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BIG DATA SOURCES AND MECHANISMS FOR THEIR USE IN THE TOURISM SECTOR OF UZBEKISTAN

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Abstract
This article discusses the theoretical and practical aspects of the effective use of Big Data technologies in the tourism sector of Uzbekistan. The article analyzes the importance of Big Data sources available in the Republic of Uzbekistan, including digital tourism platforms, mobile operator data, online booking systems, user activity on social networks, and state statistical databases.

Keywords: Big Data, smart tourism, digital, ecosystem, digital tourism.

Introduction

A conceptual model has been developed for the mechanisms of implementing Big Data technologies in the tourism sector - the stages of data collection, storage, processing and analysis. Based on the results of the research, proposals have been put forward to accelerate data-based decision-making in tourism management and marketing activities, provide personalized services to tourists, and form a “smart tourism” ecosystem.

The use of Big Data technologies is considered one of the important factors in increasing the competitiveness of Uzbekistan’s tourism sector, optimizing visitor flows, and developing sustainable tourism. The government, in cooperation with telecom companies, can involve such anonymized mobile geolocation data in tourism planning - such practices are widely used in developed countries within the framework of the “Smart Tourism” concept[1].

In addition to the above categories, many other types of information in the tourism sector, such as weather and climate data, event calendars, transport schedules and ticket sales, and bank card spending, also fall into the big data group and are valuable for analysis. It is important to collect all these sources in digital form as

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much as possible and bring them into a single integrated database. The table below presents the main types of information in the tourism sector of Uzbekistan, their sources and potential areas of application:

Table 1 Big Data sources and mechanisms for their use in the tourism sector of Uzbekistan

Information type	Source (examples)	Uses and benefits
Tourist flow statistics	Border Guard, DSQ, state reports, e-visa databases	Number of visits and growth rate, analysis by country; identification of marketing markets.
Seasonal visits	Monthly official statistics, hotel occupancy levels	Identifying high and low seasons, creating a seasonal campaign plan.
Tourist expenses	Central bank data, credit card transactions	Average cost, revenue structure for services; assessment of economic efficiency.
Online reviews and ratings	TripAdvisor, Booking.com, Google Review platforms	Service quality indices, tourist satisfaction levels; identifying problems through analysis of negative reviews.
Social media content	Instagram, Facebook, TikTok posts and videos (hashtag, geo-tag)	Monitoring tourist interests and trends; measuring brand image and reputation (sentiment analysis).
GPS and mobile movement	Geo-data of mobile operators (UZMOBILE, Beeline), Google Maps	Popular tourist routes across the country; crowding levels at attractions; information for infrastructure planning (roads, transport).
Booking and transaction	Online sales of airline and JD bus tickets, hotel reservation systems	Forecasting future visits, optimizing availability and pricing; cross-selling and up-selling opportunities.

Source: Author's work.

The above-mentioned data is collected in a scattered manner in various organizations and platforms. For example, tourist statistics are in the State Tourism Committee and the Statistics Committee, online reviews are in global platforms, and mobile data is in communication companies. Therefore, it is urgent to create an infrastructure for digitizing and integrating this data in Uzbekistan.
Methods of digitizing and analyzing data. Digitization infrastructure: To effectively manage large volumes of tourism data, it is necessary to form a special Big Data platform. This platform should be able to collect, store, process and

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update data from various sources in real time. In world experience, such platforms are usually built on the basis of cloud technologies and distributed computing systems (such as Hadoop, Spark). It is planned to introduce a similar platform in Uzbekistan, and a plan to create a Big Data platform for tourism in cooperation with China was recently announcedkun.uzkun.uz. The platform developed by the China Tourism Academy allows for real-time monitoring of more than 300 indicators and 140 metrics, and combines macro- and micro-level data for tourism development. Uzbekistan also plans to implement such a platform on a trial basis to assess the state of the local tourism industrykun.uz. In this regard, it is important to establish integration with mobile operators, banks and online platforms - for example, the Korea Tourism Big Data Lab platform, launched in the Republic of Korea in 2021, combines mobile network, credit card spending, navigation and social media data, providing open analytical services to government agencies and the tourism business.

When creating a Big Data platform, it is necessary to take into account the following:

- Data collection automation - establishing an automatic flow of data from border and visa systems, social networks, tourist attractions (for example, via electronic tickets);
- Data warehouse and cloud – creating a scalable data warehouse (e.g. cloud storage, Hadoop file system) designed to store data in various formats (structured and unstructured);
- Data cleansing and integration – cleaning incoming data of errors, linking it by unique identifiers (e.g. dates, place names, user IDs), ensuring that it is updated in real time;
- Information security and privacy – ensuring personal data protection, anonymization and compliance with relevant legislation (e.g. GDPR).

Analysis methods: Once data is collected, the most important step is to create value from it – that is, analysis. A combination of modern Artificial Intelligence (AI) and Machine Learning (ML) methods, as well as classic statistical and visualization tools, is used to analyze big data. The main areas of analysis are as follows:

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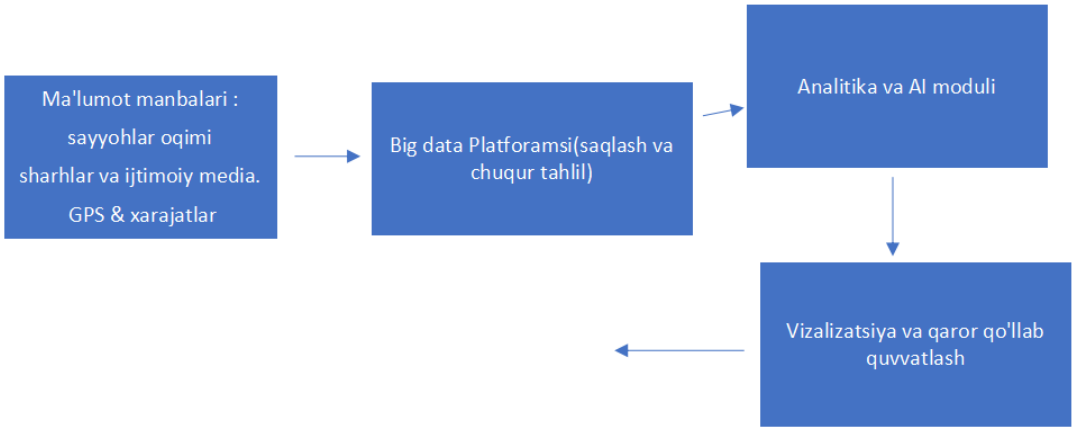
Descriptive analysis and visualization: The initial analysis of big data reveals its main features. Dashboards and interactive maps are important in this. For example, by displaying tourist flows by region on an interactive map, it is clear which regions have the highest concentration of tourists or during which periods they decrease. Using visualization tools (Tableau, PowerBI, GIS systems), seasonal trends, geographical distribution and other indicators are presented to managers in the form of a "snapshot". For example, as can be seen in the conceptual model in Figure 2, the data collected on the Big Data platform is delivered to decision makers through analytical modules and a visual panel. The conceptual model of a decision-making system based on Big Data is schematically depicted. According to it, data from various sources (tourist flow statistics, online reviews, social networks, GPS, etc.) flows into a single Big Data platform. This platform stores data and undergoes initial processing. Then, in the analytics and AI module, various analysis methods are used to generate results (forecasts, clusters, indicators, etc.). Finally, the results are transferred to the visualization and decision-making part - where reports and graphs are presented in a clear format for managers, or some automatic management decisions are made. Such an integrated system forms a culture of "informed decisions" in creating tourism policy and marketing strategies.



Picture 1. Schematic drawing of a conceptual model of a Big Data-based decision-making system [1]

[1] Tadqiqot asosida muallif ishlanmasi

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Conceptual model of a Big Data-based decision support system for tourism. Data sources (tourist statistics, online reviews, social media, GPS and expenses, etc.) are continuously collected on a Big Data platform, where storage and initial analysis are performed. The analytics and AI module performs in-depth analysis (ML algorithms, predictions). The results are presented to decision makers in a visual format and used to make strategic decisions.

Diagnostic and cluster analysis: At this stage, patterns and regularities in the data are identified. Clustering algorithms (K-means, DBSCAN, etc.) can be used to segment tourists based on their behavior or origin. For example, if groups such as “ecotourism enthusiasts”, “nightlife seekers”, “cultural heritage enthusiasts” are identified based on online purchases and travel routes, a separate approach is determined for each segment. Associative analysis studies the common behaviors of tourists – for example, it is possible to discover rules such as “if a tourist comes to city A, he usually also goes to attraction B”. Such knowledge is useful in the formation of tourist packages and itineraries. Text processing (NLP) techniques are used to identify topics in online reviews (topic modeling) and conduct sentiment analysis (sentiment analysis). For example, a program that studies 10 thousand reviews about hotels can determine the number of positive or negative opinions on topics such as service quality, cleanliness, location, and assign a “satisfaction index” to each hotel. This index is important in marketing – it determines which aspects should be emphasized in advertising or, conversely, which service quality should be improved.

Recommender systems: In tourism, there are many choices (hotels, restaurants, alternative routes, etc.), so it is also important to implement algorithms that provide appropriate recommendations to users. Big Data-based recommendation systems offer tourists places and services that may be interesting to them based on their previous behavior and reviews from other similar users. For example, a website specializing in tourism can, based on the user's previous searches and articles, issue recommendations such as "You may be interested in the historical madrasas in Bukhara" or "We recommend an excursion to the Valley of Castles near Khiva." This uses ML's collaborative filtering and content-based filtering methods. If recommender systems create value for tourists, they also serve as a tool for cross-selling (offering additional services to a tourist) and increasing

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loyalty for the tourism business. All of the above analysis methods ultimately provide tourism organizations with information that supports decision-making. To effectively convey this information, the results of analytics are presented in the form of dashboards and reports, and some decisions can also be made automatically (for example, dynamically increasing prices if hotel bookings increase - through revenue management algorithms). Continuous testing of analyses (A/B tests, pilot projects) and adaptation of models to new data (model tuning) are also an integral part of the Big Data system.

The conceptual model of a decision-making system based on Big Data is schematically depicted (shown in Figure 2). According to it, data from various sources (tourist flow statistics, online reviews, social networks, GPS, etc.) flows into a single Big Data platform. On this platform, the data is stored and undergoes initial processing. Then, various analysis methods are used in the analytics and AI module to generate results (forecasts, clusters, indicators, etc.). Finally, the results are transferred to the visualization and decision-making part - where reports and graphs presented in a clear format for managers are presented or some automatic management decisions are made. Such an integrated system forms a culture of "information-based decisions" in creating tourism policy and marketing strategies.

Conceptual model of a Big Data-based decision support system for tourism (shown in Picture 1). Data sources (tourist statistics, online reviews, social media, GPS and expenses, etc.) are continuously collected into a Big Data platform, where storage and initial analysis are performed. The analytics and AI module performs in-depth analysis (ML algorithms, predictions). The results are presented to decision makers in a visual format and used to make strategic decisions.

References:

1. Sulton N. et al. IMPORTANCE OF SMART TOURISM IN IMPROVING TOURISM MANAGEMENT IN UZBEKISTAN //Gospodarka i Innowacje. – 2024. – Т. 46. – С. 15-19.
2. Хайитбоев Б. Х., Нажмиддинов С. Н. У. Опыт зарубежных стран в формировании цифровой экономики: выводы и перспективы для

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Узбекистана //Вестник науки и образования. – 2020. – №. 1-2 (79). – С. 25-28.
3. Nuralievich S. N. et al. TURIZM SOHASIDA INNOVATSION LOYIHALARNI HAYOTGA TATBIQ ETISH //Научный Импульс. – 2025. – Т. 3. – №. 34. – С. 283-286.
4. Nuralievich S. N. et al. MEHMONXONALARDA ELEKTRON BOSHQARUV TIZIMLARI //ZAMONAVIY TA'LIM TIZIMINI RIVOJLANTIRISH VA UNGA QARATILGAN KREATIV G'OYALAR, TAKLIFLAR VA YECHIMLAR. – 2025. – Т. 8. – №. 81. – С. 3-9.
5. Elektron manba: https://www.researchgate.net/publication/395053194_Recognition_in_ziyorah_tourism_of_bukhara_region_by_world_countries/references.