The role of information and digital tools in supply chain management during the Covid crisis
Kashamida Tazhibekova, Aigerim Shametova, Rashad Maharramov, Svetlana Makar

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Abstract: Supply chains have become the most vulnerable during the COVID-19 pandemic, as evidenced by problems in the supply of semiconductors, food, and other products, which raises the problem of supply chain manageability. There has been a so-called 'shortening' of the supply chain. The paper addressed the problem of using digital tools in small and medium-sized enterprises (SMEs). The study aims to examine the main digital tools used by local businesses and evaluate the prospects for logistics management using new technology. The hypothesis is that SMEs that do not use digital tools in supply chain management are also characterized by the poor quality of management. A survey was conducted to identify the actual supply chain management practices during the COVID-19-induced crisis in the Russian Federation, the Republic of Azerbaijan, and the Republic of Kazakhstan and discover common trends and differences in these countries. A set of recommendations for implementing best global practices in these countries was suggested. The study found that poor supply chain management correlates with a lack of digital tools application. The studied enterprises were divided into five groups based on the digital tools level and provided tailored recommendations to improve the integration of such tools.

1   Introduction

The globalization trend of the world economy contributed to the formation and development of global supply chains. However, the COVID-19 pandemic has led to an unprecedented halt or slowdown in production in virtually all industries worldwide, threatening the functioning of global supply chains. International supply chains are in crisis, despite all the efforts of businesses and nations to overcome the effects of COVID-19. Structural distortions and imbalances are present in the container market, maritime logistics, port operations, air freight, road and rail freight, and even warehouse logistics. These imbalances have resulted in shortages of crucial manufacturing components, backlogs in pre-orders, delayed deliveries, rising transportation costs and consumer prices.

The real problems in supply chain operations began at the end of 2020 [1,2]. Restarting production after the lockdown proved to be a non-trivial logistical challenge. A complex logistics system moving raw materials, components, and finished goods worldwide required predictability and precision. There was a shortage of transport containers, tariffs rose rapidly on some routes (especially from China, Indonesia, and South Korea), and traffic jams formed at international ports, spreading to railroads and domestic terminals. Importers faced delays in obtaining key production components, and exporters faced problems accessing containers and booking space on seagoing vessels [3].

The COVID-19 pandemic is no ordinary short-term crisis. It has long-term implications for both people and supply chain operations. It requires a holistic approach to supply chain management. Companies must be flexible enough to make management decisions. This approach must be based on the latest technologies and platforms that support applied analytics, artificial intelligence, and machine learning. It should also provide end-to-end transparency across the entire supply chain. Risk response should become an integral part of standard protocols in the long run. Thus, research toward digitalization and

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transformation of global supply chains remains relevant, considering new challenges and threats (e.g., COVID-19).

1.1 Literature review

It is necessary to separate the criteria of supply chain reliability (ability to continue working through crisis) from the criteria of sustainability (ability to recover from the crisis) [2,4]. The consequences of the COVID-19 pandemic on the development of global supply chains can be considered through the prism of new world economy trends – the regionalization of production and market diversification, which lead to localization and reduction of supply chains. One of the consequences of the COVID-19 pandemic may be the exit of weak players from the logistics market, which, in turn, can cause bankruptcies, acquisitions, and mergers [5]. At the same time, there is likely to be a consolidation of the sustainable companies' market share. The main problems in the global economy after the pandemic are [6]:

1) sharp spikes in demand in specific segments (fall and growth);

2) supply shortages;

3) inventory allocation problems;

4) productivity declines.

The transformation of the traditional linear supply chain logistics model into digital networks that provide end-to-end visibility, responsiveness, and the ability to optimize current processes is expected to accelerate. Therefore, new global supply chain development technologies are now emerging that significantly improve the visibility of the entire chain and support the ability of companies to withstand such shocks. Today's environment requires a fundamentally new supply chain model. Years of emphasis on supply chain optimization to minimize costs, reduce inventory, and increase asset utilization show that many companies have not prepared for such shocks and supply chains [6]. Crisis management involves urgent priority decisions once a problem has been identified. These priorities are [7,8]:

a) improving staff productivity;

b) using data to ensure transparency of demand, inventory, production capacity, supply, and finance;

c) market segmentation to prioritize demand;

d) creation of crisis sales and operations teams that can effectively respond to the challenges at hand;

e) modelling and evaluating different supply chain scenarios. Modelling is essential for anticipating when and where surpluses and shortages may occur and obtaining initial information that optimizes operational performance.

The World Bank identifies the following key barriers hindering supply chain development in the COVID-19 pandemic [1]:

– non-diversification of supply chains, which in turn leads to instability in the organization of logistics activities;

– the geographic spread of supply chains, their rigidity, and lack of coordination;

– China's role as the 'world's factory' means that a significant disruption in the Chinese market threatens global supply chains.

WTO considered the pandemic's impact on general processes in the world economy (particularly on logistics), analyzed trends in global trade volumes, and presented two plausible scenarios of development [9]. The first scenario is a repeat of the COVID-19 outbreak. This development would require a series of further blockages, affecting fiscal policy and exacerbating labour market problems. The second scenario involves the absence of outbreaks. It would facilitate rapid and robust growth in production and trade. Other positive factors include the emergence of new technology sectors, such as artificial intelligence and e-commerce, the increased use of innovation in traditional industries, which would be forced to make greater use of information technology to deliver goods and services to customers during the pandemic.

During recovery from the coronavirus crisis, the main driver of supply chain management is digital technology [5,10]. Supply chains can be strengthened through the following tools:

1) E-commerce. Against a backdrop of waning economic activity, the pandemic led to a surge in e-commerce and an acceleration of digital transformation. After quarantine measures became the 'new norm', businesses and consumers became much more active in digitalization. Today, major consumer purchases are made online [5];

2) Real-time tracking. Cargo tracking, automated warehouses, GPS, and RFID (radio frequency identification) are technologies that track the movement of personnel, equipment and inventory, collect data and improve visibility [11];

3) Interference levelling using artificial intelligence (AI) technologies. Artificial intelligence is used in logistics to analyze and select the fastest and cheapest delivery routes. In addition, there are technologies such as an automated pallet management system designed to reduce shipment processing time. Such a system allows for complete automating of pallet storage processes, transporting loaded pallets, and integrating warehouse and production processes. The automated pallet management system can be used in transportation hubs, factories, warehouses, and distribution centers [12];

4) Digital supply network. The traditional supply network can be a more open and accessible digital supply network (DSN) powered by AI, analytics, robotics, sensors, and algorithms. DSN collects physical reality data, creates a digital record of it, and allows information to be shared, analyzed and turned into action that can be carried out in the real world. Such technology improves communication between stakeholders, enables rapid response, promotes asset efficiency, reduces costs, and increases company revenues [13].

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The linear supply chain is transformed into digital supply networks (DSNs). The use of digital technologies such as Industry 4.0, Internet of Things, artificial intelligence, blockchain, logistics 4.0, robotics [11], and 5G allows for more responsive solutions to current problems and future predictions. Based on an analysis of best practices in global supply chain management, the following significant trends during the pandemic are identified:

1) anticipation of an economic downturn, which is manifested in need to find alternative sources of raw material supply, as well as doubts about whether the supply chain is too lean or whether it is worth continuing to use lean management in operations in such unstable conditions [14];

2) 'simple' steps to improve the efficiency of supply chains in many cases have already been exhausted. Further improvement may involve complete reconstruction of a network, radical simplification and elimination of links of a chain of deliveries that do not contribute in full to the creation of value [15];

3) The importance of digital tools for supply chain coherence is increasing.

1.2 Problem statement

Studies of supply chain management trends in the COVID-induced crisis have been conducted mainly in developed countries. Thus, the question remains whether these practices and trends are different in developing countries. The Russian Federation, the Republic of Azerbaijan, and the Republic of Kazakhstan, which are very different in terms of religion, geographic location, and size, are chosen for the study. This choice makes it possible to summarize general trends and develop recommendations for implementing the world's best practices in this group of countries.

The introduction of digital technology affects the enterprise's overall performance and transforms individual business models. Digital transformation can be a strategic initiative with a clear vision and new business opportunities. The study aims to examine the main digital tools used by small and medium local enterprises (SMEs) and assess the prospects for logistics management development with the help of the latest technologies.

The research hypothesis is that SMEs that do not use digital tools are characterized by a low level of supply chain management. The criterion of processes standardization was chosen as a criterion of supply chain management quality as it corresponds to the best global practices.

Research objectives:
- interview residents of the selected countries and identify actual supply chain management practices during the COVID-19 crisis;
- identify common trends and differences in these countries;
- develop recommendations for implementing global best practices in this group of countries.

Respondents were selected from three countries – the Russian Federation, the Republic of Azerbaijan, and the Republic of Kazakhstan. This choice is explained by the fact that the countries have common features as post-socialist developing countries, making it possible to assess their differences (prevailing religion, geographical location, size) and develop recommendations for implementing best global practices.

2 Methodology

The study was conducted in several stages. The *first phase* of the study involved an online survey of managers at various levels of supply chain management in manufacturing companies and logistics operators. The purpose of the survey was to obtain empirical data on what digital technologies were used in supply chain management using Google forms.

Respondents were selected randomly. An invitation to take the survey was sent to those managers who stated Russia, Azerbaijan, or Kazakhstan as their place of residence in their Facebook profile. The survey was conducted between June and August 2021. From each country, 300 people from different industries participated in the study. The general characteristics of respondents are presented in Table 1.

Table 1 The number of SMEs involved in the study from each country

Sphere of activity	Russian Federation	Republic of Azerbaijan	Republic of Kazakhstan
Agriculture	18	12	19
Industry	21	25	24
Trade	58	73	81
Transport	41	17	25
Food industry	42	44	35
Information and telecommunications	24	28	29
Finance and insurance	33	28	33
Education and services	38	48	35
Medicine	25	25	19
Total	300	300	300

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The study's limitation is the possible inconsistency of actual and official data. The questionnaire asked the following several questions (a maximum number of points received equalled 20):

1. Does the organization have a website? Does it work effectively? Yes, it works effectively (the chain 'view-select-box-payment' works) – 1; Yes, it works ineffectively – 0.5; No – 0.
2. Does search SEO-optimization of the firm's website exist? Yes – 1; Partly (with the help of professionals) – 0.67; Yes, independently – 0.33; No – 0.
3. Evaluate the effectiveness of information campaigns in social networks (not including advertising)? – Yes, we have a business page on Facebook and Instagram; a marketing person works effectively – 1; Yes, we run a business page; we work independently and successfully – 0.8; The pages are operating without a plan – 0.6; The webpages are very rarely updated – 0.4; There is a page, but it is not managed – 0.2; No page – 0.
4. Do you do informative business-related activities on other social networks (Telegram, YouTube, LinkedIn, Twitter, etc.)? Yes – 1; No – 0.
5. Do you use Facebook or Instagram ads, and are you satisfied with the results? Yes, we are satisfied with the results – 1; Yes, but we are not satisfied with the results – 0.67; Yes, we use ads very rarely, and we are not satisfied with the results – 0.33; No, we do not use Facebook/Instagram ads – 0.
6. Do you use advertising in Google Ads (Google AdWords)? Are you satisfied with the results? Yes, we use Google manager and are satisfied with the results – 1; Yes, we do it independently and are satisfied with the results – 0.67; Yes, we do it independently, but we are not satisfied with the results – 0.33; No – 0.
7. Do you use analytical tools (e.g. Google Analytics or another program)? Yes, we use Google Analytics, and we use this information – 1; Yes, but we do not use the results – 0.5; No, we do not use Google Analytics (we use another analytics tool – 0.
8. Do you use a program for resource planning? Yes, we use our ERP system – 1; No, we do not use such programs. We save information in Excel or another program – 0.5; No, we do not use any resource planning system – 0.
9. Do you use specialized financial and strategic management systems (budgeting, planning, consolidation, profitability)? Yes, we use 1C or another system – 1; No, we use only Excel spreadsheets - 0.5; No, we manage everything manually - 0.
10. Do you use a CRM system? Yes – 1; No, we use Excel spreadsheets or another system – 0.
11. What digital tools do you use to communicate with your staff (for surveys and information sharing)? Email/CRM/internal chat – 1; Viber/Skype/Telegram - 0.5; We communicate orally in person in the office or by phone – 0.
12. Do you use digital systems (online programs, manipulators, stimulators) for staff training? Yes, we use an electronic platform for training – 1; No, we teach without digital tools – 0.5; No, we do not do training at all – 0.
13. How do you communicate (get feedback, retain, stimulate a new purchase) with the customer? QR/social media/chat-bot – 1; Feedback on the website/email – 0.5; Personally/phone/in the office – 0.
14. Do you use specialized analytical applications for supply chain management (SCM systems and PDM (Product Data Management)? Yes – 1; No – 0.
15. Do you use a specialized BPM system? Yes, we use a BPM system – 1; No, we do not use a BPM system – 0.
16. Do you use advanced specialized tools for intelligent business analytics – Data Mining, Big Data, Business Intelligence, integration, consolidation, etc.? Yes, we use Data Mining technologies (our developments) – 1; Yes, we use various services (queries, reports, analytical tools: OLAP, Dashboards, production reporting, etc.) – 0.5; No, we do not use any analytical tools – 0.
17. Specify the ways of storing and maintaining your data. If you use several approaches, indicate them in the 'Other' option. Cloud technology and backups – 1; Excel spreadsheets (Google docs on Google drive) – 0.5; Ordinary files on computers – 0.
18. Is it possible to purchase (order) your service or its component (consultation, reservation, etc.) via the Internet, and what percentage of sales are covered by Internet sales? Yes, more than 90% of sales are performed online – 1; Yes, more than 50% of sales are done online – 0.8; Yes, 10% to 50% of sales are performed online – 0.6; Up to 10% of sales are performed online – 0.4; Less than 1% of sales are performed online – 0.2; No services/products are sold online – 0.
19. Do you use highly-specialized geographic information systems, area modelling, 3D printing, product location tracking, etc.? Yes, we use several highly specialized technologies – 1; Yes, we partially use such technologies – 0.5; No, we do not use any such technologies – 0.

Companies were divided into five groups based on the number of received points: 0-4 points (group 1), 4-11 points (group 2), 11-14 points (group 3), 14-18 points (group 4), 18-20 points (group 5). The decision to have five groups made it possible to identify all the necessary categories of digital maturity of business structures:
- companies with no experience in using digital tools;
- companies that only use social networks;
- companies partially using SMM, SEO and analytics;
- companies using professional services;
- leading companies that actively use analytics and specialized applications.

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In the *study's second phase*, these same respondents were asked about their supply chain management practices. In the *third phase* of the study, recommendations were developed for each group on how to implement digital tools in supply chain management.

3 Results and discussion

The results of the *study's first stage* in the Russian Federation, the Republic of Azerbaijan, and the Republic of Kazakhstan are presented in Table 2.

Table 2 The percentage of respondents in each group of enterprises

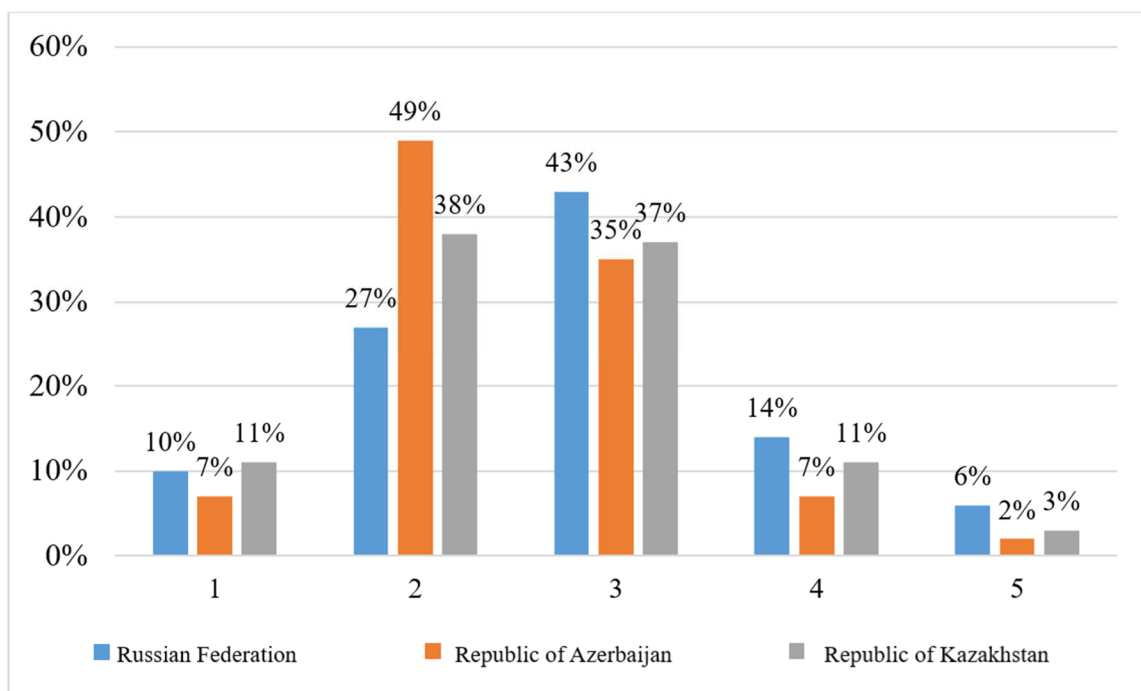| Group / Percentage of enterprises	Russian Federation	Republic of Azerbaijan	Republic of Kazakhstan
1	10%	7%	11%
2	27%	49%	38%
3	43%	35%	37%
4	14%	7%	11%
5	6%	2%	3%

Figure 1 Percentage of enterprises in each group by country

There are similar trends in the distribution of the number of respondents in each group for all three countries. The maximum number of respondents is in groups 2 and 3 (Figure 1). Group 2 is characterized by the absence of purchase chain functioning on the website, complex digital and supply chain management tools. Social media is the only available tool. Group 3 is characterized by effective functioning of the website and the buying chain, active use of most digital tools (including advertising), absence of supply chain management tools, and the presence of a marketer who promotes a brand or product.

Respondents in groups 4 and 5 are the least numerous. Group 4 is characterized by a company's presence on the Internet, the use of simple tools partially or independently (SEO, social networks, advertising). Enterprises in group 5 use almost all advanced digital technologies, including the Data Science method.

In the *study's second phase*, the same respondents were surveyed about their supply chain management practices. A high proportion of respondents (55%, 60%, 55% in Russia, Azerbaijan, and Kazakhstan, respectively) working in markets in other countries confirm the increased awareness in this area and understanding of the importance of standardizing supply chain processes. Those entering or planning to enter international markets (50%, 35%, 33% in Russia, Azerbaijan, and Kazakhstan, respectively) are motivated to adopt European standards in their operations and be part of a responsible supply chain. Table 3 shows the survey results showing the extent to which supply chain processes are standardized. Respondents could choose several answers. Figure 2 shows the distribution of enterprises by the level of standardization of the supply management process in their activities.

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Table 3 The level of standardization of the supply management process in enterprises' activities

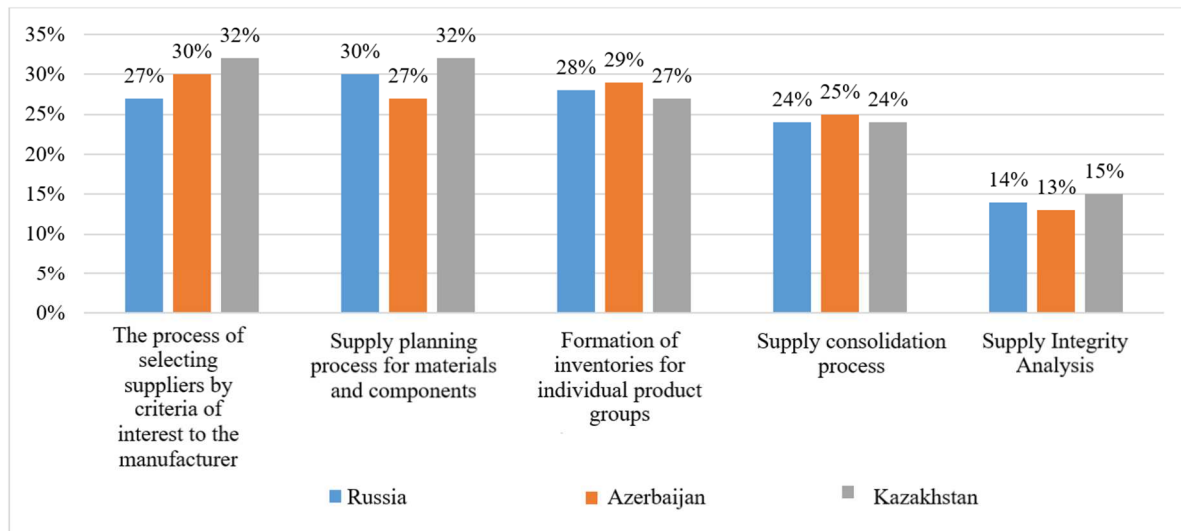| Indicator	Russia	Azerbaijan	Kazakhstan
The process of selecting suppliers by criteria of interest to the manufacturer	27%	30%	32%
The supply planning process for materials and components	30%	27%	32%
Formation of inventories for individual product groups	28%	29%	27%
Supply consolidation process	24%	25%	24%
Supply Integrity Analysis	14%	13%	15%

Figure 2 The level of standardization of the supply management process in enterprises' activities

The survey results were summarized into five groups according to the number of processes used (one process - one score). The results are presented in Table 4.

Table 4 Percentage of matching respondents in the groups based on the first and second phases of the study

Groups	Russia	Azerbaijan	Kazakhstan
Group 1	80%	77%	72%
Group 2	67%	65%	63%
Group 3	55%	50%	50%
Group 4	45%	45%	40%
Group 5	50%	50%	55%

A direct correlation confirms the research hypothesis that poor supply chain management is typical for small and medium-sized businesses that do not use digital tools. The results show the degree of standardization of supply chain processes. The highest number of applied standards is observed for the following processes: planning of material and component supplies; formation of inventories for certain product assortment groups; selecting suppliers by criteria of interest to the manufacturer.

The survey allowed the authors to identify the processes that need to be standardized first:

-implementation of the code of conduct for suppliers;

-selection of suppliers according to the criteria of interest to the manufacturer;

- consolidation of supplies.

Only one-third of respondents are motivated to implement the principles of standardization. These respondents belong to enterprises operating mainly in foreign markets.

Standardization of supplier selection can be represented through the following components:

- market analysis and selection of vendors' offers based on price and environmental 'friendliness' of the product (service);

- analysis of potential applicants according to other parameters of cost-effectiveness;

- ranking suppliers by a composite index, defined as a weighted average assessment of the supplier by selected criteria.

Table 5 presents the summary of processes, which should be standardized according to the respondents.

In the *third phase* of the study, recommendations were developed for each group on how to implement digital tools in supply chain management (Figure 3).

Group 1 should implement the following measures:

- basic digital skills for all employees;

- development of professional skills of employees who work directly with digital technologies;

- use of essential digital tools, such as social networks, messengers, online documents, design platforms;

- providing employees with the required amount of digital technology.

Recommendations for group 2 include:

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- basic digital skills of all employees in the enterprise and developing the professional skills of employees who work directly with digital technologies;

- create the position of SMM manager/internet marketer/specialist in digital technology after increasing the presence on social networks and other platforms;

- transition to more sophisticated use of social networks, regular content creation, automation of communication with clients through chatbots, QR-codes, etc.;

- having the necessary amount of technology and keeping it up to date.

Table 5 Processes to be standardized in supply management

| Indicator	Russia	Azerbaijan	Kazakhstan
The process of selecting suppliers by criteria of interest to the manufacturer	33%	35%	34%
Grid model development of supply processes	28%	27%	28%
Material supply planning	12%	14%	13%
Consolidation of supplies	29%	32%	30%
Introduction of a code of conduct for suppliers	10%	11%	5%
Selection of inventory method for product assortment groups	21%	22%	25%
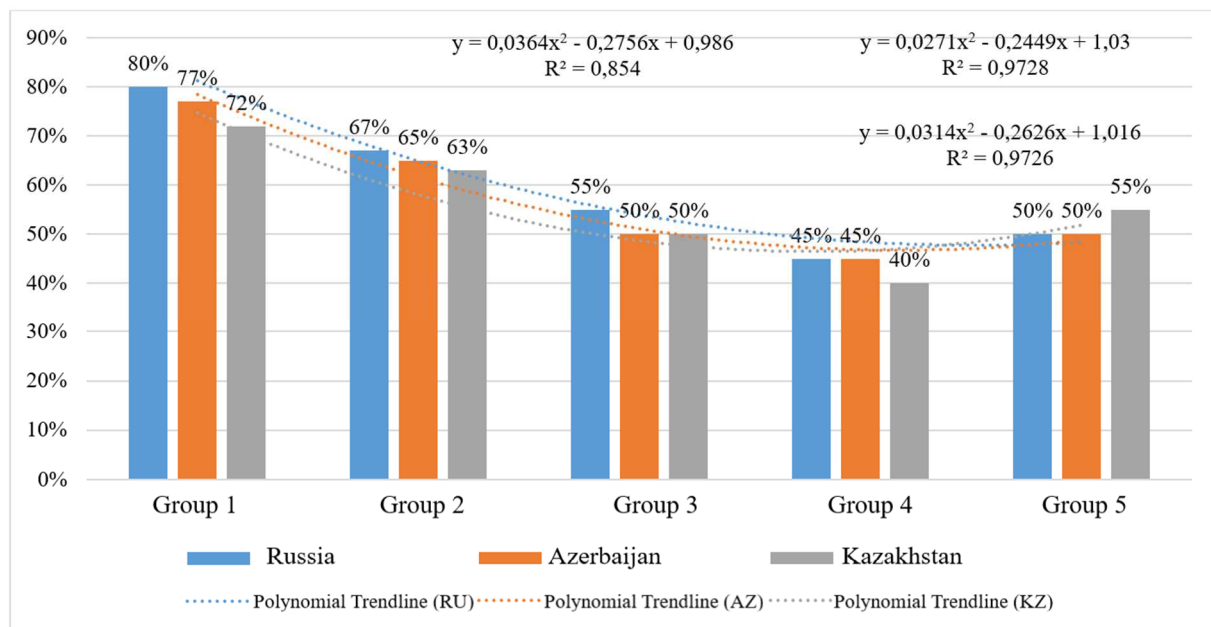
Figure 3 Percentage of matched respondents in groups based on the first and second stage

The enterprises in group 3 should take the following measures:

- conduct an external audit of the quality digital tools used by the enterprise and consult with professionals in the field, if necessary;

- follow trends in the industry, attend conferences, and adopt the experience of competitors and trendsetters;

- create a strategy for positioning the company in the online space,

- use data analytics for decision making and specialized systems for complete automation of business processes;

- use statistical analytics and forecasting technologies, industrial robots, sensors, etc., if necessary;

- keep technology and software up-to-date.

Businesses in group 4 should take the following measures:

- create a position of SMM-manager/internet-marketer, etc.

- analyze trends in the industry, adopt the experience of competitors or brands from related businesses, consult with professionals on the problems and opportunities for the use of a particular digital tool;

- position the company on social networks, create regular content, and publish it according to the content plan, use advertising campaigns on social networks;

- introduce automatic communication with clients using chatbots, QR codes, etc., carry out SEO optimization of the website;

- use CRM systems, financial management systems, connect analytical tools to data collection;

- keeping technology and software up to date.

The enterprises of group 5 should continue the professional development of company specialists and attend highly specialized conferences, events, courses, and webinars.

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Analysis of the list of specific recommendations developed to increase ownership of digital tools in supply chain management for different groups of SMEs showed that most proposals aim to improve the digital literacy of company employees and increase the share of digital tools used. Practice shows that digital tools are rarely used in supply chain management, and companies do not have specialized software.

On the other hand, the problem is complex since the standardization system provides digital tools for supply chain management [16]. Thus, the digitalization of SMEs in the studied countries is quite difficult. It should be noted that the low level of digital technologies application leads to poor business processes [17]. One of the critical implications for enterprise management is focusing on interactions with all counterparties, not just internal processes.

With the easing of quarantine restrictions, most companies wholly or partially returned or will return to the usual mode of work in the office. Researchers notice that many managers have changed their position regarding remote work. They prefer a remote form of work due to the growth of efficiency indicators [12]. New technological solutions, the development of new products and services, finding new suppliers or selling through new sales channels will be a nice bonus and income for organizations after the pandemic. Thus, business models will be divided into the ones operating before and after the pandemic. The main supply chain management strategies in this area will be focused on resilience [18,19]. Other strategies will be aimed at reducing supply chain losses [20]. However, in general, all researchers agree that companies will face total digitalization [21,22].

Digitalization of business is not only an anti-crisis tool but also a common way to increase company revenues. Those who make maximum efforts during the crisis to win their audience with quality services and reasonable prices win [23]. The global business trend shows that the annual growth of online retailing was about 20% over the past five years, while offline growth was only 3.5% [24]. In a few decades, online commerce will be the main channel for the sale of goods, and offline will be relegated to the background. In this new environment, companies must not only learn how to digitize their business but also be able to manage their activities with the help of various modern, practical anti-crisis tools.

Before the pandemic, globalization was the prevailing trend. Digitalization will increase the globalization of all markets, which will affect the organizational culture of companies. New requirements for digital culture and tools will include [25]:

- the ability to produce and use digital technology;
- increased requirements for hard-skilled personnel;
- access to hardware and software products;
- the importance of systems integration of software products;
- the ability to act out of the box and generate ideas.

The actions of those enterprises that demonstrate the understanding of digital transformation importance can be divided into four steps:

1. Investments in the latest digital tools are often chaotic and unsystematic due to the lack of a systematic policy in this area;
2. Investment in the Internet of things;
3. Digital tools training for staff, development of monitoring systems and logistics;
4. Develop an effective digitalization strategy and implement its main provisions in practice.

4 Conclusions

The article discusses the practice of using digital tools by small and medium-sized enterprises (SMEs). A survey of companies' employees in the Russian Federation, the Republic of Kazakhstan, and the Republic of Azerbaijan was conducted to confirm that SMEs that do not use digital tools in supply chain management are also characterized by poor supply chain management. The selected criterion of processes standardization was quality supply chain management, which corresponds to the best international practices.

The study found that the level of digital tools and specialized software used in supply chain management in Russia, Azerbaijan, and Kazakhstan is low. Most of the supply management processes are chaotic and non-standardized. The following processes are the most standardized: planning the materials and components supply; forming inventories for individual product assortment groups; selecting suppliers according to the criteria of interest to the manufacturer. The survey found that the respondents understand the importance of the processes and plan to use digital tools in the future. Most motivated to introduce the best practices of supply management are employees of companies operating in foreign markets. Further research is going to be focused on the implementation of digital tools.

References

[1] TWINN, C.I., QURESHI, N.A., CONDE, M.L., GUINEA, C.G., PEREA ROJAS, D.S., GUPTA, H., LUO, J., GUPTA, H.: *The Impact of COVID-19 on Logistics*, IFC. World Bank Group, [Online], Available: https://www.ifc.org/wps/wcm/connect/2d6ec419-41df-46c9-8b7b-96384cd36ab3/IFC-Covid19-Logistics-final_web.pdf?MOD=AJPERES&CVID=naqOED5 [24 Aug 2022], 2020.

[2] MEYER, A., WALTER, W., SEURING, S.: The impact of the coronavirus pandemic on supply chains and their sustainability: A text mining approach, *Frontiers in Sustainability*, Vol. 2, No. 3, pp. 1-23, 2021. https://doi.org/10.3389/frsus.2021.631182

[3] CAPPELLI, A., CINI, E.: Will the COVID-19 pandemic make us reconsider the relevance of short

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food supply chains and local productions?, *Trends in Food Science & Technology*, Vol. 99, pp. 566-567, 2020. https://doi.org/10.1016/j.tifs.2020.03.041

[4] THE ECONOMIST: *Changing places*, [Online], Available: https://www.economist.com/special-report/2020/10/08/changing-places [24 Aug 2022], 2020.

[5] PWC: *How do you transform your supply chain into an intelligent, digital ecosystem?,* [Online], Available: https://www.pwc.com/us/en/services/consulting/risk-regulatory/connected-supply-chain.html [24 Aug 2022], 2017.

[6] HAREN, P., SIMCHI-LEVI, D.: *How Coronavirus Could Impact the Global Supply Chain by Mid-March,* Harvard Business Review, [Online], Available: https://hbr.org/2020/02/how-coronavirus-could-impact-the-global-supply-chain-by-mid-march [24 Aug 2022], 2020.

[7] ALICKE, K., BARRIBALL, E., TRAUTWEIN, V.: *How COVID-19 is reshaping supply chains,* McKinsey & Company, [Online], Available: https://www.mckinsey.com/business-functions/operations/our-insights/how-covid-19-is-reshaping-supply-chains [24 Aug 2022], 2021.

[8] DUBEY, R., BRYDE, D.J., FOROPON, C., TIWARI, M., GUNASEKARAN, A., How frugal innovation shape global sustainable supply chains during the pandemic crisis: lessons from the COVID-19, *Supply Chain Management,* Vol. 27, No. 2, pp. 295-311, 2021. https://doi.org/10.1108/SCM-02-2021-0071

[9] SUPPLY CHAIN 24/7: *Fundamental Supply Chain Changes in a Post-COVID-19 World,* n.d., [Online], Available: https://www.supplychain247.com/article/fundamental_supply_chain_changes_in_a_post-covid19_world [24 Aug 2022], 2020.

[10] CHOWDHURY, P., PAUL, S.K., KAISAR, S., MOKTADIR, M.A.: COVID-19 pandemic related supply chain studies: A systematic review, *Transportation Research Part E: Logistics and Transportation Review*, Vol. 148, No. April, pp. 1-26, 2021. https://doi.org/10.1016/j.tre.2021.102271

[11] IVANOV, D.: Digital supply chain management and technology to enhance resilience by building and using end-to-end visibility during the COVID-19 pandemic, *IEEE Transactions on Engineering Management,* 2021. https://doi.org/10.1109/TEM.2021.3095193

[12] XU, Y., LI, J.P., CHU, C.C., DINCA, G.: Impact of COVID-19 on transportation and logistics: a case of China. *Economic Research-Ekonomska Istraživanja*, Vol. 35, No. 1, pp. 2386-2404, 2022. https://doi.org/10.1080/1331677X.2021.1947339

[13] FONSECA, L., AZEVEDO, A.L.: COVID-19: outcomes for global supply chains, *Management & Marketing. Challenges for the Knowledge Society*, Vol. 15, No. s1, pp. 424-438, 2020. https://doi.org/10.2478/mmcks-2020-0025

[14] MARTINS, V.W.B., ANHOLON, R., LEAL FILHO, W., QUELHAS, O.L.G.: Resilience in the supply chain management: understanding critical aspects and how digital technologies can contribute to Brazilian companies in the COVID-19 context, *Modern Supply Chain Research and Applications,* Vol. 4, No. 1, pp. 2-18, 2021. https://doi.org/10.1108/MSCRA-05-2021-0005

[15] CHOI, T.M.: Risk analysis in logistics systems: A research agenda during and after the COVID-19 pandemic, *Transportation Research Part E: Logistics and Transportation Review*, Vol. 145, No. January, pp. 1-8, 2021. https://doi.org/10.1016/j.tre.2020.102190

[16] ISO: *ISO 9001 - What does it mean in the supply chain?,* n.d., [Online], Available: https://www.iso.org/publication/PUB100304.html [24 Aug 2022], 2016.

[17] AKHMETZHANOV, B., TAZHIBEKOVA, K., SHAMETOVA, A., URAZBEKOV, A.: Coal supply chain management and economic efficiency of using high-ash coking coal in ferroalloy manufacturing, *International Journal of Supply Chain Management*, Vol. 8, No. 2, pp. 624-632, 2019.

[18] PAUL, S.K., MOKTADIR, M.A., AHSAN, K.: Key supply chain strategies for the post-COVID-19 era: implications for resilience and sustainability, *The International Journal of Logistics Management*, 2021. https://doi.org/10.1108/IJLM-04-2021-0238

[19] ISHIDA, S.: Perspectives on supply chain management in a pandemic and the post-COVID-19 era, *IEEE Engineering Management Review*, Vol. 48, No. 3, pp. 146-152, 2020. https://doi.org/10.1109/EMR.2020.3016350

[20] SUDAN, T., TAGGAR, R.: Recovering Supply Chain Disruptions in Post-COVID-19 Pandemic Through Transport Intelligence and Logistics Systems: India's Experiences and Policy Options, *Frontiers in Future Transportation*, Vol. 2, No. 2, pp. 1-18, 2021. https://doi.org/10.3389/ffutr.2021.660116

[21] SINHA, D., BAGODI, V., DEY, D.: The supply chain disruption framework post COVID-19: A system dynamics model, *Foreign Trade Review*, Vol. 55, No. 4, pp. 511-534, 2020. https://doi.org/10.1177/0015732520947904

[22] SWANSON, D., SANTAMARIA, L.: Pandemic supply chain research: A structured literature review and bibliometric network analysis, *Logistics*, Vol. 5, No. 1, pp. 1-22, 2021. https://doi.org/10.3390/logistics5010007

[23] QUEIROZ, M.M., IVANOV, D., DOLGUI, A., FOSSO WAMBA, S.: Impacts of epidemic outbreaks on supply chains: mapping a research agenda amid the COVID-19 pandemic through a structured

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literature review, *Annals of Operations Research*, 2020. https://doi.org/10.1007/s10479-020-03685-7

[24] JOHNS HOPKINS UNIVERSITY: *COVID-19 United States Cases by County, JHU,* [Online], Available: https://coronavirus.jhu.edu/us-map [24 Aug 2022], 2020.

[25] BARYANNIS, G., VALIDI, S., DANI, S., ANTONIOU, G.: Supply chain risk management and artificial intelligence: state of the art and future research directions, *International Journal of Production Research*, Vol. 57, No. 7, pp. 2179-2202, 2019. https://doi.org/10.1080/00207543.2018.1530476

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