PERSPECTIVES AND PROBLEMS OF BIG DATA ANALYSIS & ANALYTICS FOR EFFECTIVE MARKETING OF TOURISM INDUSTRY

Abstract. For years, all individuals and legal entities generate, register and store (in databases, repositories and data showcases) huge volumes of heterogeneous structured and semi-structured information (quantitative, qualitative, text, hypertext, transactional, geo-information, multimedia, meta-information, etc.) regarding all aspects of their business, technological and management activity. In addition, the rapid development and spread of Big Data, Web 4.0 and Web 5.0, IOT, augmented reality, blockchain in recent years caused an additional avalanche-like increase in stored data.

This big data contains a significant potential for finding and formalizing hidden new regularities (knowledge, patterns), which are the basis for making optimal and effective managerial and technological decisions, including and in the field of marketing.

From these regularities and patterns (after their verification and interpretation), the corporate knowledge base is mainly formed, including and for expert systems and classic artificial intelligence systems, which should become an integral part of the innovative marketing management system of any company or enterprise.

In the modern conditions of the development of the global economy, and in connection with the emergence of new branches of economic activity in the field of informatization [1], the application of innovative technologies for the preparation, processing, analysis and analytics of extremely large arrays of heterogeneous data leads to the obtaining of additional competitive advantages by users at the state,
regional, branch and corporate levels levels of management, which is especially relevant in times of crisis [2-3].

In the modern tourism industry, Big Data technologies are an important technology of innovative competitive tourism management.

The first component of the mentioned technology is targeted, efficient and productive configuration of automated search and ETL of relevant big data in structured (in particular web logs, geospatial data), semi-structured (text comments and replays from social networks and social media) and unstructured format (in particular packet/streaming data from virtual reality, augmented and mixed reality) in particular, with the involvement of relevant data from specialized and verified pages of social networks, web booking platforms and web platforms for customer reviews.

The second key technology of innovative competitive tourism management is the use (after appropriate data orchestration and processing) of the above collected big data for their analysis and analytics, in particular in the 24/7/365 mode. An important further component of the stage of analysis and analytics of big data of the tourism industry is the further functioning of the anomaly detection option in such data [4].

In this way, travel companies can receive effective and detailed analytics results about specific preferences, possible behavior patterns and general trends among travel consumers in a timely manner, which allows to automatically generate the most personalized and flexible targeted marketing tactics&strategies to increase conversion and customer satisfaction.

The article presents the scientific and practical results of the authors' preliminary research on the features, trends and barriers to the systematic application of analytics and analysis of big data in marketing.

The proposed solutions should be taken into account when reengineering marketing management systems not only for companies and enterprises of Ukraine [5]. After all, the obtained results are relevant and effective not only for local companies, but also for private companies and corporations in other developing markets, in the context of global and regional macroeconomic crisis phenomena.

**Keywords**: marketing, big data, analytics, management, tourism.
ПЕРСПЕКТИВИ ТА ПРОБЛЕМИ АНАЛІЗУ ТА АНАЛІТИКИ ВЕЛИКИХ ДАНИХ ДЛЯ ЕФЕКТИВНОГО МАРКЕТИНГУ ІНДУСТРІЇ ТУРИЗМУ

Анотація. Всі фізичні та юридичні особи роками генерують, реєструють та зберігають (у БД, сховищах та вітринках даних) величезні обсяги різноманітної структурованої та напівструктурованої інформації (кількісної, якісної, текстової, гіпертекстової, транзакційної, геоінформації, мультимедійної, метаінформації тощо) щодо всіх аспектів своєї бізнесової, технологічної та управлінської діяльності. Крім того, бурхливий розвиток та поширення Big Data, Web 4.0 та Web 5.0, IOT, augmented reality, blockchaine в останні роки зумовив додаткове лавиноподібне збільшення збережених даних.

Ці великі дані містять в собі значний потенціал для пошуку та формалізації прихованих нових закономірностей (знань, patterns), які є основою прийняття оптимальних та ефективних управлінських та технологічних рішень, в т.ч. і у сфері маркетингу.

З цих закономірностей та патернів (після їх верифікації та інтерпретації) переважним чином і формується корпоративна база знань, в т.ч. і для експертних систем та класичних систем штучного інтелекту, які мають стати невід’ємною частиною інноваційної систему управління маркетингом будь-якої компанії чи підприємства..

В сучасних умовах розвитку глобальної економіки, і в зв’язку з появою нових галузей економічної діяльності в сфері інформатизації [1], застосування інноваційних технологій підготовки, оброблення, аналізу та аналітики надвеликих масивів різноманітних даних зумовлює отримання додаткових конкурентних переваг користувачами на державному, регіональному, галузевому та корпоративному рівнях менеджменту, що особливо актуально в умовах кризових явищ [2-3].

У сучасному туристичному секторі технології Big Data є важливою технологією інноваційного конкурентного туристичного менеджменту.

Першим важливим компонентом згаданої технології є таргетоване, ефективне та продуктивне налагодження автоматизованого пошуку та ETL релевантних великих даних структурованого (зокрема web logs, geospatial data), напівструктурованого формату (text comments and replays from social networks and social media,) та неструктурованого формату (зокрема потокові та пакетні дані віртуальної реальності, доповненої та змішаної реальності) зокрема і з залученням відповідних даних спеціалізованих і верифікованих сторінок соціальних мереж, web платформ бронювання та web платформ відгуку клієнтів.

Другою ключовою технологією інноваційного конкурентного туристичного менеджменту є використання (після відповідного оркестрування даних та їх
процесінгу) вищезазначених великих даних для їх аналізу та аналітики, зокрема і в режимі 24/7/365. Важливою подальшою складовою етапу аналізу та аналітики великих даних туристичної індустрії є подальше функціонування режиму виявлення аномалій в таких даних [4].

Таким чином туристичні компанії можуть вчасно отримувати ефективні та деталізовані результати аналітики про конкретні вподобання, можливі моделі поведінки та загальні тенденції серед споживачів туристичних послуг, що дає змогу в автоматичному режимі генерувати максимально персоніфіковані та гнучкі цільові маркетингові тактики та стратегії для підвищення конверсії та рівня задоволення клієнтів.

У статті викладено науково-практичні результати попереднього дослідження авторів щодо особливостей, тенденцій та перепон щодо системного застосування аналітики та аналізу великих даних в маркетингу.

Запропоновані рішення - варто враховувати при реінжинірингу систем управління маркетингом не тільки для компаній та підприємств України [5]. Адже отримані результати є актуальними та ефективними не лише для місцевих компаній, а й для приватних компаній та корпорацій на інших ринках, що розвиваються, в контексті глобальних та регіональних макроекономічних кризових явищ.

Ключові слова: маркетинг, велики дани, аналітика, менеджмент, туризм

Problem statement and relevance of the research. Big Data technologies — a complex of methods, algorithms and tools for processing, analysis and analytics (on a distributed scale) of data of huge volumes and significant diversity in conditions of continuous growth, distribution of information across numerous nodes of a computer network. Big data encompasses any and all structured and unstructured information collected, stored, linked and analyzed both online and offline [6, 7].

An array of larger data (Big Data) in enterprises is usually formed from a combination of sources, such as traditional enterprise data, data registered by software and captured with sensors (machine data), personal and social web data. The first, transactional data, include ERP and CRM systems, part of the transactions of accounting systems and online stores. Machine data can include software system logs, information from trading platforms, streams from industrial sensors, equipment logs. Social sources of big data include social networks, microblogs, and arrays of customer reviews. Social networks and microblogs do not generate as much information as industrial systems, but they provide a significant increase in data for evaluation in the field of customer relations.

All this highly structured, semi-structured and unstructured data is stored in many repositories, often even outside the organization. Companies can have access to vast amounts of their own data and don't need tools that can establish relationships between these data and draw important conclusions based on them [8]. Traditional
methods of analysis and analytics cannot be used for huge volumes of constantly growing and updated data, which ultimately paves the way for Big Data technologies [9].

Traditional data formats are well defined and little changed. In contrast, non-traditional data formats show high support for change, which corresponds to the third characteristic of Big Data. New types of data are needed to collect performance and summary information when adding new services, deploying new sensors, or launching new marketing companies. For example, one of the technologies, that can provide such data is virtual, augmented and mixed reality with different trackers and sensors to capture the users’ physical behavior seamlessly while maintaining an immersive user experience [10, 11].

Techniques and tools for working with structured data have been created for a long time. It is a relational data model and database management system. But in modern conditions, enterprises need to process large volumes of unstructured data of various types, and the previous methods are not quite suitable for this work. New methods of dealing with data are necessary - effective technologies, methods and algorithms for analysis and analytics of big data, in particular in real time 24/7/365.

Today, the term Big Data is generally used to refer not only to the most enormous data sets, but also to the tools for processing them and extracting the possible benefit that can be obtained as a result of their deep intellectual analysis [12].

The infrastructure required for big data analysis must support hybrid analytical techniques such as statistical analysis and data mining across a wider range of data types stored in different systems [13]. Importantly, the infrastructure must be able to integrate analytics from a combination of big data and traditional enterprise data. By processing and analyzing big data in combination with traditional enterprise data, enterprises can gain a deeper and clearer understanding of their business, which leads to increased productivity, stronger competitive positions and the identification of new opportunities [14].

Regardless of the specifics of the industry, there are two directions for the application of technologies based on Big Data analysis in each company, this is internal and external interaction.

In the framework of external interaction research, the accumulated customer experience is of interest, namely, understanding customers through social network analysis, their social status, age, preferences, etc., information about regions, market segments, satisfaction with a product or service, methods of promotion, as well as methods of contact, etc [15]. External interactions can also include everything related to the business model and structure of the business and its interaction with the outside world, for example, suppliers, partners and sales channels [16].

The study of internal interaction is aimed at the study and optimization of operational processes in the company, the purpose of which is to increase the productivity of not only equipment, but also employees, as well as the rational use of resources [17, 18]. It is worth noting that enterprises will be able to gain the main
competitive advantage not so much at the expense of data collection, but at the expense of the ability to quickly obtain useful information from the overall huge amount of generated Big Data.

Let's consider the advantages of using Big Data in enterprise management [19-21]:

First, it helps to improve the efficiency of decision-making. The Big Data platform has the function of collecting data resources in real time and can obtain key information based on the rapid processing and analysis of massive data, which can meet the urgent needs of enterprises.

Second, promote more and more diverse decision-making tools.

Thirdly, it increases the persuasiveness and quality of the decisions made, because they are based on a large statistical base of source information, which significantly strengthens the trust in decision-making schemes.

Fourth, big data technology is also a guide for the company's operational strategy.

Evaluating the directions of influence of Big Data technologies on the process of management decision-making, the following should be emphasized:

1) Impact on the management decision-making environment.
2) Impact on the participants of the management decision.
3) Influence on the process of making management decisions by the organization.
4) Influence on management decision-making technologies.

However, when studying the degree of influence of Big Data on the level of economic efficiency of the enterprise, it is important that management decisions are aimed at achieving several mandatory benchmarks.

First, Big Data technologies are a way to understand the customer by studying all his preferences.

Second, with the help of big data technologies, companies can collect and analyze the resource output, specific conditions and allocation of reserves required in the operation mode of the enterprise to form an enterprise-level resource allocation map, similar to an "electronic map".

Third, Big Data technologies can be used to plan production technologies.

Fourth, thanks to the intelligent analysis of big data, the direction of the company's work method will become reasonably clear and easily identifiable, and will be more confident in brand promotion, location selection and strategic approach planning. On the other hand, big data technology can contribute to the intellectual activity of enterprises.

Fifth, with the help of the calculation of big data, social information data, data on interaction with customers, the enterprise can carry out horizontal design and segmentation of information about the brand. Business intelligence software

Sixth, big data creates differentiated advantages that are mainly reflected at the strategic level of the business model.
Analysis of recent research and publications. The fundamental questions of the theory of big data were revealed in their works by such scientists as: John R. Mashey, Jacobs A., Clifford Lynch, Magoulas Roger and Lorica Ben, Steve Lohr, Boyd Dana and Crawford Kate, Hilbert Martin and López Priscila, Sagiroglu Seref and other.


However, not only the broader and more urgent issue of the optimal use of modern Big Data processing, analysis and analytics technologies in innovative marketing, but also the more applied scientific and practical task of determining the specifics and increasing the efficiency of the use of such technologies by tourism industry companies remained unresolved.

The purpose of the article (statement of the task). The purpose of this study is not only a comprehensive study of modern Big Data processing, analysis and analytics technologies in innovative marketing, but also to determine the specifics and increase the effectiveness of the use of such technologies for tourism industry companies in developing and/or crisis or pre-crisis countries.

The main part. The information obtained as a result of Big Data processing is used at all stages of the marketing process.

At the stage of researching the marketing environment, it provides many opportunities for analyzing consumers and competitors, auditing marketing activities:

— creation of the most accurate portrait of the target audience: socio-demographic, psychographic characteristics, information on making purchases, online resources that are most often visited, how they spend time on the Internet, what devices they use and much more. In fact, the data that is continuously created in the digital environment transforms the activity of a marketer into a permanent process of studying its consumers [22];

— analyzing the profiles of users of certain services, for example, Amazon, and expanding the audience by offering products to users with a similar profile;

— assessment of changes in purchasing behavior to prevent the loss of customers;

— monitoring of social media to determine the attitude towards own product/brand and competitor's product/brand, search for ideas for product improvement, analysis of service quality;

— analysis of competitors' activities;
— analysis of various sales channels and selection of the best ones for specific clients.

The results of using Big Data technology to process collected data form the basis of building and optimizing a marketing strategy. Continuity of the process of receiving information provides an opportunity to turn static marketing campaigns into flexible tools in the hands of marketers, which ensures a timely response to changing consumer behavior. Examples of the use of Big Data for various elements of the marketing complex can be:

— personalization of the offer for a specific consumer based on the analysis of information about him in real time;
— price discrimination depending on the user profile;
— automation and optimization of the process of supplying goods to retail networks;
— creation of personalized advertising campaigns. Broad targeting capabilities in the online environment allow you to provide consumers with information about products that may be of interest to them. Moreover, the campaign can be adjusted not only by geographic region, socio-demographic characteristics of users, but also by interests based on the analysis of the user's search history and pages in social networks.

Therefore, the use of technological and algorithmic tools of Big Data and the use of the obtained information in planning and adjusting marketing activities provides benefits to both producers and consumers. The consumer receives personalized content that meets his needs and interests. The manufacturer manages not only to automate routine data ETL processes, but also to automate typical analytical tasks and free up the time resources of experienced experts to solve problems that require a more creative approach; optimize marketing activities: spend less, getting better results; to establish mutually beneficial relations with the consumer due to the maximum correspondence of the marketing complex to the needs of an individual client.

In this context, the use of specially developed algorithms and advanced analysis methods revolutionize sales and marketing methods.

Below are some of the effects and impacts [23-29]:

1. The price optimization process is much more accurate. Thus, according to McKinsey data, a 1% price increase will lead to an 8.7% increase in operating profit (without loss of volume);
2. Almost 40% of advertisers use three or more data management platforms and almost 45% use three or more analytics platforms;
3. It is expected that the total volume of the data market will almost double in five years;
4. Analytics can provide a clearer picture of the client, which will increase profit leverage;
5. Increased customer loyalty and engagement, giving competitive advantage to leaders in the top ten industry sectors that use data-driven strategies.

This part of the article offers an analysis of the prospects and trends of the Big Data processing, storage, analysis and analytics market:

1. In the last five-year period, not only fundamental, but also applied scientific research and research and development (R&D) in the field of development of basic and auxiliary technologies for in-depth intellectual analysis of big data using supercomputers have gained special relevance.

2. State programs with the following subtasks are actively implemented and improved:
   - Active systematic promotion of know-how necessary for storage, collection, distribution, management, analysis and analytics of big data;
   - Activation of Big Data technologies to accelerate innovation processes in science (health care, biotechnology, fundamental research) and engineering (mining, energy), as well as in training personnel in the profile under consideration.

   In addition, based on the analysis of consortia, it can be highlighted that developing countries will become the most active markets for the active evolution of Big Data technologies in the coming years. It can be argued that within the framework of this developing trend, a state strategy in the field of Big Data is already being implemented or developed as part of the course for the formation of electronic government, acting to ensure state transparency, strengthening and increasing the competitiveness of the economy.

   The main tools for achieving the set state tasks for the promotion of Big Data include the following support measures [30-35]:
   - Total applications of big data in the fields of broadcasting, information and communication technologies, health care, education, transport;
   - Training of relevant personnel;
   - Further improvement of Big Data platforms and technologies;
   - Organization of support centers for pilot projects and R&D in the field of Big Data;
   - Formation of a favorable environment for the dissemination of Big Data technologies;
   - Protection of personal data and reduction of its abuse;
   - Structuring of regulatory frameworks for conducting business on the basis of Big Data.

3. In the Big Data market, the most invested areas are visualization and data analysis and data collection. In line with current market trends and demand, investments have been used to improve data quality, improve forecasting and planning [35], and increase data processing speed.
4. According to forecasts, trends in the evolution of the Big Data market look like this:

- in the next 5 years, the costs of cloud transformations in the field of Big Data technologies will grow 3 times faster than the costs of local transformations.
- hybrid platforms for data storage will become popular.
- The growth of applications using predictive and advanced analytics, including machine learning, will accelerate, the supply of such applications will grow faster than applications that do not use predictive analytics.
- Media analytics will triple and become a significant driver of the growth of the Big Data technology market.
- trends in the implementation of transformations for the analysis of the constant flow of information data used for the Internet of Things will accelerate.
- by 2018, 50% of users will interact with services based on cognitive computing.
- the expert community identifies 3 drivers of the Big Data market: mass absorption of the client base of firms that offer mobile applications and other platforms; evolution of cloud infrastructure; changes in data privacy legislation.

5. In addition, it is also worth highlighting the following current tactical trends:

- increased interest in processing media materials that previously belonged to unstructured information;
- Increasing the popularity of training courses in the field of Big Data;
- investments in data visualization and active storytelling by data analysts;
- Constant investments by web giants in Big Data, for example, Amazon, Google, Facebook, etc.

6. The distribution of the global Big Data market by business categories will look like this: most of the Big Data market will be occupied by technologies in the field of improving customer service; point marketing will be second in priority; it will then give way to transformations to improve operational efficiency. The segment "improving customer service" will also have the highest growth rate.

7. The market forecast from the subtypes of Big Data will look like this: the dominant market share is now occupied by professional services, and the highest growth rate will be in applications with analytics, the share of computing equipment, on the contrary, will decrease, the offer of cloud technologies will gradually increase, the market share of data conversions and transformations , on the contrary, will decrease.

8. According to the forecast, the distribution of the Big Data market by industry will look like this:

- financial industry with annual average growth of more than 20%;
- Internet companies will have an annual average growth of more than 25%;
- public sector spending will be proportional to the spending of Internet firms, but the growth rate will be lower;
- the telecommunications sector will grow at an average growth rate of 40%;
- energy companies will invest a relatively small amount in these technologies, but the growth rate will be one of the highest - more than 50% every year.

Therefore, a large share of the Big Data market in 2020 will be occupied by firms in the financial industry, and the fastest growing sector will be energy.

9. According to experts’ forecasts, the total volume of the market will increase in the coming years. The growth of the market will be ensured due to the implementation of Big Data technologies in developing countries. The projected size of the market will depend on how developing nations will be interested in implementing Big Data technologies, or whether these technologies will also be popular as they are in developed nations. The recent structure of the market, with the predominance of developed countries, changed about 3-5 years ago (according to various estimates), and the share of countries reaches more than 60%. Developing countries will actively work with Big Data, this will be largely related to the availability of technologies and the accumulation of a sufficient amount of data to the level of Big Data.

However, speaking about the undeniable advantages of using Big Data technologies in modern companies, enterprises and organizations, it is worth paying considerable attention to the following two generalized clusters of problems:

A. Practice has shown that there are still many limitations and problems in the effective application of big data within the enterprise. In particular, a large amount of data is not always a good thing, because due to the imperfection of their processing algorithms, it can turn into low-quality, unreliable information, on the basis of which significant mistakes can be made when making decisions regarding various aspects of business organization.

B. There is also an ethical aspect to the generation of large amounts of consumer data by companies. It is important to control when companies use private, personal and confidential information in a non-transparent manner or in ways that are not foreseen by the current regulatory framework and GDPR. Also, when using Big Data, problems of transparency and discrimination appear, because the practice of differentiated pricing depending on user characteristics is gaining popularity among manufacturers.

Let us now consider in detail the most typical and significant problems and contradictions of the effective implementation of Big Data processing, analysis and analytics technologies in the field of private, state and corporate management in the direction of the above-mentioned aspect A.

A.1. The problem of data processing in the company. Today, most companies can only process structured data, and structured data is only 15% of the total data volume, and the technology to process more than 85% of semi-structured and
unstructured data is not enough. Mature, improved data processing and analysis technologies are challenging for enterprises. Again, the world's generated data is increasing by 40% annually. The total volume of global information can double every two years. The increase in utilization rate does not exceed 5%, 90% of existing digital content is unstructured.

A.2. The shape of big data is important in determining the tools for processing and decision-making in visualizing the appearance of the solution. Moreover, most of the information about the company is stored in several databases, while it is difficult to exchange and correlate data between different business modules. Achieving correlation and integration of data information between business platforms is also a major challenge facing enterprises. Business analytics is the main technology in the era of big data, but this direction has not become widespread and is used only in industries closely related to IT (finance [36], telecommunications, networks, e-commerce, etc.).

A.3. In addition, in the era of big data, companies are faced with huge amounts of data that become extremely difficult to protect. This data includes both business secrets of the enterprise and private confidentiality. Some unscrupulous hackers use it to harm the interests of enterprises. Enterprises deal with information security issues, which is another serious problem.

A.4. Also, the rather high cost of solutions, which are often accompanied by a lack of quick results, can also be attributed to the limitation associated with data processing problems within the enterprise. Enterprises, especially on the scale of medium-sized businesses, do not adhere to the market development strategy and limit budgetary expenditures on information technology [37]. Big data processing tools require large computing power and are expensive to purchase, install, and use. Business owners want to see a return on investment in a short period of time, and systems such as big data and its application are a long-term process, and it is impossible to say for sure that the expected result can be obtained from the application of such technologies. The use of big data technologies refers to innovative projects, and as you know, they are difficult in terms of evaluating the effectiveness of investments and guaranteed results, so not all companies seek to implement them in their operational processes [38]. However, if we talk about companies close to the public sector, then things are simpler there, taking into account the general focus of the state on the development of such technologies and the allocation of budgets there is based on a slightly different understanding of the process.

A.5. The problem of forming a data warehouse within the enterprise. The most important challenge for enterprises when launching big data technologies is data fragmentation. In many enterprises, especially large ones, data is often located in different departments, stored in different storages, and the data processing technology in different departments can also be different, which leads to the inability
of the company to get access to its own data. If companies are unable to use this data in a timely manner, their value is lost [39].

A.6. The problem of insufficient mobility and adaptability of enterprise management systems. Currently, only some high-tech enterprises attach great importance to the application of big data in decision-making. Most business leaders do not understand the value of big data. Some business leaders believe that big data is just about entering and collating data, and its use cannot directly benefit the business. However, it is known that the more data an enterprise has and the more efficiently they integrate with each other, the more competitive the enterprise [40].

A.7. Although some companies collect and analyze data, their managers, as before, follow a traditional management model and are too attentive to cause-and-effect relationships. In the era of big data, we do not pursue causation, but correlation. In massive data, as long as the factors that are more relevant to improving corporate profits are dug out, it can provide strategic support for managing corporate decisions to a certain extent. For this, it is necessary that the managers of enterprises have a deep understanding, which creates a new problem for the thinking style of persons who make managerial decisions.

A.8. The problem of taking into account the influence of big data on the quality and timeliness of management decisions of the enterprise. Making managerial decisions for the enterprise is becoming more and more difficult, it is difficult to analyze the value of information related to decision-making, which to some extent determines the level of development of system competences of decision-makers. At the same time, it should be noted that, for example, there is still a shortage of specialists in the Russian market, there is no formed professional community that would perform the function of informing the market from the inside. Therefore, many companies prepare professional personnel independently, but these measures are equally insufficient. It should be taken into account that the speed of corporate decision-making is not as fast as market changes. In addition, enterprises face the problem of diversification of decision-making subjects. In these enterprises, it is necessary to create a hierarchical management system for decisions to increase the scientific level of management.

A.9. The problem of saving data. Today, big data is information about researched phenomena obtained from different sources, different standards, large volumes of data, numerous structural forms and requirements in real time. These challenges certainly increase the complexity of data collection and integration, especially in terms of data preprocessing and filtering. If the filtering is too fine, it is easy to filter out useful information, and the degree of detail of the screening is too coarse, and the desired effect of the analysis cannot be achieved. Problems in ensuring data security and privacy arise due to the lack of one hundred percent trust on the part of the customer regarding big data technologies in the field of data
privacy and personal information. In general, it is currently fueled by the lack of full-fledged regulatory and legal regulation in the field of big data.

A.10. In the context of the topic of this research, the main difficulty of implementing Big Data is the difficulty of designing, modeling and implementing a specific task/case/project. The possibility that such an interdisciplinary and cross-platform Big Data project will be implemented by a team without certain experience and skills is quite small. The knowledge to be used in such a complex study is usually acquired through hard work, so previous experience is important in this field. In general, insights and heuristics about a specific interdisciplinary task/case/project are currently the main value [41-46]. The market will always have a significant shortage of such specialists who not only have an understanding of the specifics of running a specific business (all areas of its management), knowledge of current production technologies of this business, outstanding skills in preparation and OLAP analysis of big data and understanding of mathematical methods of their in-depth analysis.

And now, let's take a closer look at the problems and contradictions of the implementation of Big Data processing, analysis and analytics technologies in the direction of the above-mentioned aspect B.

The digital transformation of society in recent decades has generated unprecedented amounts of Big Data, which contain highly detailed, complex, and integrated information about human behavior and social interactions that are so valuable for determining consumer behavior. Thus, big data technologies make it possible to form a detailed portrait of the consumer with estimated income and consumption pattern. The use of the results of processing and analysis of such data for the purpose of obtaining profit is connected not only with the ethical aspect, but also due to some contradictions. Because Big Data technology affects many areas of everyday life and deeply affects the socio-economic context of a person's everyday life.

However, Big Data is not always a guarantee of objectivity, accuracy, reliability and comprehensiveness. More is not better, affordability is inextricably linked to ethics, and convenience does not always mean efficiency. Big Data can be a tool both to facilitate and improve the daily life of a person, and a tool to suppress and manipulate it.

Big data research most often relies on traces of people's behavior in social networks, as this data provides a dynamic and multifaceted view of the user. But it is worth considering that data from social networks does not give an idea of all types of people equally. Only certain parts of the population (by age, income, education, etc.) reveal their thoughts and behavior. Big data can reflect the needs and wants of some social groups, but can make the needs of other groups largely invisible, leading to data distortions and, ultimately, unequal provision of information about goods and
services. It is necessary to combine the results of Big Data analysis and other qualitative and quantitative methods of target audience research in order to avoid the bias inherent in data from social networks.

When using the digital footprint of a person, the boundaries between the consumer and the producer are blurred. These two sides adapt to each other, we can talk about a dialectical interaction between the company and the consumer. Digital activity and its traces work for the consumer, it is the beginning of the chain of production of a commercial offer, not its end. The consumer is a co-creator of what form, circumstances and at what price the seller will ultimately offer him a product or service.

Thus, communication activity based on Big Data expands the possibilities of the collective consumer - it gives the opportunity to manipulate, to force producers and sellers to do what they would not otherwise do. On the other hand, communication based on digital observation turns to manipulation and control over the consumer and his behavior. Individual autonomy and freedom of action of a person are severely limited within the framework of personalized communication, which is expressed in the cycle of the so-called hyper push to consumption.

Uncontrolled use of Big Data contributes to inequality and discrimination, for example in law enforcement, social services and employment. It should not be forgotten that it is a fundamental right of everyone to have control and the right to make decisions about their "digital" life and its traces.

For advertising messages to be relevant to consumers, professionals need to know consumers, interact with them at a very close level, and control their environment and consumption. Thus, manipulation, autonomy, expansion of consumer rights become one and the same, marketing is completely woven into everyday life and becomes a technique of mutual preemptive compliance. The development scenario of digital marketing is to create a reality that seamlessly and fully integrates with the expected reality of fully personalized consumers in ways that consumers no longer perceive as marketing.

**Conclusions**

The active development of information technologies during the last few decades, which was a consequence of the information revolution, changed the approaches to the collection of marketing data and their management. A significant amount of heterogeneous and unstructured data that accumulates in the digital environment and is of great practical importance for companies requires an intelligent approach to their collection, processing and analysis, which creates the need to automate these processes. A set of tools aimed at meeting the needs of modern organizations in transforming a chaotic mass of data into information suitable for use in the decision-making process is called Big Data.

Analysis and analytics of big data opens up real inexhaustible and unprecedented opportunities for business entities in terms of adopting more proven
and justified transformations, increasing and optimizing the efficiency of activities, as well as creating new types of services and products, relying on all aspects, complex intellectual analysis of problems and situations, planning their trends and dynamics [47-49], establishing cause-and-effect relationships with factors not previously taken into account in the calculation, and identifying circumstances that are considered insignificant.

Analysis and analytics of big data is not another hype on the IT market, it is a systematic, qualitative transition to the creation of value chains based on knowledge.

Therefore, the prospects for the use of Big Data are expected, and with each year their importance and significance for corporate growth. It is difficult to imagine future production enterprises without implementing Big Data mechanisms. Since any sensors, devices and systems in industry are actually full-fledged sources of data, it is in the interests of any developing enterprise to attract the maximum volume of meaningful information for making economically profitable decisions.

Summing up, we can conclude that the value of larger data (Big Data) grows with the growth of the introduction of new technologies into the activities of corporations, they reduce the period of data processing, and thus, allow to reduce costs and obtain an amplification effect, which is especially relevant in modern conditions of change paradigms. As already noted above, such a vision and approaches to dealing with Big Data in marketing are particularly relevant. The use of Big Data leads to a significant improvement in decision-making processes, increases the competitiveness of companies and reduces management risks. The analysis and analytics of large marketing data allows you to select from the entire huge flow of processed information only what is necessary for solving a specific problem, finds a cause-and-effect relationship in certain indicators and makes accurate and reliable conclusions.

Big Data technology has a high value in marketing activities, because it allows companies to regularly receive detailed information about their consumers, not as a single mass, but about each customer individually. This determines the transition to personalized customer service with the automatic formation of an individual marketing program for each consumer. Thanks to the increasing level of relevance of information offered by brands to consumers, companies manage to significantly increase the effectiveness of marketing investments.

The key role of big data in innovative tourism marketing and management is largely due to not only structured data, but also semi-structured and unstructured data that influence consumer attitudes, preferences and chosen/preferred travel patterns of potential travel company customers. Tourism marketing involves the need to collect, analyze and effectively and target use personalized experience, which is formalized in batch and streaming structured, semi-structured and unstructured big data. That is why processing, analysis and analytics of the aforementioned data makes it possible to automatically generate not only segmented
effective marketing/advertising companies, but also a set of personalized proposals regarding the purpose/route/schedule of a possible tourist service. This level of maximum flexibility and timely personalization is crucial in the tourism industry, where customer satisfaction and loyalty are very important in the current conditions of global and regional macroeconomic, political and even military crisis phenomena.

The purpose of this study included demonstrating not only the potential of big data management, artificial intelligence and analytics in the field of strategic and applied marketing, but also the limitations and potential challenges of this technology.

Summarizing the above research, it is possible to summarize that among the limitations of the Big Data market, the following should be highlighted:
- the still relatively high cost of implementing Big Data technologies;
- the need to ensure the protection of information and its confidentiality;
- lack of qualified personnel;
- mistrust of firms in such technologies;
- insufficient amount of accumulated information;
- database support requires constant funding, which creates an additional barrier to the use of big data;
- integration problems with existing systems;
- a limited number of data providers.

Regardless of the tactical problems and obstacles listed above, companies with more complete information can better choose their markets, develop better quality offers and better implement marketing planning. Every company must organize and distribute a continuous flow of information for its marketing. A marketing information system consists of people, equipment, and procedures for collecting, sorting, analyzing, and disseminating relevant, timely, and accurate information to marketing decision makers. The use of specially developed algorithms and advanced methods of analysis in the digital age is becoming necessary for every marketing strategy.

As innovative tourism companies and their current and potential customers continue to provide and even generate (via virtual, augmented and mixed reality technologies) valuable big data for customized data-driven solutions for tourism management and marketing decisions - processing, analysis and analytics such big data will remain a vital source of efficiency and competitiveness.

Companies and projects in the field of retail and marketing are constantly looking for ways to overcome the problems described above and develop their own strategies for working with big data. To overcome obstacles to the implementation of big data, the following are used: interdisciplinary cross working groups, which unite specialists from different areas and departments capable of working with big data; project groups or startups offering innovative tools for working with big data; democratization of work with big data, i.e. transition from complex processing
systems to visualization or well-known BI tools; new roles and statuses in companies, that is, the positions of digital technology directors or marketing technology directors are emerging.

In order to remain maximally efficient and therefore competitive in the current and expected crisis conditions, tourism companies are recommended not only to systematically implement Industry 4.0 technologies (in particular, processing, analysis and analytics of Big Data), but also innovative Industry 5.0 technologies, which, in particular, are necessary for deepening and expanding digital boundaries, for example, the use of virtual, augmented and mixed reality, the use of digital doubles etc. After all, similar technologies of Industry 5.0. combined with 24/7/365 analysis and analytics of streaming big data (in the mode of ensemble machine learning and deep machine learning, in particular generative) will change the marketing paradigm of the travel industry - allowing travelers to explore different options of travel offers virtually and offering a preliminary virtual experience, which drives engagement and bookings.

But, for now, classic Big Data technologies have ceased to be an innovative phenomenon for companies and organizations in all sectors of the economy. The use of this technology is not a competitive advantage, but a necessary condition for ensuring competitiveness. However, the total transformation of management to the concept based on effective and timely results of deep analysis and analytics of big data continues in the current crisis environment.

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