of logistics systems, users must remember the influence of a large number of objective and subjective factors operating at a certain point in time. The main ones are listed in the table. 2.

Table 2

Factors influencing the development of a logistics system model

A group of factors	Description of impact
1. Composition of subjects and their placement.	The system may include one or more legally dependent or independent organizations in the area of production and circulation. The need for material, economic and labor resources determines the choice of a logistics system model, as well as a marketing strategy on the market of goods and services. When organizing the logistics system, forming new production facilities, the availability and location of suppliers must be taken into account; they do not have the opportunity to effectively influence the localization of suppliers or consumers of most economic structures, therefore they have their enterprises at their disposal, taking into account the reduction of transport costs.
2. The number and placement of warehouses and transfer points	They can be installed directly at enterprises, connected to storage and processing systems of material resources received from suppliers, or to warehouse transformation centers focused on satisfying consumer requests. If necessary, intermediate warehouses can be created in the immediate vicinity of consumers.
3. Transport models	When forming logistics systems, several variants of transport models are developed. Each of them is distinguished by costs, type of transport, speed of delivery, reliability, rhythm, originality of packaging and storage. The optimal option under the currently formed conditions is determined and implemented. In the event of a change in conditions, which resulted in the transformation of calculated indicators, the subjects of logistics systems should be able to use other options of transport models.
4. Communication	Functional subdivisions of the logistics system at all levels are integrated not only by transport, control, but also communication links, forming complex subsystems. Communication between units and subsystems is implemented by telephone, telegraph, cable, computer network, and others. Each type of communication has its pros and cons. The factor of fast communication plays an important role in the functioning of the logistics system. It affects the level of adaptation of the system to the environment, has a direct impact on the decision-making and implementation processes.
5. Information system	When creating logistics systems, its presence is mandatory. Its structure depends on users, which include elements not only of a certain system, but also of the external environment. Verification of the latter is limited. The chosen approach to order processing has a great impact on the type of information system. Therefore, the system can be centralized and decentralized.

Source: constructed by the author according to (V. M. Kisliy et. al., 2010) [24, p. 139]

The process of development of logistics systems is based on logistics principles and involves the exact interaction and coordination of all the previously listed functional elements, taking into account the impact of influencing factors. Logistics

systems are characterized by polystructurality, which is expressed in the interpenetration of various subsystems that form several structures. A peculiarity of logistics systems is their relation to systems with a variable structure. They are not static and are organized taking into account the working conditions, and have the property of rapid restructuring.

The theory of logistics and the currently available practical experience allow us to reduce the variety of features of the movement of material, financial and other resources, as well as information in enterprises to a certain number of standard models. This approach reduces time and saves money for the formation of individual programs.

The essence of modeling is based on determining the similarity of the studied systems or processes, which can be complete or partial. According to this feature, all models of economic systems are divided into isomorphic and homomorphic. Isomorphic models include the characteristics of a real subject, and their correspondence is complete. Homomorphic models are based on incomplete similarity of the selected model, in other words, the similarity is partial. When modeling logistics systems, there simply cannot be complete similarity.

The most important characteristic of logistic models is their materiality. According to this feature, they are divided into two classes: material and abstract.

Material models reproduce the main geometric, physical and functional characteristics of the subject or processes under study.

In logistics, often the only modeling method is abstract modeling, it can be symbolic and mathematical in terms of expression.

Symbolic models are divided into two types.

1. Languages based on a certain set of words that are understood unambiguously.

2. Sign models, the essence of which is that certain concepts are assigned some conventional designations, that is, signs (A. G. Kalchenko, 2004) [25, p. 174].

Mathematical modeling is the most effective in logistics. Two types of mathematical modeling are most common in logistics: analytical and simulation.

Analytical modeling is a kind of mathematical approach in the process of researching logistics systems. Its purpose is to obtain the most accurate solutions. The analytical modeling process itself is divided into three stages. The first one formulates mathematical laws and dependencies that connect individual objects of the system. At the second stage, equations are solved and theoretical results are obtained. On the third, the obtained results are compared with reality, an adequacy check is provided. The advantages of analytical modeling are the great generalization potential and the possibility of repeated use.

Simulation modeling is used in those cases when analytical methods for researching one or another logistic model are not available or their search requires large costs. Simulation modeling is used both for analysis and optimization of logistics

systems and is the main method of flow process research. Simulation modeling is divided into two stages: the first is to construct a model of a real logistics system, the second is to conduct experiments on this model.

There are two main disadvantages to consider when using simulation modeling. First, it is the high cost of this research method. Secondly, there is a high probability of false imitation, since not only flow processes, but also other processes in logistics systems have an approximate nature.

A typical logistics system consists of a specific number of elements and certain relationships. Logistic modeling allows you to combine not only possible connections in the conditions of the development of the existing market, but also heuristic relationships in the forecasted market. This nature of logistics system management modeling takes place at both the macro and micro levels. The modeling of logistics systems is greatly influenced by differences in the operating conditions of enterprises and even similar divisions.

The use of outsourcing in logistics has recently gained considerable popularity.

Outsourcing involves the transfer to external organizations on the basis of a contract of functions that were previously performed in-house. The transfer of functions causes changes in material and human resources, and the right to make decisions is also redistributed. In addition to issues that may be stipulated in the contract (level of service, quality, price of services), the provider independently chooses technologies, resources, etc., with the help of which it will perform its functions (O. V. Yeletenko, 2008) [26, p. 495]. Outsourcing also means hiring third-party employees or companies that provide services to perform these additional processes. Currently, these services are used by millions of companies around the world in various fields of activity.

Outsourcing is especially often used in logistics, as its effective use allows to increase the competitiveness of the enterprise many times over. The use of outsourcing allows you to reduce the company's costs in the process of carrying out logistics activities thanks to the involvement of professional employees.

Outsourcing in logistics, assuming part or full implementation of functions, allows to increase the profitability of the enterprise due to the reduction of the cost of production and general expenses. The management of the company, in turn, can use the resulting time savings for more focused regulation and control of management activities. It also allows you to increase the concentration of staff efforts on improving the quality of their professional activities, which will have a favorable effect on profits. There are several more reasons to use outsourcing:

1. Insufficient qualification of personnel to carry out logistic activities. Outsourcers allow you to solve this problem by providing highly qualified specialists.

In addition to this, the customer's personal staff will have the opportunity to quickly acquire the necessary knowledge that will increase their competence.

2. The company's management is aware of the need to implement changes in its own activities, the exact definition of which can be found only with the help of outsourcing.

3. Improvement of performance indicators of the logistics department without the use of significant costs for personnel training.

4. Implementation of new ideas, for the implementation of which it is necessary to leave only the main activity and get rid of additional (V. I. Katsma, 2016) [27, p. 63].

The use of outsourcing in logistics activities has its advantages and disadvantages (Table 3):

Table 3

Use of outsourcing in logistics activities: advantages and disadvantages

Advantages	Disadvantages
1. Focusing on the main processes in connection with the transfer of secondary ones to the hands of professionals.	1. There is a possibility of increased costs if the company outsources too many processes.
2. Significant cost savings. It consists of the fact that the costs of transportation and warehouse activities are minimized; there remains an objective number of personnel necessary to solve the necessary tasks; investment costs are partially or completely reduced.	2. Possible loss of control over the execution of transferred processes, which in turn reduces managerial flexibility.
3. The qualification of the enterprise's own personnel in carrying out logistics operations is improved.	3. There is no clear legal framework for outsourcing. Many companies are afraid to outsource business processes due to the possibility of information leakage. However, with a competent use of outsourcing and a careful selection of the company that will undertake logistics activities, it is possible to significantly reduce costs and gain a significant competitive advantage.
4. The risks associated with the implementation of logistics processes due to the transfer of this form of activity to an outsourcer are reduced	
5. Operational control is improving.	
6. The quality of the services provided improves because the specialists involved are constantly developing and using the latest technologies.	

Source: constructed by the author according to (M. Yu. Hryhorak et. al., 2013) [12, p. 177-179]

As a conclusion, we note that the competent organization of the logistics operation from the purchase of raw materials, materials, components and to the delivery of finished products to the buyer allows to obtain a very noticeable saving of working capital and in this sense is an important tool in the management of the production and commercial activities of the enterprise.

The most popular modern methods of evaluating business performance is the key performance indicators (KPI) system, which is used by most large global companies. Key performance indicators (KPIs) are measurable company goals, usually related to

strategy, revealed by performance management tools such as the balanced scorecard (Ye.V. Krykavskyi, 2004) [28, p. 353].

Accordingly, global companies use a set of key performance indicators to evaluate the effectiveness of logistics management.

For now, having studied the theoretical aspects of logistics, in particular, defining the essence of this concept, as well as characterizing the logistics management system in the company's activities, as well as clarifying the essence of logistics approaches in the organization of sales channels, we will proceed to analyzing the practical experience of the transformation of logistics support of economic activity.

2. Practical experience of transformation of logistic support of economic activity

The company "Witron Logistik + Informatik GmbH" was founded in Germany in the middle of the 20th century [30]. Today, Witron Logistik + Informatik GmbH is a developer of dynamic and innovative logistics and order picking systems for retail and industry. A decisive factor in the success of Witron Logistik + Informatik GmbH projects is the overall responsibility for design, IT systems, control/PLC, mechanics, implementation, deployment and system maintenance. Therefore, "Witron Logistik + Informatik GmbH" relies on the triad of design, construction and operation (O. O. Kuchmeev, 2018) [29, p. 102].

Regarding the last stage – operation, thanks to innovative remote services such as IT support and maintenance, maintenance services, individual training, a global spare parts network, as well as supporting software tools (Witools), customers receive everything for daily success. In addition, the Witron service supports the customer with analysis, audit and modernization services.

For Witron Logistik + Informatik GmbH, system design is the first step in the client's project ("Design" stage of the strategic triad) [30]. Together with customers, the company's specialists develop a general concept of logistics and together clarify questions about warehouse equipment, assembly technologies, ergonomics, user experience and usability, we take care of energy efficiency. "Witron Logistik + Informatik GmbH" guarantees its customers constant functional responsibility and partnership throughout life. From the first data analysis of existing logistics processes to the classification and selection of suitable logistics personnel, "Witron Logistik + Informatik GmbH" means process knowledge in logistics planning. In addition to design experience, employees of "Witron Logistik + Informatik GmbH" also possess technological knowledge and integrate solutions into the customer's ecosystem to create ergonomic workstations and establish economic and ecological processes. In addition to building new logistics centers, "Witron Logistik + Informatik GmbH" also supports customers in creating future business models [30]. The assortment of logistics solutions of "Witron Logistik + Informatik GmbH" is given in the table. 4.

Table 4

The assortment of logistics solutions "Witron Logistik + Informatik GmbH"

Type of logistics solutions	Logistics solutions and technologies	Brief description
Warehouse logistics	Logistics center	Design of warehouses, development of IT warehouse management systems
Transport logistics	Platforms for supply chain management	Development and maintenance of supply chains

Source: by authors based on Witron Logistik + Informatik GmbH data [30]

In fact, "Witron Logistik + Informatik GmbH" is not a logistics service provider in the classical sense of the word, but designs warehouses and completes value-added supply chains and strives for end-to-end optimization. The logistics center manages the material flow, so new tasks arise with new technology. Many want to continue to optimize machines, but much greater efficiency gains are achieved between transportation, the logistics center and the end consumer. It is possible to prepare the goods in the warehouse very quickly, but this does not benefit the customer if the trailer is not yet on the loading dock. It makes no sense either from an economic or an environmental point of view. Process intelligence will save money, increase flexibility and help manage business processes in a more sustainable way. This concept of the platform creates transparency and efficiency of processes.

New developments in the IT industry are also changing the warehouse management system (WMS). In addition to standard warehouse management functions, such as registration and management of all goods and stocks in one interface, flexible warehouse configuration, quality control and inventory, as well as extensive statistics, diagnostics, modeling and visualization functions, the Witron Logistik + Informatik warehouse management system GmbH" offers various performance features. Example: seamless connection of a wide range of subsystems. Whether it is portable radio terminals or voice picking systems, forklift control systems, automated material flow processes or lighting solutions, the Witron Logistik + Informatik GmbH warehouse management system combines a wide range of subsystems and warehouse types. platform. Witron Logistik + Informatik GmbH aims to become a logistics platform for its customers, set new trends in user experience (UX) and use data science for machine learning projects, as this requires knowledge of mechanics, controls and processes.

For the operation phase, thanks to innovative remote services such as IT support and maintenance, maintenance services, individual training, a global spare parts network, as well as supporting software tools (Witools), customers receive everything

for daily success. In addition, the WITRON service supports the customer with analysis, audit and modernization services.

Commitment and responsibility are key components of corporate culture at Witron Logistik + Informatik GmbH.

Planning and implementing the best solutions depends on various factors. Developing and implementing the best solutions requires being faster and better than the competition, taking responsibility, being predictable, delivering on promises and being inspired. These are the main pillars of the corporate culture of "Witron Logistik + Informatik GmbH" (Table 5).

Table 5

The main pillars of the corporate culture of "Witron Logistik + Informatik GmbH"

Elements of corporate culture	Implementation examples
Commitment is when a person takes responsibility	There is one phrase that our clients never hear from us: "I'm not responsible for this!" This does not mean that all our people can do absolutely everything. But every person at "Witron Logistik + Informatik GmbH" feels responsible for customers and will help them solve any problem. Given that teams often work together for years without any change, most can do a lot. Or they ensure that a colleague takes care of everything.
Commitment transcends borders	For many years, the company has supported work for children in Brazil in the field of education and training. In Africa, Witron Logistik + Informatik GmbH also supports the development of projects, as well as the construction of hospitals and educational institutes.
Responsibility has a future	"It is a shame on the part of society that fewer and fewer young people are getting educational opportunities." – Walter Winkler has a very clear view of social responsibility. That is why "Witron Logistik + Informatik GmbH" has been training more than 1,000 young people since 1971. Many small businesses in the region are unable to offer lifelong learning, so Witron GmbH has taken on some of these training costs.

Source: Witron Logistik + Informatik GmbH [30]

The company takes care of its partners, to whom it provides logistics service. Since 1990, separate territorial divisions of Witron GmbH have been operating in the Netherlands, Spain, Great Britain, France, the USA, Canada and Singapore (Fig. 1).

From the point of view of "Witron Logistik + Informatik GmbH", the decisive factor for a successful project is the overall responsibility for the design, IT systems, control/PLC, mechanics, implementation, expansion and maintenance of the system. Therefore, "Witron Logistik + Informatik GmbH" relies on a strategic triad. Thanks to the experts and solutions of Witron Logistik + Informatik GmbH, the customer can concentrate on the core business. This saves time and resources.

An enterprise as an open system bases its existence and development on interaction with the external environment. At the same time, a certain correspondence between the environment and the system is a condition for the existence of the system.

Any changes in the environment and (or) in the system itself lead to malfunctioning or destruction of this system. The system can adapt to changes in the environment in different ways. You can change the number or quality of the elements that make up the system. But you can change the connections between the elements to achieve a new synergistic effect. The interaction of elements within the system ensures the transformation of inputs into outputs.

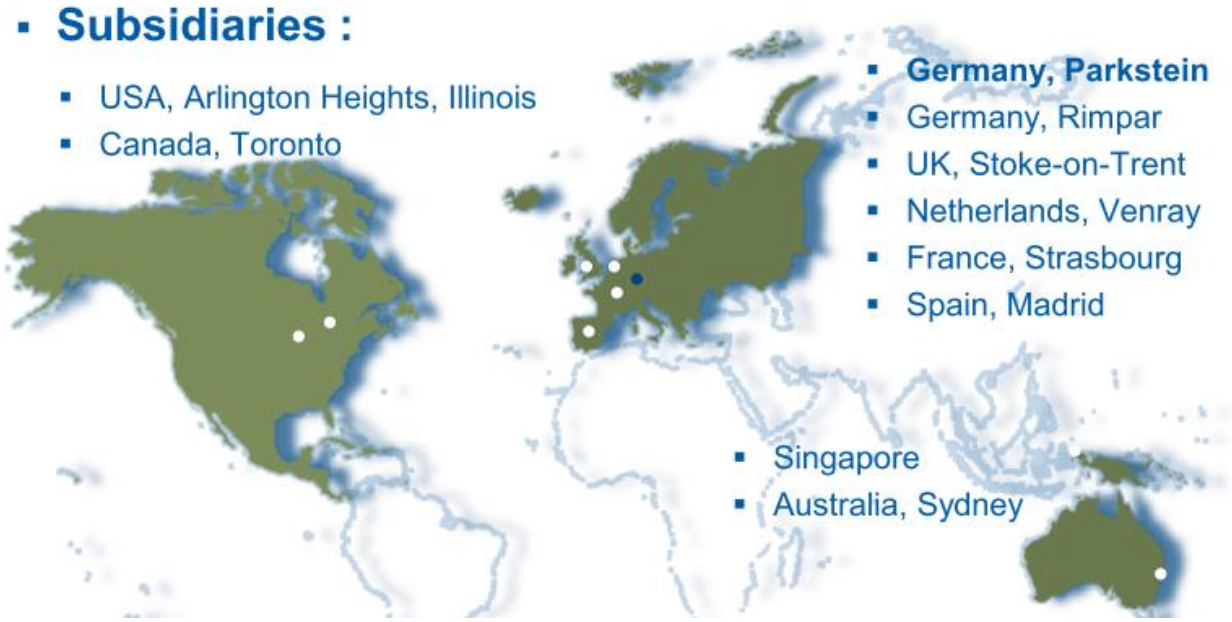

Fig. 1. Geography of separated territorial divisions of "Witron Logistik + Informatik GmbH"

Source: Witron Logistik + Informatik GmbH [30]

Analysis of the market situation of "Witron Logistik + Informatik GmbH" is of great importance, taking into account the fact that the company operates in a specific high-tech market of developers of logistics solutions with a high level of competition. The main competitors of "Witron Logistik + Informatik GmbH" in the field of logistics management are: Bringg Delivery Technologies, Bastian Solutions, Stord, Logistimo.

The main results of the activity of "Witron Logistik + Informatik GmbH" include both financial results and intangible assets in the form of patented developments of logistics management solutions.

The authorized capital of Witron GmbH is EUR 3,500,000. 2,200 employees work for Witron worldwide. 1,300 employees work in Parkstein, i.e. in the main company in Germany. 75% of all employees have undergone or are undergoing training within the company.

The main patented solutions for logistics management of Witron GmbH are listed in the table. 6.

Table 6

The main results among the logistics management solutions of "Witron Logistik + Informatik GmbH"

Acro-nym	Product	Description
OPM	Order picking machinery	it is a fully automated picking of boxes in the retail area food trade. Now this solution is implemented in the fifth generation and is in demand all over the world. It is used for storing dry, perishable and frozen products. OPM is currently proving its effectiveness in more than 90 projects in 13 countries. Some customers are already using the solution with its multi-channel features and the artificial intelligence behind it.
FPM	Flow picking machinery	is a highly efficient system for fully automated picking in distribution centers without stocks (Flow through) – an integrated end-to-end system from receipt to shipment. The FPM concept is thus a solution for fresh produce logistics, which are handled almost exclusively through warehouses without stock and place high demands on product assortment, product quality and storage time.
AIO	All-in-one	is a warehouse logistics solution suitable for systems of all sizes and industry sectors, for almost all business models, product structures and delivery channels, with short order fulfillment times, integrated returns processing, ergonomic, flexible, scalable and therefore very economic.
DPS	Dynamics picking system	Highly dynamic and automated selection of small parts in DPS is supported by the backlight system. DPS works on the principles of "goods to people" or "people to goods". Depending on the structure of the order, the items are placed permanently or on demand on the assembly front, which means that it is always optimized.
OPS	Order picking system	The OPS automated picking system is an integration of the automated small parts warehouse (AS/RS), distribution circuit and picking workstations. In OPS, goods are prepared for picking at picking workstations according to the "goods to person" principle for each order and in the correct sequence.
GTP	Goods to person	Thanks to the full integration of the newly developed Goods-to-person (GTP) solution into the overall OPM concept, it is now possible to pick and consolidate non-automated goods in an ergonomic, cost-effective and storable way directly at the delivery point. units that have already been preselected in OPM.
CPS	Car picking system	The CPS storage system is a manual order picking system for an optimized routing of boxes on pallets or roll containers, supported by radio frequency communication, voice picking and illumination technology.
ATS / ACS	Automatic tray / case system	ATS/ACS for fully automatic assembly of whole bags, carton trays (fresh produce, fruit, vegetables) and beverage cartons. This one the system is most commonly found in temperature-controlled food retail areas.
BOS	Box order system	A WITRON development that not only meets high expectations for product handling, but also sets new standards for efficiency, productivity and ergonomics in the fresh produce environment. Due to its high flexibility, the solution can also be used to transport beverage crates.
DPP	Display palette picking	The DPP solution is an integrated concept for the fully automated creation of store-friendly customer orders consisting of different quarter and half pallets. At the same time, the order can be completed with DPP both on pallets and on rolls.
MPS	Module picking system	Heavy, bulky goods are stored economically with the MPS order picking system and collected on pallets or mesh boxes. The user is supported by pick-by-light.

	Shipping buffer	Conveyor storage technology is used for temporary storage of finished customer orders in double-depth warehouses for euro pallets and triple-depth for pallets of the roll system containers. To increase system availability, roll containers are always transported and stored on system pallets. Rolled containers are prepared for shipment without a system pallet on the lifting conveyor.
	Witron conveyor system	The product range includes all key elements of the conveyor system for trucks, trays and pallets. Even Case order machine, central element of the OPM system as well as other visionary fully automatic assembly machines are designed and built in-house in a production area of 180,000 square meters.

Source: by the authors based on Source: Witron Logistik + Informatik GmbH data [30]

Therefore, solutions for logistics management developed by "Witron Logistik + Informatik GmbH" make up a single integrated system of logistics support.

Now let's analyze the projects of "Witron Logistik + Informatik GmbH" on logistics management.

A significant number of customers trust Witron Logistik + Informatik GmbH with their logistics processes as processes become more complex and customers often lack qualified personnel to service technically demanding machines. "Witron Logistik + Informatik GmbH" offers an individual solution for logistics, which promises the client a competitive advantage.

Logistics managers worldwide from various industries use Witron Logistik + Informatik GmbH solutions to optimize their processes, increase the flexibility of their material flows, save costs, liberate the environment and create ergonomic workplaces. The main data on the projects of "Witron Logistik + Informatik GmbH" are shown in fig. 2.

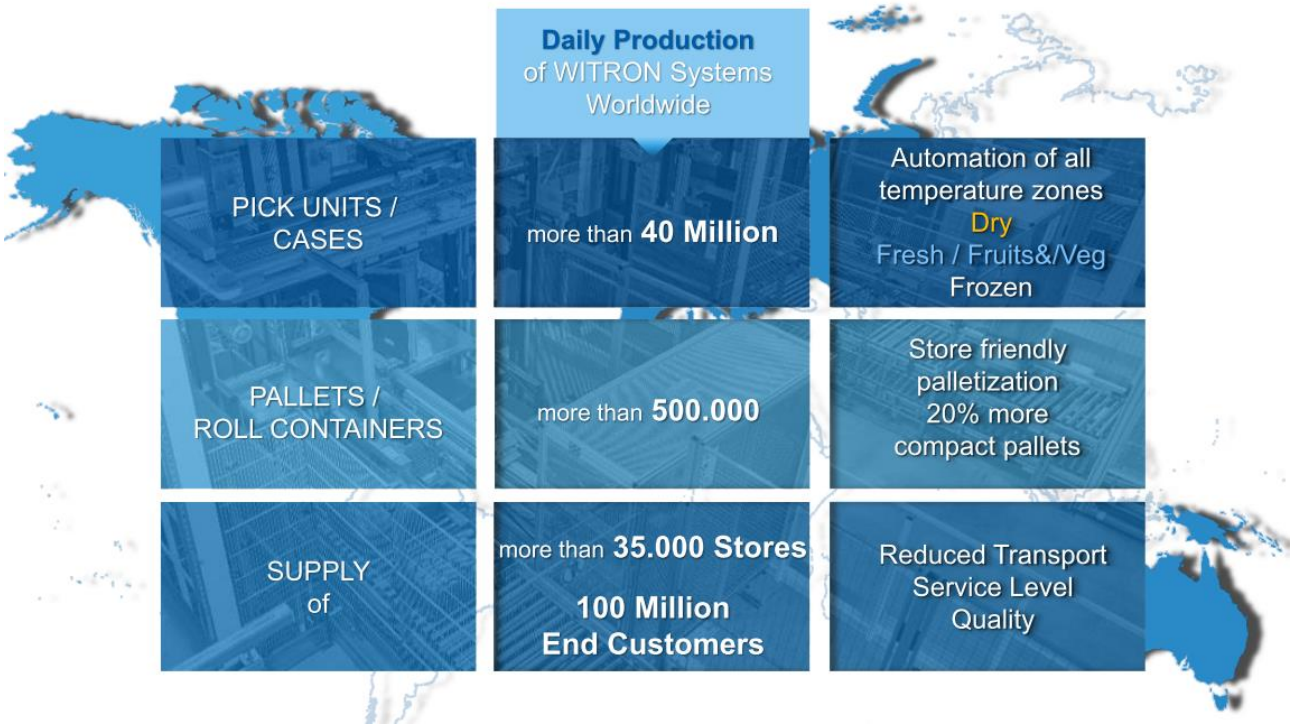

Fig. 2. Data on logistics projects "Witron Logistik + Informatik GmbH"

Source: Witron Logistik + Informatik GmbH [30]

The company ensures optimal material flow, guaranteed delivery performance and thus adds to logistics. Projects are implemented in North America, Europe, Asia and Australia. Well-known companies from trade, industry and services - corporations and medium-sized companies – trust Witron Logistik + Informatik GmbH with their logistics processes.

In particular, the Witron Logistik + Informatik GmbH project for Retailer Coop from Norway (Table 7) deserves attention, the essence of which was to solve the problem of expanding a very dynamic multi-temperature logistics center for 1,200 stores during current operations with an increase in picking productivity from 480,000 to 625000. But when, on top of that, stores and online orders continue to grow due to various obstacles, and teams have to operate within certain constraints (as was the case with Covid-19), more than just technical and organizational knowledge is needed for all involved. for both parties.

Table 7

Overview of the "Witron Logistik + Informatik GmbH" project for Coop Norge Handel AS

Project elements	Description
Customer: Coop Norge Handel AS	From a highly automated facility (with 5 different temperature zones), COOP supplies approximately 1,200 stores located throughout Norway, from the metropolitan region around Oslo and the far north of Norway, with an assortment of 13,000 different products.
Location	Jessheim (near Oslo Airport), Norway.
Sector of activity	Retail trade / distribution.
Products	13,000 items in five different temperature zones - dry, fresh, fruits, vegetables, frozen.
Decision	OPM, DPS, CPS, maximum automation of the delivery buffer.
Amount	625,000 selected cases per day.
Features of the project	The task given to project manager Gaute Glomlien of COOP and project manager Holger Weiss of Witron was described as follows: expand the dry, fresh and frozen goods logistics complex from 52,000 square meters to 84,000 square meters, increase throughput by 30%, integrate 11 new of COM machines (in the dry, fresh and frozen area), install additional AS/RS aisles for pallets and trays, as well as various conveyor system components, increase the size of the fully automated transport buffer, and upgrade the relevant WMS system to the latest technology.
Challenges of the project	All components had to be integrated into the existing material flow during ongoing operations. Of course, without any loss of productivity – taking into account all safety measures (e.g. in case of Covid 19). The extension is probably the most complex built-up project in Witron's history to date, in which existing technologies have been upgraded and new modules have been integrated – both into the existing building and into the new extension facility. COOP is a demonstration project for Witron. Many international customers visit the facility. Witron has been able to demonstrate impressively how expansion can be carried out on budget and on time within ongoing operations despite challenging framework conditions.

Customer opinion	“The upgrade gave us a state-of-the-art solution that was refined during ongoing operations to an amount of throughput that could not even have been anticipated at the initial design stage. Previously, thanks to Witron systems, we could save millions of euros annually. Therefore, it was clear that we would also implement the expansion with the help of WITRON and their leading logistics technologies," explained COOP project manager Gaute Glomlien.

Source: Witron Logistik + Informatik GmbH [30]

From a highly automated facility (with 5 temperature zones), Coop supplies about 1,200 stores located throughout Norway, from the metropolis around Oslo and in the north of Norway, from an assortment of 13,000 different products. A generalized description of the project and its result is given in the table. 7.

Let's analyze the following project "Witron Logistik + Informatik GmbH", implemented for Asko – the largest food wholesaler in Norway and part of the Norges g ruppen. A generalized description of the project and its result is given in the table. 8.

Table 8

Overview of the "Witron Logistik + Informatik GmbH" project for Asko (Norges group)

Project elements	Description
Customer: ASKO, Norway	WITRON implemented a 24,000 m² fresh produce warehouse for Asko. Asko is part of the Norges group. The company's clients include 14,000 hotels and restaurants, as well as 2,670 shop operators. Asko manages 12 regional warehouses.
Location	Vestby, Norway.
Sector of activity	Retail trade / distribution.
Products	> 4000 fresh products.
Decision	OPM with 18 COM machines, DPS with 28 pickers, OCB, MPS and consolidation system, HBW.
Amount	317,000 picks/peak day.
Features of the project	Picked fresh loads are transported using connected pallet lifts (the logistics center was built on a hillside - the ground had to be blasted) to another receiving area, where they are manually packed together with dry loads from another order placed on a forklift, and then leave a "warehouse within a warehouse" with its own fleet of Asko trucks.
Challenge	Three processes, three material flows, three vehicles, three delivery areas, three different distribution channels and three years were needed to implement the new fresh produce warehouse project – from the first mechanical installations to the full transfer in spring 2018 – a logistical masterpiece, according to employees of Asko.
Customer opinion	We did not exclusively ask for a technical expert for the project or look for technical systems, but we were looking for a company that understands the process and the dynamics, that can map these processes and develop or adapt technical solutions for them," explains Logistics Director Arild Osmul.

Source: Witron Logistik + Informatik GmbH [30]

Therefore, Asko provides efficient distribution of products to grocery stores, retail trade of goods of daily demand and public catering establishments. An effective distribution network is a necessary condition for consumers to receive products at the lowest price and best quality. Retailers across Norway benefit from competitive prices

and a wide range of products as Asko customers. "Witron Logistik + Informatik GmbH" implemented a project to create a new warehouse for fresh Asko products (+2 °C).

This was not too much of a challenge for the technical systems of "Witron Logistik + Informatik GmbH", and the logic and dynamics in the processes, the integration of technology and design were decisive for the successful implementation of this project.

"Witron Logistik + Informatik GmbH" is engaged in the management of logistics support not only for food parcelers, but also for industrial manufacturers. In particular, it was Witron Logistik + Informatik GmbH that implemented the project of the sports car manufacturer Porsche from Zuffenhausen to centralize its worldwide spare parts logistics service at the Sachsenheim plant. Now 3.2 million order lines are sent from there every year (Table 9).

Table 9

Overview of the "Witron Logistik + Informatik GmbH" project for Porsche

Project elements	Description
Customer: Porsche	Porsche, the manufacturer of premium sports cars, has invested more than 100 million euros in this huge project. More than 700 Porsche dealers worldwide are supplied with spare parts from Sachsenheim. We currently have around 85,000 different Porsche parts or material numbers in stock, from a single screw to a complete hard top.
Location	Sachsenheim.
Sector of activity	Automotive industry.
Products	85,000 different parts.
Decision	AS/RS, OPS.
Amount	3.2 million order lines per year.
Features of the project	To optimize processing, the spare parts warehouse in Sachsenheim is divided into an automated storage and picking system for small parts and a manual storage and picking area for medium and large parts. A variety of small parts in an automated small parts warehouse (AS/RS) are stored compactly and compactly using plastic containers of various sizes and dimensions. Medium-sized parts are stored in lattice boxes, large ones are stored on poles or wooden pallets. "This division into three units, which are also organizationally independent, allows us to have ideal process flows – from product to person or from person to product," Wells says. "It also allows orders to be placed in the warehouse at the latest possible time, according to the corresponding gap time." There is no need for intermediate reinforcement, which saves time and transportation, and ensures a direct flow of material. The train concept serves as an internal transportation system in the spare parts warehouse, helping to connect the three sections with the receiving area, the packing area and the shipping area. This technically simple and reliable solution ensures timely material flows according to a defined schedule and thus a constant flow of materials in the warehouse. The heart of the spare parts center in Sachsenheim is the highly dynamic automated small parts warehouse (AS/RS), developed and implemented by Witron. The decision in favor of logistics experts from Parkstein further expands the long-standing cooperation of trust between the two companies. As early as 2000, Witron implemented the TMS (Transport Management System) radio frequency system for Porsche at the former Ludwigsburg plant and at various external warehouses. It optimizes the material

	flow from receipt to shipment using the SAP LES warehouse management system. "We are focused on long-term partnerships. But a partner has to prove his worth again and again," says Jürgen Vels. In the summer of 2011, Porsche awarded WITRON with the "Porsche Supplier Award" in the category "non-production material". This award is presented annually to the sports car manufacturer's top ten suppliers and service providers.
Challenge	Two workshops with a total area of almost 113,000 m² were built in two construction phases over three years. "Our main concern at the spare parts center in Sachsenheim is to achieve excellence in physical logistics based on the principle of flow," explains Jürgen Wels. "To achieve this, we want to establish the optimal cost-benefit ratio in all processes." Time is a very important factor here. Today, when a retailer orders a part from Porsche, it is usually received within 24 hours in Europe and 48 hours elsewhere in the world. The portfolio does not only include all spare parts for current Porsche models, which has become an increasing challenge due to the increased variety of models in recent years. The stocked parts range also includes stock for classic cars, specialist aftermarket products (such as add-ons) and, more recently, parts for production prototypes in development.
Customer opinion	All strategic goals at the new location have been achieved. As far as the spare parts business is concerned, Porsche offers the cutting-edge optimum in spare parts logistics," says Jürgen Wels, Head of Logistics at Porsche, summarizing the positive achievements. We have high flexibility in all processes and benefit from even faster access. In By comparison, system availability in the overall process of over 99% is also in the absolute upper range The specifications for short distances and ergonomic processes at all workstations were consistently implemented.

Source: Witron Logistik + Informatik GmbH [30]

A project that needs attention is the development of the Corrugated packaging management system (CPMS), which is a business application for the production of corrugated cardboard worldwide (Fig. 3).

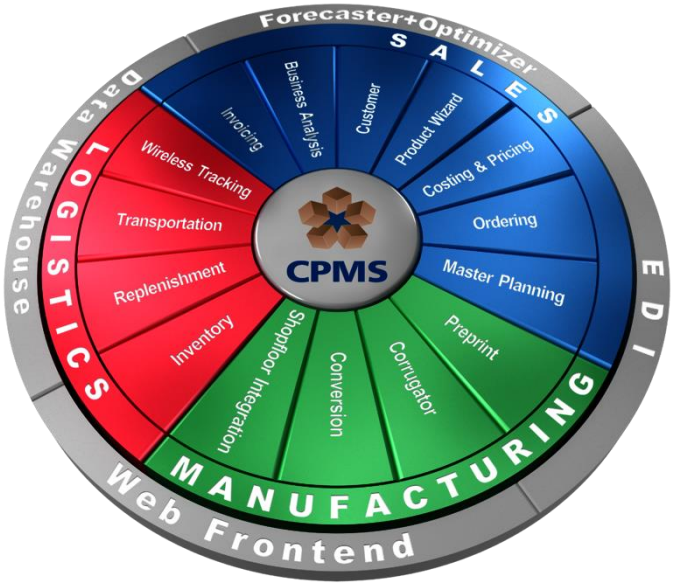

Fig. 3. Structure of a business application for manufacturers of corrugated cardboard

Source: Witron Logistik + Informatik GmbH [30]

The standard version of CPMS is extended by the CPMS Multiplant module, which extends all CPMS functionality to multiple company production sites for centralized use of CPMS functions (national sales organization, interplant planning) in a region for mutual benefit. For example, CPMS Multiplant allows you to logically centralize sales teams for multiple plants. Customer orders may be transferred to port routes subject to appropriate user authorization. The expected difference in the cost of the move will be displayed to the user in the company's currency before a final decision is made.

The modular software supports 250 corrugated plants from customer request, production to invoicing. The basis for this wide range of products was the participation of "Witron Logistik + Informatik GmbH" in the development of management applications in industry in the 1980s and 1990s. Based on this competence, the first control centers and planning systems with an industry focus were developed. The first Witron mes applications were enhanced with extensive functions for sales and delivery.

Thus, CPMS from "Witron Logistik + Informatik GmbH" displays in digital form the entire value chain of a corrugated board manufacturing plant (Fig. 3). The configuration options allow the CPMS to be used in the production of any product, from classic transport packaging to multi-component displays with digital printing for points of sale. Companies with multiple production sites benefit from the CPMS Multiplant option, which provides centralized capacity management with harmonized data.

The industrial sector, as well as many other areas of business, increasingly rely on the automation and digitization of production and logistics processes. CPMS is a future-proof platform that shares big process data with machines and supply chain partners for overall optimization.

The CPMS logistics module includes functionality for efficient inventory management, as well as transportation planning and shipment processing. All relevant material types, such as paper rolls, tools, auxiliary materials, as well as semi-finished and finished products, are managed by standard basic functionality. Material- or industry-specific functions, such as registration of paper rolls on the corrugator or recording of tool usage, etc., complement inventory management. CPMS transportation planning provides advanced algorithms for automated generation of shipments within defined delivery windows based on electronic road maps. Loading is monitored by radio frequency terminals that notify the forklift driver of loading and create all transport documents based on this information. Customer-facing external warehouses, or a central warehouse in the case of multiple locations, can be configured in CPMS and provide industry-specific delivery processes.

The CPMS Sales, Manufacturing, and Logistics modules form the core of the CPMS suite of packages. It connects to other Witron Add On modules using the Digital

access layer, which is also the basis for connecting third-party software. Additional CPMS modules are available: CPMS Data Warehouse: Business data from all areas of the CPMS Packaging core is available in a dedicated data structure that provides high-performance access using standard BI tools. CPMS EDI messaging: Customers and partners can exchange data with CPMS bi-directionally through electronic channels. CPMS Forecaster + Optimizer: an add-on module supports forecasting of paper and finished product's needs. It uses self-defined or customer-supplied forecasts to determine optimized replenishment batch sizes. Optimization is based on total costs and takes into account constraints such as capacity and warehouse size. CPMS mobile app: Mobile browser-based operations are enabled by the CPMS mobile app, which exchanges data with the Packaging core. The scope of functions covers the fields of sales, production and logistics, which benefit particularly from this technology.

So, we characterized the essence of managing the logistics support of the enterprise. It was found that logistics is a system of theoretical, methodological and practical knowledge about the management of commodity flows and related information and financial flows from the source and place of their origin to the intermediate or final destination (consumer, customer).

In addition, it was established that the use of outsourcing allows to reduce the costs of the company in the process of carrying out logistics activities due to the involvement of professional employees.

So, having studied the theoretical aspects of the logistics management system and the essence of logistics approaches in the organization of sales channels, the essence of sales logistics was determined, which is an integral part of the logistics system, which in turn is a component of the distribution system of the enterprise. Also, the essence of planning and organization of sales at the enterprise is analyzed, which includes the organization of sales of finished products, planning of product assortment, planning of product sales.

The investigated company, "Witron Logistik + Informatik GmbH," is a developer of innovative solutions for logistics management. Witron Logistik + Informatik GmbH develops highly dynamic and innovative logistics and order-picking systems for retail and industry. According to Witron Logistik + Informatik GmbH, the decisive factor for a successful project is the overall responsibility for the design, IT systems, control/PLC, mechanics, implementation, expansion, and maintenance of the system.

In general, the projects of Witron Logistik + Informatik GmbH on logistics management for the Norwegian retailer co-op, Asko (NorgesGruppen), and Porsche were analysed. It was also noted that Witron Logistik + Informatik GmbH has been engaged in the optimisation of processes in the field of corrugated board production for more than 30 years, with clients such as International Paper, DS Smith, Smurfit Kappa, Dunapack, Stora Enso, Model, THIMM Group, Delkeskamp

Verpackungswerke, and many others. With the help of CPMS, you can coherently combine all areas of business into one system. The connection of systems such as financial accounting, CAD, machines, conveyor systems, as well as map material for route planning, becomes possible through the digital access layer.

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