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# **International Supply Chain Design for Wholesale E-commerce**

By DMITRII AKULINICHEV

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## Abstract

Wholesale trade is a branch of the economy in which the volume of trade turnover is multiple times higher than that of retail trade. The high susceptibility of this industry to innovation determines the high speed of changes in it, the general direction of which is characterized by the digitalization of the world economy. In wholesale trade, electronic progress is manifested primarily in the transition to large-scale and widespread provision of trade services by its participants in electronic form. One of its consequences is the transformation of the classical institution of trade intermediation. It is accompanied by the inevitable, although not so rapid, loss of stable competitive positions by its representatives, and the simultaneous strengthening of the influence of resellers of the new digital format on the market. This trend will naturally initiate a reconfiguration of supply chains in wholesale trade, both nationally and internationally. In this regard, many problems arise related to the design of multiple logistics organizational structures of this type. They correspond to identifying the role of digital resellers/trade organizers, including electronic trading platforms, in ensuring the effectiveness and efficiency of international supply chains formed with their participation and justifying the strategic and functional rules for their design.

Among the problems that deserve scientific attention is the identification of prospects for the development of logistics projects for building, within the framework of wholesale e-commerce, supply chains of Chinese products to the domestic commodity market of other countries and vice versa. In this regard it is worth to highlight the issues related to risk management of projects for the formation of these supply chains, considering, among other things, logistics barriers to entry into the markets of different countries and post-pandemic recovery of China's economy, which is going slower than expected. Solving these problems is complicated by the lack of comprehensive research features of the design of international supply chains in wholesale e-commerce, as well as the limited data of official statistical monitoring of their functioning. Thus, the unresolved nature of several fundamentally contemporary issues in the design of international supply chains during the digitalization of the world economy leaves logistics management without a solid basis for justifying decisions, the implementation of which will ensure the sustainable development of these structures.

The problems of designing international supply chains in wholesale e-commerce are characterized by an insufficient degree of scientific development. In this regard, they are significantly inferior to the elaboration of theoretical and practical issues related to the competence of logistics of cross-border (international) retail trade. This situation is primarily stipulated by the pronounced dynamism of development of the e-retail sector and the peak load on logistics processes in this industry. As a result, scientific interest has been attracted to it. However, no less important is the underestimation of the speed of shifts in wholesale trade in favor of the electronic form of this type of activity. Although this trend gives a powerful impetus to the transformation of the subject composition of supply chains in wholesale e-commerce and logistics interactions between their participants. The unresolved problems of designing international supply chains in this industry are also determined by the general trend of considering ways to digitalize supply chains within the first lines of consumers and suppliers, i.e., without the participation of resellers and trade organizers.

The current state of these problems is also determined by the lack of proper research into the institutional aspects of the formation of supply chains in wholesale e-commerce in the PRC and abroad. Under these conditions, comprehensive consideration of the design features of such structures thus becomes mandatory.

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## Chapter 1. Introduction and Aim of Study

Thanks to the operational interaction of logistics systems and modern technologies, the term digital logistics emerged, characterized by new solutions for business development.

The main function of IT tools is to provide effective capabilities for the implementation of new logistics solutions.

These capabilities consist of the exchange of necessary data between individual logistics, production and support systems and their elements, as well as goods and the external environment.

E-commerce, as a phenomenon that became widespread in the 90s, is almost the same age as the concept of supply chain management, which appeared in the 80s of the twentieth century. Their emergence during this period reflects a new vision of the international economy as significantly more integrated and informationally transparent. Subsequently, to this day, the development of electronic commerce and the global Internet leads to the formation of the so-called “network economy”, to increasing transparency, accessibility of seller and buyer, increased speed and changes in the mode of their communication. Thus, consideration of the impact of e-commerce on supply chain management techniques is especially relevant nowadays.

In its most general form, e-commerce should be understood as any systematic, targeted commercial activity carried out through the use of computer networks at the main stages and operations, as a result of which inventory and intangible assets are transferred from their seller to the buyer.

The supply chain refers to a series of organizations connected by contractual transactions: from the supplier of raw materials to the end user. Supply chain management is an automated process of planning, executing and monitoring orders for the supply of products and exchanging information between the focal company and counterparties under the terms of coordinating efforts to meet demand and minimize costs from the moment the need is formed until the moment the product is consumed. The counterparties in this model are manufacturers, forwarders, providers and other



participants in logistics processes. As part of cost minimization, material, financial, information flows, and time costs to satisfy consumer requests are optimized on an ongoing basis.

It is important to note that e-commerce today is becoming one of the ways to manage supply chains, which is associated with the strengthening of the digital technology factor, which simultaneously changes the structure of business processes for the company and the external effect produced on the buyer, as well as the structure of associated costs.

The concept of a network economy makes it possible and necessary to redistribute management functions that were previously concentrated within one enterprise.

In conditions when the exchange of up-to-date information and real-time monitoring becomes technically possible and financially accessible, it turns out to be more profitable to outsource some of the functions (production, distribution) and transfer them to external providers. The electronic trading format makes its own adjustments to the balance of the considered processes within the framework of supply management. One can note a significant improvement in the processes associated with the transfer of information between counterparties, as well as the emergence of new complexities and problems in inventory management processes, the turnover rate of which adapts to electronic commerce more slowly. At the same time, information technologies, when used more thoughtfully, can provide tools for optimizing costs in this segment of supply chain management. Ideally, there should be no visible difference between e-commerce and traditional sales for the end consumer. On the contrary, the Internet format must be able to better, more accurately and faster satisfy the needs of customers.

Methodological approaches that ensure increased efficiency of supply chain management in electronic commerce come down to building a more developed and detailed system around the above concepts. At the same time, it is important to use their strengths to the maximum, as well as identify weaknesses and reduce the risks characteristic of e-commerce tools.

The purpose of this research is to develop scientific and methodological

recommendations for the design of international supply chains in wholesale e-commerce, considering the influence of institutional restrictions on their configuration in the PRC and its counterparties.

To achieve the formulated goal, the following main objectives of the dissertation research were set:

- analyze the typology of e-commerce models, taking into account the peculiarities of their categorization.
- identify and disclose the dependence of transformations of supply chain configurations on the level of development of wholesale e-commerce.
- justify the strategic rules for designing supply chains in wholesale e-commerce.
- explore the distinctive aspects of the development of wholesale e-commerce, considering country specifics.
- reveal the features of the focus of state regulation of the economy in the PRC on interactions in supply chains in the conditions of digitalization of wholesale trade.
- clarify the types of functional areas for designing international supply chains in wholesale e-commerce, their boundaries and purpose.
- develop the theoretical foundations of strategies for designing international supply chains in wholesale e-commerce between enterprises of the PRC and other countries.
- develop recommendations for managing logistics risks of projects for building international supply chains in wholesale e-commerce.

The methodological basis of the study included: principles of system analysis, tools for statistical data processing; methods for searching for unstructured information, extracting it from large arrays of logistics data and processing; techniques of abstraction in scientific logistics research and formalized expression of their results.

The validity and reliability of the research results are confirmed by:

- adherence to traditional norms and rules of supply chain management.
- an integrated approach to performing the research work.
- preservation and development of scientific logistics values in the provisions of the research.

- using known and verifiable data that determines the current state of electronic commodity markets, wholesale trade and the prospects for their development, taking into account the post-pandemic evolution of cross-border trade.

The scientific novelty of the research results lies in the substantiation of a structural and functional approach to the design of international supply chains based on digital economic relations, considering the variability of their configurations and the features of their state regulation in wholesale trade in the PRC and other countries.

The theoretical basis of the study included:

- existing systems of scientific views and institutional approaches to the development of e-commerce and supply chain management in PRC and abroad.
- scientific assumptions (hypotheses) about the evolution of the structure of these multiple organizational logistics entities in the context of digitalization of the economy and priority areas for switching their management to an electronic format.

## Chapter 2. Literature Review

Despite the relatively high degree of scientific interest to the topic of e-commerce in general, the particular subject of supply chain design for wholesale e-commerce is still lacking comprehensive studies and therefore the sources used in this research represent a combination of fundamental textbooks on logistics and supply chain management, relevant articles and publications, materials from professional conferences and forums, online resources, and legislative acts of different sort.

The conceptual basis for the modern development of supply chains and logistics in the commodity distribution system of the consumer market, as well as in the product market as a whole, is laid in the works of such researchers as Michael H. Hugos, Joel D. Wisner, Keah-Choon Tan, David Burt, Paul Jackson, Barry Crocker, Rose George, Sunil Chopra and others. In the works of the listed authors, a scientific and methodological basis for the institutional-market transformation of supply chains of the consumer market has been formed.

Problematic aspects of cooperative interaction between parts of the commodity distribution network, market sustainability of supply chains and the formation of the vector of their current market evolution in the domestic sphere of commodity circulation were the subject of research of Michael Watson, Jonathan Kingsman, Wouter Jacobs, Robert A. Eastsun, Murad Harasheh, and others.

The modern institutional transformation of online commerce, its determining factors and conditions have received a detailed analysis in the works of such authors as Shannon Belew, Robert Kasey, Stephanie Chandler, Michael Ezeanaka, Brian Smith, Charles Camisasca, and others, who tried to assess the role of online trading and new communication sales channels in the formation of a balanced model for the development of the trade and retail system of goods supply to the consumer market.

At the present stage of development of supply chains in the consumer market, the transition to an omni-channel sales model creates the prerequisites for strengthening the role and importance of logistics as a factor in the competitive market transformation of multi-channel supply chains. The conceptual platform of modern research in the field of Internet logistics, fulfillment and last-mile logistics as the closing part of multi-channel supply chains was formed in the works of such researchers as Michael Decker, Raphael Preindl, Chris Jordan, Ramon Abalo Costa, Jonathan Reeve, Jo Weber and others.

Some challenging issues of the development of digital supply chains and the digital transformation of logistics in the context of the emergence of online commerce are reflected in the studies of such specialists as Thomas Mrozek, Daniel Seitz, Ralf W. Seifert, Richard Markoff, Bart L. MacCarthy, Dmitry Ivanov, Götz G. Wehberg, Albert Tan, Sameer Shukla and others.

Emphasizing the depth and effectiveness of the above studies, it should be noted that the development of competition in online trade and the transformation of the trade and retail system of goods supply to the consumer market require a more in-depth analysis and conceptual mapping of the logistics of omnichannel supply chain construction in the context of the growth of online commerce, which a priori opens up prospects for fundamentally new trends in the development of Internet logistics and reconfiguration of supply chains in omni-channel trade system.

## Chapter 3. Data and methodology: theoretical foundations of supply chain design in the context of digitalization of wholesale trade

### 3.1. E-commerce model

Real achievements in the digitalization of the national economy have already acquired the status of a leading criterion for progress in its development. However, this trend has not yet become universal. The lack of this attribute is broadly explained by inertia in the electronic transformation of a country's economy. Its existence is determined by several factors.

First, digitalization (full or partial) of business processes and ensuring the homogeneity of commercial activities, considering the coexistence of their various formats (classical and electronic) is a challenging task, including an investment one.

Second, the process of transferring the economic activities of enterprises into the information space is inevitably associated with resistance to digitalization. Such resistance to change is exerted not only by the staff, but also by the stakeholders of the enterprise, i.e., suppliers, consumers, etc. The motives for such behavior are different. The former consider digitalization as a threat to their interests, while the latter see an uncontrolled increase in costs and risks [21].

Third, the desire of enterprises for the total implementation of information technologies is largely hampered by the incomplete development of institutional regulations in the field of commercial digital interactions.

Fourth, the speed of penetration of digitalization into segments of the national economy is differentiated by industry.

Fifth, national markets that provide full-fledged conditions for commodity circulation, based on digital economic ties, are only just being formed.

Expectations for overcoming this inertia are most closely related to wholesale trade. It is relatively easier to digitalize [159]. In addition, its industry scope is much broader, since in the production sector, sales and logistics are conducted mainly through

wholesale trade. One of the functions of trade is to bring goods from producers to consumers. The effectiveness of this process largely depends on the quality of logistics management in the field of commodity circulation. As a result, supply chain management is rightfully given the status of a key object of digitalization in trade. The features of this transformation in scientific publications are considered from the perspective of only the formation by enterprises of their own electronic logistics environment within the first lines of consumers and suppliers [76, 138]. The modern potential of trade intermediation, in which wholesale trade plays a vital role, is therefore not considered. This is not the optimal approach. Wholesale trade provides the largest movement of goods in the economic space, although within the boundaries of only the B2B sphere. In addition, it plays a dominant role in changing the form of value of a product (i.e., in performing another main function of trade). Moreover, it is in wholesale trade that there is a frequent change of ownership of goods. They move from one counterparty to another, essentially forming a flow of “rights” of this type. The direction of their movement determines the logic of building supply chains. The nature of trade intermediation in the B2B sphere is undoubtedly changing under the influence of digitalization. Considering the consequences of this trend to justify supply chain design policies in the context of the gradual transfer of commercial (trade) and logistics interactions into innovative virtual economic reality (primarily in the B2B sphere) thus becomes particularly relevant.

Among the most expected consequences of the total digitalization of the world economy, it is necessary to highlight a sharp reduction in transaction costs and the loss of the need for the services of intermediaries (primarily trade) in commodity circulation. The first one is obvious. The formation of a unified technological basis for electronic commercial relations and the growth of trust in them (through electronic guaranteed identification and authentication of participants in trade, including full access to the history of their business activities) certainly contributes to the rationalization of market self-regulation. Because of this, classical transaction operations are gradually losing their relevance.

For example, the search for potential counterparties is increasingly carried out using special software tools that include constantly updated databases. However, there's no discussion about the rapid elimination of transaction costs as a result of electronic

progress. The onset of this event is hampered by the social component of commodity exchange, the digitalization of which is difficult. This factor determines the complexity of creating supply chains whose life cycle is not limited to achieving a one-time goal. The relationships between their participants are always unique [163].

Therefore, responsibility for their management cannot be transferred to special software [59]. Another consequence of total digitalization (elimination of the institution of classical market intermediation, and in particular, its distribution and dealer links), is not so obvious. There is every reason to believe that this institution will continue, although its structure and nature will change.

The theory of electronic commerce, despite the explosive growth in the number of scientific and methodological publications devoted to this branch of knowledge (in recent years it can be seen quite clearly), has not yet been finally formed. The following provisions should be considered as arguments in favor of this statement:

1. Exclusive attention in scientific and methodological works on the topics is focused on those problems that arise in the field of electronic retail trade (domestic and cross-border), although its volumes are extremely negligible compared to electronic wholesale trade.
2. Lack of a clear terminological policy in such an area of knowledge as the implementation of commodity exchange in electronic format.

The presence of opposing opinions regarding the interpretation of the category of electronic commerce is shown in Fig. 3.1.

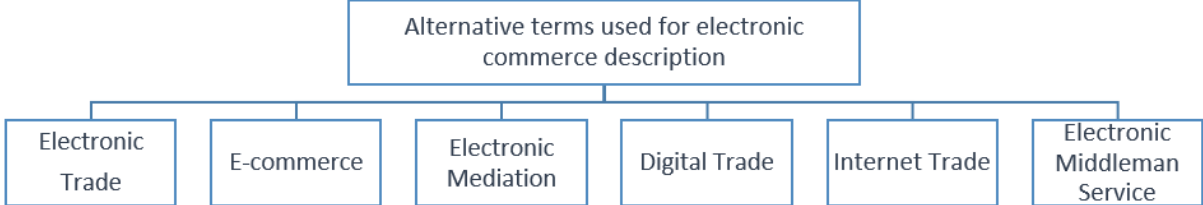


Figure 3.1 Variability of definitions of the concept "electronic commerce"

For the purposes of this research, it is suggested to use the following terminology for the definition of diverse types of electronic transactions related to goods and services circulation (Fig. 3.2).

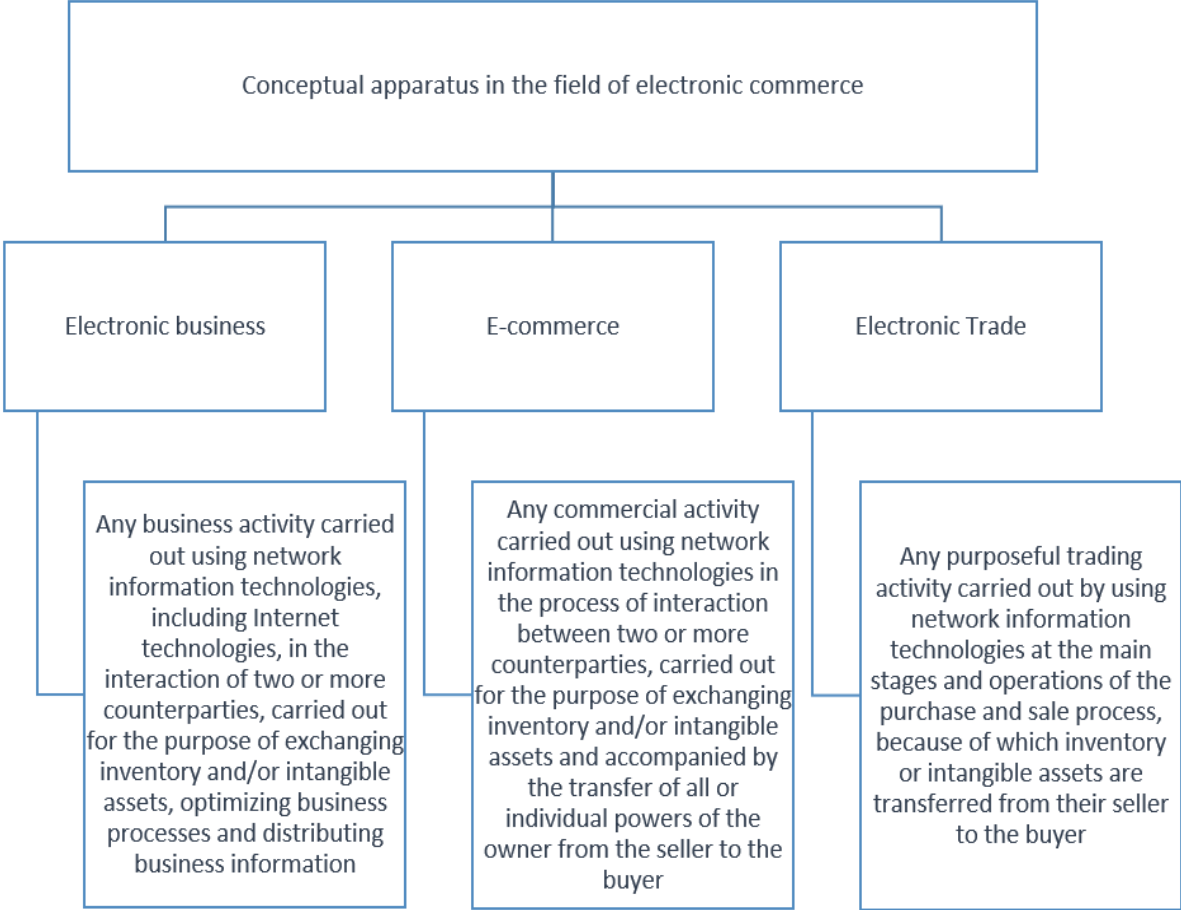


Figure 3.2 Conceptual approach to the definition of E-commerce related activities

The development of information technologies determines the transformation of e-commerce models into an e-commerce format with a pronounced platform component. The presence of this component creates objective prerequisites for combining the functionality of the purchase and sale of inventory and/or intangible assets with the functionality of providing related services (logistics, financial, information, etc.). The concepts “electronic commerce” and “electronic trade” should therefore be considered synonymous.

To substantiate this point of view, it is reasonable to refer to the priority trends noted in [151,37] in the field of electronic commerce, which have a significant impact, including



the one on the organization and management of supply chains (Fig. 3.3).

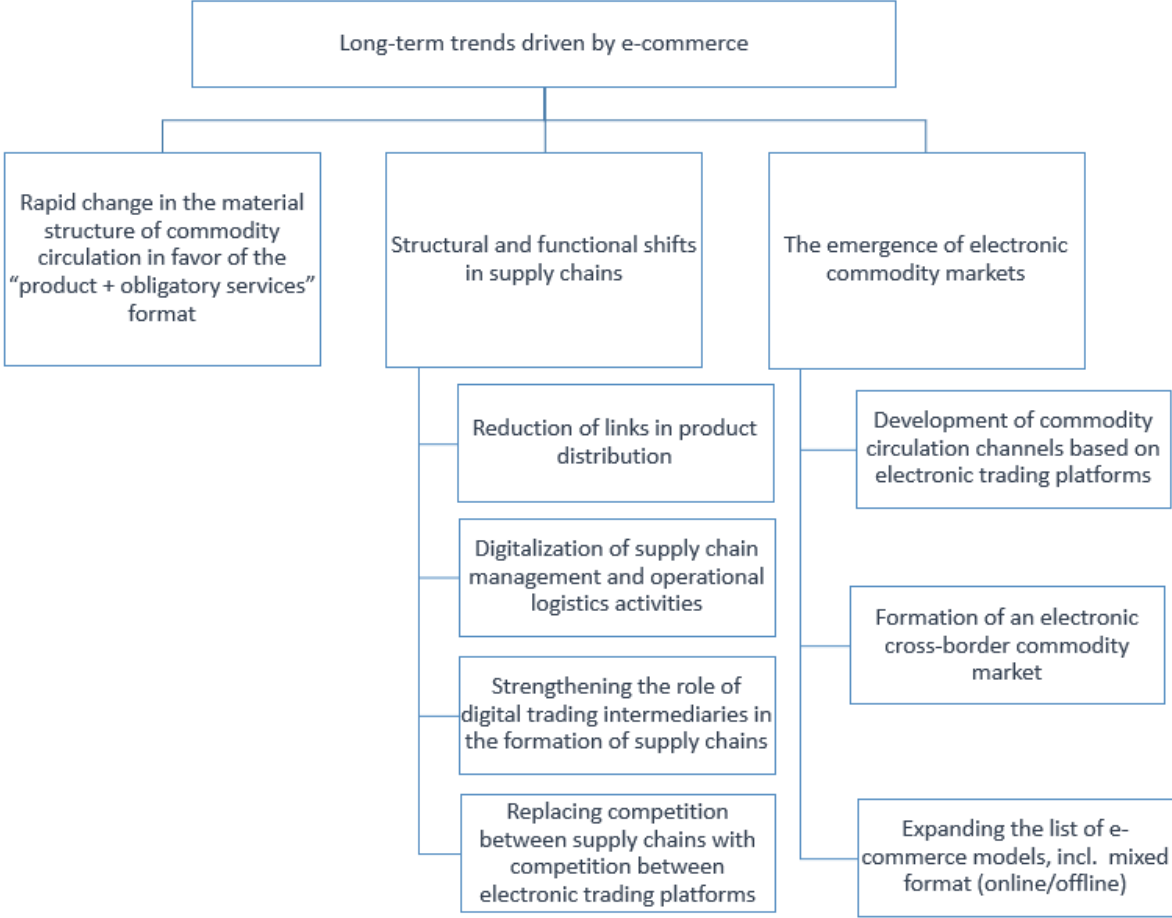


Figure 3.3 Anticipated consequences of the positive dynamics of e-commerce development [37, 151]

Development of network information technologies, big data technologies, etc. digital mechanisms led to total and widespread transition of economic relations between enterprises, including the stages of their formation at the pre-contractual stage of transactions, into electronic format. The massive formation of electronic trading platforms (ETPs) has contributed to the expansion of this practice of commercial interactions. All this initiated the objective need for the development and institutional regulation of formalized platform-type actions that ensure the algorithmizing of trade interactions within a single business-information global space. Achieving this goal has led to the emergence of several types of digital platforms.

The emergence of such new entities in the commodity and services market, including logistics, has largely changed the landscape of commodity exchange (both at the level

of a country's domestic market and at the level of international trade). This is manifested in the following main aspects:

1. the system of market transactions undergoes significant transformation:
  - the scope of visibility of the list of potential counterparties and supply chain participants is expanding (thanks to the construction of a global business information space).
  - there are many opportunities for direct access to suppliers without involving classic trade intermediaries in this process (in other words, objective prospects arise for a legitimate reduction in the level of commodity flow, a reasonable reduction in the number of participants in supply chains and, accordingly, a reduction in transaction costs).
  - c) the rules for conducting transactions in electronic format are established by the operators of e-commerce platforms (they also control the life cycle of digital economic relations that are carried out under their auspices, including commercial interactions with consumers - individuals, and take delivery orders of goods that arrive on these platforms, on themselves).
  - d) e-commerce platforms function as aggregators (integrators) of a range of services that are vital for the execution of transactions in this industry with their help (a set of measures for service support of electronic trade transactions with the allocation of a logistics component in it, that is, fulfillment, which can be outsourced).
2. e-commerce platforms are increasingly taking over the initiative to form supply chains from "focal" companies.
3. competition between supply chains, including international ones, is today being replaced by economic competition among e-commerce platforms (this trend is prompting states to develop a new approach to regulating e-commerce) [2].

Digitalization of the market for goods and services creates new prospects for the development of international trade. This statement applies to electronic cross-border trade (retail and wholesale). This is due to a number of provisions:

- the presence of state borders between countries is not an obstacle to the formation of a single global space.

- the efficiency of international trade due to the direct supply of goods abroad, reducing transaction costs (eliminating the trade intermediary link) and increasing the level of personalized attention to the needs of the end consumer in this case increases.
- the trend of mutual recognition by many countries of the institution of an authorized economic operator significantly simplifies the import of goods into domestic markets of other countries, etc.

E-commerce is based on different business models that bring diverse sources of value to enterprises and have different limitations. There are four main and several less popular models of electronic commerce that can characterize almost any transaction that takes place between suppliers of goods and services and their consumers.

The B2B (Business to Business) model is a conventional description of trade relationships, the characteristic feature of which is business interaction between enterprises – suppliers and enterprises – consumers, that is, the exclusive participation in the process of buying and selling goods/services only by institutional counterparties.

- Operators of B2B e-commerce platforms, including international ones, provide a wide range of services that are necessary for the full execution of an electronic transaction. These include:
  - familiarizing potential consumers with products offered for online sale.
  - conducting verification of potential suppliers (legal and qualification) to determine the possibility of their admission to online sales through the e-commerce platform.
  - providing suppliers with the results of comprehensive analytical studies of trends in the field of online sales of goods through the e-commerce platform.
  - a list of services that form the basis of fulfillment, including provision of logistics support for the execution of supply orders and organizing warranty and after-sales services for consumers.
  - resolution of commercial disputes.
  - quick response to consumer complaints, etc.

The B2B model is aimed at the exchange of information between an enterprise and participants in the system of economic relations, including potential institutional counterparties. Thanks to this process, the enterprise conducts logistics positioning in

the external environment, that is, it determines the need for network business connections with other economic entities or, in other words, justifies the optimal option for integrating into supply chains/forming such structures under its “focal” leadership [4, 181].

The B2C (Business to Consumer) model is a description of trade cooperation that involves direct interaction between manufacturing/wholesaling enterprises and representatives of the last link in the supply chain (that is, with retailers). This model is primarily used to organize sales of consumer goods to individuals.

One of the varieties of the B2C e-commerce model should be considered the M2C scheme (from manufacturer to consumer). Its distinctive feature is direct trade cooperation between manufacturing enterprises and retail enterprises [69].

The M2C e-commerce model is based on a mechanism of comprehensive information support for transactions, which allows to:

- manage sales considering personalized consumer requests.
- integrate marketing, trading, logistics and other functions within order management.

The C2C (Consumer to Consumer) model is a scheme of trade interactions in electronic format, which involves the establishment of direct commercial relations (conclusion of a purchase and sale agreement) between end consumers (individuals). The implementation of this model in practice leads to the construction of cross-border C2C platforms. Representatives of the latter are, for example, eBay and Taobao [4].

The C2B (Consumer to Business) model is based on the principle that the operator of an e-commerce platform uses a policy of positive response to consumer requests that indicate their desired selling price [69].

It is worth noting that in this case, the platform operator carries out the function of selecting suppliers who are ready to ship goods at the price requested by consumers. In this way, the operator, among other things, sends signals to potential suppliers about the need to adapt their commercial offers to the real structure of demand.

Innovative models of e-commerce include B2Q, B2T, B2B2C and M2M, which reflect

the trend of development of the functionality of related necessary services within e-commerce platforms.

For example, when using the B2Q model (quality control for corporate online purchases), both parties to an electronic trade transaction provide in the supply agreement the possibility of involving a third party, that is, qualified experts, in checking the quality of the goods and after-sales service. This approach creates objective prerequisites for:

- constructive assessment of supplier's fulfillment of contractual obligations.
- reduction of the risk of commercial disputes between counterparties.
- improvement of the level of customer service, including logistics services.

The B2T (Business to Team) model of e-commerce characterizes "group purchases" from a single seller. The peculiarity of such joint procurement using Internet technologies is as follows. The basic condition for the shipment of goods to consumers at a reduced selling price is the receipt of a number of orders limited by the supplier.

In China, group purchasing (conducted by individuals) is most common in large cities such as Beijing, Shanghai, and Shenzhen, among consumers aged 25 to 35 [187].

The widespread use of the B2T e-commerce model is explained by the following provisions.

First, suppliers thus ensure that the requirement for a minimum shipment of goods is met, securing the profitability of sales. From the point of view of better logistics services to consumers, the latter should be able to purchase goods individually. However, such logistics practice does not always allow the supplier to obtain a significant economic effect for him.

Second, the practice of B2T e-commerce is extremely attractive to many consumers, in particular, because it allows to avoid:

- the need for a long wait for trade discounts.
- risk caused by the withdrawal of an attractive product from circulation.

The B2B2C model (business to business to customers) is characterized by at least two provisions.

First, it needs to be considered in the context of business interaction between a supplier of goods and an operator of an e-commerce platform aimed at consumers. In this case, it means agreeing on the list of goods offered by the supplier for online sales, including the terms of their sale, with the conditions for the operator of the e-commerce platform to provide related services, including logistics services, in order to provide better trading services to customers.

Second, the B2B2C model in e-commerce should be considered in the context of electronic business interactions between suppliers and retail chains. The peculiarity of such trade relations is manifested in the following.

Retail chains widely practice placing orders for the supply of goods through electronic trading platforms. As part of this logistics activity, they operate by product categories, that is, they impose specific requirements on the assortment component of each individual lot. Suppliers and, accordingly, ETPs should take this circumstance into account.

Cross-border B2B2C e-commerce platforms tend to carry out a wider range of business activities:

- servicing domestic producers or trading enterprises and foreign wholesale and/or retail buyers.
- promotion of goods under their own trademark on the domestic product markets of other countries.

The M2M (Marketplace to Marketplace) model refers to a business model that characterizes the innovative features of business interactions between marketplaces. Such cooperation contributes to the convergence of their areas of trade responsibility and the subsequent integration of their external business processes into a single unit.

In the process of implementing the model at least two main stages are notable:

- connecting marketplaces (aggregators of many independent online stores) to an e-commerce platform.
- integration of these e-commerce entities with other similar organizations.

The obvious advantage of this model is the significant expansion of the product range,

that is, the formation of a pool of commercial offers attractive to consumers. However, there are several disadvantages.

Among them, the complexity of not only developing a full-fledged product catalog (common for the entire e-commerce platform), but also a convenient navigator for consumers, allowing them to select the right commercial offer in the shortest possible time.

The B2A (Business to Administration) model, by its purpose, does not belong to cross-border e-commerce models, but is characterized by high rates of development both in China and in other countries. The B2A model combines transactions conducted online between enterprises and government bodies, and includes all forms of interaction between the state and business in an interactive environment:

- conducting electronic tenders for the supply of products and services for government needs.
- calculations for tax and customs payments, etc.

The C2A (Consumer to Administration) model is also not an e-commerce model. It characterizes special transactions. The latter are carried out in the format of interaction between consumers of public services and government agencies to which the relevant functions for this type of service are delegated.

The list of such services is quite wide and includes the following items:

- educational services.
- information Services.
- services provided by various government departments, for example, the Federal Tax Service.
- health care services, for example, making an appointment with a doctor, providing information about diseases, paying for medical services, etc.

Currently, government agencies are creating and using electronic platforms to interact with their citizens. This is a global institutional strategy. It is being implemented as part of the implementation of the concept "electronic government".

In [37], there are three successive stages (phases) that e-commerce goes through in

its evolutionary development (Fig. 3.4).

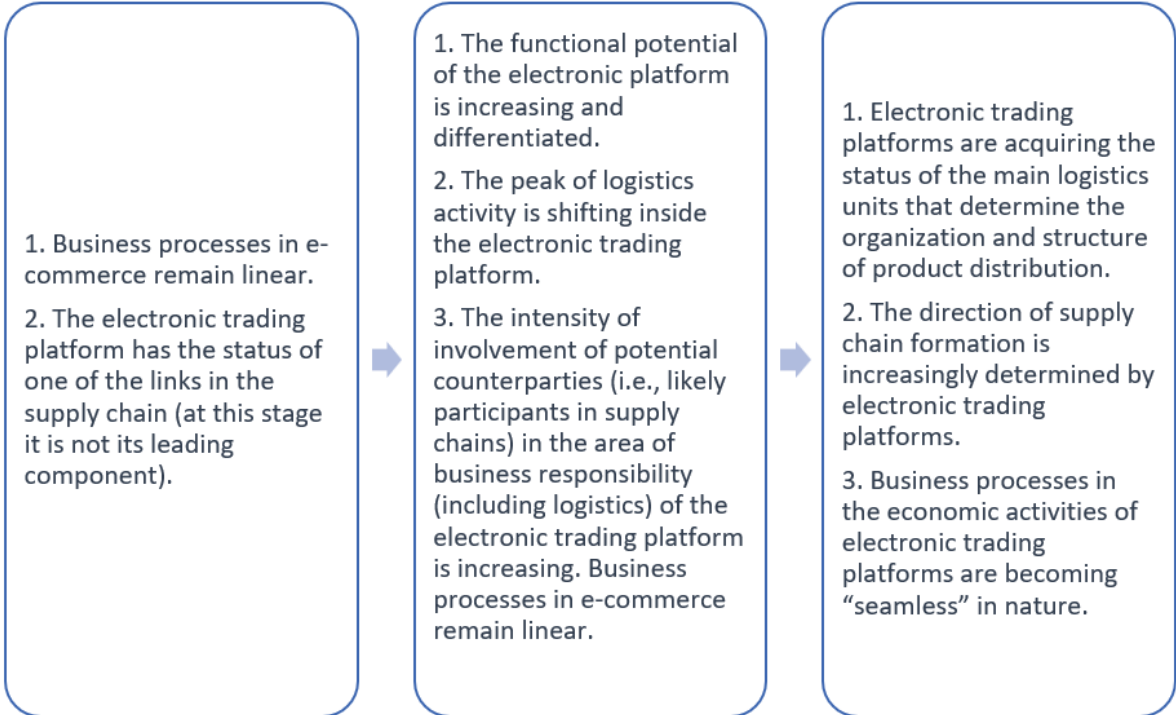


Figure 3.4 Characteristics of the stages of progress in the field of e-commerce and its logistics consequences [37, 151]

There is every reason to believe that the third stage of evolutionary development will see the integration of all known e-commerce models within the framework of cross-border digital platforms, which are the basis of global ecosystems.

### 3.2. The impact of digitalization of wholesale trade on the transformation of supply chain configurations

The digital transformation of the B2B sphere began with the transition of enterprises to electronic data interchange (EDI) based on the Internet [154, p. 121]. This process directly affected classical trade intermediation only after the emergence of the opportunity to make electronic transactions and organize wholesale trade on the Internet, i.e., facilitate the change of ownership of the goods. Subsequent structural and functional shifts in trade intermediation, in turn, have led to the need to reconsider approaches to supply chain design in the new "digital" environment. This is explained



primarily by the fact that the digitalization of commerce, i.e., trade, and logistics (including supply chain management), are analyzed in isolation from each other. Meanwhile, these trends are inextricably linked with each other. The first of them initiates the formation of a digital infrastructure of the market for goods and services, which has a new subject and object composition. It represents a complex of trading intermediaries operating in electronic format (independent public electronic trading platforms/e-marketplaces, aggregators of information about goods, etc.) and a material and technical base that ensures the main market processes in the digital space. This creates new conditions for the functioning of supply chains, which predetermines the need to search for new strategies for their design. The second trend (digitalization of logistics) is due to the increasing influence of e-commerce on both the configuration of supply chains and the flows in them [75]. This impact contributes to the rationalization of:

- product distribution (due to the growth in the volume and quality of information in the Internet resources, and the spread of the practice of electronic interactions in the B2B sphere, i.e., the formation of a single digital market for goods and services).
- information flows (by ensuring continuous access to the necessary data, etc.).
- financial flows (due to fast payments, comprehensive cost control), etc. [154, p. 125; 156, p.541].

An analysis of works devoted to electronic commerce indicates that one of the most complete typologies of intermediaries representing this sector of the economy is shown in [121, p. 47]. In it, as well as in [16, 56], there is no emphasis on the impact of e-commerce on supply chain management. In [121, p.49], the category of “electronic” resellers includes an electronic trading platform (ETP) operating in the B2B sphere. However, the owner of the ETP is not a reseller, but an organizer of wholesale trade (he does not acquire ownership of the goods). Here it is necessary to note that in the future, by commercial ETP the following will be meant: an information system that includes special software which provides the ability to conduct electronic procurement and sales procedures in the B2B sphere on a reimbursable basis. A similar definition, but for the B2G sphere is given in [100]. In [16, p.56; 56, p. 141] online catalogs of goods and services generated by third parties are identified as separate types of ETP.

This approach does not look relevant. Such catalogs are aggregators of information about goods (services), so their owners are also organizers of trade turnover [97]. The typology of resellers given in [121, p.49] has not lost its relevance. However, considering the modern vision of the B2B electronic market, it is reasonable to divide it into groups of digital resellers in the following sequence:

- enterprises specializing in the resale of goods.
- organizers of trade turnover.
- logistics and functional intermediaries.

The first group of the classification of electronic trading intermediaries should include organizations that fit the classic definition of this category (independent electronic stores; e-marketplaces, in which their owner retains a part of the retail space for himself and rents out the other). Stores engaged in wholesale sales using the Internet in the B2B sphere in the Russian Federation have quite a large development potential for the following reasons:

- it is easier for them to implement a policy of focusing on clients, including those located outside large agglomerations and east of the Urals.
- they have the opportunity to:
  - a) eliminate unproductive intermediaries from supply chains.
  - b) provide consumers with personalized advisory support.
  - c) rationalize the functional cycle of wholesale logistics.
- an electronic store, unlike an ETP, allows the formation of stable economic relations (the sales mechanism in this case does not exclude the establishment of informal relations between the seller and the consumer).
- their creation is in demand from small and medium-sized businesses for the purchase of small volumes of goods based on simple methods of placing orders for supplies, which today is practically not satisfied.
- the projected share of e-sales in the B2B sector in the near future may reach 30%, i.e., increase by more than five times, etc. [35, p.45; 114, p.6; 175, p.38].

E-marketplaces can also be considered as digital analogues of shopping centers [150, p.3]. In the B2B sphere, their clients are entrepreneurial structures whose scale of activity ranges from micro to mid-level enterprises. Practice shows that their owners,

using these trading capacities, often carry out wholesale sales themselves, i.e., their business is diversified. In this case, they are simultaneously a trade intermediary and an organizer of trade turnover. It should be noted that in the Russian B2B sphere, there has recently been an influx of classic distributors into the electronic market and functioning on it as marketplace owners. One of the factors that stimulates this transition might be considered the non-recognition of the standard international distribution agreement by the Federal Antimonopoly Service of Russia. Meaning those provisions according to which restrictions are imposed on the activities of a distributor, for example, in the form of prohibiting him from operating outside the exclusive territory allocated to him. Such actions by the FAS Russia reduce the effect of preferences provided to classic distributors, forcing them to reconsider their strategic positions in the product market. This situation is aggravated by at least two circumstances:

- an increase in the frequency of occurrence of precedents for direct access of individual producers to consumers, i.e., accepting orders for supplies, bypassing intermediaries.
- the emergence of objective prerequisites for the transfer of wholesale trade to omnichannel services.

In this case, the market power of the focal company of the distribution network increases significantly, which does not exclude it from extracting quasi-rent from this situation [151].

The second group of the classification of electronic trading intermediaries should include organizers of trade turnover, i.e., ETP and e-marketplaces. ETPs operating in the B2B sphere are differentiated based on the following characteristics:

- ETP has an obligation to provide services to all enterprises (public ETP).
- ETP owner status - corporate ETP/ETP created by a third party (trade organizer).
- functionality of basic services for organizing trade turnover of ETP - purchases/sales.
- type of electronic procedures for placing an order for supplies performed by ETP.
- request for quotations/request for commercial proposals/conducting an auction (classical or reverse) or competition.
- product specialization of ETP – narrow/broad.

- focus of the ETP on servicing industry needs - vertical/horizontal.
- level of trade and logistics services of ETPs (depends on the quality and variety of services they offer).
- geographical boundaries of the provision of ETP services – national ETP/ international ETP [16, p.54; 35, p.132].

It should be noted that in [121, p. 56] “requests for quotations” are considered as one of the types of ETP, which is not correct. According to open data, about 100 ETPs operate in the B2B sector in the Russian Federation. Most of them are corporate, and predominantly owned by large enterprises. In the B2G sphere, at the same time, there are about 10 ETPs that meet the requirements [94, 100, 103]. The volume of contracts concluded using these ETPs is about 40% of the total wholesale turnover [116]. In theory, this means that more than 70% of B2B ETPs have excess sales capacity. Such a strong difference between the number of ETPs in B2B and B2G is not determined only by institutional policy, although its influence on the centralization of public procurement is obvious. This is evidenced, for example, by the introduction into legal circulation in the B2G sphere of regulations for the functioning of a single trade aggregator [127]. The imbalance between the number of corporate and external commercial ETPs in the B2B sphere is explained by the following reasons:

- the Russian market is dominated by monopolistic suppliers (not consumers like in other countries), who do not see the economic feasibility of solving the dilemma “own ETP / third party ETP” not in their favor, also due to the lack of the necessary functionality in external ETPs.
- it is difficult for external ETPs in the Russian Federation to attract large orders for supplies (this casts doubt on ensuring the break-even of their activities).
- individual corporate ETPs provide services for conducting procurement procedures not only for their own needs, but also for third-party organizations (commercial, government and with government participation).
- the maximum number of external ETPs in the industry, as international practice shows, does not exceed 1-2 ([154, p. 129]).
- small and medium-sized enterprises in the Russian Federation do not actively use electronic procedures for placing orders for supplies.

ETPs in the B2B sphere do not have the status of an object of statistical observation conducted by the Federal Service of State Statistics of the Russian Federation. This situation is due to the fact that e-commerce is not singled out in the official classification of industries, although there are all reasons for this. All this, accordingly, complicates the analysis of the digital transformation of wholesale trade in general and the state of the market for such ETP services in particular [168]. In this regard, attention is drawn to an article [71, p. 3], devoted to the assessment of the market for ETP services and “intercorporate” electronic commerce in the Russian Federation. Analysis of [71] indicates that its authors do not adhere to a strict division of ETP services based on the sign of belonging to the B2B and B2G spheres. For example, in [71, p. 10], participants in the electronic “intercorporate” market include enterprises that are subject to the law [95], i.e., Federal contract system regulating state and municipal procurement [12]. However, the trends noted in [71] to a certain extent can still be extended to ETPs in the B2B sphere. Among them, the following should be noted:

- retail chains form about half of the demand for ETP services.
- opening by enterprises of their own ETP (including their ownership) is losing relevance.
- corporate ETPs are gradually losing the ability to compete with independent ETPs.
- increased competition between ETPs leads to a flow of consumers of their services between them.
- the demand for purchasing small quantities of goods using ETP is increasing, etc. [71].

The growth of competition among Russian ETPs is also facilitated by their inclusion in a single interactive digital space under the auspices of the national ETP association [6]. A similar factor determines competition between e-marketplaces in the B2B sphere, only its source is somewhat different. This is an increase in the activity of commodity aggregators. Today, many suppliers are diversifying their sales presence in different e-marketplaces, primarily for the simple reason that potential consumers do not have a single point of entry into the entire system of e-marketplaces. The acquisition of goods and services by enterprises using external ETP allows to:

- reduce the number of employees in purchasing departments.
- shift the focus from searching for potential suppliers to debugging corporate procedures for placing orders for supplies.
- increase competition among such suppliers for the right to receive an order (due to access of an unlimited number of them to ETP services).
- more accurately track logistics costs.
- reduce the risk of corruption in procurement, etc.

At the same time, turning to ETP services entails the emergence of problems that require special consideration.

First, ETP services in the B2B sector are most in demand for the needs of material and technical supply of enterprises. This is because the main initiator of transactions using ETPs are customers (buyers). This calls into question the implementation of demand management strategies by suppliers, which in [143, p. 51] refers to one of the functional areas of management in supply chains. In addition, the list of goods purchased on the ETP is limited. In the B2G sphere, it is regulated in [107]. There is no such practice in the B2B sphere. However, its analysis shows that the following requirements are generally imposed on goods purchased on the ETP:

- they must comply with the conditions for using competitive methods of placing orders for supplies (reverse auction, competition).
- the ability to draw up precise specifications.
- no need for commercial negotiations at the transaction preparation stage.
- a clear understanding of the characteristics of receiving goods in terms of quantity and quality.
- delivery of goods does not require the provision of a wide range of additional services, which require approval, etc.

Second, placing orders for supplies on the ETP based primarily on a reverse auction and competition does not imply the formation of long-term economic ties. This practice leads to at least two consequences:

- potential suppliers may lose interest in interacting with the customer.

- the customer loses the opportunity to ensure reliability of supplies and optimize the size of the purchasing department by building long-term interactions with a limited number of suppliers [55, p. 23; 154, p.139].

Third, only single-link supply chains are formed based on ETP services.

Fourth, reliance on ETP services practically eliminates the establishment of personal contacts between representatives of potential counterparties. The likelihood of their establishment within the framework of a chat, which is allowed on the ETP for the purpose of personalizing transactions, is minimal. The exclusion of the social component of commodity exchange entails excessive formalization of purchase and sale processes, which also gives rise to new logistics risks. They arise in the case of transferring the responsibility of logistics managers to special software, which actualizes the legitimacy of this approach [59, p. 126].

Fifth, the creation of a unified digital business space, despite the institutional support for this project, is a lengthy process [102]. In addition, there is no reason to believe that large-scale replacement of classical wholesale trade with electronic trade will occur in the near future.

Sixth, as part of the decision by enterprises to shift the center of activity of placing and accepting orders for supplies in favor of ETP, assessment of the quality of the services they provide comes to the fore. Achieving this goal is made difficult by the lack of a special ISO standard that allows assessing the compliance of ETP services with the requirements of the quality management system. It should also be noted that the regulation of the list of KPIs for these services is insufficiently detailed. In [71], this list includes:

- level of customer support.
- ease of navigation on the ETP website.
- speed of processing requests.
- ensuring ETP competition between potential counterparties for obtaining a supply order.
- completeness and flexibility of the intermediary functionality of ETP services.

In this context, the latter type of KPI deserves special attention. It is worth highlighting

the indicators that reflect the degree of logistics support of ETPs for supporting transactions concluded on them throughout their entire life cycle. Such support should include:

- provision of consulting services on logistics and supply chain management.
- assistance in attracting logistics providers (3PL and higher) to support transactions.
- introduction of additional logistics services allowing to sell unclaimed warehouse balances, promptly rent out/handover storage facilities, etc.
- ETPs that specialize in international trade, between the Russian Federation and the PRC, deserve special attention. The main task of their owners is to configure the information technology interfaces used by the ETP in order to ensure convenient interactions between potential counterparties, considering country differences in the conduct of not only business, but logistics management.

The third group of electronic trading intermediaries consists of logistics and functional intermediaries. The first of them include those that provide services to ETPs and e-marketplaces in the B2B sphere in terms of comprehensive services to consumers in the process of executing electronic supply orders, i.e., fulfillment services. There are several points to note here.

First, if in the B2B sphere the demand for these services is just emerging, then in the B2C sphere their provision has already become the norm.

Second, the prospects for the development of electronic logistics intermediation largely depend on the degree of digitalization of logistics services.

Functional intermediaries include all those organizations that create conditions for conducting electronic transactions (for example, providing intermediary services for accepting payments).

Enterprises that provide commercial, logistics, financial and other interactions between counterparties in the electronic market based on information technology, i.e., creating normal conditions for conducting electronic commerce (digital trading platforms, Internet providers, digital services, etc.), should be categorized as an independent group of the participants of the market. It should also include information intermediary



organizations that specialize, among other things, in providing consulting logistics assistance to enterprises:

- to justify the need for their acquisition of material resources (MR), taking into account:
  - the presence of substitutes.
  - the emergence of new progressive types of MR.
  - systematization of MR.
  - verification of MR characteristics declared by manufacturers.
- to sell out the excess and unnecessary MR, etc.

It is worth noting that checking the distinctive properties of MR is extremely important for consumers - participants in the B2B sphere, for at least two reasons.

First, one of the marketing sales strategies in this sector involves diverting the buyer's attention from those criteria for evaluating MRs that they do not meet [72, p.42]. This approach generally corresponds to the theory of supply chain management (one of its competencies is demand management) and the cognitive theory of marketing [143, p.51; 174, p.130]. At the same time, it does not entirely coincide with the position of M. Kotler, according to which marketing is expected to assist customers in purchasing goods (by conducting examination/testing of goods) [48, p. 16].

Second, the practice of international trade indicates the relevance of insurance against the purchase of low-quality goods in the event of their purchase in large quantities. The participants of the group that was noted above form and ensure the functioning of the "production" component of its electronic infrastructure (part of the infrastructure of the digital environment), which somewhat distances them from resellers [8, p. 192; 145, p.167].

The leading component of the formation of the institution of electronic intermediation in the B2B sphere, therefore, is a large-scale process of transferring ownership of goods to the national digital business space. The powers to execute (assist in this) commercial transactions in electronic form are transferred, accordingly, to a new type of resellers. This factor objectively determines the transformation of the vertical and horizontal structure of economic relations and the configurations of supply chains.

Ensuring the sustainable development of the intermediaries in question (e-marketplaces, electronic trading platforms, etc.) also depends on the degree of attractiveness of their organization of logistics support for the life cycle of a trade transaction for customers, i.e., consumers of their services. The fulfillment of this condition is primarily determined by progress in the digitalization of the classical logistics infrastructure of the commodity market (transport and warehouse facilities), i.e., integration of its objects with the global information system (Internet). However, no less important here is the creation by resellers of a new type of specialized logistics service. One of the promising directions for their design should be the imputation of a function that allows them to collect data about logistics infrastructure objects and interact with them directly using the Internet. A necessary condition for achieving this goal is the ability to monitor the following parameters of the functioning of these objects:

- location.
- degree of load.
- types of logistics services provided.
- readiness to provide them.
- level of logistics service.
- productivity.
- guarantees of supply security.
- the ability to interact with logistics service providers in a continuous interactive mode.
- tariffs for logistics services and pricing for them (for example, considering the peculiarities of warehousing goods, order picking, shipment of goods, transport and warehouse interactions), etc.

The need to develop such a service is determined by the difficulty of outsourcing marketplaces and electronic trading platforms to transfer the authority to organize personalized logistics support. The reasons that determine this situation include:

- the contract logistics sector, in the Russian Federation, is at an early stage of development.
- a complete list of key performance indicators for logistics services has not been generated.

- interaction with logistics providers is associated with a number of risks (contractual and commercial).
- not all logistics providers pursue a customer-oriented policy (in particular, this is most often manifested in their lack of demonstration of empathy for the client, i.e., sympathy for his logistics problems), etc.

Organizing the collection by digital resellers of data on logistics infrastructure objects and interacting with them directly using the Internet will make it possible to consider disparate (stationed in different territories and providing numerous services) logistics infrastructure objects as a distributed system (logistics) [ 9, p.17]. The independence of such objects from each other and their redundancy should allow online selection of those combinations that meet the requirements for logistics support of the life cycle of an electronic trade transaction. The implementation of this approach will provide the basis:

- to reduce the dependence of digital resellers on logistics providers.
- to improve the efficiency of risk management due to the likelihood of failures in their work.
- for consumers to independently select marketplace services and ETP settings for logistics services.
- to quickly resolve logistics conflicts between digital resellers and consumers of their services.

However, it should be considered that the implementation of this approach requires the formation of large databases. There is a risk that the dependence of the quality of logistics solutions on them may turn out to be unacceptable [68, p.229]. It should be noted though that the strengthening of the logistics responsibility of intermediaries of this type for servicing consumers in fact means that they acquire the status of a focal company in the supply chains they form (at the stage after the transaction). Separately, it should be highlighted that as the attractiveness of marketplace services in the B2B sphere grows, their market power over suppliers increases. Some marketplaces seek to obtain quasi-rent from this situation, which today requires amendments to the antimonopoly legislation. All this also objectively determines the transformation of the vertical and horizontal structure of economic relations and, accordingly, the

configurations of supply chains.

The integration of the national digital business space into the global digital commercial system (this is an inevitable trend, despite several geopolitical restrictions) leads to a gradual blurring of the line between domestic and international trade [142, p. 20]. This means that competition in the electronic goods market will move to a new dimension. The center of gravity of competition will consequently shift from the economic competition of supply chains to the economic struggle between marketplaces created on the basis of global digital trading platforms. The seriousness of this situation is characterized by the declaration of intentions by a number of Chinese marketplaces to localize their trading activities in the Russian Federation. It is obvious that if this event occurs, the Russian system of economic relations and, accordingly, supply chains will face a new stage of transformation, including digital.

The formation of a digital institution of trade intermediation does not mean that in the near future its classical version will completely lose its advantages. The strongest positions in this context belong to dealers specializing in the sale of cars. This situation is explained by the following reasons:

- the sale of these goods to individuals is associated with significant transaction costs, due to personalized customer service (for car manufacturers, so it is advisable to concentrate on core activities rather than sales).
- the sale of passenger cars requires the organization of their technical maintenance during the warranty and post-warranty periods (this type of activity is not the main one for manufacturers).
- FAS Russia recognizes the legitimacy of agreements with dealers (as opposed to distribution agreements).
- supplies of spare parts as a link of the distribution chain of automotive products (spare parts, etc.) bring manufacturers income commensurate with the income from car sales by dealers [15, 129].

At the same time, it should be noted that in recent years there has been a tendency to reorganize the network of car dealers, which is accompanied by changes in the configurations of supply chains of goods for their needs. The demand for the services of classic distributors in the context of digitalization of product markets is gradually

being lost. However, the intensity of this trend varies depending on the industry. For example, the physical distribution of products from metallurgical plants (manufacturers of industrial and technical goods (MITG)) is quite actively carried out by distributors. One of them is TK EvrazHolding LLC, which represents the interests of a number of enterprises in the metallurgical industry. This list also includes JSC EVRAZ Nizhny Tagil Iron and Steel Works and PJSC Severstal. In this regard, it should be noted that Severstal PJSC mainly uses four distribution channels:

- own network of sales branches.
- distribution (it is focused on trade and logistics services for small and medium-sized enterprises).
- own electronic store.
- ETP.

About one third of total sales are sold through ETP. It is expected that in a few years this figure will double. In addition, Severstal PJSC plans to open an e-marketplace in the B2B sphere on the basis of its own e-store. As a result of the implementation of these plans, the distribution network of PJSC Severstal should be reduced. The positions of the sales branches of PJSC Severstal will remain. This is due to the fact that these branches are focused on large consumers and supplies for the needs of infrastructure projects. In both cases, it is important to ensure guaranteed uninterrupted supply, which requires maintaining the necessary stocks of medical supplies in the warehouses of these branches. Logistics support for MR sales through ETPs and e-marketplaces does not always provide for such a function. It is also appropriate to note that the practice of metallurgical plants making digital transactions in the field of material and technical supply, i.e., through ETP, is mainly limited to purchases of goods that are not strategically significant for them ("tail spend"), including low-value and wearable items. The cost of their acquisition can exceed 20% of the total procurement budget. At the same time, placing orders for their supplies is associated with excessive transaction costs. Using your own ETP allows you to reduce them to a minimum. Supplies of basic raw materials for such plants are conducted within the framework of long-term economic ties [57, p. 82]. This example shows that the transfer of procedures for placing and executing orders for the supply of MR at manufacturing enterprises to the electronic category is largely determined by the

specifics of digital changes in a particular industry. This means that special attention should be paid to this circumstance when designing international supply chains. It should be noted that not all distributors are losing their positions. The following are immune to the negative consequences of economic digitalization.

First, these are the distributors who specialize in selling goods, the remote format of which is not permitted by law.

Second, this list includes distributors who deliver according to the formula “product + program of additional services, including logistics services.” It is appropriate to note that as the efficiency of logistics services belonging to e-marketplaces increases, the stability of the market positions of the distributors will be lost.

Third, these classic resellers include those who represent the interests of manufacturers who have greater market power due to widespread demand for their products.

Fourth, the list includes distributors who implement a policy of targeting small and medium-sized enterprises, taking into account the geographical structure of demand and price gradients in local product markets.

Fifth, the distributors who are actively implementing a business model in the B2B2C format with a focus on product categories (rather than individual product items) in demand by retailers. Note that some marketplaces operating in the B2B sector are switching to this model, reconfiguring their logistics services.

Sixth, these are distributors who specialize in the supply of customized products.

At the same time, it should be noted once again that some wholesale trade enterprises are abandoning the status of a classic distributor in favor of opening an e-marketplace in the B2B sphere or reorienting themselves to perform the functions of a logistics provider [128, p. 58].

Thus, the following conclusions can be made:

- digitalization of trade intermediation in the B2B sphere objectively leads to the transformation of economic relations.

- the ratio of digital and classical regulators based on trade intermediation in the B2B sphere in the development of the commodity market demonstrates growth dynamics (however, its pace is not high enough).
- the formation of long-term economic relations with suppliers and consumers in the B2B sphere based on the use of digital procedures for placing and accepting orders for supplies is impossible (this does not allow for the sustainable development of supply chains by building intercompany interactions on the principles of partnership and long-term cooperation).
- modern design of supply chains under the leadership of the focal company provides for the diversification of transaction formats (differentiating them into classic and digital), which leads to a reorganization of supply chain configurations in the B2B sphere with both national and international participation.

### 3.3. Strategic priorities for supply chain design in wholesale e-commerce

The issues of digitalization of supply chains have been at the center of scientific discussion for quite some time. However, according to experts many of them remain open [19, p.155; 170, p.70]. This situation is, to a certain extent, determined by the lack of a single point of view on the management of classical supply chains as a whole. For example, in [80, p. 104] it is believed that such structures are "...consequentially connected channels...". At the same time, a completely different definition is given [64, p. 390]. Also noteworthy is [54, p. 98], which believes that in a "digitized" supply chain, logistics administration will become centralized. This statement is controversial for a number of reasons:

- the widespread use of the category "supply chain" does not mean that the status of its participant has independent legal significance (in practice, this is manifested in the fact that suppliers and consumers interacting with the same enterprise often do not consider themselves participants in its supply chains with all the ensuing consequences ([143, p.54]);
- complete centralization of the management of such supplies is possible only when they are intra-company (otherwise the rights and obligations of legally

independent contractors, including logistics ones, are delimited in the supply agreement).

- conditionally complete centralization of logistics administration is achievable only if all supply chain participants conclude an agreement on logistics coordination in these chains (in this case it cannot be ruled out that it will be subject to antimonopoly legislation), etc.

The last example confirms the conclusion made in [156, p. 549], according to which artificially inflating the impact of digitalization of trade on supply chains is a typical situation. In line with this reasoning, [139] is of interest. However, attention is paid more to the problem of using information technology in logistics than to the digitalization of supply chains [139, p. 136]. The logistics trends predicted in [186] in 2016 were taken as the starting point for considering this problem. It is worth noting that over the past years, the forecasts made in this work have remained virtually unchanged. Their relevance was confirmed in 2019 with regard to the highest demand for omnichannel logistics and big data analysis in this functional area. However, in 2019, a new trend was noted that belongs to the previously noted group. It is associated with the formation of logistics marketplaces. It is also of scientific interest [31]. It defines the invariant functions of supply chain management (their list was first proposed in [143, p. 51]), which are subject to mandatory and complete digitalization:

- relationships with clients.
- their maintenance.
- demand.
- fulfillment of orders [31, p.8].

It is obvious that there is an intention to connect digitalization with intangible “logistics activities.” A similar opinion is expressed in [7, p. 16], according to which the objects of such digitalization should be information and communication flows in the multiple logistics structures. Accepting the position formulated in [31, p.8], it is necessary to point out the following circumstance. Some of the processes noted in [31, p. 8], for example, fulfilling a purchase order, also have a material component (in particular, due to the transfer of goods to the buyer) [152, p. 318]. One should also agree with the conclusion made in [31, p.9] that the digitalization of supply chains entails a reduction



in transaction costs. Indeed, in this case, the degree of need for personalized and long-term, primarily personal contacts with a potential/existing counterparty is reduced. However, one cannot ignore that, along with this, the center of such costs is shifting towards costs that are caused by:

- preparation of draft contracts in electronic format (“ink” transaction costs).
- assessment of the likelihood of the counterparty fulfilling its contractual supply obligations and the occurrence of costs for resolving commercial and logistics conflicts with it.
- reputational losses for customers arising because of the transfer of logistics interactions into fully formalized procedures (in this case, it is not excluded that counterparties may form the opinion that the customer is not ready to build relationships with them on the principles of partnership and cooperation), etc.

In addition, it should be considered that negotiations in the form of personal communication with a potential counterparty at the stage preceding the placement of an order for supplies top the rating of factors that predetermine the efficiency of procurement [61, p. 560]. Abandoning them will necessitate a radical revision of approaches to establishing economic ties, especially in cases where purchases are planned for:

- non-standardized products.
- innovative products.
- not being repeated.
- with a new counterparty.
- goods whose modernization in the future is difficult to predict.

In [41, p. 24] the factors that determine the direction of digitalization of supply chain management are given. They (with some modifications) are shown in Fig. 3.5.

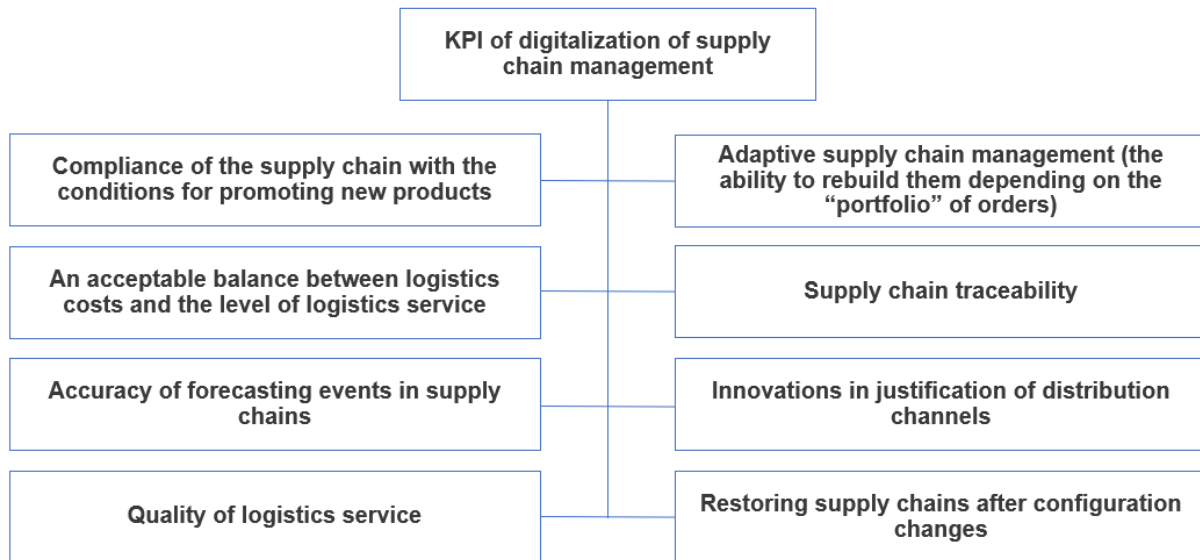


Figure 3.5 Factors driving the transition of supply chain management to digital format [41, p.24]

The steady trend of growing uncertainty in the external environment throughout the world objectively determines the permanent increase in the complexity of planning the functioning of supply chains. To guarantee the reliability of the distribution of resources, including material reserves in such logistics structures, is impossible. In this regard, the following point should be taken into account. An imbalance in logistics interactions in supply chains is formed by:

- fluctuations in the parameters of the processes that are performed in these circuits.
- violations of the functioning modes of their individual components (their consequences, due to the interdependence of supply chain participants, lead to negative multiplier effects) [156, p. 403].

Adjustments to the original supply chain plan therefore become inevitable. One of the effective ways to implement it is event management in SCM (the principles of this management are implemented in a special software tool Supply Chain Event Management (SCEM)) [156, p. 396]. The disadvantage of SCEM is its reactive response to events in supply chains since it is designed to detect deviations of logistics process parameters from planned (standardized) values. This means that proactive decision-making to return the supply chain to normal operation is not possible in this

case. The way out of this situation in [41, p. 24] is reasonably considered to be the accuracy of forecasting events in supply chains. Innovations in the justification of distribution channels would be related to:

- the use of an omnichannel logistics trading model in the B2B sphere (its concept is formulated in [151, p. 119]).
- the “removal of boundaries” between the B2B and B2C spheres, i.e., the formation of a “seamless” logistics channel that permeates the B2BC sphere [53, p. 23].

In the first case, the object of digitalization should be the process of logistics coordination of horizontal interactions of supply chains in various distribution channels, ensuring their “seamless” integration. In the second case, it should be a similar process, distinguished by its focus on closer coupling of vertical logistics interactions right up to retail enterprises.

The need for another KPI of digitalization (facilitation of the supply chain requirements for the promotion of new products), is due to the need to synchronize logistics and marketing activities. For example, an urgent task is the formation of inventory at a wholesale trade enterprise at the time of the start of sales, which was declared in the process of carrying out promotional events.

The introduction of information technologies to ensure tracking of supply chains and the quality of logistics services is one of the most difficult problems of digitalization of such structures [49]. An argument in favor of this conclusion is the expected entry into legal circulation of an agreement on a mechanism for the traceability of goods supplied from abroad to the territory of the EAEU [101].

It is worth mentioning that information technologies which implement business continuity management strategies should facilitate the prompt restoration of supply chain performance after breaks in economic ties regardless of the cause (crisis events, reorganization, etc.) [25, etc.]. As part of their development, it is necessary to justify the maximum acceptable duration of failures in critical types of processes for the supply chain.

The effectiveness of supply chain management largely depends on their visualization,

i.e., ensuring “transparency”. Although the relevance of this problem has long been noted by specialists, significant progress in this area has not been observed [163, p.63]. Achieving this goal is almost impossible without the use of modern information technologies, which make it possible to make the transition from documenting processes in supply chains to building their digital image (“copy”).

Such KPI as adaptive supply chain management deserves special attention. The effectiveness of logistics management is largely determined by the comprehensive consideration of all processes in supply chains. However, in practice this is hampered by the nature of the functioning of such circuits:

- non-stationary (e.g., due to changes in the work plan).
- multi-mode (e.g., due to the seasonality of supplies).

This factor, among other things, actualizes the processing of big data, which requires a transition to innovative information technologies.

Providing a competitive level of logistics service is one of the priority strategic objectives of supply chain management. However, achieving this goal does not exclude going beyond the economic feasibility of increasing the quality of logistics services. This is possible, for example, due to unacceptable costs for maintaining inventory or low elasticity of demand for high quality logistics services. Establishing logistics controlling allows you to avoid this. However, this requires a special information service.

In [41, p. 24], digitalization of supply chains is highlighted as an independent type of KPI (Fig. 3.5). However, before moving on to its consideration, let us pay attention to the following position. In [142, p. 31], the directions that determine the transition of logistics to a new state are identified (Fig. 3.6).

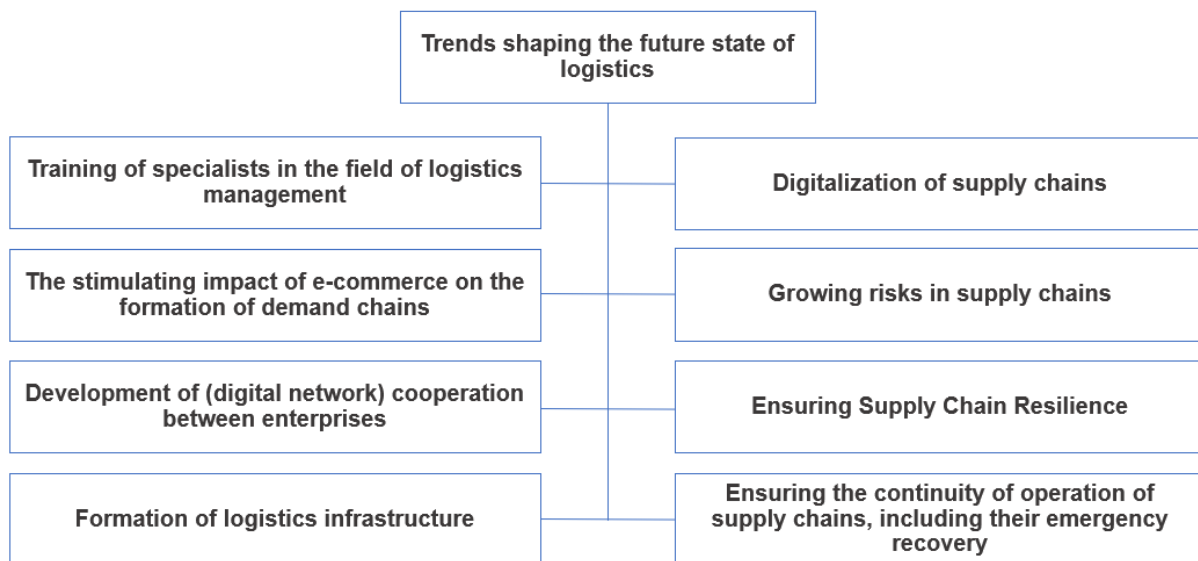


Figure 3.6 Directions that determine the transition of logistics and supply chain management to a new state [180, p.31]

These directions generally correspond with the forecast estimates shown in Fig. 3.5. However, some of them deserve special attention. First, it is worth noting the relationship between the development of e-commerce and the transformation of supply chains, which are based on the push principle of commodity circulation, in the demand chain. The ratio between e-commerce (especially in the B2B sphere) and its classic form is still in favor of the second of them. The preservation of this situation in the Russian Federation is facilitated by:

- low degree of business digitalization.
- lack of proper logistics and customs infrastructure that meets the needs of the economy.
- “opacity” of logistics management at enterprises, primarily those related to small and medium-sized businesses, etc. [130, pp. 482, 483].

This means that the digitalization of supply chains should be carried out selectively, considering the feasibility of distributing commodity flows through various logistics channels, i.e., diversification of these channels depending on the profitability of digital and classical ways of bringing goods to consumers, taking into account their life cycles.

Second, the development of digital network cooperation between enterprises in each country largely depends on the speed of formation of a common national information space, i.e., national digital platforms for public use. Achieving this goal according to [102], should allow to:

- transfer most commercial (trade) operations to virtual reality.
- eliminate a significant part of transaction restrictions.
- reduce the time spent searching for business partners and improve the quality of their selection.
- increase the speed of response to consumer requests, etc.

A separate problem is the elimination of discrepancies between the national platforms which were noted above. This prevents enterprises from several countries from entering international markets. In addition, one should not expect that the question of the acceptable degree of permissibility of the exchange of information between participants in supply chains, which does not affect the balance of their interests, thanks to digital cooperation in the B2B sphere, will lose relevance [144, p. 54].

Third, it is evident that the digitalization of trade (commerce) opens up new prospects for network cooperation between enterprises (“collaboration” of business) [45, 46]. They consist of building alliances, including logistics, on new principles. However, it should be taken into account that such structures are unstable by their nature [17, p.9; 172]. This means that digitalization will help transfer the problem of ensuring a balance of interests of their participants to a new dimension. It will involve logistical risks of a slightly different nature, for example, due to:

- varying degrees of digital readiness of alliance members for joint logistics actions.
- the likelihood of digital resistance of its participants to the development of a collective logistics strategy.

The objective prerequisites for such resistance are created by:

1. the possibility of artificially delaying the process of agreeing on logistics solutions, using the disadvantages of corporate chat, which include:
  - lack of a detailed procedure for exchanging messages, including conflicting messages.

- the likelihood of misunderstanding of incoming messages.
  - delegation of moderator functions to a special software option.
  - the likelihood that participants will delay taking the initiative until the positions of other parties are finally identified, etc.
2. differences in the culture of logistics management among alliance participants, i.e., strategic alliances [3, p.458].

Fourth, the formation of logistics infrastructure (classical and digital) has a stimulating effect on the digitalization of supply chains. This is due to the following provisions.

1. Currently, there is a convergence of the classical logistics infrastructure of the commodity market, represented by material objects (warehouses, etc.), and its information component [39, p. 36].
2. The impact of the widespread and large-scale use of information technology on the transformation of supply chains has a limit since it is impossible to eliminate the process of physical movement of goods. As a result, the material component of the commodity market infrastructure cannot lose the status of its basic component. Although, of course, it will evolve in the following directions:
  - warehouses, vehicles and other logistics facilities will be completely equipped with devices that allow them to be monitored and transmit their results to external consumers via the Internet (i.e., control these objects and change their status remotely).
  - the use of autonomous vehicles and robotics will become the norm in the future.
  - the trend of refusal from storage of information on a computer will intensify in favor of the use of cloud technologies (the object composition of computer systems, which form part of the material and technical base of warehouses, etc., will be reduced).
3. Digital logistics infrastructure (in [51, p. 62] it is classified as information infrastructure), which is based on platform solutions according to [51, p. 200]), allows to create completely new opportunities to provide the continuity of the implementation of discrete logistics processes, and on the other hand, the “unity” of logistics flows ([132, p. 82]).

4. The infrastructure of the commodity market is represented by wholesale trade enterprises and logistics providers, therefore their ability to adapt to digital challenges has a direct impact on both the change in the subject composition of supply chains and their integration into the digital business space. It should be noted that achieving this goal requires fairly large-scale investments in supply chain reengineering, i.e., in their redesign taking into account the digital transformation of trade.

Fifth, the training of logistics management specialists is of particular importance for accelerating the transition of logistics to a new state in terms of the digitalization of trade. In this regard it is noteworthy to mention [171, p. 299], which declares the strengthening of their role in the design of the “architecture of transport and logistics business.”

It was already noted earlier that in [41, p. 24], the digitalization of supply chains is highlighted as an independent type of KPI (Fig. 3.5). Its features are not disclosed. At the same time, one of the authors [41] published [138], the title of which declares the methodology of such digitalization. Let's pay special attention to it. Analysis [138] shows that this methodology is presented in a philosophical context of two aspects of digitalization - business and supply chains. The content of the first category correlates with the transition to a new business model, which opens prospects for the widespread use of special software. This interpretation is not new. For example, back in [160, p. 151] it was noted that the use of information technology cannot be the main goal of redesigning business processes. ERP systems are considered as the main special software tool for digitizing business and supply chains in [138, p. 1769, 1776]. This indicates the continuity in [127] of the idea formulated in [136, p. 34], that ERP systems play a vital role in the construction of a unified information space of supply chains. While this factor being relevant, it should be noted that such systems have a number of disadvantages.

1. The concept of the ERP system does not provide for supply chain management, based on the principle of ensuring the overall competitiveness of its participants. The central principle of building such logistics structures is the technical integration of their participants into one enterprise, i.e., ensuring balance based



on the scheme: requests for supplies (including expected ones) of consumers → verification of the ability to fulfill them by the enterprise (“focal company”) → availability of suppliers who are able to provide production requests of the focal company [133, 176, p.189]. The inclusion of “focal company” in quotation marks is justified by the fact that this status will be valid only from the point of view of its vision. ERP stands for enterprise resource planning, i.e., this is the process of distributing them exclusively in the interests of this one organization. In fairness, it should be noted that within the framework of ERP there is an opportunity to make tactical adjustments to operational logistics activities in supply chains in order to consider changes in the conditions of their functioning [36, p. 489; 63].

2. The concept of an ERP system does not provide for integrated planning of logistics interactions between participants in supply chains and, accordingly, coordination in them, the functions of which are regulated by a special intercompany agreement. An example of the latter is given in [123, p. 54]. Thus, supply contracts concluded using an ERP system are not characterized by comprehensive contractual connectivity.
3. Improvement of ERP systems for the purpose of supply chain management is carried out through the development of additional modules that only allow fixing the parameters of intercompany logistics interactions [63, 163, p. 126]. At the same time, practice needs services that will allow management decisions to be made regarding the entire supply chain.
4. The implementation of ERP systems requires large-scale investments. After several years of its operation, the need for their modernization very often arises. This pattern demonstrates the difficulty of using such systems to build an accurate digital image (“twin”) of the supply chain. Capital investments in the modernization of the systems under consideration are often comparable in scale to the initial ones.

Digitalization of supply chains in [138, p. 1778] is characterized by the following stages:

1. fragmented implementation of functional logistics and geographic information systems (for tracking vehicles).
2. use of ERP systems using modules:
  - logistics.

- integrated supply chain planning.
- 3. integration of ERP systems with CRM and SRM, and information systems that provide logistics controlling in supply chains.
- 4. the use of a cognitive logistics platform that forms a single “seamless” digital space for logistics interactions and ensures “transparency” and reliable functioning of all supply chains (also through blockchain technology).

While giving this framework its due, it should be noted that [138] does not contain practical recommendations for the digital transformation of supply chains. At the same time, it fits into the general idea of the evolution of the information society, which makes it possible to recognize its scientific significance.

Our analysis of scientific publications devoted to the problems of digitalization of supply chains, including international ones, allows us to draw the following conclusions.

First, the development of electronic wholesale trade contributes to the active formation of the institution of electronic trade intermediation. This trend leads to an expansion of the list of potential supply chain entities and the number of electronic transactions in the B2B sphere, and, accordingly, to an increase in the electronic component of the commodity market infrastructure. The execution of such transactions gradually changes the classical practice of establishing economic relations in favor of electronic ones [173]. Considering that it is transactions that ensure the connectivity of supply chain entities, the digitalization of logistics structures of this type is taking place. At the same time, special software tools are being widely implemented in supply chains, including those that make it possible to integrate logistics facilities (warehouses, etc.) with the Internet environment. Internet services are increasingly used as such means, i.e., “cloud” modules of logistics/trade information systems (platforms), which are also part of the electronic infrastructure of the commodity market. Thus, it is reasonable to identify at least two main trends that predetermine the progress of digitalization of supply chains.

Second, the formation of supply chains in the B2B sphere with the participation of electronic trading intermediaries (marketplaces, electronic trading platforms, etc.) is carried out for the purpose of selling a fairly limited list of goods (“non-strategic”, etc.). As a result, B2B supply chains will continue to be formed for a long time through the

establishment of classical and electronic business connections, and the one-off nature of the latter will remain. Thus, the issue of diversification of economic relations in the context of digitalization of the economy should be subject to mandatory consideration when designing supply chains in wholesale trade.

Third, it should be taken into account that the pace of digitalization of various functional areas of logistics at enterprises varies. In particular, the greatest progress is taking place in purchasing (supply), while in the distribution sector the achievements are not so significant. The fact is that transferring the sales of a number of goods (primarily innovative and technically complex) and, accordingly, their deliveries to consumers into an automated mode is impossible due to the need to establish personal contacts with them at the pre-contractual stage of the transaction.

Fourth, not all enterprises (especially small ones) have the opportunity to purchase ERP systems with a full set of modules due to their excessive cost. In addition, the payback period for these systems is about 10 years, whereas, for example, in the Russian Federation the share of enterprises that are more than 5 years old is negligible.

Fifth, modern special logistics software allows you to work with big data, carry out integrated planning of supply and distribution activities (sales and procurement), etc. However, they leave at least one major question open. In conditions of uncertainty, how can logistics coordination be carried out between adjacent links of supply chains if their participants are not ready for a confidential exchange of information?

## Chapter 4. Organizational and economic features of designing international supply chains in electronic wholesale trade

### 4.1. Analytical assessment of development trends in global electronic wholesale trade

The digitalization of wholesale trade requires fundamental changes in all functional areas of international supply chain management. First, it is necessary to bring this type

of management into full compliance with the requirements of the logistics 4.0 concept. This will create objective prerequisites for ensuring effective coordination of the actions of participants in these supply chains in the context of global digital challenges. To achieve this goal, it is advisable to take into account a number of provisions:

- progress in the development of electronic wholesale trade largely depends on the quality of logistics services for institutional consumers, who, unlike households, are more demanding.
- supply chains in electronic commerce are dominated by logistics interactions, which are characterized by a high degree of formalism (in particular, due to the selection of counterparties based on competitive methods of placing orders for supplies, i.e., without preliminary negotiations).
- international wholesale trade, regardless of the format of its implementation, is a priori inherent in the complexity of performing logistics operations.
- the conceptual foundations for the sustainable development of electronic wholesale trade and, accordingly, supply chains in it are still being formed.
- classical wholesale trade retains its role as a leading component in the organization of commodity exchange.

Progress in the development of electronic wholesale and retail trade around the world is illustrated in Fig. 4.1. However, in a spatial context it is not so homogeneous (Fig. 4.2). The world leaders in this area of business are the PRC and the USA, although the gap between their achievements in its development is quite significant. In the EU, the results of the transition to e-commerce are not as significant as compared to China and the USA. However, electronic sales volumes in the EU are constantly increasing. The absolute leaders in this area are Ireland and the Czech Republic. The contribution of each of these countries in 2019 to the total volume of electronic sales was about 35% [183]. According to estimates of [184] such a prominent level of development of e-commerce in China is predetermined by the fact that its subjects are dominated by small and medium-sized enterprises that supply goods at low prices.

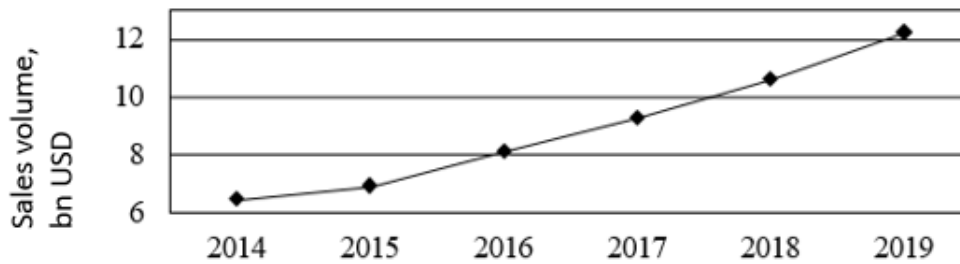


Figure 4.1 Dynamics of changes in the volume of electronic wholesale sales in the world [178, p.2]

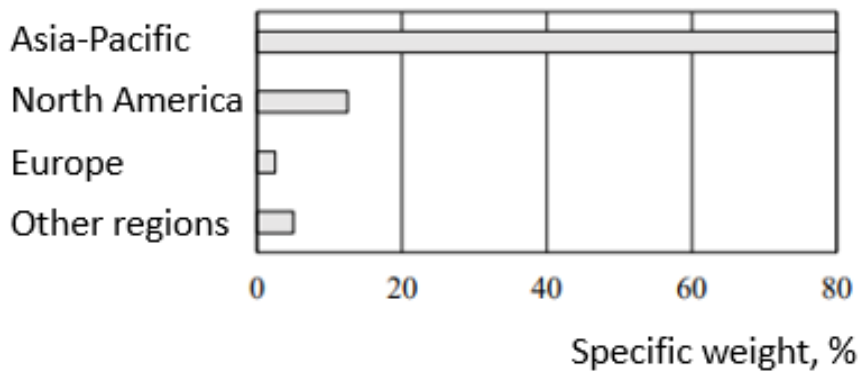


Figure 4.2 Distribution of electronic sales volumes by region of the world [178, p.7]

World practice shows that electronic wholesale trade is developing at a faster rate than similar forms of retail trade. For example, the share of the volume of the first of them in the total volume of wholesale trade, according to open-source data, is approaching 20%. Global digital wholesale sales volumes are more than three times higher than the corresponding e-retailing parameter. Considering the consequences of globalization and international trade and economic integration, it should be assumed that the development trend of electronic wholesale trade has become irreversible. Let us consider its features using the example of China, the Russian Federation and the USA.

China is Russia's main trading partner. Official statistics indicate that cooperation between countries is constantly developing (Fig. 4.3, 4.4).

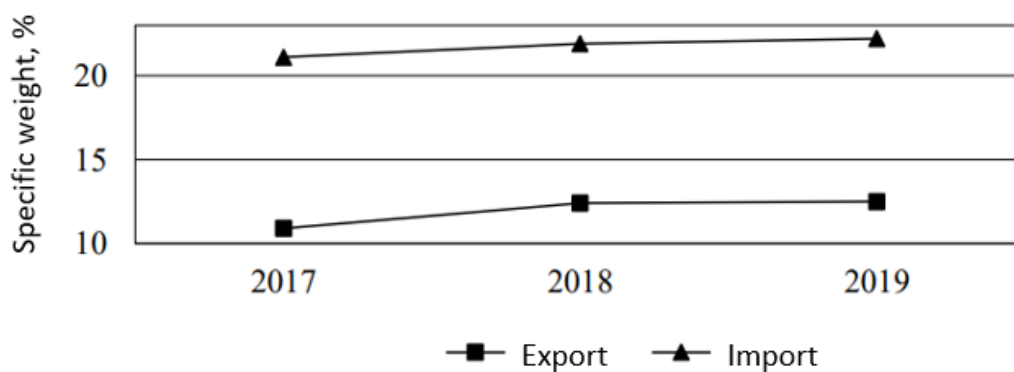


Figure 4.3 Dynamics of changes in the specific share of China in the foreign trade of the Russian Federation [131, p.583]

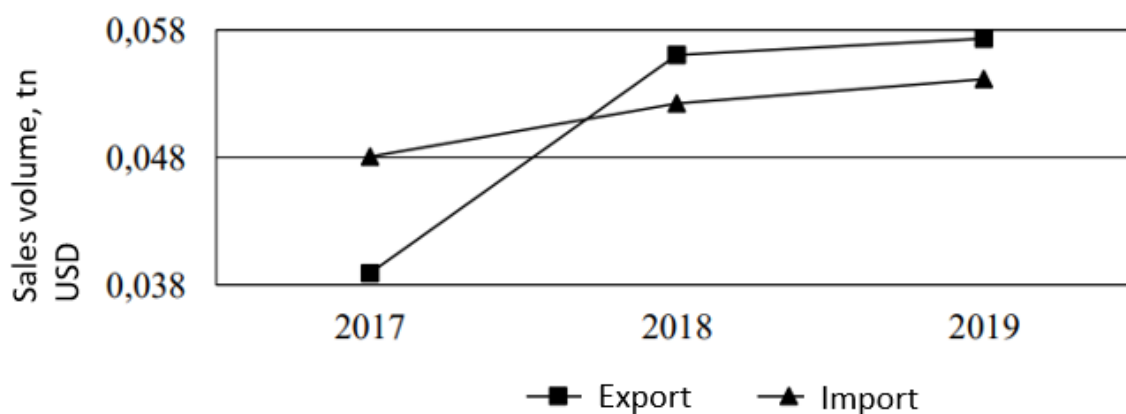


Figure 4.4 Dynamics of changes in the parameters of foreign trade between the Russian Federation and China [131, p.584]

However, for the PRC, the Russian Federation is largely a strategic trading partner. The share of the volume of imports of goods from the Russian Federation to China in 2019 was about 20% of the value of the same indicator for both ASEAN and the EU. The volume of exports of Chinese goods to the Russian Federation this year did not exceed 2%. Compared to supplies from China to the EU, as well as to the USA, this is almost 8 times less [179]. The PRC, as it was previously noted, is a country in which the maximum level of development of electronic commerce has been achieved (Fig. 4.5). Its distinctive feature should be considered the large-scale participation of small and medium-sized enterprises in it (Fig. 4.6).

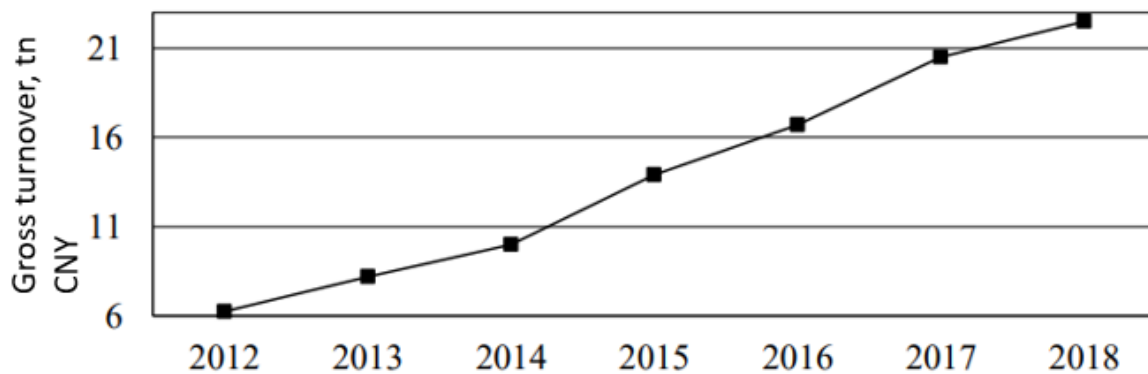


Figure 4.5 Gross turnover in electronic wholesale trade in China [182]

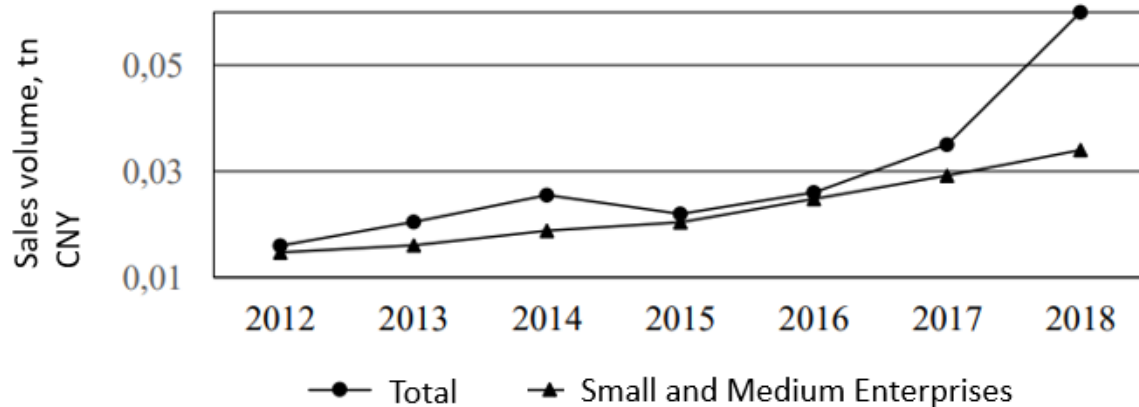


Figure 4.6 Dynamics of changes in revenue from electronic wholesale sales in China [182]

The share of electronic sales in the total volume of retail trade in China in 2019 exceeded 20% (Fig. 4.7). This allows us to conclude that in China the objective prerequisites for large-scale organization of sales according to the B2B2C scheme are being developed quite intensively.

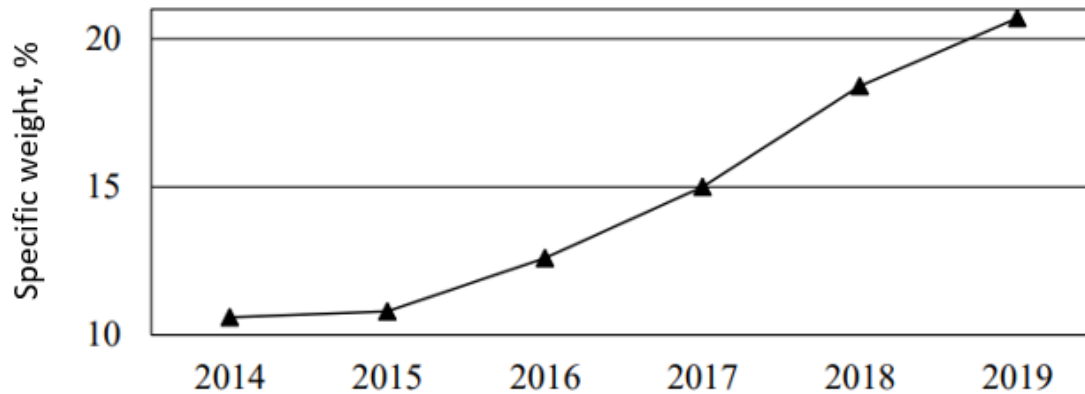


Figure 4.7 Dynamics of changes in the share of e-commerce in the total volume of retail sales in China [81]

In Chinese industry, the practice of e-commerce has become somewhat less widespread than in the wholesale and retail trade sectors (Fig. 4.8).

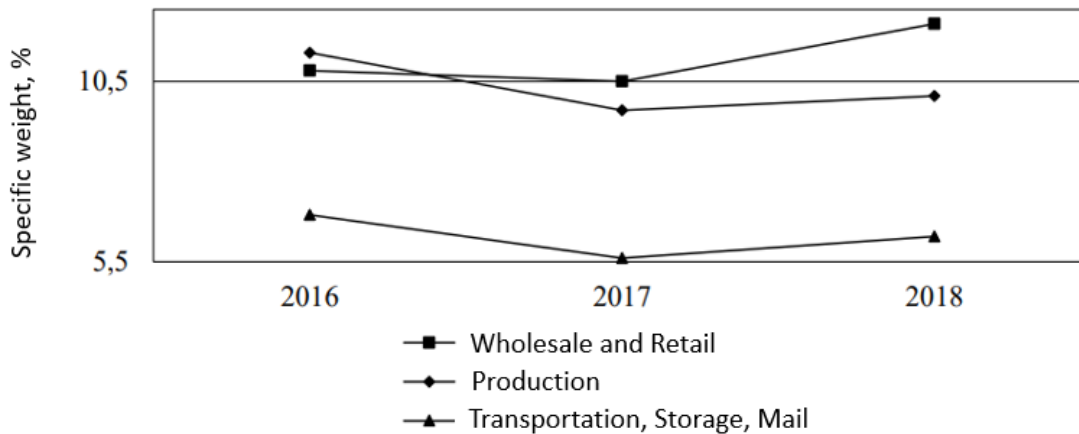


Figure 4.8 Dynamics of changes in the specific share of e-commerce transactions in the economic activities of Chinese enterprises in certain industries [81]

However, in e-commerce, Chinese wholesale and retail trade enterprises are not leaders (Fig. 4.9). Figure 4.9 indicates that the greatest progress in this area has been achieved in the sphere of intangibles, i.e., intangible services (hotel services, etc.).



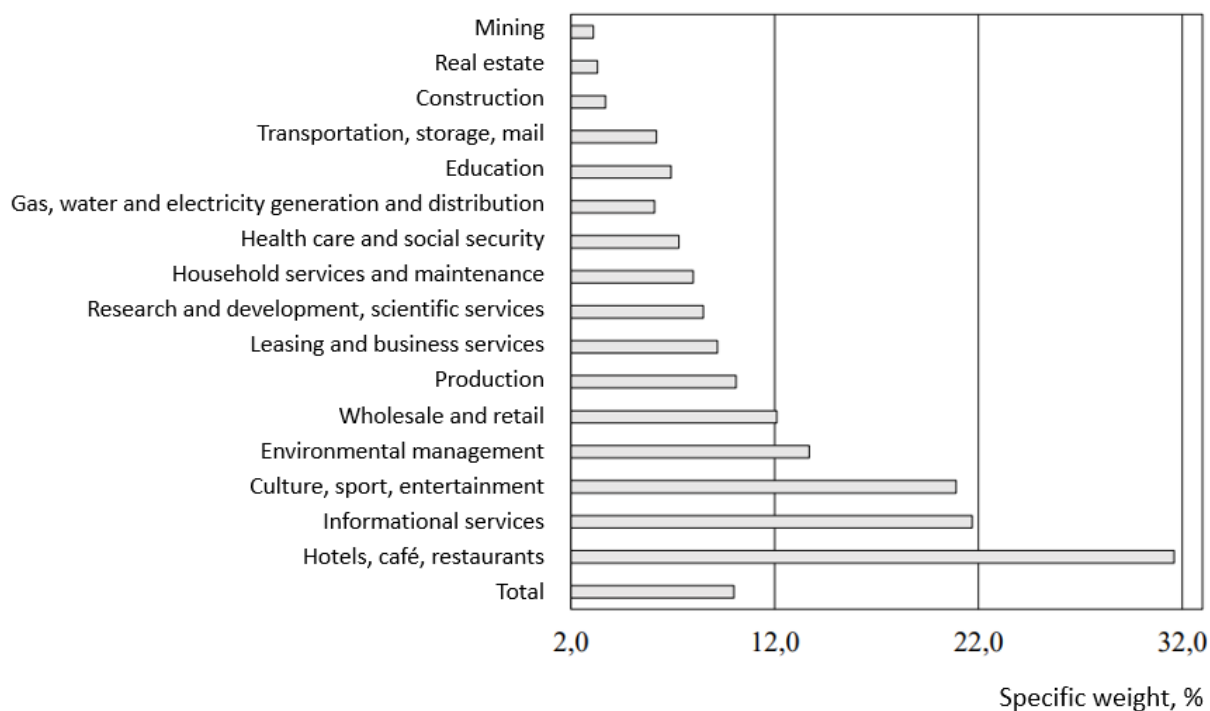


Figure 4.9 Specific shares of e-commerce transactions in the economic activities of Chinese enterprises in certain industries in 2018 [81]

According to official statistics of the PRC, purchasing activities at enterprises in this country have undergone greater digitalization than activities related to sales (Fig. 4.10).

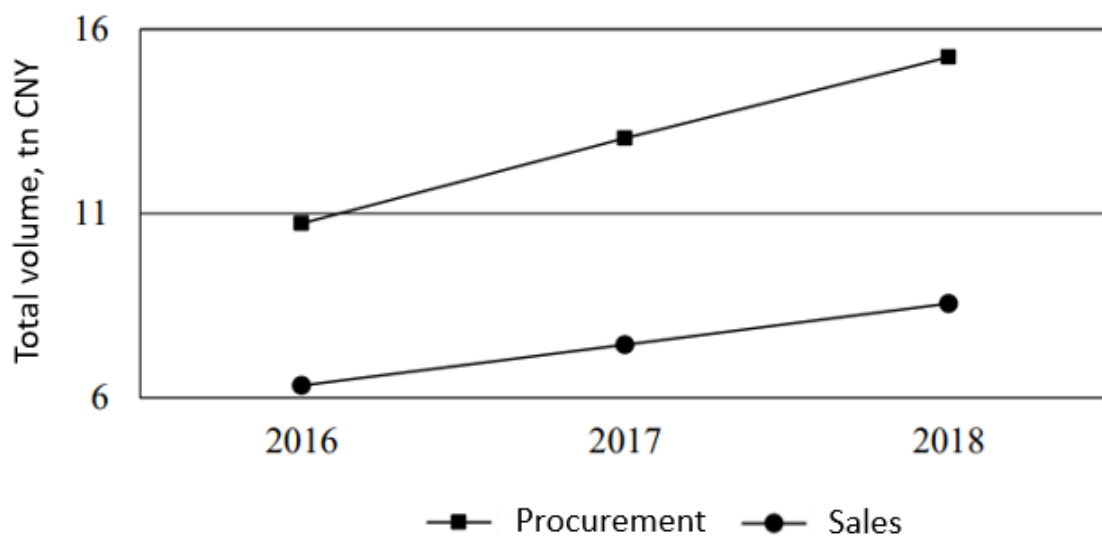


Figure 4.10 Dynamics of changes in the volume of electronic sales and procurement in China [81]

This is a general trend for all countries.

Chinese trading enterprises, compared with manufacturing, transport, warehouse and postal enterprises, conduct more large-scale e-commerce operations in purchasing activities (Figures 4.11 and 4.12).

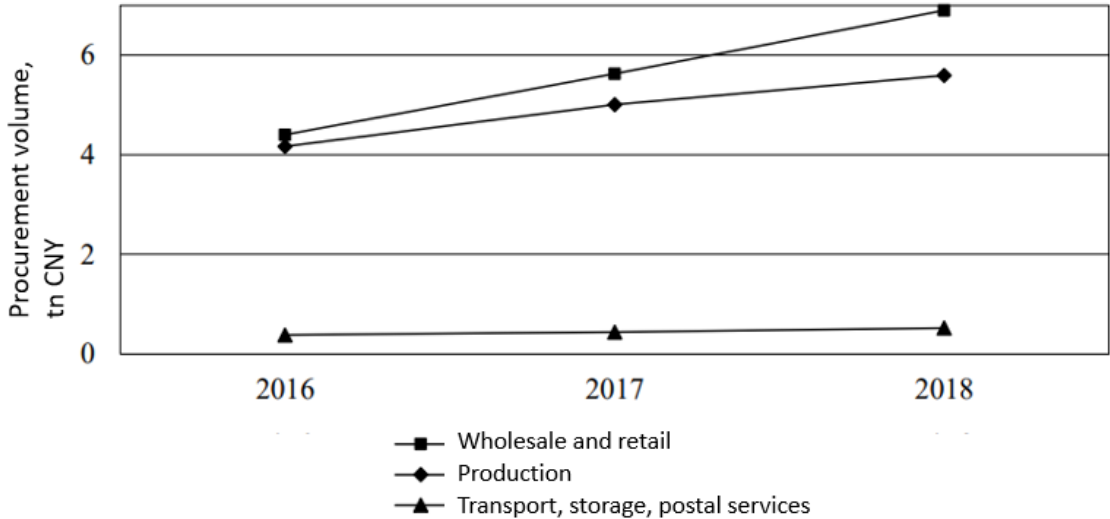


Figure 4.11 Dynamics of changes in the specific share of e-commerce transactions in the procurement activities of Chinese enterprises in certain industries [81]

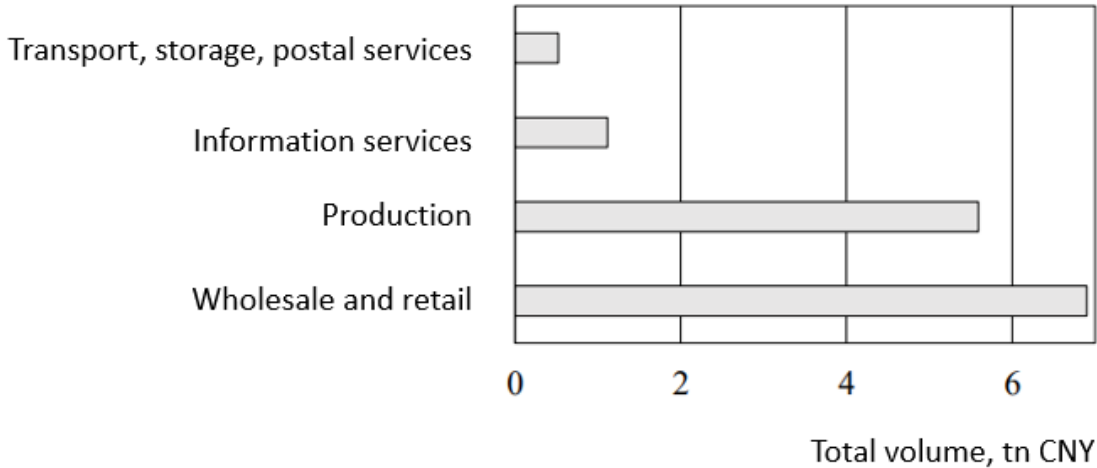


Figure 4.12 Specific shares of e-commerce transactions in the procurement activities of Chinese enterprises in selected industries in 2018 [81]

Chinese wholesale and retail trade enterprises are somewhat inferior to manufacturing enterprises in terms of the volume of e-commerce sales operations (Fig. 4.13 and

4.14).

This situation is to a certain extent predetermined by insufficient equipment of Chinese trading enterprises with websites (Fig. 4.15). Official statistics of the PRC do not distinguish between data on their availability in wholesale and retail trade. However, it can be assumed that the most unfavorable situation has developed precisely in the last sector of the economy (retail trade). This situation is due to differences in the degree of digitalization of the economy of Chinese urban agglomerations and small settlements remote from them.

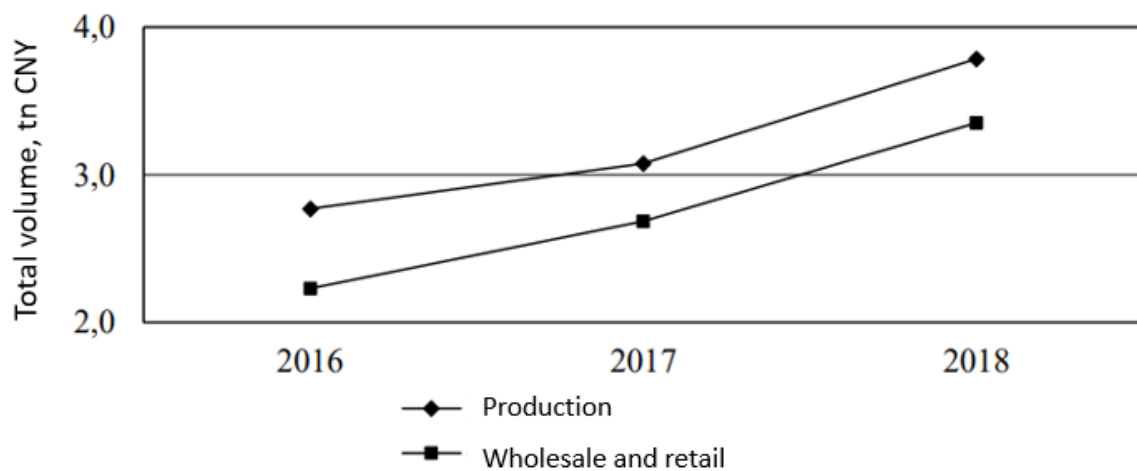


Figure 4.13 Dynamics of changes in the volume of e-commerce transactions in the field of sales at Chinese enterprises in certain industries [81]



Figure 4.14 Specific shares of e-commerce transactions in the field of sales at Chinese enterprises in selected industries in 2018 [81]

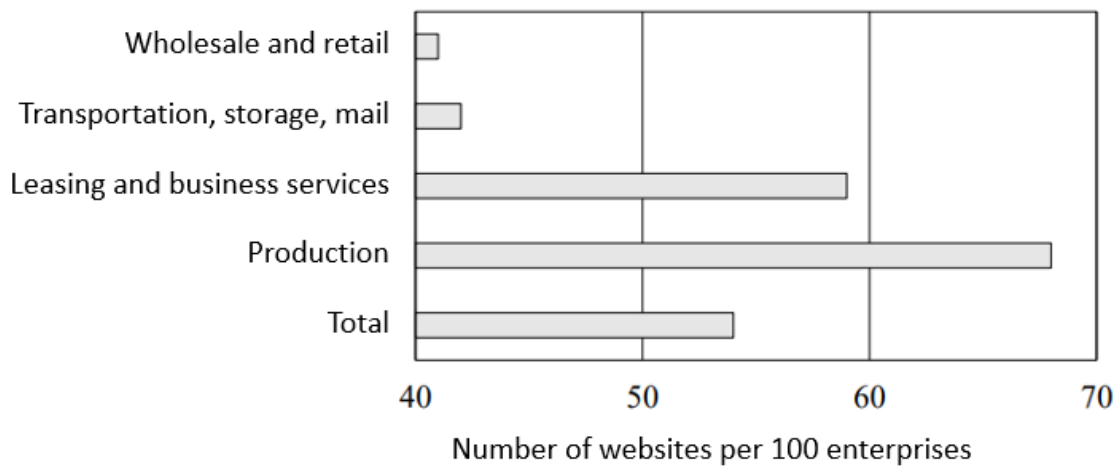


Figure 4.15 Availability of websites for Chinese enterprises in 2018 [81]

In the domestic electronic market, Alibaba Group dominates among online B2B platforms in China (Fig. 4.16). It should be clarified that this company conducts wholesale trade in China through subsidiaries:

- 1688.com (electronic trading platform for making B2B transactions with consumer goods and consumer goods).
- Lingshoutong (an electronic trading platform for making B2B transactions with perishable goods in the “goods + delivery services” format).

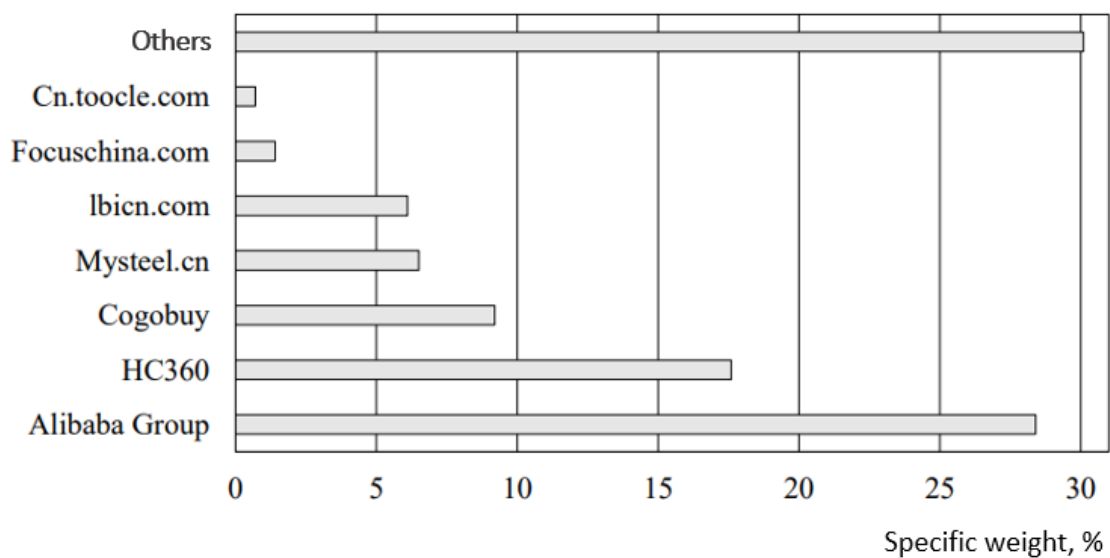


Figure 4.16 Market share of online B2B platforms in China in 2018 [182]

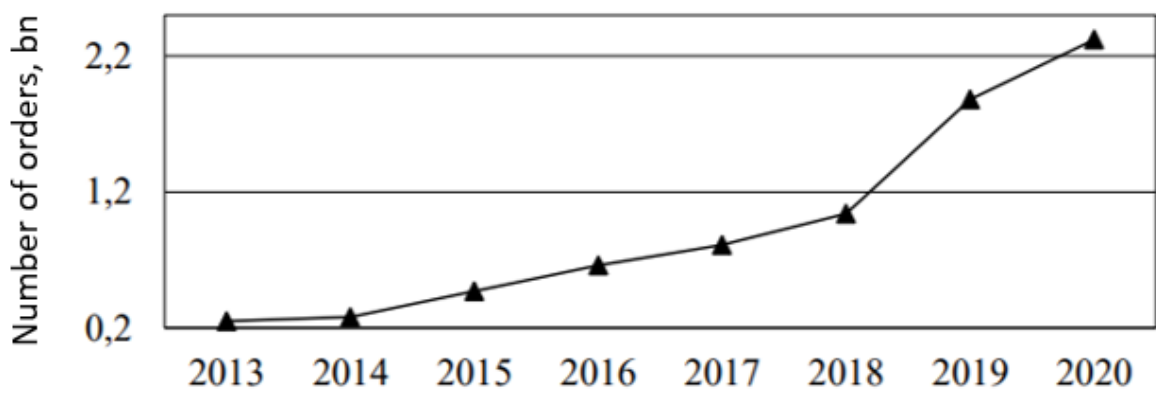


Figure 4.17 Dynamics of changes in the number of electronic orders on Singles Day received by Alibaba in China [177]

However, the graph shown in Fig. 4.17 clearly illustrates the importance and complexity of organizing logistics support for electronic wholesale sales, in the conditions of a sudden increase in the number of requests for service.

The electronic component in the total volume of wholesale sales in the B2B sector in the USA is growing at a fairly high rate (Fig. 4.18 and 4.19). In 2019, its share was 17% (Fig. 4.20). The leader in the transition to Internet sales is the US industry (Fig. 4.21). Retail trade is significantly inferior to wholesale trade in this indicator.

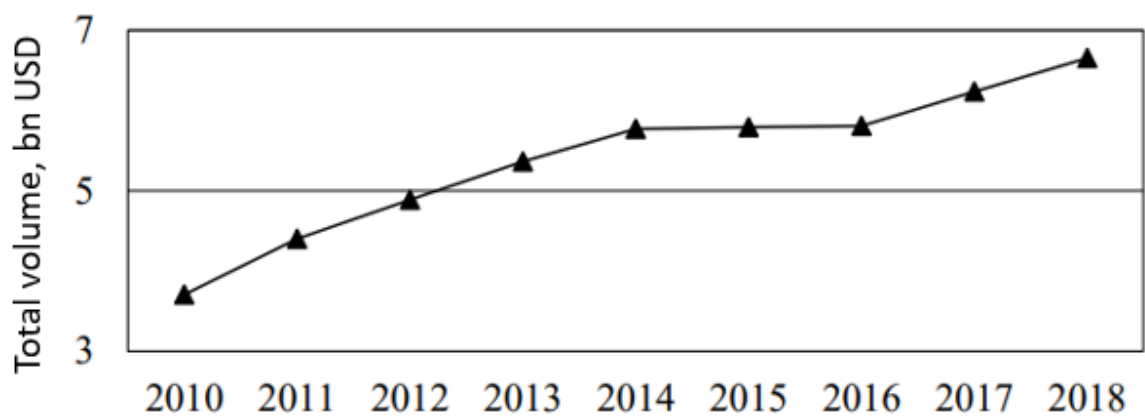


Figure 4.18 Dynamics of changes in the volume of electronic wholesale sales in the USA [178]

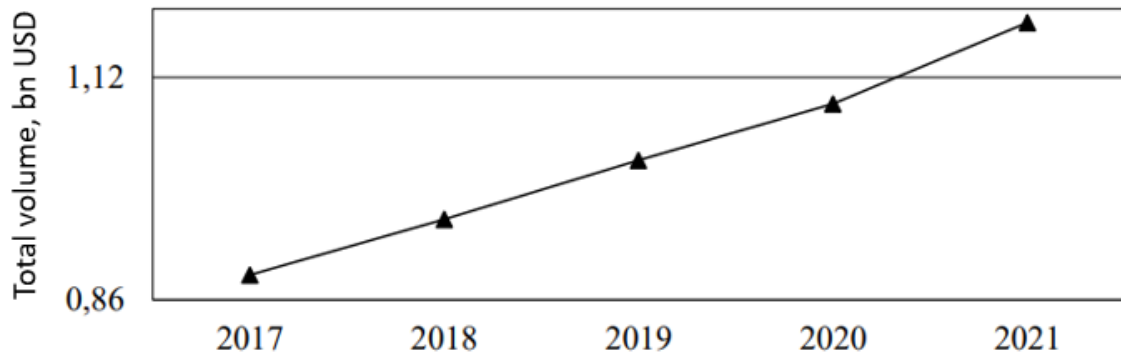


Figure 4.19 Dynamics of changes in revenue from electronic wholesale sales in the USA [178]

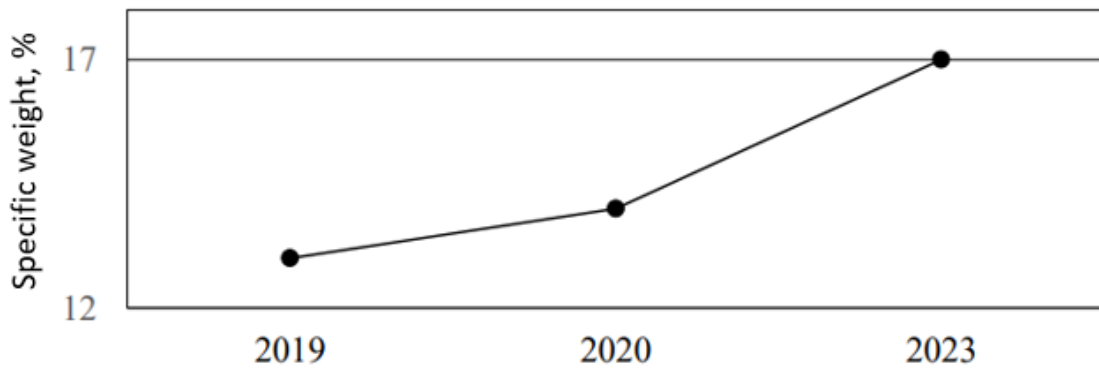


Figure 4.20 Dynamics of changes in the share of e-commerce in total B2B sales in the USA [167]

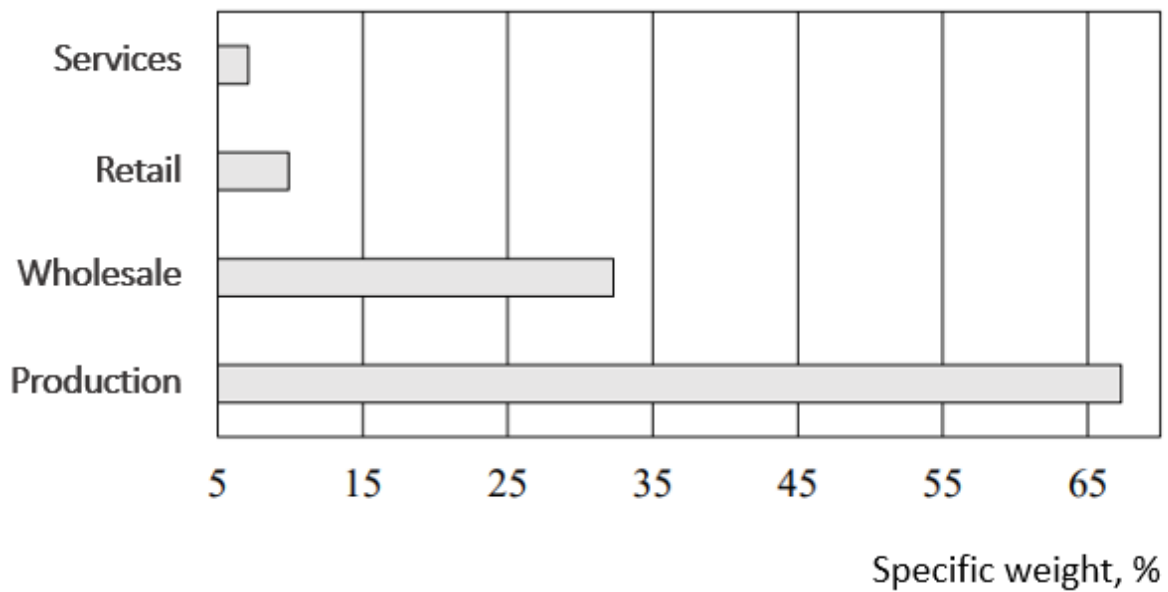


Figure 4.21 Dynamics of changes in the share of sales via the Internet from total sales by sectors of the US economy in 2018 [178]

Figure 4.22 shows data on the distribution of shares of electronic sales of various goods in the United States in 2019 within the framework of the B2B2C vertical integration scheme. They indicate that manufacturing enterprises are outsiders in this context.

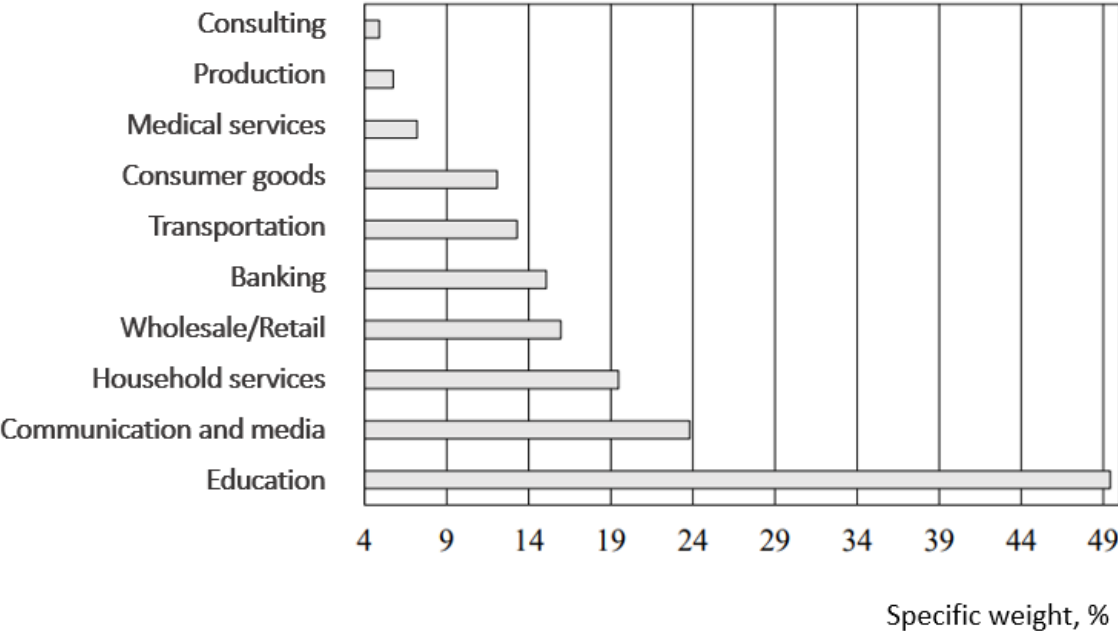


Figure 4.22 Share of electronic sales of US enterprises in August 2019 according to the B2B2C scheme [178]

In the latter context, it should be noted that the largest income from electronic sales in the United States in 2018 came from the sale durable goods (Figure 4.23).

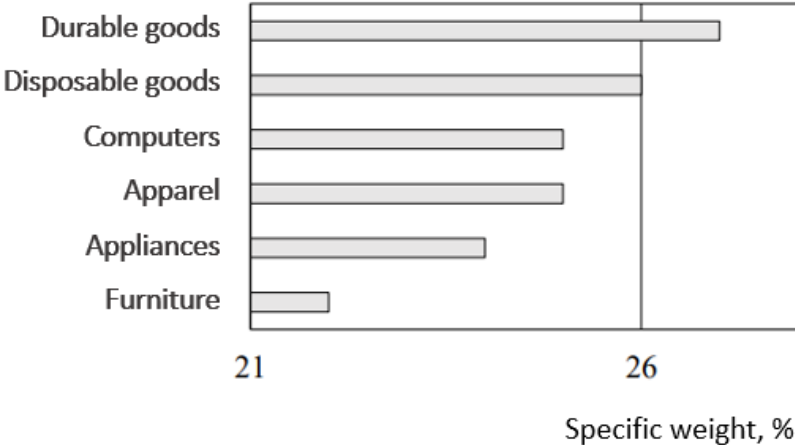


Figure 4.23 Share of electronic sales in trade in 2018 in the USA [178]

Noteworthy is the fact that for US enterprises the main source of information about suppliers is the data provided by the Amazon Business online platform (Fig. 4.24). Alibaba (more precisely, its subsidiary Alibaba.com, which specializes in international trade) in this context ranks second by a wide margin.

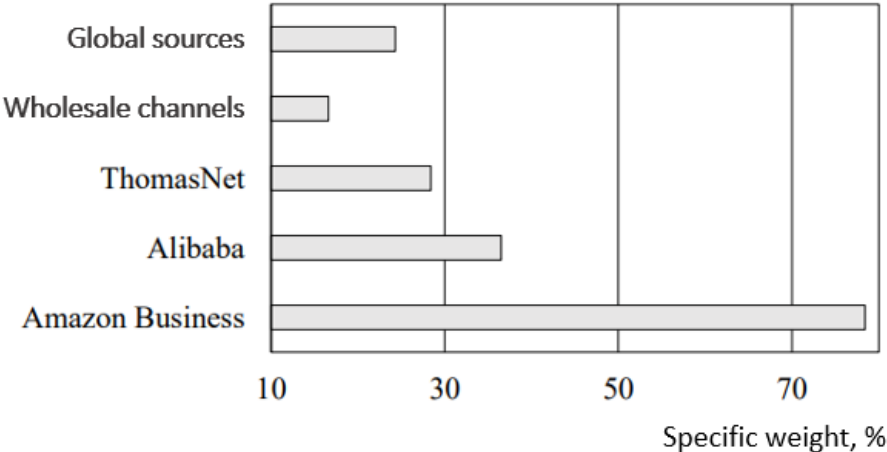


Figure 4.24 Sources of information that US enterprises rely on when planning purchases [178]

The Russian domestic commodity market, despite the economic recession, is very promising for Chinese enterprises. Its attractiveness is determined not only by the prospects for the development of retail, but also wholesale trade in the Russian Federation. One of the arguments in favor of this statement is the high rate of increase in wholesale sales in the country, while negative trends have become noticeable in the Russian retail trade (Fig. 4.25).

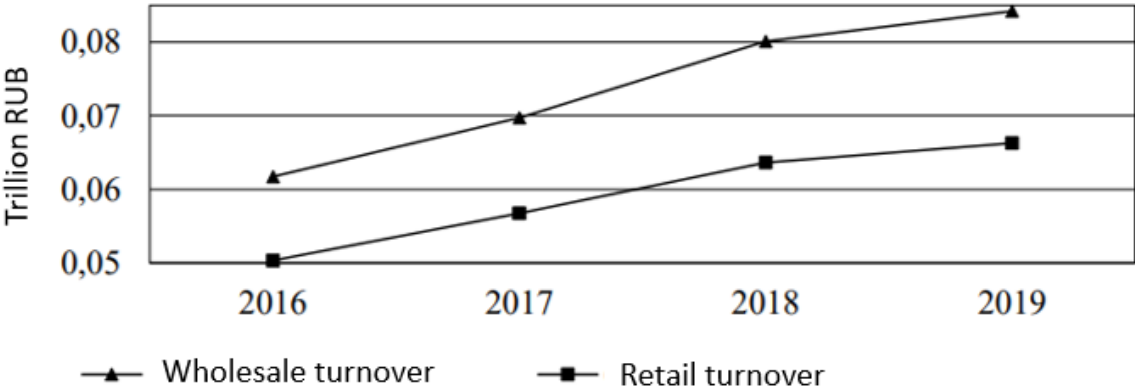


Figure 4.25 Dynamics of changes in wholesale trade turnover in the Russian Federation [131]



The share of unprofitable wholesale trade enterprises in the Russian Federation is significantly lower than in the country's economy as a whole (Fig. 4.26).

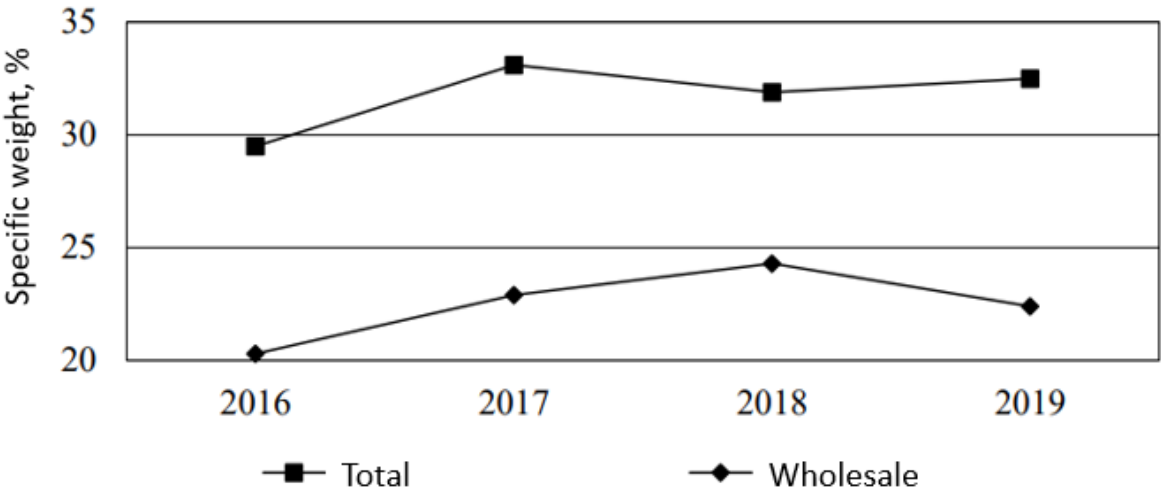


Figure 4.26 Dynamics of changes in the specific share of unprofitable wholesale trade enterprises in the Russian Federation [131]

It should be noted that the number of wholesale trade enterprises in the Russian Federation has been declining in recent years (Fig. 4.27). The obvious reason for the existence of this trend is the consolidation of wholesale trade enterprises (in the Russian Federation, most of them are small and micro enterprises). Another reason is the gradual reduction in the number of classic resellers as a result of the development of electronic wholesale trade.

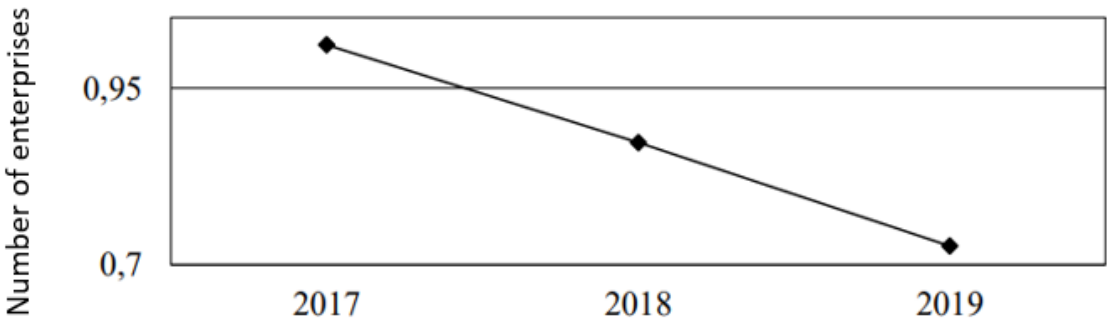


Figure 4.27 Dynamics of changes in the number of wholesale trade enterprises in the Russian Federation [131]

This trend should be taken into account by Chinese enterprises, for which the Russian wholesale commodity market is extremely attractive for the following reasons:

- this market is not saturated (i.e., it has potential for growth, the limits of which, as a first approximation, are characterized by the ratio between the volumes of electronic wholesale and retail trade as 3:1).
- the structure of Russian wholesale trade is currently being transformed (this creates conditions for new enterprises to enter the Russian market).

Electronic wholesale trade in the Russian Federation is not the object of official statistical observation, which makes it difficult to assess its parameters. In addition, publications devoted to the development of e-commerce in the Russian Federation, which are presented on the Internet, are mainly focused on the B2C sphere. However, everything indicates that the pace of digitalization in wholesale trade is much lower than in retail trade. Although the trading potential in B2B is more than 2 times greater than in B2C. Here it is advisable to note at least one circumstance. The pandemic, of course, had a stimulating effect on the development of e-retailing (although it may be temporary). Its share in the total volume of sales by enterprises in this sector of the economy in 2020, according to various experts, reached almost 10%. However, this opinion has not yet been confirmed by statistical data. Practice shows that many of such expert assessments are subsequently not confirmed by the Federal Service of State Statistics of Russia. For example, from Fig. 4.28 it is clear that in 2019 the value of the indicator did not exceed 2%. At the same time, in [5] it is estimated at 6.1%.

The research shows that one of the factors hindering the development of electronic wholesale trade in the Russian Federation is the extremely low utilization of the Internet potential by Russian manufacturing and trading enterprises. According to the FSSS of the Russian Federation, there is no progress observed here. More than 70% of such organizations use the Internet to manage supply and sales activities (purchases and sales). However, this figure is not indicative. The share of wholesale and retail trade enterprises that have implemented electronic document management (EDI) is less than 70%. Although the potential for progress in this area remains high (in the public administration system, EDI is used by almost 80% of organizations) [131].

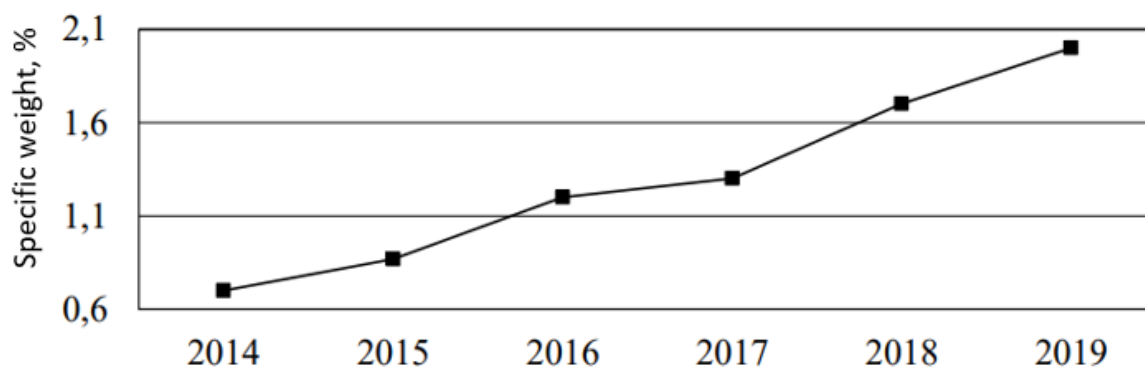


Figure 4.28 Dynamics of changes in sales via the Internet in the total volume of retail trade turnover in the Russian Federation [157]

Figures 4.29 and 4.30 clearly illustrate the fact that the use of the Internet by such enterprises is limited. In particular, in 2019, only about 45% of Russian enterprises placed orders for the supply of material resources (goods) using the Internet. Things are not going well in the area of its application in sales. In 2019, only about 25% of Russian enterprises received orders for supplies via the Internet.

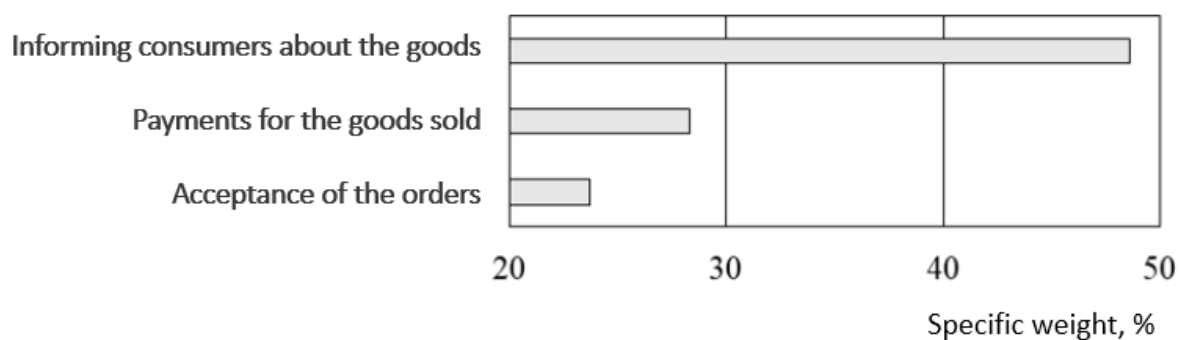


Figure 4.29 Characteristics of the functional orientation of the use of the Internet by Russian enterprises in the field of sales in 2019 [131, p.482]

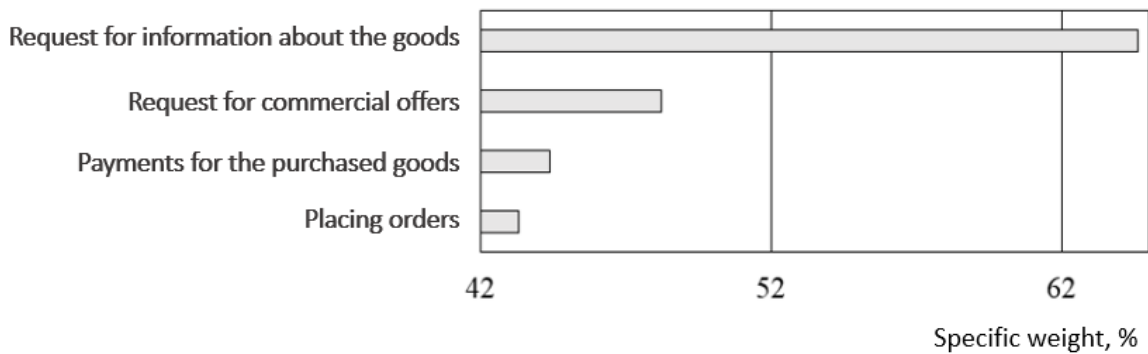


Figure 4.30 Characteristics of the functional orientation of the use of the Internet by Russian enterprises in the field of procurement in 2019 [131, p.482]

The introduction of special logistics software at Russian enterprises, especially integrated ones, is also not happening so quickly (Fig. 4.31). It should be noted that the specific share of ERP systems in the total volume of information technologies (CRM, ERP, SCM) is quite small. This is explained primarily by their complexity, as well as the fact that they are capital intensive. The latter characteristic makes them unaffordable for many micro and small enterprises.

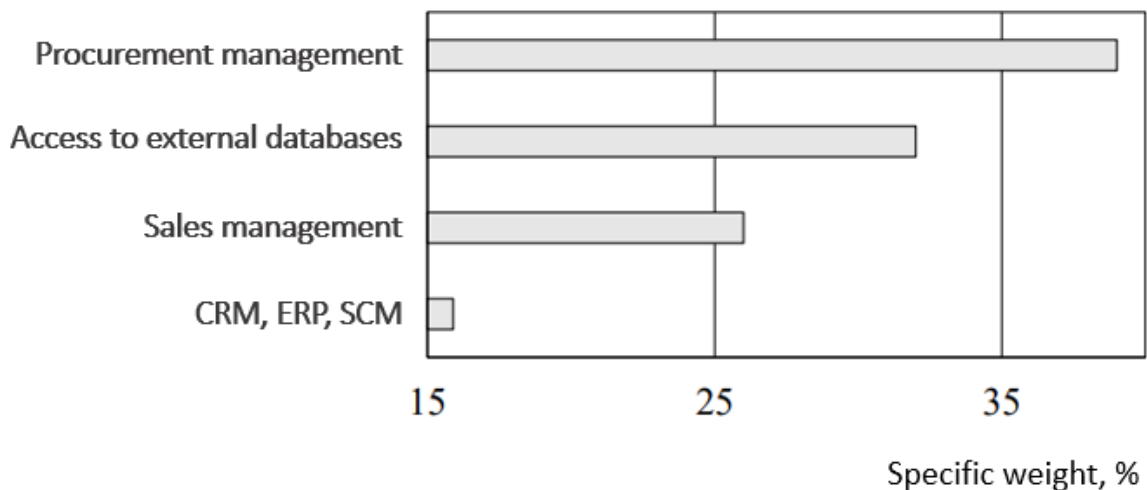


Figure 4.31 Use of special software tools by Russian enterprises in 2019 to solve logistics and supply chain management problems [131]

An analysis of the features of product distribution in the B2B sector shows that supply chains in it are predominantly multi-linked both in the sphere of distribution and in

procurement (Fig. 4.32 and 4.33). However, the largest number of resellers is represented in the second of the previously mentioned areas. This is primarily due to the fact that many Russian manufacturers use distribution and dealer networks.

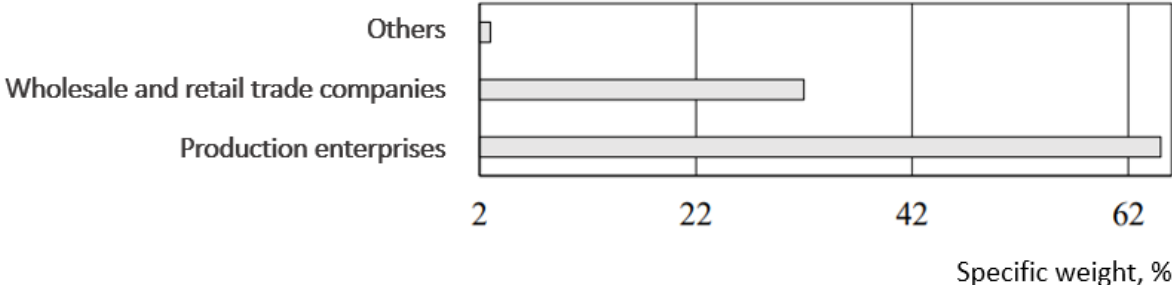


Figure 4.32 Channels for purchasing goods in wholesale trade in the Russian Federation in the 3rd quarter of 2020 [157]



Figure 4.33 Channels of distribution of goods in wholesale trade in the Russian Federation in the 3rd quarter of 2020 [157]

According to the FSSS of the Russian Federation, in the material structure of the turnover of wholesale trade enterprises in the Russian Federation in 2019, specialized goods (others) prevailed, i.e., intermediate consumption goods (Fig. 4.34). This means that the center of activity of such trade is shifted more towards the B2B sphere than into the B2B2C sphere. Direct integration into B2B intermediate goods supply chains is difficult. However, it should be taken into account that the digital transformation of wholesale trade has already launched a mechanism for transforming the existing system of economic relations in the Russian economy in favor of their transfer to an electronic format and, accordingly, the abandonment of the services of classical trading

intermediaries. This situation, according to M. Porter, opens up prospects for Chinese enterprises to enter the intersectoral supply system.



Figure 4.34 Commodity structure of wholesale trade turnover in the Russian Federation in 2019 [131]

The research of the features of electronic wholesale trade in China, the USA and the Russian Federation allows to come to the following conclusions:

- the evolution of the formation of this sector of the economy, despite the different rates of progress in this sector of the economy, is subject to general laws (one of them is the shift of the peak of commercial activity from the area of classical wholesale trade to the area of electronic trade).
- digitalization of wholesale trade affects purchasing activities to a greater extent than activities related to the distribution of goods (sales).
- supply chain competition in countries' domestic commodity markets is gradually being replaced by the economic competition of global online trading platforms (many countries consider this situation as a threat to national economic security).
- the formation of supply chains, including international ones, despite the total digitalization of wholesale trade, will be carried out for quite a long period taking into account classical and electronic distribution channels (as a result of this, the task of their diversification will become urgent, taking into account the benefits and risks of each format of wholesale trade).

- balancing the logistics needs and expectations of supply chain participants based on digital trade intermediation after transactions do not involve negotiations (this calls into question the formation of loyalty programs between counterparties to each other).

All the above actualizes the search for promising directions for ensuring the sustainable development of international supply chains in electronic wholesale trade, taking into account the peculiarities of its institutional regulation in the Russian Federation and China, as well as the culture of logistics management in these countries.

#### 4.2. Institutional determinants of state regulation of supply chains in the Russian Federation and China in the context of digitalization of wholesale trade

Noticeable progress in the digitalization of markets for goods and services increases the relevance of government regulation of domestic and international trade. The establishment of institutional norms and rules for its subjects, in turn, determines the nature of their logistics behavior and the features of their construction of supply chains. Let us consider the specifics of such regulation of e-commerce in the B2B sphere in more detail, considering the approaches that are used in the Russian Federation and China. The legislative system in the Russian Federation regulating e-commerce in the B2B sphere is still being formed, so it is fragmented [79]. For example, the basic regulator of domestic trade in the Russian Federation is limited only to establishing such a form as remote sales (without identifying an electronic format in it) [106]. In [105], which defines the basic norms of institutional regulation of international trade (foreign trade activities) in the Russian Federation, its remote and, accordingly, digital form is not mentioned. Noteworthy is the fact that the national strategy for the development of wholesale trade in the Russian Federation does not yet define guidelines for its digital sector [108]. In addition, in [108], the prospects for the evolution of wholesale trade are correlated with an increase in the number of large enterprises engaged in this type of activity and distributors, and, accordingly, with a reduction in the number of resellers, whose scale of activity is insignificant. The strategy for

developing trade in the Russian Federation, formulated in [108], is in effect. However, at the institutional level, a draft strategy for the development of its electronic segment has been developed, which is still being discussed [144].

E-commerce in the B2C sphere in the Russian Federation is mainly regulated by special rules and guidelines, which have the status of a state standard [26, 104, 124]. They establish a general procedure for the sale of goods remotely, but do not provide for its specification for electronic retail trade. The key legal norm for electronic wholesale trade is determined by the Civil Code of the Russian Federation (Civil Code of the Russian Federation) [94]. According to the Civil Code of the Russian Federation, a transaction can be made in electronic format, i.e., an agreement is considered concluded if it is drawn up in the form of an electronic document and signed using a digital signature (it is regulated by [110]). [94] also introduces into legal circulation the rules for the application of “digital” rights and smart contracts, i.e., contracts that are “self-executing” based on special information technology. This is almost the end of the list of current legislative acts related to e-commerce in the B2B sphere. Russian antimonopoly legislation regarding electronic commerce (wholesale and retail) has also not yet been developed. For example, in [96], the features of ensuring conditions for the effective operation of electronic commodity markets are considered only in terms of appealing the actions (their absence) of the ETP operator. It should be noted that in 2001, an attempt was made in the Russian Federation to adopt a national law on electronic commerce [112]. However, it did not acquire official status. At the same time, this type of trade, including wholesale, fell into the legal field of the CIS in 2008 (which includes the Russian Federation) [100]. In addition to the rules for conducting e-transactions in wholesale trade, [111] defines:

- distinctive aspects of information intermediation in e-commerce.
- fundamental requirements for the disclosure of information about the objects of electronic transactions and their participants, including e-trading and functional intermediaries.
- requirements for the execution of these transactions, executed in an automated mode (directly by counterparties and third parties).
- features of forms of international e-transactions, etc.



In 2017, a project was presented in the Russian Federation defining the strategic priorities of electronic commerce (its status has not yet changed [144]). ETP and marketplace are considered identical concepts. They correlate with information systems for infrastructure support for transactions in electronic format. In [144] it is noted that in the Russian Federation there are about 6 thousand ETPs. This number is radically different from what was noted earlier. The existence of this conflict is explained by the fact that in [144] when calculating ETPs, online catalogs (shops) were also taken into account as enterprises. Analysis [144] shows that this project is of a declarative nature. The emphasis in it is mainly placed on stating the problems that hinder development in the field of e-commerce. Specific strategic guidelines for it (in particular, for its wholesale type) have not been established.

The list of restrictions hindering progress in electronic wholesale trade, according to [144], includes:

- “rigidity” of electronic transactions, i.e., fixation of all its conditions before they are completed without the right to change (this circumstance does not allow the formation of dynamic supply chains and prompt elimination of errors made during their justification, including those caused by underestimation of logistics project risks).
- mandatory settlements in cross-border (international) wholesale trade based on banking services (double currency conversion leads to additional costs).
- non-compliance of the national logistics infrastructure with the requirements of electronic wholesale trade, which is manifested by:
  - a. the need to expand the practice of purchasing logistics services based on such a competitive method of placing an order as an electronic auction.
  - b. in the formation of a common digital space for electronic organizers of trade turnover and logistics (transport) capacities (commercial and public), ensuring their integration through virtual connections.
- insufficient transparency of cross-border wholesale trade.
- inaccessibility of Russian enterprises (small, medium) through national electronic trading platforms to foreign markets.
- lack of digital mechanisms for resolving conflicts in electronic wholesale trade, etc.

It should be noted that the identification in [144] of ETP and marketplace is not entirely legitimate for the following reasons.

First, the concept of ETP needs an expanded interpretation. In Russian practice, it largely corresponds to the organization of state and municipal procurement in electronic format [103]. However, ETPs, for example, corporate ones, can also be used for sales. In addition, it is necessary to distinguish between the ETP, considering its performance of commercial functions (organizers of trade turnover) and servicing state (municipal) customers.

Second, there is every reason to directly correlate the concept of marketplace, used in international practice, with the local electronic market, the boundaries of which have their own specifics. Thus, in addition to the right assessment of the status of the marketplace, it is necessary to establish institutional requirements for it.

Additionally, at least two points should be noted. Through ETP in the B2B sphere, simple supply chains are formed: supplier → consumer (this can be a trading network, and the listed counterparties can equally be active in establishing an economic connection between them). The electronic trading functionality of the marketplace is disproportionately greater than that of ETP. This category is closer to a digital trading platform than to an ETP. It implements a business model of full-fledged commodity exchange in a unified information environment (information infrastructure conditions), created on the basis of special software tools. This means that the list of options for supply chain configurations formed on the basis of the marketplace (digital trading platform) is disproportionately larger compared to ETP. They will be characterized later using the example of e-commerce platforms in China.

The EAEU, of which the Russian Federation is a member, is currently also making significant efforts to develop electronic wholesale trade on its territory. The need for this step is primarily dictated by understanding of the following challenges:

1. that the center of activity of commodity exchange is shifting precisely towards e-commerce in the B2B sphere (it is expected that the global sales volume in it should exceed the value of the same indicator for B2C by more than 2 times).

2. the degree of threat to the economic security of the EAEU, which arises because of the assertion of the primacy of global supply chains controlled by foreign electronic trading systems over local supply chains that are formed due to the development of electronic commerce in the member countries of this union, is increasing.
3. national supply chains, for the subjects of which the EAEU member countries are the main location, under the dominance of foreign electronic trading platforms, lose their competitive advantages [37, pp. 18, 23].

It is obvious that without the EAEU regulating its internal electronic market, there is a danger of a structural imbalance in the systems of economic relations and, accordingly, the configurations of supply chains in the economies of the member countries of the union. Ignoring it does not exclude the acceleration of obsolescence of many industries and the lack of demand for products produced by EAEU enterprises. The EAEU is concerned about the opacity of decision-making algorithms in foreign electronic trading systems (global e-marketplaces, ETP) and the unwillingness to disclose them, which does not exclude discrimination against goods produced in the EAEU [37, p. 26]. Similar problems in the EAEU include:

- the restrictions imposed on electronic commerce in them put its participants at a disadvantage compared to its foreign representatives.
- differences in the level of development of e-commerce and logistics infrastructure in the EAEU countries hinder the formation of a single union digital business space.
- the parameters of this trade are not an independent object of institutional statistical observation.
- E
  - a. characterized by low quality (due to insufficient technical equipment and P lack of investment).
  - b. practically not focused on supporting the export of goods.
  - s. functionally limited to transactions with goods, and not with product e categories (i.e., groups of goods that are supposed to be used together), r etc.

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The EAEU does not leave these problems open. This is evidenced by the preparation for the implementation of the project for the digitalization of transport corridors on its territory [42].

China is a world leader in the development of e-commerce. As a result, the domestic market of this country is formally “protected” from the international expansion of foreign digital trading platforms. It is this circumstance that explains the fact that the law on such trade was adopted in the PRC only several years ago [109]. It should be noted that the domestic commodity market of the PRC is still experiencing some pressure from foreign ETPs. However, this applies to deliveries that are conducted under a cross-border B2C scheme. In the PRC they are regulated by establishing a list of goods that are subject to tax preferences [164, p. 184]. Note that in [109] the category “electronic commerce” is used (sale of goods/services on the Internet in order to constantly make a profit with the assumption of all risks), i.e., this type of economic activity is classified as electronic commerce. In [109] it is not divided into wholesale and retail. This does not allow us to differentiate in detail the core competencies of an ETP operator and those operators who are limited to sales on the Internet. Analysis of [109] highlights a number of fundamental provisions. Digital and classical trade in China are considered as two equal industries, i.e. None of them are given special preferences. However, the development of e-commerce is more actively stimulated by the state (Fig. 4.35).



Figure 4.35 Institutional directions for supporting the development of e-commerce in China [109]

In [109], two classes of e-commerce operators are distinguished.

One of them consists of ETP operators. They are the organizers of trade turnover since they do not take part in electronic transactions. The functions of ETP operators are limited to creating the necessary conditions for potential counterparties to enter supply contracts (without providing related services, including logistics services).

Another class is represented by e-commerce platform operators and their participants (business operators). These platforms are information systems, the organizational and economic nature of which, based on their function, is dual in nature.

The individual responsibilities of operators of both classes are common (Fig. 4.36).

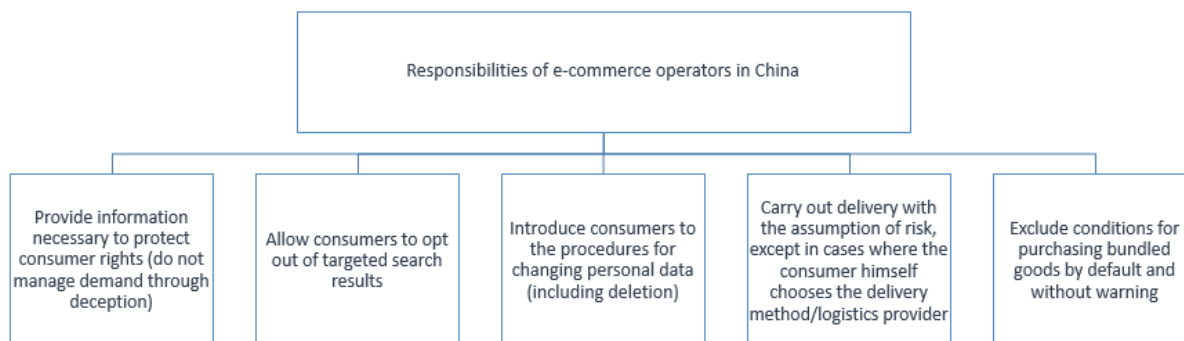


Figure 4.36 Responsibilities of e-commerce operators in China [109]

According to Article 17 [109], all types of e-commerce operators are required to provide consumers information about goods in a volume that eliminates the risk of making the wrong choice. In connection with this formulation, at least three questions arise.

How should an ETP operator verify the quality and completeness of such information in order to fulfill the requirement which was mentioned earlier?

Is it possible and in what cases is it necessary to involve outside organizations for such verification?

How to avoid the risk caused by errors in the specification of product properties when placing an order for delivery through an ETP?

The listed issues are directly relevant to the design of supply chains in international e-commerce. When planning entering the domestic market of the PRC enterprises of the Russian Federation need to pay special attention to the national institutional practice of clarifying legislation.

E-commerce platforms have the following features:

1. an object of electronic market infrastructure for public use.
2. local electronic market, i.e., “marketplace”, if one assumes the literal translation of this term.

The latter feature is supported by the imposition in [109] of the duties of a regulator of organizational and economic relations on operators of e-commerce platforms within

the limits of its responsibility for carrying out electronic transactions:

- qualification verification of participants of this platform.
- supervision over the quality of goods, including the use of mechanisms for the formation of their rating and evaluation.

The functionality and responsibilities of the operators of these platforms are described in Fig. 4.37.



Figure 4.37 Functionality of e-commerce platform operators in China [109]

It should be noted that Chinese legislation allows the operator of an e-commerce platform to conduct trading activities on it. However, he is obliged to inform all participants of such a platform (business operators) about this.

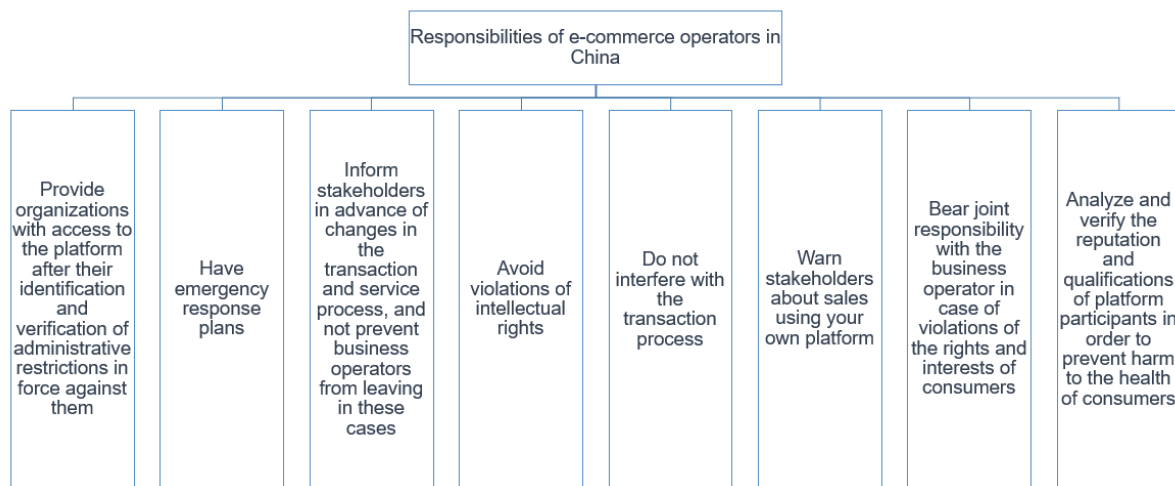


Figure 4.38 Responsibilities of e-commerce platform operators in China [109]

Thus, in China's electronic wholesale trade, two groups of typical supply chain configurations should be distinguished.

A characteristic feature of those included in the first group is the establishment of an economic connection between the supplier and the consumer using ETP services.

The basic configuration of the supply chain in this case is the same: supplier → consumer. The initiator of its formation can be any potential counterparty, regardless of its role in trading activities (sales/purchases).

The range of supply chain configurations of the second group, formed on the basis of the e-commerce platform, is wider:

1. supplier → business operator (participant of the e-commerce platform) → consumer.
2. supplier → business operator (participant of the e-commerce platform) → logistics intermediary (provider of 3 or more PLs, engaged by the supplier or consumer / operator of the e-commerce platform / organization to which the authority to provide logistics services to participants of the e-commerce platform is transferred) → consumer.
3. supplier → e-commerce platform operator → consumer



4. supplier → e-commerce platform operator → logistics intermediary (organization to which the authority to provide logistics services to platform participants is delegated/provider 3 or more PL, attracted by the consumer) → consumer.

The insufficient pace of digitalization of wholesale trade actualizes the diversification of distribution channels, taking into account the advantages of their classic and electronic format. Based on this provision, the features of state regulation of classical trade intermediation (its representatives often act as subjects of supply chains) in the Russian Federation and China will be considered.

The institution of classical trade intermediation in the B2B sphere is almost completely represented only in countries with developed market economies. For example, in the Russian Federation and China, such trade intermediation, in comparison with them, entered the path of intensive formation much later. This circumstance in the Russian Federation and China manifests itself in at least two forms.

First, the heterogeneity of coverage of the territories of these countries by commodity distribution networks. A number of factors support this conclusion:

- the territorial coverage of Russian and Chinese enterprises' distribution networks of their own domestic markets is, as a rule, incomplete.
- the largest number of wholesale and retail enterprises, including chain retail, are located in the European part of the Russian Federation, etc.

Second, the category of trade intermediation, as well as the categories of distributor and dealer, have not received direct institutional support in the Russian Federation and China. To be fair, several aspects need to be noted. In the Russian Federation, a group of activities is distinguished: "Wholesale trade for remuneration or on a contractual basis" [113]. However, their number, not counting the activities of wholesale auction houses, includes only those that are conducted on the basis of agency agreements. The term distributor is used in certain documents of the Federal Antimonopoly Service of Russia, for example, in [129]. The existence of this precedent is not due to the institutional recognition of the distributor category, but to the need to target the FAS Russia's appeal to organizations that declare that they have this status ([129]. State regulation of trade intermediation in the Russian Federation and China is carried out

by regulation of:

- contracts.
- protection of competition.

A comparative analysis of the Civil Code of the Russian Federation and the PRC Law “On Contracts” shows that they are similar in terms of:

- lack of definition of mediation.
- legislative identification of contracts concluded with intermediaries, depending on the nature of their actions.
- classification of these actions with a slight discrepancy:
  - a) in the Russian Federation - agency, commission, assignment.
  - b) in the PRC - everything is the same, only excluding agency (its substitute is a detailed order) and including the provision of intermediary services, i.e., "pure" mediation.

It should be especially noted that Chinese legislation does not allow foreign enterprises in the country to independently conduct foreign and domestic trade. The ban on this activity is not direct. It manifests itself in the form of strict requirements for it, which include:

- presence of a large authorized capital.
- mandatory participation in its formation of a Chinese enterprise within the range of 35-51%.
- admission to the trade industry of foreign enterprises if they have a trade mission in the PRC for 3 years or in exchange for significant investments, etc.

All this determines the mandatory demand for the services of trade intermediaries for foreign enterprises that plan to enter the Chinese market. Such encumbrances for Chinese enterprises do not exist on the Russian market. However, this does not in any way affect the growth of activity in the formation of their own intermediary structures in the Russian Federation. The fact is that Chinese enterprises do not practice deploying their own sales networks in other countries, even with the involvement of local resellers, limiting themselves to simply fulfilling foreign orders for supplies on an FOB or FCA basis (as per Incoterms 2020). Against this background, another circumstance

stands out, which encourages Chinese manufacturers of technical goods (TPPP) to conduct international trade with Russian enterprises within the supply chain: Chinese manufacturing enterprise → cross-border trade intermediary (PRC enterprise located in China near the border with the Russian Federation) → Russian enterprise. It lies in the fact that the state reimburses PRC resellers of this type, specializing in the supply of TPTN, 13% of their price [44, p.3].

Separately, it should be noted that in the Russian Federation and China, such agreements as distribution and dealer agreements are mixed. In a number of other countries, these treaties have an independent status. This circumstance, accordingly, not only complicates the establishment of economic ties in the PRC and the Russian Federation with trade intermediaries, but also introduces elements of risk into the formation of supply chains based on transactions with them. Regulation of competition protection in the Russian Federation and China is conducted practically on the same principles. The corresponding law in the Russian Federation has the same name, while in the PRC it is the law “On Combating Monopolies” [96, 125]. Trade intermediation in [96.125] is correlated with the participation of enterprises in “vertical” agreements” (i.e., with the pairwise interaction of economic entities within the framework of supply contracts). According to the Civil Code of the Russian Federation, supply agreements create a contract platform only for wholesale trade. This means that each participant in a “vertical” agreement who purchases goods for resale is always a reseller. It is also worth noting two more aspects:

- commodity flows in supply chains are formed on the basis of “vertical” agreements.
- the number of resellers in supply chains, within which the same product is repeatedly resold, is directly proportional to the level of product distribution.

A “vertical” agreement in the Russian Federation is allowed only in the following cases:

1. if the share of each participant within the boundaries of one product market does not exceed 20%.
2. if the seller:
  - a) does not impose a ban on the buyer’s commercial cooperation with its competitors.

- b) does not establish fixed or minimum prices for resale of goods by the buyer.
  - c) introduces a maximum resale price, which provides the buyer with the freedom to determine the value of this price that is rational for him.
3. if it does not restrict competition [96].

The first condition means that sequentially structured “vertical” agreements that form the contractual framework of the supply chain can only initiate the emergence of a homogeneous material flow, i.e., movement of goods of one type. However, the FAS RF interprets this issue more broadly. According to their position, the agreements also apply to supply chains, the participants of which interact within a single technological cycle. Obviously, members of such supply chains operate in different product markets. As a result, the probability of “vertical” relationships in them is higher. Fulfillment of the first condition updates the focal supply chain company's tracking of the share of its participants in the product market. Here a reservation should be made that this is not an easy task not only for a company, but also for the FAS Russia. A necessary condition for its implementation by the FAS of the Russian Federation is to institutionalize the practice of tracking supply chain configurations and their parameters in the country. Let us recall that this idea was declared in [99]. It remained unrealized. There is every reason to believe that digitalization of the economy will ultimately resolve this issue. In this case large-scale supply networks managed by a single focal company will face new institutional challenges. To emphasize the significance of this problem, the following arguments should be made.

First, many Russian retail chains, to avoid unproductive investments in their development, are forced to independently monitor the approach of the volume of sales of food products to the maximum permissible value (25% of total sales within the regions of the Russian Federation, etc.) [106]. It should be expected that the size of this value will be reduced by law. This will support non-chain retailers that are unable to compete with retail chains.

Second, expanding the boundaries of commodity markets is a stable trend. One of the driving forces of its development should be considered an increase in the efficiency of the Russian logistics infrastructure, which leads to:

- 1. increase of the speed of freight transportation.

2. increase of the quality of ensuring the safety of goods, the transportation of which requires compliance with the temperature regime, etc.

Another such force is the replacement of the economic competition of classical supply chains managed by a focal company with competition between digital trading platforms [151]. This process inevitably eliminates a number of existing restrictions (spatial, temporal) that are imposed on “vertical” agreements, which also lead to the expansion of the boundaries of commodity markets. Their transformation initiates a redistribution of the shares of these markets, which existed within the previous boundaries, between federal (including international) supply chains and local (regional), and in favor of the former. This process cannot but increase the attention of the Federal Antimonopoly Service of Russia to “vertical” agreements in general and supply chains in particular. Regulation of competition protection in the PRC is carried out through the Law “On Anti-Monopolies” [125]. It also places emphasis on “vertical” agreements. However, compared to [96], they are subject to less stringent requirements. They mainly come down to:

- prohibiting the resale price of goods by the buyer.
- limiting some actions of a seller who occupies a dominant position in the product market (the seller’s share is 50% or higher), which are classified as abuse of this status.

Our analysis of the institutional regulation of relations regarding resale of goods in the B2B sphere in the Russian Federation and China allows us to draw a number of conclusions:

- indirect definition by the laws of these countries of the legal status of resellers (distributors, dealers) makes it difficult to differentiate product distribution and, accordingly, build sustainable supply chains.
- in the PRC, compared to the Russian Federation, fewer restrictions are imposed on “vertical” agreements, as a result of which the legally permitted throughput of supply chains in the PRC is much higher than in the Russian Federation.
- Chinese legislation allows for the removal of restrictions from “vertical” agreements, for example, in the case of a need to ensure the efficiency of small

businesses (this allows to quickly not only form new supply chains, but also reformat the supply conditions of existing ones).

Separately, it should be noted that in global trade, the practice of involving (non-digital) resellers in international supply chains varies greatly depending on the country:

- in South Korea, almost half of foreign trade transactions are carried out by three trade intermediaries.
- in a number of countries in the Near and Middle East, only local enterprises have the right to apply for distributor status.
- small US businesses, as a rule, enter foreign markets without the services of resellers, etc. [126, p. 234; 166, p.74].

Our research into the characteristics of wholesale trade and trade intermediation in the Russian Federation and China and their regulation in these countries allows us to come to the following conclusions.

First, against the backdrop of obvious progress in international electronic commerce between these countries, the justification for the limits of openness of Russia's internal market for foreign suppliers is being updated [141, p. 78]. There is every reason to believe that changes will be made to the antimonopoly legislation in the Russian Federation in this regard in the near future. They will be likely aimed at preventing global international supply chains from dominating the domestic electronic market of the Russian Federation. As a result of their implementation, the rules for making digital transactions will change. This will therefore require adjustments to the design of international e-wholesaling supply chains.

Second, government stimulation of the development of e-commerce in China contributes to a more rapid change in the system of economic relations (configuration of supply chains) in this country than in the Russian Federation [158, p. 155].

Third, the development of digital trade between the Russian Federation and the PRC entails a partial replacement of classic intermediaries with new types of intermediaries. This determines not only the reconfiguration of international supply chains, but also the need to understand new logistics, including digital risks that arise in foreign economic activity [82, p.62; 152].

Fourth, the intensification of digital trade between the Russian Federation and the PRC today depends on progress in increasing the efficiency of the macro-logistics system of the Russian Federation and the speed of its integration with the corresponding system of the PRC [60, p.66; 67, p.61; 165 p.109]. Achieving this goal correlates with the digitalization of the “Silk Road” [66, p.64; 147, p.494].

Fifth, due to the pandemic, the challenges of supply chain design in the digitalization of the global economy have appeared in a new light.

The pandemic, of course, has had a large-scale destabilizing effect on global international supply chains, including those formed under the leadership of Chinese enterprises [62, p.93; 70, p.67]. However, along with this, it once again (after the global financial crisis of 2008) proved that multi-link international supply chains are extremely unstable logistics structures [167]. Digitalization of trade will reduce the redundancy of their subject composition and, accordingly, increase the reliability of operations. However, this trend should be supported by the digitalization of supply chains and the formation of new comfortable infrastructure logistics conditions for their operation.

#### 4.3. Functional areas for designing international supply chains in wholesale e-commerce

The long-term impact of the pandemic on the national economy objectively forces not only to accelerate the digitalization of basic business processes at wholesale trade enterprises, but also to transfer their main activities to an electronic mode of operation. Achieving this goal requires understanding the problems associated with the design of supply chains in a new format of interactions with suppliers and other logistics stakeholders. This situation is aggravated by at least several factors.

First, the concept of supply chain management has not yet taken shape. This position is predetermined, among other things, by the fact that it is a product of the synthesis of various scientific knowledge [64, p. 400; 136, p.52]. A significant role here is played by the fact that the institutional regulation of supplies in works devoted to the issues under consideration is given unreasonably little attention.

Second, supply chain management refers to an end-to-end type of management, the competencies of which are not strictly defined.

Third, professional standards governing supply chain management include many controversial provisions. Studying the listed factors is an independent direction of research. Therefore, the research is limited to paying attention only to the problems of designing supply chains in electronic wholesale trade. However, before moving on to them, the existence of fundamentally different logistics priorities for such design depending on the type of trading activity will be proved. The situation of retail and wholesale trade enterprises from the point of view of the features of digitalization of logistics processes, incl. external, is not the same for a number of reasons.

1. Retail trade is the first (compared to other industries) to reflect the need to introduce process logistics innovations [134,137].
2. The introduction of restrictive measures by the state to stop the spread of coronavirus contributed to a large-scale change in consumer behavior, i.e., led to a large-scale transition of households to placing purchase orders remotely (electronically).
3. This transition is facilitated by the growth in the number of online intermediaries (product aggregators and marketplaces) in the B2C sphere.
4. The e-retail market is relatively free.
5. The problems of digitalization of processes of enterprises in this industry are simpler and less expensive than for wholesale trade enterprises.
6. The problem of supply chain management in retail trade, as a rule, comes down to integrating its subjects into higher-level logistics systems. Retail networks are not considered, since their parameters correspond to intermediary logistics systems [10, 120, 122].
7. Retail trade enterprises, compared to wholesale trade enterprises, play a smaller role in the formation of a single commodity distribution (logistics) space [118].
8. The primary strategy for digitalizing the core activities of retail enterprises is the opening of electronic stores with the prospect of them performing the functions of a marketplace.

All this determines the focus of actions for the digitalization of retail trade on the transfer



of sales to an omnichannel format [4, 151]. Its context is purely marketing in nature. It is designed to integrate contacts with individuals, taking into account the diversity of communication channels between consumers and retailers [4]. The emphasis of the logistics activity of retail trade enterprises is shifting towards fulfillment, i.e., operational activities, which are associated with the cycles of fulfilling consumer orders (from registration to receipt).

It is necessary to highlight at least several fundamental differences in the digitalization of logistics processes in wholesale trade enterprises.

1. Its objects are external processes, i.e., those that determine the nature of logistics interactions with stakeholders and are regulated by the supply agreement. And the application of this agreement is limited to the B2B sphere.
2. The choice of a strategy for transferring logistics interactions in the B2B sphere to an electronic format depends, among other things, on the position occupied by a wholesale trade enterprise in the system of economic relations of market economy entities. The rules for such a choice predominantly belong to those enterprises that have significant market power and, accordingly, have the ability to form and manage supply chains (networks), i.e., focal companies.
3. Marketing supply chains formed under the leadership of such enterprises are very often multi-level (retail trade enterprises simply do not have such structures). The development of the information space, which provides direct contacts between consumers (retailers) and suppliers, has not yet led to the large-scale elimination of trade intermediation in the B2B sphere, and there are several reasons for this:
  - the accuracy of recognizing the structure of demand as the sales geography expands into other countries has its limits.
  - centralized supplies have disadvantages (in particular, they do not have flexibility).
  - not all B2B resellers are ready to invest in the development of logistics systems, information systems, etc.

All this means that digitalization of the process of intervention in logistics interactions arising in the supply chains reporting to focal companies is one of the main priorities for the development of their operational logistics activities. The

widespread adoption of blockchain technology is an example of this.

4. Digitalization of ensuring customer-centricity of supply chains in the B2B sphere has a slightly different nature than in the case of the B2C sphere. This is explained by the following:
  - a) different approaches of wholesale and retail trade enterprises to understanding the competitive level of logistics service (the former often adhere to selective customer service, while the latter place higher demands on logistics services than wholesale trade enterprises).
  - b) the main obstacles to such digitalization in the B2B sphere are:
    - the unwillingness of supply chain participants to share supply plans (replenishment of stocks).
    - the dominance of dual relations in supply chains.
    - an imbalance in the benefits from the introduction of digital technologies between the focal company and the participants in the supply chains reporting to it.

As a basic scheme for designing a supply chain in electronic wholesale trade, one should take the invariant algorithm, which is given in [115, p. 271]. It involves substantiating the goal of forming such a multiple organizational structure with subsequent substantiation of the subject composition of the supply chain and key performance indicators of its functioning. In general, this algorithm quite clearly outlines the contours of supply chain design. However, it has several disadvantages:

1. The question remains open about the distinction between trade and logistics activities at a wholesale trade enterprise. The latter is a classic trade, rather than logistics, intermediary.
2. It is not clear on what basis suppliers and consumers of a wholesale trade enterprise's services will consider themselves participants in its supply chains. Such statuses are not defined in supply contracts, which calls into question the fact of supply chain management by individual wholesale trade enterprises. The exception here is precedents, as a result of which these structures are formed as part of the implementation of distribution agreements and dealer agreements [149]. The question that was raised is one of the key ones in the context of

designing supply chains in electronic wholesale trade. Answering this is a prerequisite for ensuring integrity in the supply chain. To emphasize the significance of this provision, it should be noted that the concept of supply chain management is based on the idea of ensuring the overall competitiveness of their participants. Its implementation, on the one hand, goes far beyond the scope of concluding a classic supply contract, and on the other hand, does not exclude falling under antimonopoly legislation.

3. The question arises: what step in B2B supply chain design should be considered primary? Determining their object or process composition?
4. The question remains unclear: how to assess the controllability of the supply chain? The answer to this should be sought in the area of formalizing logistics coordination on the basis of special agreements between business entities, considering Russian legal practice. This step will accordingly update the review of “vertical” agreements for compliance with the admissibility criteria. Separately, it should be noted that the design algorithm that was shown does not take into account the requirements for supply chains in electronic commerce, which include the need for:
  - large-scale transition to e-SCM.
  - increasing the speed of logistics response to consumer requests received via the Internet.
  - making logistics interactions interactive.
  - visualization of the levels of current and safety stocks in supply chains.
  - increasing the degree of trust of their participants in each other.
  - planning logistics operational activities in supply chains using large databases, etc.

Electronic wholesale trade has incomparably greater commercial potential than electronic retail trade. However, in terms of trade turnover, it is still significantly inferior to the second type of trading activity. One of the obstacles to its interception of commercial initiative should be considered the uncertainty of likely changes in supply chain management under the influence of increased use of the capabilities of the Internet.

Electronic wholesale trade needs logistics assistance that can take it to a new level of

development. The demand for this step is determined by the need to adapt the organization of operational logistics activities to the specifics of electronic transactions. Market interactions of this type are characterized by higher dynamics. The logistics response to e-commerce solutions in the B2B sector is expected to be faster than in the classic type of wholesale trade. Solving this problem involves developing an innovative approach to supply chain design that takes into account modern electronic economic realities.

This problem is especially acute in international trade, where logistics activities are particularly complex. This is explained by:

1. high uncertainty of the occurrence of events in international supply chains.
2. the existence of a wide range of restrictions preventing their control.
3. the scale of investment in the formation of assets necessary for logistics support of processes in international supply chains.
4. high logistics risks.
5. country differences in the culture of logistics management.
6. a variety of forms of shipping documentation.
7. the length of cycles for executing supply orders and the difficulty of their coordination within the supply chain, etc.

All this requires increased attention to the organizational and economic features of designing international supply chains in electronic wholesale trade.

The impact of e-wholesaling on supply chains should be considered multifaceted.

First, the task of replacing stocks of material resources with information about the possibilities of their replenishment appears in a new light. This is due to the fact that e-commerce, compared to the classic procurement option, guarantees access to a wider, essentially unlimited, range of suppliers [156, p. 541].

Second, e-commerce in the B2B sphere contributes to the overall transformation of paper circulation in supply chains into paperless, the security and transparency of which is ensured, among other things, by blockchain technology [77, p.32; 140, p.58]. This means that the ability to track the movement of consignments in supply chains increases.

Third, e-commerce in the B2B sphere makes it possible to speed up financial settlements for completed deliveries and thereby increase the speed of goods movement in logistics chains. To effectively use this opportunity, it becomes necessary to redesign the functional cycles for executing purchase orders and justify novel approaches to their harmonization throughout the chain.

Fourth, higher visibility of events occurring in supply chains in the case of B2B e-commerce creates objective preconditions for rationalizing decisions on delays in logistics operations. Their implementation, in turn, allows one to avoid unproductive movement of material resources [11, p.541].

Fifth, B2B e-commerce opens up new prospects for supply chain integration. The conditions for this are created by the possibility of connecting logistics information systems (LIS) of their participants into a single network.

Sixth, e-commerce in the B2B sphere contributes to increased attention to the connection of external areas of logistics responsibility at each enterprise participating in the supply chain, which is a pressing problem for many of them.

Seventh, e-commerce in the B2B sphere actualizes the need for readiness to quickly restructure the configuration of supply chains, the need for which can be determined by:

1. rapid changes in the situation on commodity markets.
2. adjustment by:
  - the focal company of the sales plan (placement of supply orders).
  - clients of their requests.

Eighth, B2B e-commerce stimulates the total digitalization of supply chains. This trend increases the urgency of the issue of the division of powers for supply chain management between logistics managers and LIS.

Ninth, it makes necessary the transition to multi-channel deliveries [1, p. 13]. It should be noted that this step, in turn, updates the management of inventories of material resources, which are distributed not only in their units, but also in various supply channels.

The change in the format of wholesale trade from classical to electronic, as the research shows, is accompanied by changes in the logistics interactions of supply chain participants. However, before characterizing them, it is worth looking at the following points.

First, e-commerce in the B2B sphere cannot claim to completely replace its classical form. The pace of its development is quite high (compared to B2C trading). However, its maximum specific share in the total volume of wholesale trade in the United States, which leads in the development of wholesale e-commerce, only reached 17%. This result was achieved in the sales sector of production-intended goods (machinery and equipment), which indicates the local focus of wholesale e-commerce. If one assumes that the supply of these goods was conducted within the framework of long-term economic relations, then the actual functionality of electronic wholesale trade will be even lower.

Second, it's hard to agree that e-commerce (regardless of whether it is wholesale or retail) guarantees a quick and high-quality search for potential suppliers, as stated in [40, p. 45]. There are several arguments in favor of this conclusion:

- not all suppliers provide complete data on the advantages and disadvantages of their products.
- there is a general practice according to which suppliers do not always include highly liquid goods in the electronic catalog of products offered for sale.
- the introduction of information technologies in the field of sales and procurement is insufficient.
- recently, a trend has clearly emerged, which is characterized by the fact that potential suppliers, in response to a request for a commercial proposal, often send offers containing conditions that do not differ from those specified in the request (this practice significantly complicates their acceptance).
- not the complete list of goods is subject to purchases and sales through electronic wholesale trade (due to the need for pre-contractual commercial negotiations).
- the results of searching for potential suppliers on the Internet require special verification.

However, it is advisable to note that in the future, as a result of the creation of a single

digital space in the EAEU, as well as the widespread introduction of blockchain technology in logistics, the search for potential suppliers will be simplified.

Third, B2B e-commerce does not completely eliminate transaction constraints. Some of them are simply transformed into new types. For example, tracking the movement of goods by scanning signals from radio frequency RFID tags creates the need to introduce control over the operation of the corresponding technical means.

Fourth, e-commerce in the B2B sphere generates logistics risks, which are based on failures (errors) in the functioning of special software and LIS. Separately, in this context, one should note the likelihood of unauthorized external penetration into these systems, the vulnerability of which to such influences remains high.

Fifth, despite all the advantages of e-commerce in the B2B sphere, many supply chain participants are not ready to fully share information with partners about the availability of stocks, plans (facts) for their replenishment and shipment of goods.

The direction of changes in the logistics interactions of supply chain participants, which are determined by electronic wholesale trade, is characterized by the following provisions. Preferences regarding methods of placing orders for supplies, primarily of non-core material resources, will shift in favor of reverse auctions, tenders, etc. in electronic form.

There are various models for conducting such auctions (English, Dutch, American) [156, pp. 448, 449]. The search for information about potential suppliers will mainly be carried out based on sources offering aggregated data, using directory “hubs” [14, p.4; 117, p.172; 163, p. 308]. Intermediaries (operators of electronic platforms) will be more widely involved in placing orders, whose functions may vary:

- ensuring interaction between buyer and supplier.
- providing the opportunity to purchase goods in one place.
- bringing together the buyer and supplier with the ability to change the price of a product in real time [163, p. 309].

The idea of integrated logistics support will receive new impetus in product design, also through increased cooperation in supply chains. The integration of the participants of LIS is getting vital as it will allow to improve:

- customer focus.
- supply planning.
- processing and fulfilling supply orders.
- after-sales service, in particular, management of returns of defective goods.

Particularly important in achieving them will be the introduction of interfaces that will remove technical barriers to intercompany communications between participants in supply chains. Management of logistics interactions in these structures will become more formalized. It should be assumed that in the future, competition between supply chains will be replaced by economic competition between digital (trading) platforms [117, p. 172].

When designing international supply chains for e-wholesaling, it is necessary to take into account all the points that were given above. However, there are a number of aspects to which it is advisable to pay special attention.

First, country differences in the culture of communication through electronic communications, should be considered.

Second, it is necessary to present in detail the requirements for customs clearance in various countries, including the customs declaration of goods in electronic form [148]. In addition, it should be taken into account that the EAEU has completed the development of a concept for creating a digital transport and logistics service (digital transport corridor).

Third, you need to be aware that returning defective goods entails high logistics costs.

Fourth, the substantiation of a competitive level of logistics service becomes of particular importance in such design.

Fifth, it is advisable to determine the configuration of the logistics capacity network as a result of solving the dilemma “the distribution warehouse is located in front of the state border of the country to which the supply is made, or on its territory.”

Sixth, in the design of international supply chains in this type of trade, special emphasis should be placed on the development of a contract strategy. In this context, the contract model of the supply chain is of interest, designed to assess the impact of the type of



contract with its participants (it is derived from the organization of industrial cooperation and the decision to attract resellers) on ensuring the value of manufactured products [13, 32].

Seventh, the design of multi-channel sales in international electronic wholesale trade should be conducted taking into account the freedom of choice by consumers of the logistics service channel.

Eighth, the justification of the management structure is of particular importance in the design of the supply chains under consideration. This issue is addressed, for example, in [34]. However, the features of logistics management in such chains are not specified in it.

Logistics risks in international supply chains in electronic wholesale trade arise due to their length, the high degree of uncertainty in the timing of operations for the movement of goods, the difficulty of their synchronization and considering institutional factors, etc. [11, p. 163; 33]. They should be managed on the principles of risk management, formulated in international ISO quality standards, and monitoring the likelihood of risk events occurring in supply chains. In the latter connection, it is not clear for what reason in [38, p. 62] it is proposed to limit ourselves to monitoring the negative consequences of the occurrence of such events?

One should agree with [189, p. 199] that special attention in supply chain management should be paid to their most vulnerable sections, since they are the main sources of logistics risks. In addition, it is necessary to take into account the risks of emergency situations and develop emergency logistics procedures for this case. In this context, blockchain technology is applicable, which makes it possible to timely block unjustified logistics actions of supply chain participants. The emphasis in its development should be placed, among other things, on the formation of a list of formalized ideas about trust options [77, p. 50].

Electronic wholesale trade does not directly compete with its classic form, although its functionality has significant potential. The speed of its disclosure is determined by progress in the field of creation and improvement of:

- B2B communications on the Internet.

- organizational and economic mechanisms of electronic forms of commercial interactions between business structures and distance trading models.
- legislation regulating remote forms of wholesale trade.
- technological (digital) platforms for cross-border e-commerce.

Obvious achievements in this direction have led to the fact that electronic wholesale trade has acquired the status of a promising area of business development, primarily in technologically and economically developed countries. In this situation, when designing international supply chains, it becomes necessary to consider new challenges:

- establishing the influence of e-commerce in the B2B sphere on the functional areas of management of these structures (including the geographical limits of its influence).
- creation of new standards for logistics interactions both at the micro level and at the inter-company level, and at the level of interstate integration structures (for example, the EAEU).
- justification of priorities for visualization and management of events in supply chains using special software (in order to reduce transaction costs, manage logistics risks and improve relations between supply chain participants).
- assessment of the effectiveness of fresh solutions for transforming classical functional areas of logistics and supply chain management into electronic forms.
- searching for ways to synchronize processes in electronic operational logistics activities.
- ensuring the security of both physical and “electronic” supply chains.
- the formation of global transport and logistics hubs as innovative value creation centers, which can be regional distribution centers.
- provision of comprehensive services for transshipment and cargo consolidation in cross-border e-commerce, development of warehouse facilities providing digital services, etc.
- unification of customs administration procedures in order to increase the efficiency of cross-border e-commerce.
- the formation of standardized practices in cross-border e-commerce in order to ensure the security of intercompany transactions.

Thus, electronic wholesale trade needs logistics assistance that can take it to a new level of development. The demand for this step is determined by the need to adapt the organization of operational logistics activities to the specifics of electronic transactions. Market interactions of this type are characterized by higher dynamics. The logistics response to e-commerce solutions in the B2B sector is expected to be faster than in the classic type of wholesale trade. Solving this problem involves developing an innovative approach to supply chain design that takes into account modern electronic economic realities.

## Chapter 5. Directions for improving the design of international supply chains in wholesale e-commerce

### 5.1. Strategies for designing international supply chains in wholesale e-commerce

The pandemic has made negative adjustments to trade cooperation between the Russian Federation and the PRC. However, their consequences in monetary terms were not so significant. Exports of goods from the Russian Federation to the PRC and, accordingly, imports of goods from the PRC to the Russian Federation, in the first half of 2020 decreased almost equally (within 5%) [20]. However, their product structure has undergone changes. In the export of goods from the Russian Federation to China, they manifested themselves in an increase in the specific share of agricultural products and food products to almost 10%. This result was achieved mainly due to an increase in supplies of vegetable oils and poultry meat to China. The volumes of exports to China of most other Russian goods decreased during the period under review. Although, it should be noted that supplies of plastic products to China increased by more than 20% compared to 2019. However, their share is extremely small (almost half a percent). In addition, the prospects for increasing their supplies to China are unclear. This is due to the fact that anti-dumping duties apply to a group of these goods in China. The shares of wood and non-ferrous metals in Russian exports were less than 7% and 5%, respectively. Another incomparably large (main) part of Russian

exports is oil and gas (about 65%). The import of Chinese goods in the 1st half of 2020 was dominated by TPTN goods (equipment, machines, etc.) (Fig. 5.1). However, for all product items (excluding textiles, toys, and sports equipment), supply volumes decreased in 2020 compared to the previous year.

The import of a wide range of products of plant and animal origin into the PRC is subject to prohibitions and restrictions. In addition, it should be taken into account that the PRC has a practice of approving Russian enterprises that are allowed to export food products (agricultural products, animal products, dairy) to this country. Direct deliveries of these products from the Russian Federation to China are possible. To do this, a Russian enterprise must obtain permission to trade food products in the PRC. The latter procedure involves a substantial number of formalities. It is possible to speed up its passage by involving a Chinese reseller in organizing supplies.

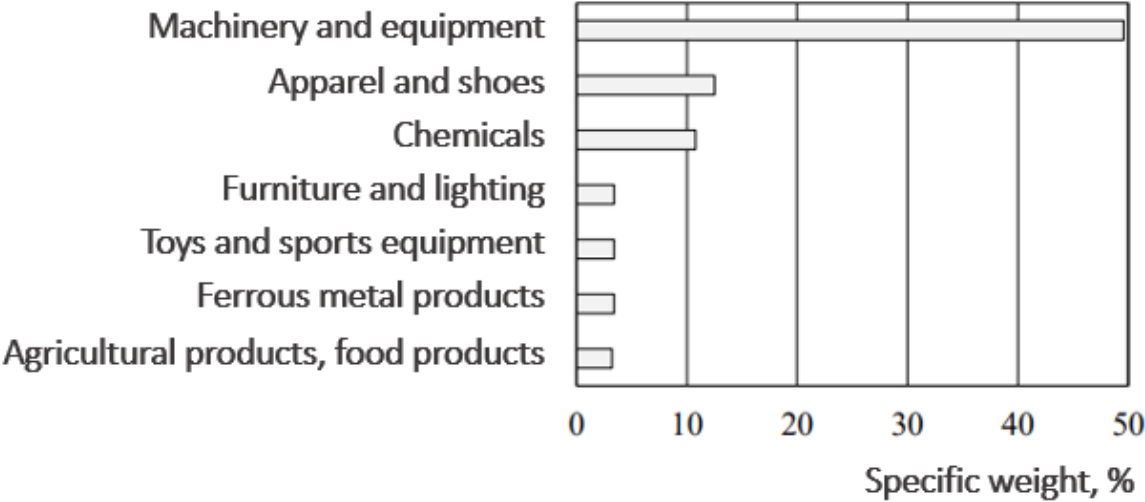


Figure 5.1 Commodity structure of imports of goods from China to the Russian Federation in the 1st half of 2020 [153]

It is advisable to distinguish the following alternative structures of supply chains for Russian food products in the PRC:

1. exporting enterprise of the Russian Federation → importing enterprise of the People's Republic of China → wholesale trade enterprise of the People's Republic of China → retail trade enterprise of the People's Republic of China.
2. exporting enterprise of the Russian Federation → reseller (wholesale trade enterprise) of the People's Republic of China → retail trade enterprise of the People's Republic of China.
3. an exporting enterprise of the Russian Federation → its branch/trade mission in the PRC → a wholesale/retail trade enterprise of the PRC.
4. an exporting enterprise of the Russian Federation → an electronic B2B/C store in the PRC owned by it (created on the basis of its own information technologies, i.e., not on the basis of one of the e-commerce platforms of the PRC) → a wholesale/retail trade enterprise of the PRC.
5. exporting enterprise of the Russian Federation → wholesale trade enterprise of the People's Republic of China (economic connection is established on the basis of the services of the ETP of the Russian Federation).
6. exporting enterprise of the Russian Federation → wholesale trade enterprise of the People's Republic of China (economic connection is established on the basis of the services of the ETP of the People's Republic of China).
7. Russian exporting enterprise → business operator of the PRC e-commerce platform (PRC enterprise) → PRC wholesale/retail trade enterprise.
8. exporting enterprise of the Russian Federation → business operator of the e-commerce platform of the People's Republic of China (exporting enterprise of the Russian Federation) → wholesale/retail trade enterprise of the People's Republic of China.

If these supply chains include a PRC reseller or wholesale sales by a Russian food exporter are carried out through an ETP/e-commerce platform (as a business operator), then it will not have the opportunity to effectively promote its brand in the Chinese domestic market. In the second case, i.e., when a Russian exporting enterprise chooses supply chain options No. 7 and 8 (see above), its brand positioning must comply with the rules established by the e-commerce platform operator. Obviously, this factor does not contribute to increasing awareness of Chinese consumers about the Russian brand. In addition, it creates objective prerequisites for

the risk of copying, for example, recipes for certain types of exported dairy products, in particular ice cream (it is supplied to the PRC from the Russian Federation) and organizing its production in the PRC under a new brand.

One of the conditions for the functioning of the food supply chains is obtaining the right to import them into the territory of the PRC, i.e., after the goods have been released by the customs authority of that country. This right is confirmed by the issuance of a quarantine and inspection certificate for the import of food products [153].

In the process of justifying a strategy for designing international supply chains of Russian food products in the PRC, providing for their wholesale sales through an electronic store owned by a Russian exporting enterprise, or with the participation of digital resellers (Russian and Chinese), it is necessary to take into account a number of provisions.

First, it is recommended to open an electronic store aimed at wholesale sales of goods in China on the basis of Chinese hosting. This is due to the fact that China has a special filtering system for Internet resources. It was created as part of the Golden Shield project. The opening speed of external websites in China is therefore terribly slow.

Second, the interface for users in such stores as well as business operators (participants of Chinese e-commerce platforms), should include clear settings that should allow users to make a full calculation of the logistics costs arising during the delivery of goods in China. Its algorithm should provide the definition of:

- where such costs arise in the supply chain.
- the time spent on passing cargo through customs control in a Russian port.
- selling price on EXW terms (this is necessary to understand the FOB terms, taking into account the possibility of delivering consignments to various Russian seaports of shipment) and other conditions for their delivery to the destination in China, which is selected by the Chinese user.

Russian equipment is supplied to China in small quantities. Data on the share of electronic wholesale sales of this group of goods in the total volume of their sales in China are not presented in official statistics. However, the key factors for the effectiveness of their deliveries to China through digital resellers are:

- wide awareness of the positive characteristics of this equipment not only in China, but also abroad.
- active participation of Russian manufacturers in industrial exhibitions held in China.
- provision, upon request, of potential Chinese consumers (representatives of the B2B sphere) of product samples (free or charge).
- the presence of a special option in the interface for users, which allows them to evaluate the value of equipment on an integrated basis, i.e., determine whether it has necessary and unnecessary characteristics for the consumer.

Justification for the project of international supply chains of Russian goods in electronic wholesale trade with Chinese enterprises should include the implementation of invariant stages, which are shown in Fig. 5.2.

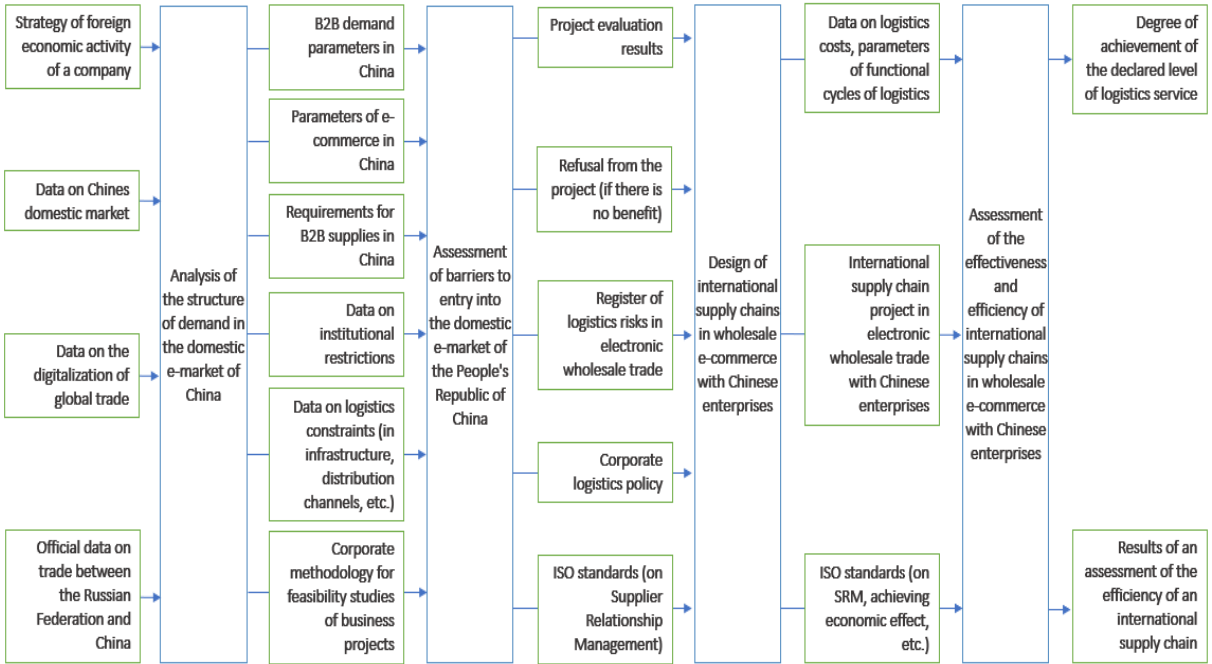


Figure 5.2 SADT diagram of the development of a project for the supply chain of Russian goods to China within the framework of electronic wholesale trade

The proposed supply chain design strategy is based on a cyclic approach, since if negative results are obtained at the second and last stages of this process, a return to the beginning of the algorithm is assumed.

As part of its 2nd stage, it is advisable to pay special attention to the following logistical features of entering the domestic market of the PRC (Fig. 5.3).

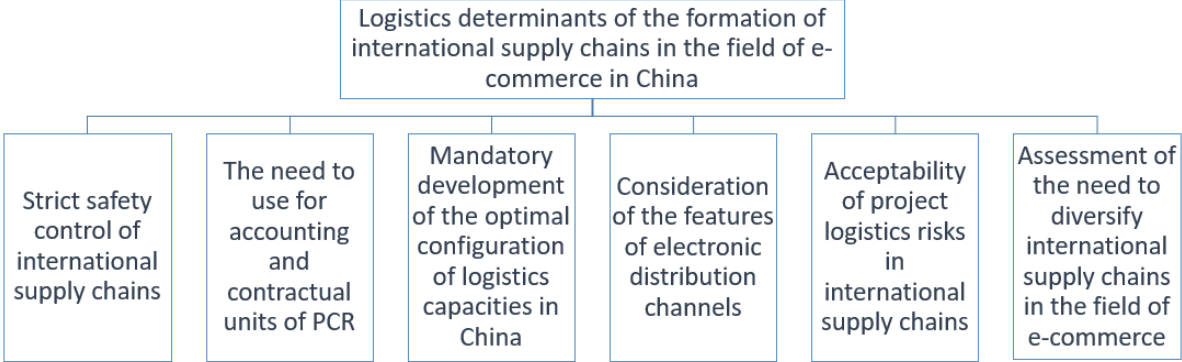


Figure 5.3 Project priorities for logistics assessment of entry barriers in the domestic electronic market of the PRC

1. It is worth highlighting the increased institutional requirements for ensuring the safety of international “cold” supply chains for food products entering the PRC. These include, in particular:
  - strict control over their storage (testing of the warehouse environment and logistics personnel for the presence of COVID-19).
  - disinfection of food products, vehicles, and logistics personnel) [73].
2. It is necessary to study the national specifics of logistics accounting and contractual units that are used in the PRC (general, transport and warehouse, goods, and packaging) [135, p. 266]. Taking this factor into account is essential for cross-border supply chain design in wholesale e-commerce. This is explained not only by the fact that the harmonization of these units will help avoid “gaps” in the system of logistics processes connecting the participants in the supply chains and simplify their re-execution. The user interface in an electronic store, ETP, etc. information and trading services focused on selling goods in China should include an additional service option. It should provide a potential Chinese customer with the opportunity to ensure that the electronic transaction guarantees full integration of the connecting logistics processes in the international supply chain. The presence of this option will create objective prerequisites for a Chinese enterprise to make a positive decision on placing an order for supplies.



3. It is recommended to work out (especially if the supplier assumes the obligation to fulfill the CIP condition) the optimal configuration of Chinese logistics capacities, the use of which will ensure the implementation of transport and logistics operations as part of the process of delivering goods to a Chinese customer in the territory of the PRC.
4. Particular attention should be paid to a comprehensive analysis of the channels of distribution of goods in the PRC, i.e., fundamental justification for the best option for the subject composition of the international supply chain [11, p. 145; 47, p.633]. In the process of conducting it, it is advisable to use invariant configurations of supply chains of Russian goods to the PRC with the participation of digital trading intermediaries and organizers of trade turnover (RF and PRC), which were previously presented in this paragraph. The list of potential subjects of the supply chains should include logistics providers of PL 3 and above. The selection of distribution channels should be based on the following criteria:
  - profitability of electronic sales, considering the characteristics of the life cycles of these channels.
  - efficiency of logistics service potential (functional compliance of the channel with the requirement to provide a competitive level of logistics services to Chinese customer enterprises).
5. It is advisable to pay special attention to assessing project logistics risks in the supply chains under consideration. The following areas of the 3rd stage of designing the supply chain of Russian goods to China within the framework of electronic wholesale trade (see Fig. 3.3) should be prioritized:
  - personalization of participants in these international logistics structures.
  - identification and assessment of spatiotemporal interdependencies in operational logistics activities in the international supply chain formed on the basis of an electronic transaction.
  - specification of functional logistics cycles that form the process framework of this supply chain.
  - determination of types of logistics costs in the international supply chain and their calculation.

6. Additional attention should be paid to justifying the need to diversify international supply chains in electronic wholesale trade with Chinese enterprises. In this case, one of the feasible options for implementing this approach is to organize the simultaneous sale of goods through business operators of the Chinese e-commerce platform and their own electronic store registered in the PRC. In these cases, commercial offers should differ according to assortment characteristics, for example, by its exclusivity or novelty.

In the first case, their goal should be to increase awareness of Chinese consumers about Russian products of a particular manufacturer.

In the second case, the desired result should be the formation of sustainable demand for these goods from the most demanding Chinese customers.

The performance of the supply chain, which is assessed at the last stage of the algorithm shown in Fig. 5.3, represents the degree to which the goal of designing this logistics structure is achieved [130]. This goal correlates (desired result) with providing a competitive level of service to Chinese consumers at acceptable costs. Carrying out this assessment should assume:

- justification for variations in the duration of local and integrated logistics cycles (execution of a supply order) in the international chain under consideration.
- determining the degree of reliability of international supplies (full fulfillment of contractual obligations).

The commodity focus of international supply chains of Chinese products to the Russian Federation, as follows from Fig. 5.1, is disproportionately narrower than in the case of the export of Russian goods to the PRC. There is no statistical monitoring of electronic sales of Chinese goods to Russia. Data on electronic sales of Chinese goods in the Russian Federation under the B2B business scheme are not presented on the websites of the Federal State Statistics Service and the National Bureau of Statistics of the People's Republic of China. However, there is every reason to believe that it is quite low. The share of sales of Chinese goods in the Russian Federation in 2019 in the total volume of electronic sales of goods by Chinese enterprises (wholesale, retail, and industry), according to estimates, is less than 4%. It is obvious that the real value

of this indicator is at least several times less.

An analysis of trade practices in China in the B2B sphere shows that manufacturing enterprises in this country give preference to supplying their products, also to Russia, on terms of shipment from a warehouse (Ex-Works). Orders for such supplies are accepted through the company's online storefront, i.e., via the website. In addition, Chinese enterprises prefer the business model of organizing electronic sales of goods in the Russian Federation based on the B2C scheme rather than B2B. All this creates objective prerequisites for the greatest activity in the formation of supply chains of Chinese goods (not taking into account machinery and equipment) in the Russian Federation on the basis of electronic transactions by Russian corporate enterprises. In the range of these goods, as can be seen from Fig. 5.1 above, the dominant position is held by two groups:

- clothes, shoes.
- products of the chemical industry (reagents, chemical components, etc.).

These products are widely offered by Alibaba.com (an entity of the Alibaba Group that specializes in international wholesale). It was already noted that within the last years there was a decline in the volume of supplies of Chinese technological and consumer goods to the Russian Federation across all product lines, excluding textiles, toys and sports equipment. The latter means that orders for the supply of Chinese goods are most consistently placed by Russian wholesale and retail trade enterprises. Individual entrepreneurs are not counted, although they actively participate in the purchase of such goods.

All this indicates that the following supply structure retains the greatest stability in international electronic wholesale trade between companies of the PRC and the Russian Federation: wholesale (retail) trade enterprises/trade networks of the Russian Federation → manufacturing enterprises of the PRC (they accept orders through online storefronts)/business operators of e-commerce platforms in China. Obviously, in this case, the organization of electronic wholesale sales by representatives of the Chinese B2B sector is somewhat passive in nature.

The supply of machinery and equipment to the Russian Federation accounts for about

half of the volume of Chinese imports. It makes this area of international wholesale trade extremely attractive for Chinese enterprises, also from the standpoint of conducting it through electronic transactions.

An assessment of the prospects for Chinese manufacturers designing international supply chains for machinery and equipment in electronic wholesale trade with Russian institutional consumers should be conducted taking into account the specifics of sales and purchases of these goods. It is characterized by the following provisions.

First, the state reimburses a significant part of the costs to Chinese trade intermediaries involved in the sale of technological goods (equipment, etc.) abroad [44, p.3]. This factor creates objective prerequisites for Chinese manufacturers to establish indirect economic ties based on classical rather than electronic transactions.

Second, the organizational and economic nature of the purchase of machinery and equipment has a number of distinctive features:

1. equipment is an “investment” product (the justification for its purchase requires primary attention not only to technical characteristics and selling price, but also to the payback period).
2. in the Russian Federation there is a ban on government procurement of certain equipment from foreign suppliers.
3. equipment is often purchased through centralized procurement, which is characterized by:
  - focus on consolidating applications for the purchase of goods for industrial and technical purposes and, accordingly, purchasing significant quantities of goods.
  - presentation of professional requirements for the characteristics of goods for industrial and technical purposes (high quality of their specification).
  - justification of an acceptable price for goods for industrial and technical purposes based on a comprehensive analysis of the price structure for similar goods from different manufacturers.
  - the possible provision of delivery of goods for industrial and technical purposes by the supplier to various addresses as a condition of the contract, i.e., not to the buyer’s central warehouse, but to the warehouses of its

divisions remote from each other (logistics costs and risks for the supplier in this case increase).

4. machines and equipment (especially those purchase of which involves their commissioning by the supplier, warranty and post-warranty service) are supplied under the “goods + services” program (coordination of delivery terms in this case often requires commercial negotiations in person, which cannot be reduced to an electronic communication format).
5. purchase of high-tech, technically complex or innovative machinery and equipment, as a rule, is preceded by a procedure for pre-qualification of suppliers (the latter also often involves personal business communication of potential contractors), etc.
6. purchases of expensive equipment (its service life is usually long, at least 5 years) are mainly acquired through a competition (tender).
7. purchases of low-value fixed assets (including machinery and equipment) are carried out:
  - mainly by requesting commercial proposals and increasingly in electronic format (such funds include those that meet the criteria: cost from 0.04 to 0.1 million rubles, depending on the accounting policy; service life is more than 1 year etc.; they can be depreciated at once).
  - by a wide list of enterprises, representatives of large, medium and small enterprises (businesses).

The participation of Chinese enterprises in a competition for the supply of equipment for the needs of Russian enterprises (also when it is carried out in electronic format) is associated with high project logistics risks. Among them the following factors are:

- the probability of non-receipt of a purchase order, i.e., loss (the reasons for the occurrence of this risk event are different: incorrect interpretation by the PRC enterprise of the criteria for evaluating applications for participation in the competition; underestimation of the possibility of other participants in the competition underestimating the price in their final proposals, etc.).
- tender organizers (ETP), as a rule, reserve the right to cancel the placement of an order for supplies based on this procurement procedure 105 days in advance.

- market conditions during the competition, given the high volatility of the ruble, may change not in favor of the winner of the competition (due to formal procedures, taking into account the time allotted for concluding a supply agreement with the winner, it can reach two months).
- expenses for preparing for participation in a competition for the supply of equipment (for example, for attracting consultants or conducting marketing research) in the event of a loss may turn out to be unproductive.
- unproductive diversion of funds from a Chinese enterprise (to secure an application for participation in a competition) in the event of its loss (the simultaneous participation of an enterprise in several such competitions increases this risk), etc.

The logistics procedure for placing an order for supplies based on a request for commercial proposals from the point of view of the formal organization of procurement in this way is simpler. It is implemented in a shorter time and does not require collateral, including a bank guarantee from potential suppliers. As a result, small and medium-sized businesses in the Russian Federation are actively placing orders for the supply of low-value equipment through Russian commercial ETPs, using this particular logistics procedure. It is advisable to note that the list of such equipment, corresponding to such a sign of low-value fixed assets as operation for more than 1 year, is quite wide [98]. However, the participation of Chinese manufacturers in the supply of equipment to Russian enterprises, orders for which are placed by requesting proposals through the ETP of the Russian Federation, is also associated with certain logistics risks:

1. ensuring the competitiveness of commercial offers from Chinese suppliers in a number of Russian regions (excluding territories bordering China) is difficult to guarantee for the following reasons:
  - a. due to the high transport component in the price structure of Chinese equipment.
  - b. due to limitations in the speed of execution of the logistics functional cycle, i.e., cycle of execution of orders for the supply of equipment, due to the geographical distance of Chinese manufacturers from Russian consumer enterprises, primarily from those located in the European part of Russia.

2. requirements for the minimum shipment of equipment established by Chinese manufacturing enterprises may contradict the intentions of Russian enterprises (primarily small ones) to purchase smaller quantities of goods.
3. fulfillment by Chinese manufacturers of the requirement to respond to a request for commercial proposals in the B2B sphere in Russia, which consists in guaranteeing the preservation of the proposed selling prices for a long time up to four months, is not always economically feasible, etc.

Additionally, it is necessary to note at least two more provisions. First, planning by Chinese manufacturers for the supply of equipment to the Russian Federation should include the organization of warranty and post-warranty service. This puts them in front of the dilemma of creating their own service center in the Russian Federation / transferring maintenance responsibilities to Russian enterprises on the basis of outsourcing. A necessary condition for its solution is to ensure the profitability of sales of specific types of equipment in the Russian Federation, taking into account the fulfillment of accepted warranty obligations by Chinese suppliers. Second, the limitation on logistics services for Russian consumers caused by the establishment of a minimum shipment batch by Chinese enterprises can be eliminated by creating logistics centers (distribution warehouses) on the territory of the Russian Federation. If you use the logistics sharing model, i.e., joint consumption of logistics capacities simultaneously by several Chinese enterprises, then the investment burden on them will decrease [18]. It should be taken into account that the need for storage capacity for each participant in such a project is a dynamic quantity. To avoid unproductive reservation of these logistics capacities, a special digital service is required that allows you to book warehouse space for a certain period.

Obviously, if the described model is implemented, Chinese enterprises will incur additional logistics costs due to the payment of mandatory payments when importing equipment into the Russian Federation. An alternative option for creating your own warehouses is to use customs warehouses. However, such projects also require a thorough feasibility study based on a systematic approach to logistics risks of a customs nature.

Considering the above provisions, it would be reasonable to propose an algorithm for

developing a strategy for designing international equipment supply chains in the Russian Federation by Chinese enterprises, formed with the help of Russian ETPs. It is shown in Fig. 5.4.

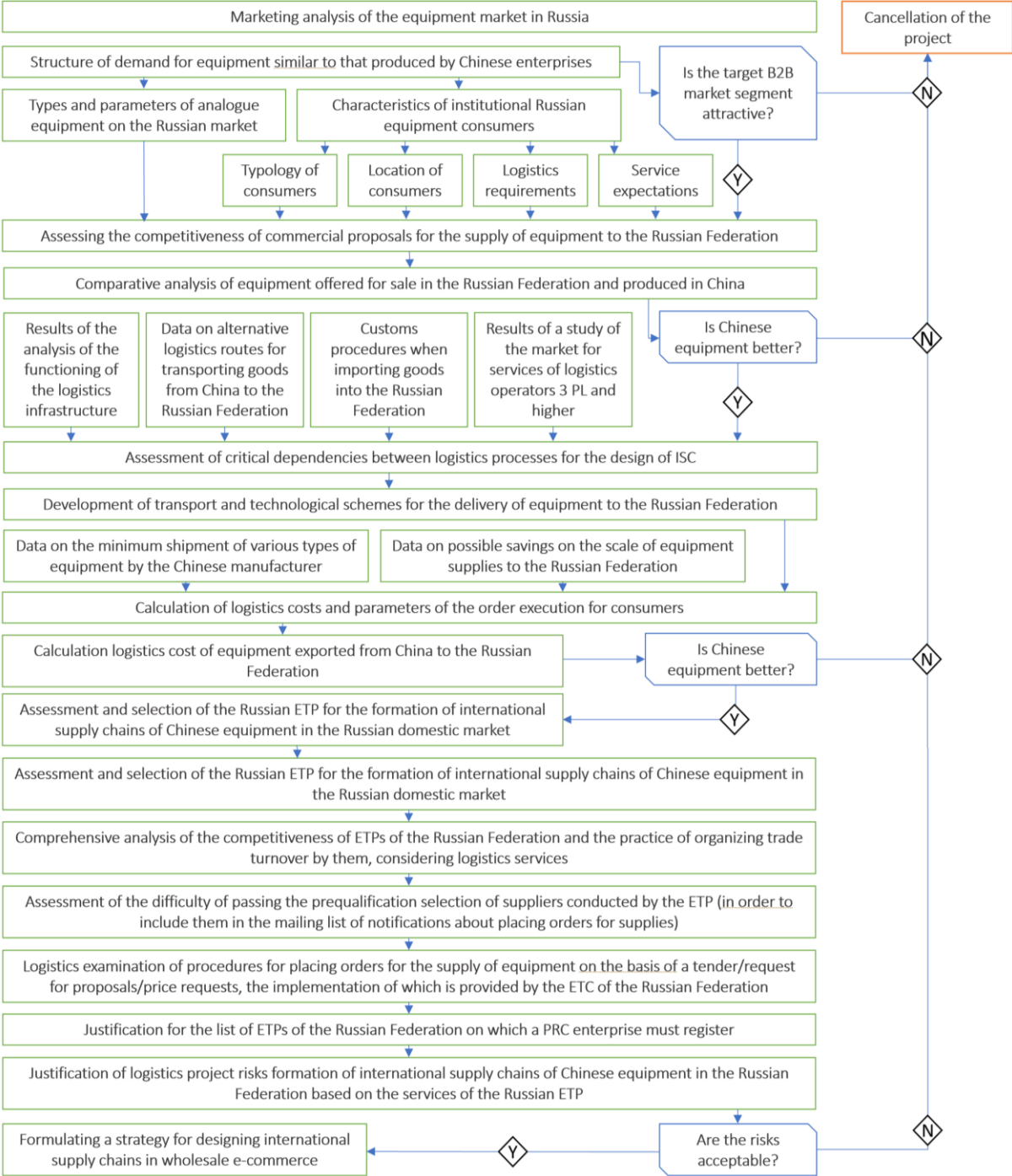


Figure 5.4 Algorithm for developing a strategy for designing international supply chains of Chinese equipment in the Russian Federation, formed on the basis of the services of Russian ETPs



The intensive development of international electronic wholesale trade stimulates the formation of supply chains based on digital economic ties. However, it is quite difficult to predict the complete replacement of classical transactions with electronic ones. Progress in this area is not going that fast (the maximum specific share of electronic sales in the B2B sector does not reach 20%, and only for certain product groups).

Taking these provisions into account, it is advisable for Chinese enterprises to consider a mixed strategy for designing international supply chains for goods in the Russian Federation. It should provide for at least two “pure” strategies for the formation of the multiple logistics structures:

- with the participation of digital resellers/trade organizers.
- based on classic international logistics channels.

In the latter context, it is necessary to note a number of fundamental provisions:

1. The distribution of goods within international trade, including digital trade, is based on the classical principles of logistics management [11, p. 145]. The complexity of managing this process is disproportionately higher than in the case of trading on the domestic market of the country. This situation is traditionally determined by:
  - high length of international supply chains.
  - cultural and institutional differences in the regulation of processes in logistics multiple organizational structures.
  - discrepancies in the quality level of national logistics infrastructures, etc.
2. Classic resellers in the Russian Federation still retain the status of influential participants in supply chains for the following reasons:
  - they can understand the needs of end consumers and track the dynamics of changes in their preferences better than manufacturers.
  - progress in the digitalization of wholesale sales in the B2B commercial sphere is lower than in a similar transformation of wholesale purchasing.
3. International supply chains of Chinese goods to the Russian domestic market, projects of which involved the participation of classic trade intermediaries (distributors, dealers), can subsequently be reorganized in order to ensure the primacy of electronic transactions in wholesale trade. To a certain extent, this is

facilitated by Russian legislation, according to which it is not recognized as legal to grant distributors the rights to conduct trading activities in an exclusive territory. This creates objective preconditions for the focal supply chain company to intercept orders from its resellers for the supply of goods to end-consumers using the Internet. An example confirming this possibility is Hyundai's declaration of intention to create a special online platform. It will allow sales in the Russian Federation, bypassing the dealer network [161].

## 5.2. Recommendations for managing project logistics risks of international supply chains in wholesale e-commerce

The strategic task of managing international supply chains should be considered to ensure their sustainable functioning [119, 169, p. 30]. Achieving this goal in accordance with [28, pp. 2, 29] involves consistently meeting the needs and expectations of supply chain participants in a balanced manner in the long term. However, several factors prevent the implementation of this requirement in practice:

1. the presence of asymmetric information in supply chains, i.e., uneven distribution between their members of the data on:
  - the requirements of end consumers for logistics services.
  - the plans for replenishment of supply chain participants with production and commodity stocks.
  - the extent to which supply orders are fulfilled by these participants, etc.
2. statistical fluctuations in the operational logistics activities of supply chain participants.
3. events occurring in the supply chain are dependent (a random event that disrupts the planned progress of a local logistics process does not exclude the initiation of an extended cause-and-effect chain of undesirable effects, also within the boundaries of the entire supply chain).
4. high length of international supply chains.
5. the presence of country differences in the culture of logistics management between participants in these supply chains.

- 6. lack of reliable information about demand (in the context of a focus on conducting electronic international transactions based on the results of participation in a competition for placing purchase orders and selecting suppliers based on the best response to a request for a commercial proposal, this problem is most acute).
- 7. environmental variability of the international supply chain, etc.

All these factors determine the functioning of supply chains, including international ones, in conditions of significant uncertainty. This situation actualizes the development of an approach to managing supply chain logistics risks. One of the arguments in favor of this statement is the steady trend of increasing the number of cases of disputes under supply contracts in the Russian Federation (Fig. 5.5). As another argument, it should be noted that there is a prominent level of activity in challenging the decisions of the Federal Customs Service of the Russian Federation by participants in international supply chains in the Russian Federation (Fig. 5.6). Here it is reasonable to emphasize at least the following two circumstances. First, the reduction in the number of claims against the Federal Customs Service of the Russian Federation in recent years is explained by the decrease in the volume of foreign trade of the Russian Federation with other countries. Second, the share of negative decisions in such cases considered by the federal arbitration courts of the Russian Federation in the total volume of claims against the Federal Customs Service of the Russian Federation has been growing sharply in recent years (this dependence is not shown in Fig. 5.6).

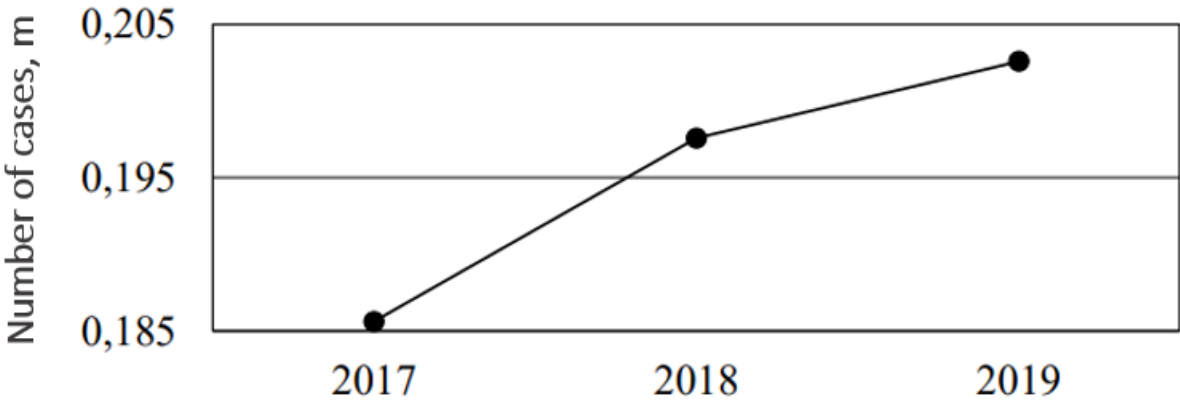


Figure 5.5 Dynamics of changes in the number of cases of disputes under supply contracts considered in the federal arbitration courts of the Russian Federation [146]

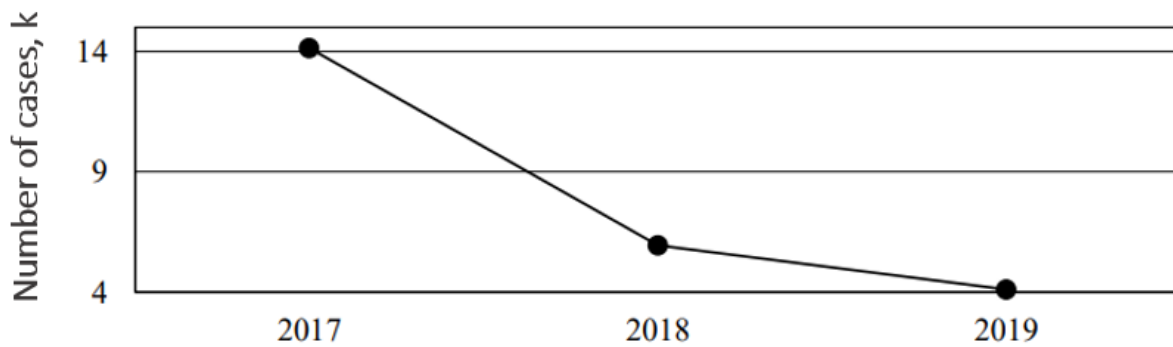


Figure 5.6 Dynamics of changes in the number of claims challenging decisions of the Federal Customs Service of the Russian Federation in the federal arbitration courts of the Russian Federation [146]

Scientific publications devoted to logistics risk management are largely fragmented. In particular, the question remains open about the concept of a systematic approach in logistics risk management, i.e., integrated risk management in all functional areas of logistics at enterprises in various industries. It is reasonable to note that in the ISO international quality standards, ensuring management effectiveness are directly related to risk-oriented thinking [27]. Among the works on these issues, it is especially worth highlighting [58], in which the following provisions are noteworthy.

First, in [58, p. 31] it is believed that the content of the categories “logistics risk” and “risk in supply chains/supply chain risks” are the subject of scientific discussion, and the relationship between them is not defined. At the same time, its author has the opinion that risks in supply chains (logistics risks of supply chains) should be correlated with the management of relationships between their participants [58, p. 31]. This is a reasonable approach. However, it should be taken into account that balancing such inter-company ties is a necessary condition for ensuring the sustainable functioning of supply chains. Thus, it’s worth considering the logistics risks of supply chains precisely in the context of the strategic importance of fulfilling this condition. It should also be noted that the category “logistics risks of supply chains” is more consistent with modern practice of logistics management. In this case, one should consider such a characteristic feature of the risks as their manifestation precisely at the level of the entire supply chain, i.e., from the perspective of considering it as an integral carrier of logistics risks.

Second, in [58] no attempt was made to present the concept of logistics risk management based on international ISO quality standards. An analogous situation occurs in [43, 47, 155]. Although, in [43, p. 108] SCM security standards are mentioned as one of the tools for reducing risks in supply chains. However, this work does not indicate that the latter are introduced into legal circulation in a number of international ISO quality standards, in particular in [185]. In the bibliography [43], there is a link only to a scientific publication devoted to the safety of SCM. All this confirms the underestimation by the authors of [43] of the “logistics” potential of ISO standards both in the field of risk management and supply chain security.

The results of the analysis of scientific publications devoted to the problems of logistics risks indicate a lack of adequate attention to project risks of supply chains. It should be recognized that the relevance of the issue of managing supply chain project risks in scientific publications is confirmed. For example, in [43, p. 99] it is recommended to consider the risks (without limiting their subject content within the logistics framework) associated with the functioning of supply chains at the stage of their structural and functional synthesis.

The logistics project risks (project logistics risks) of supply chains may be considered as the ratio of:

1. likelihood of an event that could have a negative impact on achieving the supply chain design goal.
2. undesirable consequences for the goals of the supply chain project:
  - the difficulty of ensuring their sustainable functioning.
  - lack of competitiveness in supply chains.
  - extended periods of formation of supply chains.
  - unacceptable logistics costs in supply chains.
  - low flexibility of operational logistics activities in supply chains.
  - ineffectiveness of the contract strategy for forming supply chains and others [11, 23, 30, 32, 52].

Ensuring the effectiveness of the proposed plan primarily depends on the quality of marketing research of the domestic market of the Russian Federation and its logistics infrastructure (environment) [52]. The need to fulfill the condition is determined by the

need for careful comprehensive consideration of factors not only of direct impact on the level of logistics project risks of international supply chains of Chinese equipment in the Russian Federation, but also of indirect impact. The ability to transform the uncertainty of the conditions in which international supply chains of Chinese equipment in the Russian Federation will operate into measurable project logistics risks largely depends on this.

It is advisable to note that the effectiveness of substantiating the logistics situation in electronic wholesale trade with Russian enterprises depends on the quality of the development of:

1. logistics policy of the enterprise (focal company of the international supply chain).
2. strategy for designing international supply.
3. contract strategy for the formation of international supply chains of Chinese equipment in the Russian Federation, formed on the basis of the services of Russian electronic trading platforms.

In the process of developing a contract strategy it is recommended to pay special attention to the following key aspects.

1. Methods to ensure the efficiency of freight shipments to the Russian Federation should be justified considering alternatives of:
  - logistics routes (including border checkpoints across the state border of the Russian Federation).
  - approaches to consolidation of cargo transportation to Russian consumers [11, p. 427].

Among these approaches, it is reasonable to highlight the transfer of several cargoes to an international carrier for delivery to one port of destination, from which they will be exported by Russian consumer enterprises located close to each other.

A necessary condition for the implementation of this method is the coincidence in execution time of orders for deliveries from Russian enterprises. Objective prerequisites for this can be created by coordinating the proposed equipment delivery schedules in response to requests for commercial proposals for its supply received from Russian consumers.

2. The policy of agreeing on the terms of an international contract for the supply of equipment should, among other things, help ensure commodity and economic balance in international supply chains:

- commodity (logistics) balance is achieved by balancing functional logistics cycles in these supply chains.
- economic equilibrium involves ensuring a balance between accounts payable, current assets (inventories) and accounts receivable.

In the latter context, it should be noted that managing overdue receivables in the Russian Federation is a challenging task even for Russian business structures. In order for a Chinese manufacturing company to avoid this problem, it is first necessary to check the potential customer.

Here it should be emphasized that Russian ETP operators conduct limited verification of potential participants in an electronic transaction, the objects of which are:

- presence of an electronic signature on mandatory documents.
- validity of registration in the Unified Information System in the field of procurement.
- the validity of the enterprise's accreditation on the ETP.
- lack of inclusion of the enterprise in the Unified Information System (register of unscrupulous suppliers).

Several individual documents related to the electronic transaction are being reviewed by the procurement commission. However, logistics practice shows that all these actions do not always guarantee the customer an electronic transaction that secures proper fulfillment of contractual obligations by the supplier. Enterprises placing orders for supplies through ETP are therefore recommended to conduct additional checks of potential counterparties on their own.

3. The contractual strategy for the formation of international supply chains of Chinese equipment in the Russian Federation should be developed taking into account:

- variability in receipt of notifications about tenders and requests for commercial proposals for the supply of equipment.

- features of the classification of potential Russian counterparties (customers).
- options for outsourcing some of the logistics management functions to China and the Russian Federation.
- standards in the field of logistics management of the People's Republic of China and the Russian Federation.
- logistics accounting and contractual units of the PRC and the Russian Federation.
- environmental requirements for supplies.
- specifics of resolving commercial disputes and logistics conflicts in international supply chains.
- results of logistics examination of standard international supply contracts, etc.

## Chapter 6. Conclusions

The digitalization of wholesale trade initiated the development of transition processes in it, because of which the transformation of classical economic relations into electronic ones began. The logic of building supply chains, including international ones, began to change, and the transfer of their management to a digital format has already acquired the status of a rule. This trend is directly manifested in wholesale trade between enterprises in China and the Russian Federation. The share of e-commerce in it is increasing. In this situation, adapting international supply chain design principles to digital challenges becomes inevitable. The scale and demand for scientific developments in this area of logistics management is determined by the evolution of e-commerce models. As a result of this process, their hierarchical system begins to be dominated by e-commerce platforms, whose market power extends beyond their home country. The features of modern models of electronic commerce and the relationships between them are revealed in the dissertation.

The development of electronic wholesale trade leads to the transformation of the classical institution of intermediation in this service sector, whose representatives



largely predetermine the subject composition of multi-link supply chains. It determines the formation of a group of digital resellers. Their classification is clarified and characterized in the research. A special place in this group is occupied by the organizers of a new type of trade turnover - electronic trading platforms (ETPs), which serve the B2B sector. The research presents their typology, determines the specifics of competition between them and argues for a reduction in their numbers in the future. Special attention is paid to the role of ETPs in the formation of supply chains based on the establishment of digital economic connections with their help. It is asserted that the conclusion of supply contracts on the ETP on the basis of competitive procurement procedures does not contribute to the formation of long-term digital economic ties and negatively affects the relationship between counterparties. It is proven that the classical institution of trade intermediation will not completely lose its advantages in the near future. In the process of designing supply chains, it is therefore advisable to evaluate options for their construction based on classic and electronic transactions.

The research substantiates that distribution chains/supply networks are most susceptible to the transformational impact of digitalization of wholesale trade. This manifests itself in at least two aspects. Some of the focal companies of these supply chains are abandoning their distributor status and are reformatting their trading business into electronic stores aimed at B2B or becoming logistics operators. Another part of them, under the influence of market pressure from retail chains that are actively moving to electronic procurement, are reorganizing logistics supply systems. This is done to ensure the fulfillment of electronic orders of retail chains, taking into account the requirement for an end-to-end focus within the B2B2C supply chain on product categories, and not on groups of goods.

Understanding the features of digitalization of supply chain management in electronic wholesale trade creates the basis for their design, so special attention is paid to them in the research. Setting strategic priorities in this type of design should assume a number of provisions. First, electronic wholesale trade operates with a much smaller list of product items than classical wholesale (mainly non-strategic goods). Second, the rate of reduction in transaction costs in this service sector depends on progress in the formation of a national information business space. They vary depending on the country. Third, the profitability of digital logistics interactions with supply chain

participants should be assessed considering their life cycle. Fourth, the pace of digitalization of procurement and sales differs in favor of the former. The extreme imbalance between the degrees of digital activity in these areas should be considered as an independent source of logistics risk for supply chains in e-wholesaling. Fifth, planning of such supply chains should be preceded by research into the state of the logistics infrastructure of the electronic commodity market, which has not yet been properly formed. The research argues that in the design of these supply chains, special attention should be paid to assessing the impact of digital transactions on ensuring the required degree of logistics connectivity of their subjects.

The research also reveals current trends in the development of electronic wholesale trade in China, the EU countries, the Russian Federation, and the USA. It is shown that progress in this industry in the country context is extremely heterogeneous. The leader in the digitalization of wholesale trade is the PRC, which achieved this result thanks to large-scale participation in electronic transactions in the B2B sphere of small and medium-sized enterprises. In Chinese manufacturing sector, the practice of e-commerce has become somewhat less widespread than in the wholesale trade, which corresponds to the global trend. However, according to the criterion of calculating the volume of e-commerce sales transactions, the dynamics of which are positive, Chinese manufacturing enterprises are ahead of trading enterprises. In the domestic electronic market, Alibaba Group dominates among online B2B platforms in China (about 30%). However, more than 1/3 of this market is represented by many small ETPs, what indicates that it has the features of perfect competition. The electronic component of total B2B wholesale sales in the United States is growing at a high rate. Primarily in industry (up to 20%). The share of electronic wholesale trade in the Russian Federation is exceedingly small.

Based on the study of country specific features of the development of this industry, the research draws a number of conclusions:

- the evolution of this service sector is subject to general laws.
- supply chain competition in countries' domestic commodity markets is gradually being replaced by economic competition among global e-commerce platforms

(many states consider this situation as a serious threat to national economic security).

- the formation of supply chains, including international ones, despite the total digitalization of wholesale trade, will be carried out for quite a lengthy period considering classical and electronic distribution channels.

State regulations that determine the nature of the logistics behavior of counterparties and the features of building supply chains in electronic wholesale trade constitute the institutional basis for their design. The stage at which they are in the Russian Federation is characterized by the development of a draft industry law on e-commerce and changes to antimonopoly legislation, which are intended to limit the destructive influence of foreign e-commerce platforms on supply chains in the Russian Federation. Progress has been made in regulating the activities of electronic trading platforms, through which simple (zero-link) supply chains are formed.

Based on the study of similar institutional practices in the PRC, the research characterizes the typology of digital trading intermediaries in this country and reveals their functional role in the formation of international supply chains.

Consistently structured “vertical” agreements, which form the contractual framework of the supply chain, are subject to institutional regulation in the Russian Federation and China differently. This is reflected in the dissertation.

The list of standard supply chain configurations, the subjects of which have the status of digital trading intermediaries officially recognized by the state, in e-commerce in the PRC is wider than in the Russian Federation. These, include:

1. supplier → business operator (participant of the e-commerce platform) → institutional consumer.
2. supplier → business operator (participant of the e-commerce platform) → logistics intermediary (provider of 3 or more PL, engaged by the supplier or institutional consumer/operator of the e-commerce platform/organization to which the authority to provide logistics services to participants of the e-commerce platform is transferred) → institutional consumer.
3. supplier → e-commerce platform operator → institutional consumer.

4. supplier → e-commerce platform operator → logistics intermediary (organization to which the authority to provide logistics services to platform participants has been transferred/provider of 3 or more PLs nominated by an institutional consumer) → institutional consumer.

The content of the design of international supply chains in wholesale e-commerce is established in the work taking into account the features of digitalization of industry logistics processes and resistance to this trend in the form of:

- unpreparedness for full inter-company information exchange.
- maintaining the dominance of dual relations in supply chains.

Within the framework of this design, it is suggested to follow the invariant algorithm used in the formation of classical supply chains. It is assumed that digitalization of the process of taking coordination measures by systemically important enterprises of international supply chains in electronic wholesale trade is one of the main priorities for ensuring their sustainable development.

Based on the results of a study of the organizational and economic features of reaching potential suppliers in the digital business space, the research concludes that a quick and effective search for them is not guaranteed. Factors that hinder the achievement of this goal are identified and recommendations are given for taking them into account.

The dissertation proves that the development of the electronic wholesale commodity market predetermines the need to increase the degree of readiness of the international supply chains that are its participants to restructure their configurations. This trend creates a need for preventive justification of alternative scenarios for carrying out functional transformations in them and strategies for subsequent reformatting of the subject structure of international supply chains, taking into account promising contractual models of logistics interactions. A comprehensive study of the vulnerabilities of these supply chains, including the impact of the pandemic, creates the prerequisites for the effective management of project logistics risks. This implies strict regulation of the responsibilities of logistics managers, based on the emerging practice of delegating some of their functions to special software.

Based on the analysis of the dynamics of changes in the commodity structure of

supplies of Russian goods to China, it is stated that the specific share of food products in it is growing at the fastest rate. Based on the results of the study of the organizational and economic features of commodity exchange between countries and the specifics of their institutions of trade intermediation, including digital ones, alternative subject structures of supply chains for Russian food products in the PRC are determined.

Justification of the project of international supply chains of Russian goods in electronic wholesale trade with Chinese enterprises should include the implementation of invariant stages, the features of which are characterized in the research. As part of this process, it is advisable to pay special attention to the logistics assessment of entry barriers in the domestic electronic market of the PRC, the classification of which is given in the dissertation.

The supply of machinery and equipment to the Russian Federation accounts for about half of the volume of Chinese imports. The research formulates recommendations for assessing the prospects for Chinese manufacturers designing international supply chains for these goods to Russian institutional consumers. An algorithm is given for developing a strategy for such a design, which involves Russian ETP in organizing supplies.

It is too early to talk about complete replacement of classical transactions with electronic ones. Therefore, enterprises need to consider a mixed strategy for designing international supply chains in the sphere of wholesale e-commerce. It should provide for two “pure” strategies for their construction:

1. with the participation of digital resellers/trade organizers.
2. based on classic international logistics channels (the research provides their refined classification).

International e-wholesale supply chains operate under conditions of high uncertainty, especially due to the pandemic. This situation creates an urgent need for effective management of project logistics risks. The fulfillment of this condition largely depends on the degree of justification of the contract strategy for the formation of international supply chains, formed on the basis of the services of ETPs. The algorithm for its development is given in the dissertation. The priority goals of this strategy include

promoting trade and economic balance in these supply chains.

The contractual strategy for the formation of international supply chains should be developed considering:

1. variability in receipt of notifications about tenders and requests for commercial proposals for the supply of equipment.
2. features of the classification of potential counterparties (customers).
3. options for outsourcing some of the logistics management functions.
4. standards in the field of logistics management.
5. logistics accounting and contractual units.
6. environmental requirements for supplies.
7. specifics of resolving commercial disputes and logistics conflicts in international supply chains.

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