

Digital Supply Chain Management in the Tourism and Hospitality Industry: Trends and Prospects

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Abstract— The article discusses the basics of the digital supply chain management, its characteristic features and scope of application are covered. The analysis of a condition of development of digital supply chain management in the world reflecting growth of its share in gross domestic product, and the Russian Federation for which characteristic is the state initiative of advance and development of digital processes, but not business structures is carried out. The role of the Internet of things within digitalization of supply chain management is considered, in this regard the optimistic and conservative forecast of structure of the market of the Internet of things till 2025 is submitted. In work characteristic of information space of the sphere of tourism is given, the digital services and platforms which were widely adopted and succeeded offices of the tourist companies are described. The offered model of the digital platform for the sphere of tourism and hospitality of the Russian Federation «Tourism 4.0» with the description of the principles, characteristic of it, can be provided as a result of a combination of key technological capabilities, namely artificial intelligence, the Internet of things, robotization, voice technologies, a supply chain management. The presented «digital funnel» reflects the place of the tourism and hospitality industry among the participants in the digitalization market. Results of a research allowed to distinguish the factors constraining and keeping development of modern technologies in the industry, to reveal trends and regularities in the short term.

Keywords— Digital economy, supply chain management, concept 4.0., tourism, hospitality, modern technologies.

1. Introduction

The rapid development of the digital economy in the supply chain management provides an increase in the competitiveness of states, industries, enterprises. The ubiquitous level of the spread of digitalization entails significant changes in the

process of business organization. The current trend is digital transformation affecting all areas, focused on the global application of digital technologies in the activities of economic entities, the formation of the information society and the digital supply chain management in general.

2. Theory

In recent decades, the study of the problem of introducing digital technologies received wide coverage. In 1995 the author of this area became the professor of the Massachusetts Institute [1-3]. The basis of his research is the opposition of traditional and digital economies with the intensive development of information and communication technologies.

The digital supply chain management is considered an economy directly related to the processes of development and introduction of digital technologies in all areas of economic production and consumption. As a rule, it covers the provision of online services and products, namely, electronic payment services and e-commerce, Internet commerce and Internet of Things (IoT), crowdfunding, Internet banking and more. Among the newest digital technologies that serve as a platform for digitalization and the digital supply chain management, there are Big Data technologies, the development of cloud services and artificial intelligence (neural networks), smart location technologies, Internet of Things, and Industrial Internet of Things (IIoT), 3D printing [4-6].

Digitalization processes are particularly relevant for the service sector. Trade and transport companies, enterprises of the tourism and hospitality industry, catering were able to expand the target audience and reach and improve the

quality of service, develop at an accelerated pace, taking into account that in the global digital supply chain management the victory will be won by those in whose arsenal more and the quality of digital platforms.

3. Data and Methods

The study that was conducted by «the International Data Corporation» reflects the annual growth of world costs of digital transformation by 16.8%, the size of which in 2019 will amount to 2.1 trillion USD. «The Boston Consulting Group» estimates that the digital supply chain management will reach 16 trillion USD by 2035.

A significant part of digitalization is in the sphere of consumption (services, online commerce, offline purchases and online search) – 63 billion USD, in which the Internet of Things market plays a huge role. The development of this segment cannot be viewed outside the global trends of digital transformation. By 2025, the annual contribution of the Internet of Things market to the world economy can be from 4 to 11 trillion USD.

Figures 1 and 2 show an optimistic and conservative forecast of the structure of the Internet of Things market in the global supply chain management by 2025.

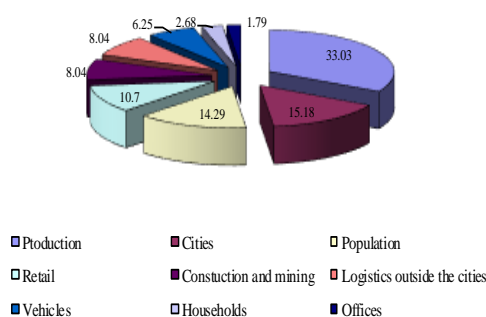


Figure 1. Optimistic forecast of the structure of the Internet of Things market in the global economy by 2025

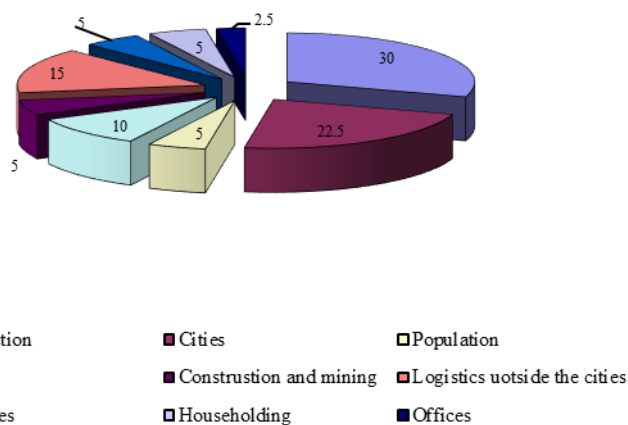


Figure 2. Conservative forecast of the structure of the Internet of Things market in the global economy by 2025

In Russia the share of the digital supply chain management in gross domestic product is \$ 75 billion or 2.8% (according to the «Boston Consulting Group»). Comparison of the digitalization index of Russia with world economies indicates a significant lag of the Russian Federation, for example, from countries such as Brazil and Israel according to the summary data for 2016. The backlog of Russia against the

background of the leaders looks significant up to critical: more than 5 times from the EU countries, 7 times from the USA.

Experts point out the Russian digitalization phenomenon, namely, a huge gap between companies in terms of introducing IT technologies: on the one hand, organizations that are literally at the forefront of digital transformation, on the other - a whole layer of enterprises and organizations that

have not even reached the basic level of process automation.

Currently, the digital supply chain management in the Russian Federation is a priority for state development. On the instructions of Putin the government approved Resolution No. 234 of March 2, 2019 «On the management system for the implementation of the national program» Digital supply chain management of the Russian Federation». According to this Resolution under public-private partnership conditions it is advisable to increase investments in such areas as IT products, IoT, services with high export potential Big Data.

Federal target program «Development of domestic and inbound tourism in the Russian Federation (2019-2025 years)» // Reference legal system «Consultant Plus»

Nowadays tourism has become a special sociocultural phenomenon that unites both the historical and cultural heritage of the state and the most modern information technologies in the field of territorial development and communications.

Foreign travel and travel companies are actively and efficiently digitizing their activities, receiving significant income. Tourism makes a significant contribution in economy of Asian countries. These countries have already begun a digital transformation at the government level.

There are dozens of technological start-ups in the field of tourism in the world who are seeking to bring their original ideas to the industry.

The tourist industry and its development both at the state level as a whole and for its subjects, municipalities and society, has a significant role in the Russian Federation. The data of Rostourism show that among the 4377 companies included in the Unified Federal Register of Tour Operators more than 2.5 thousand organizations operate in the field of domestic tourism.

The key criteria for making decisions on the digitalization of this sphere and the development of infrastructure should be an orientation to the preferences of potential and actual tourists because the development of inbound tourism is important for the country.

The 2018 World Cup exposed the main problems of digitalization of tourism in the Russian Federation. In a short period of time a large number of foreigners who came to Russia for tourism (especially from European countries, China and America) felt the contrast of using modern

technologies in their country and Russia. The main disadvantages in the opinion of tourists were the lack of electronic visas because it reduces the bureaucratization of the visa process (although they began to use this experience quite effectively in the Far East and from January 1, 2019 in Kaliningrad) including due to the lack of modern technology and infrastructure development outside the tourist centers (St. Petersburg, Moscow).

It can be noted that for the Olympics and the World Cup there was a rather intensive preparation in the sphere of tourism and hospitality due to which innovations were introduced and funds were allocated. Some companies began to introduce electronic vouchers although this experience did not allow them to solve problems with increasing competitiveness and profitability of business. Regions focused on the influx of a large number of tourists developed interactive tourist maps resources and objects. But the lack of systematization and integration of the portals of the regions into a common digital information space only repels the user.

Approved by the Federal Target Program «Development of domestic and inbound tourism in the Russian Federation (2019 - 2025 years)» predicts that by 2025 the number of tourists making out vouchers, registered in electronic form, will be more than 6.77 million people per year.

The state plans to allocate subsidies and support to market entities implementing digital technologies and developing tourism in the Russian Federation. But the remoteness of promising regions and the «subsidized position» of projects for the development of tourism in these regions (as part of the development of health tourism (Volga, Caspian), cultural and educational tourism (Ural, Silver Necklace of Russia)), active tourism - the project «Siberia», cruise tourism (projects «Kamchatka», «Primorye», «Amur», «Russian Arctic»), ecological tourism - the project «Baikal» does not allow to conclude that the investment data is highly efficient and the likelihood of redistribution dedicated resources on digitization.

4. Model

According to Google statistics users make about 400 search queries during the travel planning period. This huge data layer is actively used by travel companies in order to influence the traveler's decision and persuade him in favor of a certain route, company and hotel.

74% of travelers in the world plan their trip online, which determines the prospects of the online tourism services market. The main share of domestic tourists in the process of planning and organizing a trip in 2017 – 2018. The main share of domestic tourists in the process of planning and organizing a trip in 2017 - 2018 used the Internet. The trend of digitalization of travel services is forcing market players to adapt to new realities. Thus, mobile first offers to focus not on the version for desktops and tablets, but on applications for smartphones. Total share of requests from mobile devices increased to 40%.

However, the average Russian traveler still gives tour operators a hope for several years of prosperity. According to a global survey of Travelport, 51% of holidaymakers still prefer to buy tours from companies specializing in this type of service, regardless of the convenience of their digital platform. In general, the global trend of digitalization of the travel industry indicates a rapid and global change in this market.

The services of tour operators with visits to the physical offices of companies, uses no more than a third of travelers in Europe. The rest are planning a trip on their own using online services. In Russia, the market is developing in line with global trends so a similar situation will not take long. Online sales will grow in two planes – self-compiling a tour with the help of buying tickets and hotels on the Internet separately, as well as buying already «collected» trips from tour operators online. Electronic sales will replace the offline agencies. Some of them will be closed and the other will be reoriented to the digital environment.

Most of the currently used means of digitization of the tourism industry are applications. The first digital services for tourists appeared in the early 2000s and were focused on online booking of accommodation and purchase of tickets. Booking.com – a hotel aggregator enabled potential customers to see small hotels around the world, provided them with the widest access to the customer base. AirB& B - repeated the success of Booking.com, creating a new apartment rental market. Also Uber, Gett – taxi aggregators, attracted a huge number of people to small businesses, gave them the opportunity to earn money using their own car and, at the same time, made taxi services much more affordable [4-7].

Modern travel is hard to imagine without the use of

such platforms. Trust ratings are automatically formed between the participants thanks to such platforms allowing for the shortest possible time to combine sellers and buyers of goods and services in the market including when concluding transactions and making settlements thereby eliminating intermediary links minimizing the costs of production and exchange processes.

In general using such platforms can significantly strengthen the relationship with the client (to inform and accompany customers on the way), sell more services and increase their price; improve the quality of services (smartphone as a room key, check in at the hotel using application, exchange messages with hotel staff using application), improve emotional perception (to mark where they visited and sort the photos into places, reminders, instructions and instructions at the airport, train station, port and on board the vessel); create new opportunities for reaching out to customers and understanding (notifications, advertising, reviews), integrate with social networks to identify personal preferences customer and further search for potential customers.

The presence of fierce competition and the broadest opportunities in the application market determines the feasibility of developing this area in providing the conditions for the creation and launch of new generation digital platforms.

Russia is already using some of the elements included in the concept of Tourism 4.0, but the generalized implemented platform that a country with a huge tourism potential needs is not formed. If earlier the concept of «Industry 4.0» and «smart factory» used in industry was the basis for the development of digitalization now in many developed countries this approach is applicable to the service industry and tourism industry [8]. As part of this kind of trends Turkey and Kazakhstan in 2018, for example, announced a policy of developing the concept of «Tourism 4.0» - countries intend to invest heavily in digital marketing for their tourism industry.

Summarizing the elements of digitalization of tourism and hospitality in the Russian Federation and the experience of those countries that are already implementing the concept of «Industry 4.0» in this industry, the digital platform model «Tourism 4.0» for the tourism and hospitality industry of the Russian Federation is presented in Figure 3.

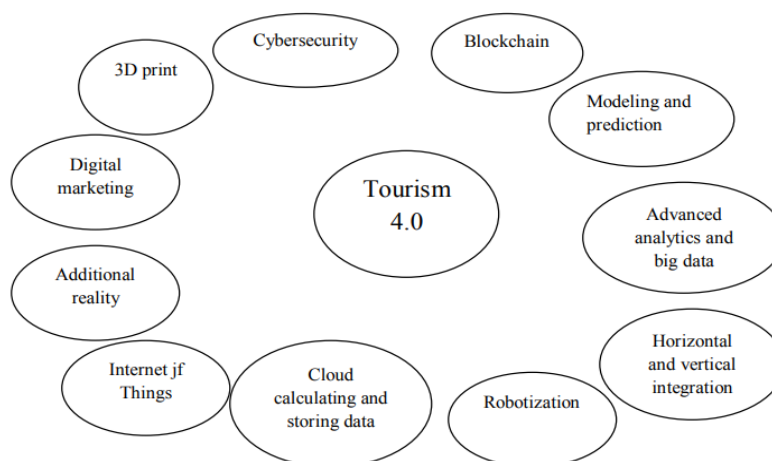


Figure 3. Model of a digital platform for tourism and hospitality of the Russian Federation «Tourism 4.0»

Digital platform model «Tourism 4.0» and its principles:

- limiting automation of all links;
- maximum share and significance of R & D;
- management of all subsystems and links is carried out by an autonomous system using the Internet of things;
- all stages of the life cycle of a tourist product are provided with the work of functional units in the form of a single interconnected whole, regulated in the online mode by feedback flows.

The potential of digitalization for the development of small and medium-sized businesses in the tourism and hospitality industry depends on the financial and technological capabilities of each specific entity and the industry as a whole. There are several key technological opportunities.

1. Artificial intelligence – will provide the most personalized result when planning a trip. Based on information about customer preferences, offering solutions used by other travelers, AI-systems can greatly simplify the organization of holidays or travel, help save.
2. The Internet of Things market is a key element of the service, providing a seamless journey – flight, transfer, hotel, car order.
3. Robotics - the technology of co-bots, robots who know how to understand and work with people, is becoming more and more real.
4. Voice technologies is an effective speech recognition makes it possible to optimize many

processes.

5. Blockchain is creating a «trusted digital environment» that can significantly increase the reliability of orders, reservations and payments.

4. Results and Discussion

In general the conducted research shows that the digital transformation in Russia is characterized by the dominant role and initiative of the state than business. This specificity leads to the advanced development of service IT for the population. It leads to the active development of «digital public services» which are used by more than 80 million people. Figure 4 shows the current location of participants in the Russian market on the turns of the «digital funnel» although it is rather conditional. The ranking largely reflects the current perception of experts and their subjective expectations as well as the author's opinion rather than being the result of a predictive analysis of the long-term perspective.

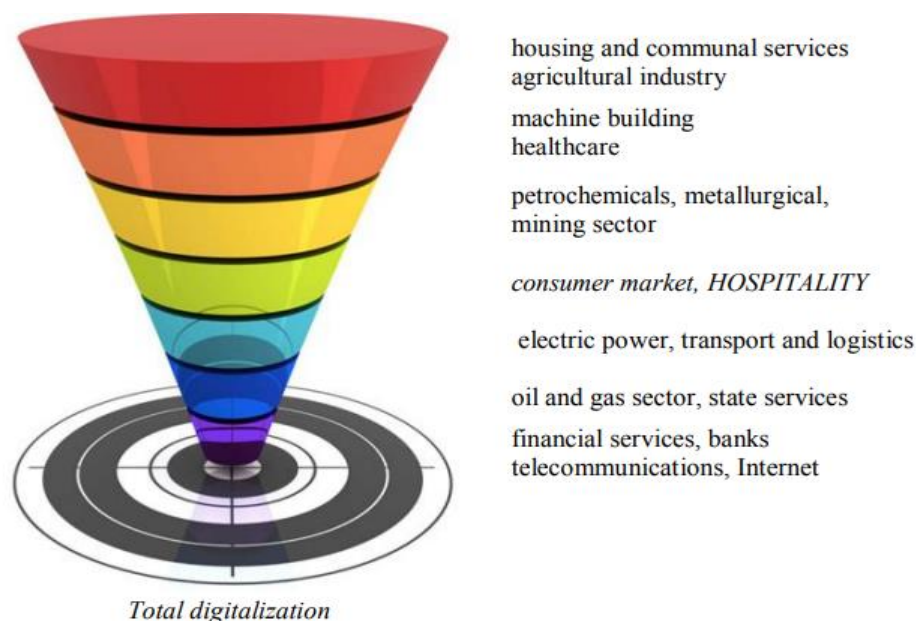


Figure 4. «Digital funnel» of participants in the digitalization market of the Russian Federation in the current period

Among the factors hindering the development of digital technologies in the hospitality industry include:

- financial and economic (for the medium-sized and small businesses in the sphere of hospitality it is quite difficult to invest heavily in the digitalization of activities. And the benefits and programs for their support and incentives in this direction are not provided);
- regulatory (lack of a clear regulatory field governing the interaction of actors in the transition to digital space, including the protection of personal data, control of the accuracy of accounts and the information provided);
- general instability (differences in the financial and political capabilities of the regions for integration into the digital space of the country);
- lack of investment in high-tech industries, the impact of sanctions - above all, limited access to technology transfer and the import of ready-made solutions;
- low standard of living of the population of the country (the lack of the possibility of acquiring modern, most functional gadgets, using paid content and roaming Internet services while traveling)
- digital illiteracy of the population (some do not know about the possibilities of digital technology or know very superficially).

The category of factors that support the development of the industry and the digitalization

processes in it include:

- isolation from technology transfer, forcing businesses to finance and implement Russian developments;
- the effect of a «low base» capable of dramatically optimizing business processes through the modernization and implementation of information technologies;
- prospects for changing business models that lead to the creation of new services.

Taking into account the specifics of digitalization of the Russian market and trends in the development of the tourism and hospitality industry it can be assumed that in the next 2–3 years this area will reach a new turn in the funnel, while acting as a catalyst for advancing the sphere of «Transport and Logistics [8]» (mainly within organization of passenger traffic).

5. Conclusion

In the near future, for most industries will be characterized by significant changes associated with the change of business models, managers and breakthrough innovations. Taking into account the new trends, players of the market of tourism services are planning to struggle for clients. One of two variants can be chosen as a solution. The first variant is available only for large tour operators who can concentrate hotels or airlines as assets to compete that reducing their own costs by supply chain system. The second variant means switching

to online and integrating into global sales channels by e-supply chain system. In this case, the obvious advantage is the dependence of travel service providers on partners is reduced, since online they can directly take money from their customers without sharing profits with anyone.

In the near future, the suppression of old-type companies by metasearch engines will continue. It is introducing new technologies that ensure interaction with the client from the start of travel planning until the moment of paying for hotels and tickets. If today it is difficult to predict the speed of ubiquitous digitalization of the market in Russia and abroad, one fact is obvious – the majority of tour operators operating in the system of offline offices fall into the risk group and, possibly, in the near future will stop their work. Thousands of agencies are already closing annually, but for the most part clients do not notice this because they are offered a more convenient alternative.

Companies that offer the most customized process of interaction with the traveller will be an advantage in the travel services market. Only this way will the loyalty of customers and business profits remain and the conversion will increase and the level of security will increase.

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