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Abstract

The COVID-19 pandemic, which has been going on for more than two years, makes us pay special attention to the study and understanding of the experience of marketing activities in the transport industry in the new reality. Knowledge and skills in marketing are required to organize effective work of transport systems. It is vital to have the ability to choose a marketing strategy, use economic information, and understand ways to increase the competitiveness of transport enterprises. The authors argue that COVID-19 has become a serious phenomenon that has changed consumer behaviour and significantly accelerated the introduction of innovative technologies in the marketing activities of transport enterprises. The restrictions associated with the pandemic have given a powerful boost to the process of digitalization of business. The research reveals that along with the serious problems associated with a reduction in the income of the population, a change in the structure of demand, and a drop in labour productivity due to the transition to remote work, there emerge unique prospects caused by the development of new marketing technologies. Summarizing the data on existing experience, the authors conclude that the pandemic gave a powerful impetus to the digitalization of marketing, revealing several previously hidden problems and opening new prospects for the use of innovative technologies in marketing activities in the management of transport systems.

Keywords: innovation; transport systems; transport systems management; marketing mix; marketing strategy; pandemic; consumer behavior; COVID-19.
1. Introduction

The COVID-19 pandemic that has been ripping around the world for over two years now has had a key impact on the business environment and above all on consumers in almost all sectors of the economy, and the transport sector is no exception by Rothengatter et al (2021).

Most countries are taking unprecedented measures to overcome the pandemic. However, the onset of new and new waves of the disease, the emergence of new strains of COVID-19, the low rate of vaccination not only leads to serious problems in the economy but also makes us talk about a new reality in which transport enterprises will have to operate. Kushnir et al. (2022) forecast a way out of the crisis in the coming years does not come true.

Quarantine restrictions on movement, attendance at mass events, contacts between people, face mask requirements, problems with vaccination have led to significant changes in consumer behavior. The volume of tourist services has sharply decreased, sales in retail trade, public catering, and the automotive industry have shrunk. All the above-mentioned factors significantly affect the profitability of transport industry enterprises. At the same time, pharmaceutical enterprises, the chemical industry, the activities of which are related to transportation, show positive dynamics by Amankwah-Amoah et al. (2021).

The COVID-19 pandemic, having had a devastating impact on the business environment in the transport industry, forced us to look for innovative approaches in marketing activities.

One of its consequences is the accelerated digital transformation of business, the transition from offline models to online models of marketing interaction.

M2M communication, geolocation, online payments, and customer identification are widely used in car-sharing during the digitalization of transport services by Sergeev et al. (2021).

In the field of container-platform transportation, digital technologies are implemented in warehousing, sales systems, customs systems, and cargo terminals by Suvorova et al. (2020).

The shift of consumers to digital channels has allowed the former to receive much more information about the proposed transport services and expand their choice. As a result, competition in the transport services market has increased significantly. In turn, this opened new opportunities for collecting and analyzing information about consumers by Sergeev et al. (2020). Accordingly, this has reduced the competitiveness of companies that cannot collect and analyze Big Data.

Enterprises need to modernize their marketing strategies to maintain a competitive position in the face of changing consumer behavior. Such modernization is possible through making changes to the marketing mix and mastering innovative marketing technologies.

As noted by Wichmann et al. (2021), the marketing mix is constantly changing under the influence of technological factors, the socio-economic and geopolitical situation, as well as the marketing micro-environment. The latter operates via three main stakeholders: consumers, suppliers, and legislators.

Depending on the national response to the pandemic in different countries, Ding and Li (2020) explore various innovative tactics to address cash shortages, facility closures, and supply chain disruptions aimed at keeping businesses alive during a pandemic.

Currently, there are no sources in literature devoted to the problems of digital transformation of marketing activities in the management of transport systems in the context of the corona crisis.

Theoretical studies on the digital transformation of the marketing activities of enterprises were carried out by Ianenko et al. (2020) (2018).

The main hypothesis put forward by the authors is the assumption that the COVID-19 pandemic is becoming a powerful impetus for the digital transformation of marketing activities. Pandemic restrictions stimulate the search for and development of innovative marketing tools by affecting the external and internal environment of transport companies and by changing consumer behavior. Therefore, in marketing development strategies in the post-COVID era, key attention should be paid to the digital transformation of all elements of the marketing complex of transport enterprises.

The main purpose of the article is to investigate the impact of marketing tools adopted in connection with the COVID-19 pandemic on consumer behavior, identify relevant changes in the marketing mix of transport companies, and identify the main problems and prospects for the digital transformation of marketing activities in the post-COVID era.
Since digital transformation can not only give a powerful impetus to the development of the transport business but also lead to unreasonable costs and losses for companies, the article provides a brief overview of data on the digital transformation of marketing activities in the pre-COVID era, as well as the main obstacles and risks of digital transformation in the COVID and post-COVID era.

Further, an analysis of the problems and prospects of the possible impact of the COVID-19 pandemic on the behavior of consumers of transport enterprises, the marketing complex, and the marketing activities of companies was carried out.

Considering the problems and prospects for the digital transformation of the marketing activities of the industry in the context of a pandemic, the authors take up the position that even though the consequences of the pandemic have not yet been sufficiently studied, the pandemic can be seen as a powerful force that accelerates the development of innovative technologies in the marketing activities of transport systems.

Materials and methods
The research was conducted during the COVID-19 pandemic (2019-2021) based on data describing the processes of digital transformation in the pre-COVID and COVID periods.

Some sectors of the economy showed active mastering of digital technologies and development of online interaction formats even during the pre-COVID period. The dynamic development of online commerce, delivery and payment services, and the creation of marketplaces and digital platforms have made it easier for businesses that provide transportation of goods to overcome severe coronavirus restrictions.

Traditionally, digital transformation is understood as the process of converting analog processes and signals into digital form, which is convenient for collecting, processing, storing, and transmitting information. In economics and marketing, we often view digitalization as the process of developing and applying digitized data or systems to elaborate innovative organizational procedures or business models and solve management problems. In general, digital transformation can be understood as the conversion of a company's business processes using digital technologies. These technologies primarily include software, mobile communications, cloud computing, artificial intelligence, the Internet of Things, etc. by Ianenko et al. (2018).

The digital transformation of marketing has been going on for quite a long time. The first steps were taken by creating customer databases to collect and organize information about existing and potential customers, their needs, and decision-makers in charge of the purchasing processes. Then CRM systems appeared. They made it possible to formalize and automate the processes of customer relationships. As the cost of collecting, storing, processing, and transmitting information has decreased due to the emergence of more productive hardware and software, the possibilities for digital transformation have expanded many times over.

Digital technologies such as websites, content exchange platforms, wearable devices and smartphones, e-procurement systems, etc., began to be actively used in the marketing activities of several transport enterprises as early as the pre-COVID period. Innovative technologies have also been used to create new forms of cooperation with clients, search for new market niches and sources of income.

During the COVID-19 pandemic, businesses have accumulated significant and diverse experience in the successful operation of marketing services in the transport industry in the context of coronavirus restrictions. There is a growing number of successful examples of the use of digital technologies to solve current marketing problems, quickly responding to the changes caused by the COVID-19 pandemic. Most of them are scattered on the websites of companies, marketing agencies, and associations and require systematization, comparative, and economic analysis. Generalization, expert assessment of the accumulated experience will make it possible to formulate proposals for modernizing the marketing strategies of transport companies in the post-COVID era.

The study used methods of system analysis, structural and logical analysis, economic and statistical methods, as well as methods of comparative analysis, forecasting, and expert assessments.

2. Results: digital transformation of marketing activities in the management of transport systems

2.1. Determinants of digital transformation

Quarantine measures taken by the authorities led to the transfer of employees to a remote (distant) work mode, which, on the one hand, reduced the need for passenger transportation, and on the other hand, led to the need to
transform the production and marketing activities of many logistics companies. By remote work we mean the performance of functions outside the office at a virtual workplace. Such a workplace can be located at home, in the country house, etc. Most of the technologies, systems, and tools for remote work had been developed a long time ago but were rarely used in the marketing activities of transport companies.

The COVID-19 pandemic, the restriction of contacts between people and business trips forced the management of many companies to switch to new digital technologies for remote work. This allowed us to quickly respond to customers' requests. The customers, who were also remote, got a chance to quickly receive all the necessary information about products and services in digital form.

The experience of virtual offices has shown that firms get access to unlimited human resources around the world and can choose the most talented and efficient employees around the world, bypassing visa and national restrictions easily. Video conferencing systems provide convenient and cheap interaction with customers located in different countries and regions instead of expensive long business trips.

A big plus of remote work is the reduction of time wasted on commuting and meeting with clients. At the same time, the need for office space and equipment, as well as the costs associated with renting expensive real estate, are reduced.

Preliminary analysis shows that the transition to remote work with the use of modern digital platforms can reduce the company's travel, office, and operating costs.

At the same time, even in the case when the benefits of remote work are undeniable for the company, it is necessary to consider several negative consequences associated with the need to monitor and evaluate the effectiveness of employees working remotely. There are reports of the use of new forms of digital control of employees during and outside of working hours, increasing requirements for productivity and work efficiency. It is not always possible to maintain a balance between work and personal life. It is assumed that the unexplored consequences of remote work can lead to a decrease in labor productivity and company efficiency. The transition to digital platforms for remote work will have a negative impact on companies that support the life of offices (supply of goods for the office, food for employees, transportation, real estate arena), which can lead to significant changes in these markets.

2.2. The Impact of the COVID-19 pandemic on consumer behaviour

Unlike previous crises, which influenced consumer behaviour by economic factors (falling consumer incomes, reduced effective demand, etc.), the impact of the corona crisis on consumer behaviour is determined by threats to life and health, as well as restrictive measures introduced by authorities and governments for the COVID-19 pandemic.

As a result, consumers reconsider their goals, life priorities, and needs, which leads to the emergence of new values, spending criteria, and ultimately changes purchasing behaviour.

The studies by Mohapatra et al. (2021), Zhang et al. (2021) describe a number of trends that are expected to influence consumer behaviour in the coming years.

Firstly, the introduction of digital technologies (means of remote work, online communication, and communications; mobile communications; artificial intelligence; robotics, etc.) allows minimizing contacts and improving the quality of life in the context of COVID-19 restrictions.

For transport operators, it is of great importance that thanks to the development of digital technologies, the methods of interaction with consumers are radically changing. The key factors are providing access to goods and services at any time and place convenient for the client; creation of personalized offers; communication in social networks to create the value of the product; creating original content that emphasizes the benefits of the product and allows you to try it in a digital environment.

The transition to remote work, training, restrictions on movement, up to the prohibition to leave residential premises or visit stores, makes it necessary to master innovative technologies for contact-free orders and delivery at a growing rate. In many cases, the pressing need for the services of Zoom, Skype, WhatsApp, etc. arises.

Secondly, social distancing requirements and other coronavirus restrictions have led to a fundamental change in shopping habits, a sharp decrease in visits to brick-and-mortar stores, and a shift to online shopping. As a result, the volume of online shopping is rocketing, while sales in offline stores are declining. This is forcing retail chains to
move to the development of online orders, payments, and delivery of goods, which requires a review of the work of the entire transport industry.

Thirdly, the growing attention to a healthy lifestyle in the context of a pandemic has caused an increased demand for exercise machines and other sports equipment, various online training courses, and healthy eating. Due to restrictions on visiting bars and restaurants, the demand for alcoholic beverages is narrowing, the demand is growing for fresh products, semi-finished products for home cooking, which need to be delivered to the consumer as soon as possible.

In the study by Cruz-Cárdenas et al. (2021), based on an analysis of more than 70 papers on the impact of the external environment on consumer behaviour in the context of the COVID-19 pandemic, the authors primarily highlight the political factors associated with the adoption of legislative acts on the introduction of coronavirus restrictions (lockdowns, social distancing, vaccination, use of protective equipment, etc.). The political and legal environment turned out to be closely intertwined with economic indicators, which showed a decline in the transport industry due to the decision of consumers who were forced to abandon tourist trips, personal contacts with other people at work and leisure.

Decision-making is also influenced by the personal (age, gender, income, etc.) and psychological characteristics (motivation, perception, etc.) of consumers. There are examples where the fear of contracting COVID-19 plays a key role in refusing services that require contact with other people (air travel, buses).

Table 1 provides some examples illustrating the impact of the COVID-19 pandemic on consumer behaviour, looking at changes in pre-COVID and post-COVID consumer behaviour.

| Pre-COVID-19 state | Influence of COVID-19 | New Condition |
|--------------------|-----------------------|---------------|
| Ability to visit off-line stores, exhibitions, and events. A significant share of off-line purchases | Restrictions on visiting offline sites and the growth of online trading. Creation of systems for courier delivery of goods to the client | Development of online commerce, digital interaction with customers, and delivery services (including the use of robots and unmanned vehicles) |
| Remote work used to be uncommon | Widespread transition to remote work | Widespread use of remote and hybrid modes of work and reduced demand for transport services |
| Sufficiently stable consumer behaviour | Rapid Change in Consumer behaviour Driven by COVID-19 Restrictions | Consumer behaviour will continue to be affected by ongoing COVID-19 restrictions, the transition to remote work, and falling income. |
| The risks of online shopping serve as a barrier for some buyers | Coronavirus restrictions stimulated the transition to online customers who used offline purchases | Increasing demand for transport services for the delivery of goods |
| First attempts to use Big Data and AI for the analysis of consumer behaviour and the formation of personalized commercial offers | Increased interest in customer interaction systems based on Big Data technologies, AI Development of customer interaction systems based on Big Data technologies, AI | Development of customer interaction systems based on Big Data technologies, AI Development of customer interaction systems based on Big Data technologies, AI |

Thus, the data presented in the table show that the main reasons for changes in consumer behaviour were political and legal factors associated with quarantine restrictions and technological factors caused by the development of information and communication technologies in transport systems.

One of the main reasons for the accelerated adoption of digital technologies by consumers during the pandemic was the possibility of obtaining additional benefits from online interaction during transportation while reducing perceived risks because of the development of the means of interaction in the digital environment.

At the same time, given the protracted nature of the COVID-19 pandemic, the emergence of new strains of coronavirus, the diverse impact on the individual and society, the study of changes in consumer behaviour should
become an important part of marketing research and the process of developing strategic marketing decisions in the management of transport systems.

The above examples also suggest that consumer behaviour in the post-COVID era will not return to the pre-COVID state. Pandemic-driven consumer experience based on digital adoption will significantly expand the use of digital interaction in meeting transportation needs.

2.3. Impact of COVID-19 on Strategic Marketing Decision Making

On the websites of the American Marketing Association and Russian marketing agencies, many success stories of marketers during COVID-19 are reviewed. Most of them are of a short-term nature and aimed at solving operational, current problems, patching holes in marketing activities. In many cases, these piecemeal actions have no connection to long-term marketing improvement strategies.

In our opinion, certain experience has already been accumulated, which allows us to assess the impact of COVID-19 on strategic marketing decisions and give recommendations on the use of innovative marketing tools in the context of the protracted corona crisis. To do this, the management of companies and marketing services should, first, analyse the company's goals and elements of the marketing mix, including the products and services offered, pricing policy, distribution channels, and communications with the target group.

During the COVID-19 pandemic, many companies, demonstrating their corporate social responsibility, put forward initiatives aimed at combating the coronavirus. In several cases, such initiatives included the allocation of funds to help the elderly and needy people, funding social protection organizations, and supporting funds. With appropriate marketing support, this led to a positive attitude of society and consumers to the company's activities and resulted in sales growth. For example, Coca-Cola donated $120 million to fight COVID-19; Nivea - 50 million, Facebook - 100 million. In some cases, companies have used their existing capabilities to fight COVID-19. For example, Toyota in the Netherlands uses its dealer network to collect and distribute medical and other supplies. Hoekstra and Leefang (2020) note that the marketing effect is greater when it is carried out by a familiar brand, or when a relatively large amount of money is donated. In other words, these companies, by doing a good deed, have strengthened consumer attachment to the brand.

During the pandemic, companies have faced the challenge of getting products to consumers as many distribution companies in the supply chain have been forced to close offices and delivery services. Shops selling clothes, furniture, and cars faced problems. Companies that had their online sales and delivery channels stood to gain from the situation. Studies have shown that companies that use strategies that combine online, and offline sales channels have achieved the greatest success. They responded faster to consumer requests and had their developments in case of coronavirus restrictions, which made it possible to quickly respond to a changing market situation.

The systems of distribution centres at large department stores proved their effectiveness. The goods from the central warehouse were distributed through a network of local centres from where they were delivered to the customer by couriers.

The COVID-19 crisis has given impetus to the development of digital platforms, using which companies that do not have their online channels can offer their products and services using innovative transport and logistics solutions.

The pandemic has clearly shown the importance of not only distribution channels, but also supply. Failures in the supply of components and materials have repeatedly caused production shutdowns in the automotive and electronics industries. In the long term, this forces us to make strategic decisions to optimize the operation of transport systems, shorten supply chains or bring suppliers closer to the place of consumption.

During the pandemic period, there have been significant changes in the advertising market. Many transport companies have drastically reduced advertising volumes, directing their main efforts to retain existing customers. Companies continued to use advertising on TV, on the Internet, but in general, there is an active desire to use several channels, given that many consumers work remotely from home, and share their time between the TV screen and computer monitor.
3. Discussion

The COVID-19 pandemic has provided the transport industry with a huge opportunity for digital transformation and the introduction of innovative technologies in marketing activities. However, the processes are uneven, giving rise to several problems for the companies implementing them. The research conducted within the framework of this article has shown that COVID-19 has become a powerful accelerator of the established and has already repeatedly described the trend in the development of innovative technologies for marketing activities in transport systems. Due to COVID-19 restrictions, the use of technologies such as Big Data, the Internet of Things, videoconferencing, 4G and 5G mobile networks, cloud technologies, etc. have significantly expanded. However, in some cases, the question of efficiency remains open.

The key drivers of digitalization are the rapidly decreasing cost of collecting, storing, processing, and transmitting data on the behavior of consumers of transport services, providing a growing economic effect from the use of innovative technologies. At the same time, the creation of a technical infrastructure may require significant costs for the acquisition of hardware and software and the organization of technical support.

For certain categories of employees, the transition to remote work and online interaction with clients can cause significant psychological difficulties, require advanced training and retraining. Significant problems can arise when interacting online with customers who do not pay enough attention to digital transformation. Changes in consumer behavior, the transition to a remote mode of operation, and the reduction in opportunities for personal contacts are forcing us to reconsider the depth and breadth of the range of transport and logistics services offered.

In times of crisis, price is not the best marketing tool. Due to declining consumer incomes, even small price cuts or discounts offered can generate a positive response and have a significant impact on traffic. At the same time, they can lead to a reduction in the company's profits, which are so necessary for a crisis period. Price promotions can lead to a price war and lower the base price that consumers are willing to pay. In our opinion, in the context of COVID-19 restrictions, it is advisable to use the possibilities of digital technologies to create more value for the client through additional services or gifts.

Amid the pandemic, it is necessary to search for and master innovative ways to reach the client.

Personalized communications focused on the desire to help clients in the current situation will be more effective only if they are constantly monitored and the declared assistance is carried out. Personalized communications focused on the desire to help clients in the current situation will be more effective only if they are under constant monitoring and the declared assistance is offered.

Companies seeking to reduce advertising costs need to move away from costly and under-performing forms of advertising and embrace innovative solutions based on blogs, social media communications, press releases, and participation in customer events online. Communications demonstrating concern for those affected by COVID-19, compliance with COVID-19 rules and restrictions are positively perceived. But one of the main directions remains to enhance the presence of the brand in the digital space and master the interaction with the client in the digital environment, using all the possibilities of innovative technologies by Ianenko et al. (2020).

One of the most important tasks of increasing competitiveness under uncertain prospects for the development of the economy is to increase the efficiency of personnel work and reduce costs. Therefore, the third group should include services that ensure the mobile work of employees of the enterprise, such as corporate mobile services that allow the use of mobile devices in professional activities.

In general, the introduction of mobile technologies, the creation of mobile workstations and conditions for remote work of employees is becoming a key area for innovation, growth of business competitiveness and increase in labor productivity. For marketers engaged in transport systems, this means that they not only need to have the skills to use marketing tools in a mobile environment, but also be able to use mobile devices in their professional activities.

The current crisis has once again shown that many companies pay insufficient attention to the timely modernization of the marketing strategy based on the study of consumers, the development of innovative technologies for interacting with customers.
4. Conclusions

Digital technologies, creating new markets, forming new types of transport services, are fundamentally changing the business environment. To increase the competitiveness of a business, when formulating marketing strategies, it is necessary to consider the rapid penetration of digital technologies into the daily life of a wide range of consumers.

In addition, in each case, the transition to new technologies carries many risks and massive unknowns, ranging from unintentional violations of security rules to global problems with Internet failures, network failures, cybercrime.

The post-COVID era requires an in-depth study of consumer behavior in a rapidly changing digital environment.

The impact of the introduction of vaccination QR codes on consumer behavior has not yet been studied. A conscious refusal to vaccinate of the so-called anti-vaxers leads to the inability by this group of people to consume a large list of services and, accordingly, to the loss of customers by transport enterprises, especially those associated with tourism and passenger transportation.

Limitation of personal contacts, self-isolation, and transition to a remote mode of work have led to the arrival in the digital environment of a huge number of potential consumers who do not have the established skills and experience of interaction in the digital environment. Their behavior and purchase decision-making processes have not yet been studied. But they should become one of the key target audiences when planning marketing activities. For the transport industry, this is already manifested in the breaks in established transport and logistics chains, a drop in the volume of cargo transportation.

There is a need for theoretical and methodological understanding of the practice of digital transformation, the creation of innovative marketing tools in the management of transport systems.

We believe that the COVID-19 pandemic, the post-COVID era, provides marketers with many opportunities to show their value to companies affected by COVID-19 by showing how COVID-19 affects consumer behavior and how to use this in shaping the marketing strategies of transport companies to gain competitive advantages in the post-COVID era.

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