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DIGITAL TOOLS INTEGRATION IN DOMESTIC TOURISM AND RESTAURANT MANAGEMENT: POTENTIAL OF CLOUD COMPUTING, BLOCKCHAIN, BIG DATA, AND AI

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**ІНТЕГРАЦІЯ ЦИФРОВИХ ЗАСОБІВ У ВІТЧИЗНЯНИЙ ТУРИСТИЧНИЙ ТА РЕСТОРАННИЙ
МЕНЕДЖМЕНТ: ПОТЕНЦІАЛ CLOUD COMPUTING, BLOCKCHAIN, BIG DATA ТА AI**

By the end of the second decade of the 21st century, scientific and technological progress had a tremendous impact on the development of various sectors of the economy. Tourism and the restaurant business were no exception, as business entities began actively utilizing modern technologies such as Cloud Computing, Blockchain, Big Data, and Artificial Intelligence (AI). It should be noted that although the overall impact of these technologies is quite consistent, in the field of tourism and recreation, they create qualitatively new opportunities that enhance efficiency and service quality, enable more precise management, and provide new avenues for customer engagement. Thus, the potential for using such technologies in tourism and restaurant management is unequal. Accordingly, the aforementioned research aims to determine the potential of utilizing Cloud Computing, Blockchain, Big Data, and AI in domestic tourism and restaurant management. According to the research findings, it has been proven that the potential integration of Cloud Computing into domestic tourism and restaurant management provides opportunities to create competitive advantages (through reduced equipment costs) and a wide range of possibilities for optimizing business processes. It has been proven that the potential of Blockchain stands out in terms of changing

approaches to data security and integrity, as well as the adaptability of enterprises to the use of distributed data storage technology. However, this potential is dependent on the chosen technical solution, which is more effective when it leads to improvements in service quality and optimization of business processes. The potential of Big Data and AI technologies stands out in the way it transforms approaches to performing tasks and actions within numerous processes. Company managers gather and analyze data on bookings, transportation, hotels, excursions, and other aspects of travel to understand customer needs and identify new opportunities. The prospects of research lie in utilizing the obtained results to develop and implement intelligent management systems for tourist and hotel complexes that leverage data from cloud resources to optimize booking, inventory management, staffing, and other business processes.

Наприкінці другої декади XXI ст. науково-технічний прогрес забезпечив величезний вплив на розвиток різних галузей господарства. Туризм та ресторанний бізнес не стали винятком, оскільки суб'єкти бізнесу почали активно використовувати такі сучасні технології, як Cloud Computing, Blockchain, Big Data та Artificial Intelligence. При цьому зазначимо, що хоча у загальному дія окреслених технологій доволі одноманітна, у сфері туризму та рекреації вона створює якісно нові можливості, які покращують ефективність та якість обслуговування, забезпечують більш точне управління та надають нові можливості для залучення клієнтів. Потенціал використання таких технологій в туристичному та ресторанному менеджменті не є однаковим. Відповідно до вищенаведеного дослідження спрямоване на визначення потенціалу використання Cloud Computing, Blockchain, Big Data та AI у вітчизняному туристичному та ресторанному менеджменті. За результатами дослідження доведено, що потенціал інтеграції Cloud Computing у вітчизняний туристичний та ресторанний менеджмент забезпечує можливості для створення конкурентних переваг (за рахунок зниження витрат на обладнання) та широкий спектр можливостей для оптимізації бізнес-процесів (за рахунок автоматизації та покращення доступу до даних). Доведено, що потенціал Blockchain вирізняється змінами підходів до безпеки та недоторканності даних, а також адаптацією підприємства до використання розподіленої технології зберігання даних. Проте, цей потенціал залежить від обраного технічного рішення, яке впливає на ефективність підвищення якості обслуговування та оптимізації бізнес-процесів. Потенціал технологій Big Data та AI вирізняється змінами підходів до виконання робіт і дій у межах багатьох бізнес-процесів. Менеджери компанії збирають та аналізують дані про бронювання, перевезення, готелі, екскурсії та інші аспекти подорожей для розуміння потреб клієнтів та виявлення нових можливостей. Перспективи досліджень полягають у використанні отриманих результатів для розробки і впровадження інтелектуальних систем управління туристичними та готельними комплексами, що використовують дані з хмарних ресурсів для оптимізації бронювання, управління запасами, персоналом та іншими бізнес-процесами.

Key words: tourism; restaurant business; digital tools; business process; databases; software and services.

Ключові слова: туризм; ресторанний бізнес; цифрові засоби; бізнес-процес; бази даних; програми та сервіси.

THE PROBLEM STATEMENT IN A GENERAL FORM AND ITS CONNECTION WITH IMPORTANT SCIENTIFIC OR PRACTICAL TASKS

At the end of the second decade of the 21st century, scientific and technological progress has had a tremendous impact on the development of various sectors of the economy. Tourism and the restaurant business were no exception, as businesses began actively using modern technologies such as Cloud Computing, Blockchain, Big Data, and Artificial Intelligence (AI). Cloud Computing allows for the storage and processing of large volumes of data on remote servers, providing access to this data over the Internet. Blockchain enables the creation of secure and reliable data and transaction exchange systems. Big Data

allows for the collection, analysis, and utilization of large volumes of data to make more informed decisions. Artificial Intelligence can be used to automate many processes in the tourism and restaurant industry. It should be noted that while the overall impact of these technologies is uniform, in the field of tourism and recreation, they open up qualitatively new possibilities that improve efficiency and service quality, enable more precise management, and provide new opportunities for customer engagement. Therefore, research in this direction is relevant and timely.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Among the research and publications that have initiated the resolution of the problem of identifying the

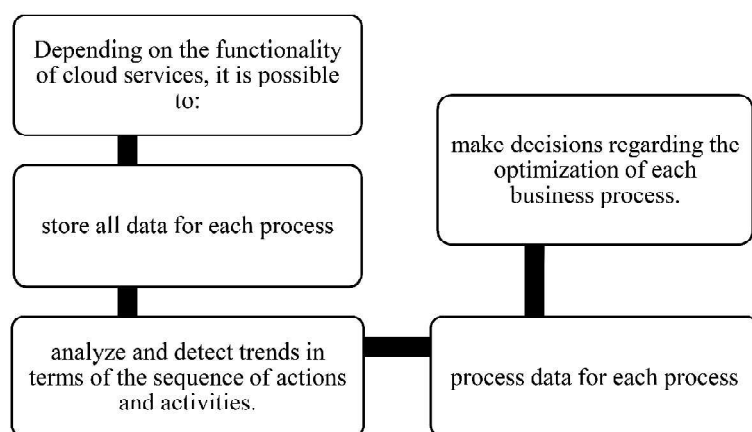


Figure 1. The directions of Cloud Computing technology potential form from data storage and processing order changes

Source: Compiled based on [3; 5].

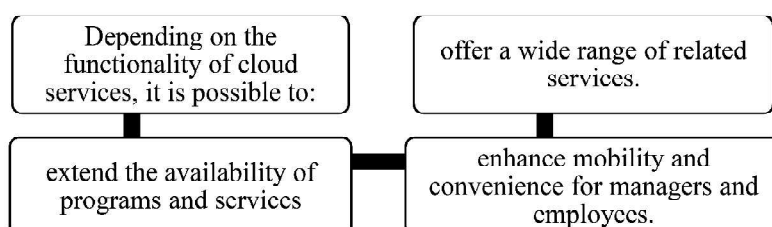


Figure 2. The directions of Cloud Computing technology potential form from the order of access to programs and services changes

Source: Compiled based on [3; 5].

peculiarities of integrating digital tools in domestic tourism and restaurant management, we highlight the contributions of Mashika Hanna, Zelic Victoria, Kiziun Alla, Maslyhan Roman, Olena Maslyhan, Valentyn Bannikov, Tetiana Lobunets, Ievgen Buriak, and Larysa Shevchuk. However, when referring to the content of the mentioned research, their fragmentary nature in identifying the potential formed by the most commonly used digital tools is noted, although the authors rely on these works. Despite the fragmentary nature of the works, they provide informative insights into the peculiarities of integrating Cloud Computing, Blockchain, Big Data, and AI into domestic tourism and restaurant management.

THE RESEARCH ARMS

The research arm is to determine the potential of using Cloud Computing, Blockchain, Big Data, and AI in domestic tourism and restaurant management.

THE PAPER MAIN BODY WITH FULL REASONING OF ACADEMIC RESULTS

According to the scientific literature, the "potential" category refers to the possibilities inherent in something or someone and can be realized or developed [5]. Therefore, in the context of this research, the potential of using digital technologies in tourism and restaurant management is considered through the lens of various possibilities they create to improve service quality, optimize business processes, and create a competitive

advantage for Ukrainian enterprises in the global market environment. Therefore, within the scope of this research, a detailed examination and study of the potential of each of the technologies actively used in the researched field is proposed. These technologies include Cloud Computing (interpreted as a model for providing computing or data storage services over the Internet), Blockchain (interpreted as a distributed data storage system built on sequential blocks containing information), Big Data (interpreted as a complex of tools such as distributed data processing systems, data analytics, machine learning, and others, for processing and collecting data), and AI (interpreted as the creation of computer systems that simulate intelligence and reasoning by combining various methods, algorithms, and technologies, including machine learning, deep learning, neural networks, natural language processing, computer vision, and others).

So, the potential of Cloud Computing technology stands out for its changes in approaches to working with computing resources and the adaptation of businesses to the use of Internet-based services it provides. Specifically in tourism and restaurant management, this involves the use of cloud services (such as Oracle Hospitality Opera Cloud, Cloudbeds, and Hotelogix), whose environments can be utilized for:

1. Storage and processing of data (such as booking information, customer data, sales statistics, customer reviews, and much more). Specifically, this technology enables the optimization of business processes in the directions shown in Figure 1.

In particular, the potential is shaped by changes in the following areas:

- Storage of all data for each process in cloud storage. The nature of the changes is focused on data security and accessibility for users and business process owners from any location (via the Internet).

- Data processing for each process in cloud storage. The nature of the changes is directed towards utilizing powerful computing resources hosted on remote platforms.

- Analysis and detection of trends regarding the sequence of actions and activities performed within the business process. The nature of the changes involves using data from various sources, such as action logs, databases, monitoring systems, and so on.

- Decision-making regarding the optimization of the business process. The nature of the changes is focused on modifying the processed data.

1. Remote access to programs and services; reduction in equipment costs. Specifically, this technology enables the optimization of business processes in the directions shown in Figure 2.

In particular, the potential is shaped by changes in the following areas:

Table 1. Characteristics of methods for accessing programs and services necessary for managing tourism and restaurant enterprises through Cloud Computing

Method of access.	Characteristics of the method.	Features of access.
Cloud applications and services	Developers of tourism and restaurant applications can create and host their applications in cloud environments.	Users can access these programs through a web browser or dedicated mobile applications, regardless of the device they are using.
Remote access to cloud workspace	Cloud platforms provide remote access to the complete workspace, including programs and services, through virtual desktops or virtual private networks (VPNs).	Users can remotely connect to their workspace and utilize the necessary programs and services, regardless of their location.
Mobile applications with access to cloud services	Many programs and services for managing tourism and restaurant enterprises are hosted in the cloud but accessible through mobile applications that can be installed on smartphones or tablets.	Users can access the functionality of the program through mobile devices, regardless of their location.
Web browser with access to cloud services	Many programs and services for enterprise management are hosted in the cloud but accessible through a web-based environment, which means they can be used through a regular web browser.	Users can log in to their account using any device with a web browser, such as a computer, laptop, smartphone, or tablet.

Source: Compiled based on [3; 5].

1. Accessibility of programs and services necessary for managing tourism and restaurant enterprises. The nature of the changes focuses on using cloud services for hosting programs and services and ensuring their accessibility via the Internet. The changes result enables the usage of these programs and services from any device and location, as specified in Table 1.

— Mobility and convenience of programs and services for managers and employees. The nature of the changes is focused on transforming hotel management systems, reservation systems, accounting systems, and others, as they become accessible in remote mode via the Internet, according to the specifics listed in Table 2.

The result is always a change in operational efficiency, achieved through improved accessibility and flexibility in using programs and services, as well as a reduction in the need for physical servers and infrastructure.

— a wide range of accompanying services, including computational resources, data storage, analytics, artificial intelligence, machine learning, and others.

2. Cost reduction in equipment. The nature of the changes is aimed at the nature of the business and the costs associated with equipment (such as servers, networking equipment, and storage devices [5]). This technology enables cost optimization (as the computational and storage processes are transferred to the cloud service provider [5]). In the tourism and hotel industry, as a user, you only pay for the actual resources used, making this approach more cost-effective and providing a competitive advantage for Ukrainian businesses in the global market environment.

Table 2. Characteristics of methods ensuring mobility and convenience of programs and services for managers and employees through Cloud Computing

Cloud-based service.	Characteristics of the service.	Functionality
Property Management Systems (PMS) in cloud	Allow hotels and restaurants to manage all aspects of their operational activities, including reservations, front-office operations, customer management, inventory management, financial accounting, and reporting.	Operate on cloud platforms and are accessible for use through web browsers or mobile applications.
Online Booking Engines	Allow hotels and restaurants to accept and manage bookings through websites or mobile applications.	Provide a wide range of features, such as booking calendars, online payments, web integration, and reporting.
Point of Sale (POS) Systems:	Enable restaurants to efficiently process orders and payments. They may include features such as menu management, integration with external systems, reporting, and analytics.	Can be available on tablets or other devices and connect to cloud servers for data storage and processing.
Customer Relationship Management (CRM) Systems	Assist hotels and restaurants in managing their interaction with customers, including collecting and analyzing customer data, managing loyalty programs, automating marketing campaigns, and customer support.	Provide access to these functions through cloud platforms, ensuring convenience and flexibility in working with customer data.

Source: Compiled based on [3; 5].

The Cloud Computing integration into the domestic tourism and restaurant management sector provides certain opportunities for creating competitive advantages (through cost reduction in equipment) and a wide range of possibilities for optimizing business processes. This assertion is supported by the experiences of many business entities. Indeed, among the most active users are Puzata Hata, one of the most well-known fast-food restaurant chains in Ukraine, which actively utilizes cloud solutions to manage its food establishments. They have transitioned to cloud order processing, inventory management, and financial accounting. Another notable example is Reikartz Hotel Group, one of the largest hotel chains in Ukraine, which employs cloud solutions for hotel

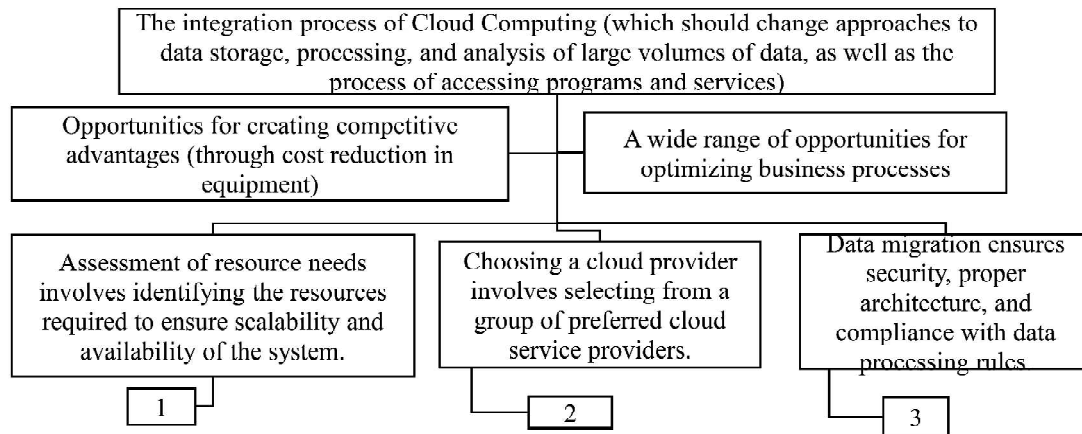


Figure 3. General Process of Cloud Computing Integration into Domestic Tourism and Restaurant Management

Note: (1) Virtual servers, data storage, etc. should be taken into account. (2) Different cloud service providers should be considered if they meet the business needs. (3) All data and applications should be migrated to the cloud environment.

Source: Based on information from Puzata Hata and Reikartz Hotel Group and [5]

management, including Property Management Systems, reservation systems, and sales management. These cases demonstrate how cloud computing is being effectively utilized in the Ukrainian tourism and restaurant industry.

It should be noted that Cloud Computing creates significant potential in the domestic tourism and restaurant management sector, provided that the general framework is followed when integrating these technologies (Figure 3).

The need arises from the importance of changing approaches to storage, processing, and analysis of large volumes of data, as well as access to applications and services (which become accessible from anywhere with an internet connection).

The potential of Blockchain technology stands out due to the changes it brings in data security and integrity approaches. Each block of distributed data in a Blockchain has a unique identifier and references the previous block, forming a chain of blocks. It ensures the security and immutability of the data. Additionally, the business adaptation to utilize distributed data storage technology is crucial, although it depends on the chosen technical solution. The implementation effectiveness service quality determined and optimization of business processes improvement. In the context of tourism and restaurant management, the potential of Blockchain is realized through various individual or integrated changes in numerous processes (Figure 4).

In particular, the potential is shaped by changes in the following areas:

1. Registration and confirmation of transactions. The nature of the changes is focused on establishing an immutable system for registering and confirming transactions [5].

2. Hotel reservations, restaurant table bookings. The nature of the changes in tourism management is aimed at altering the processes of confirming hotel reservations,

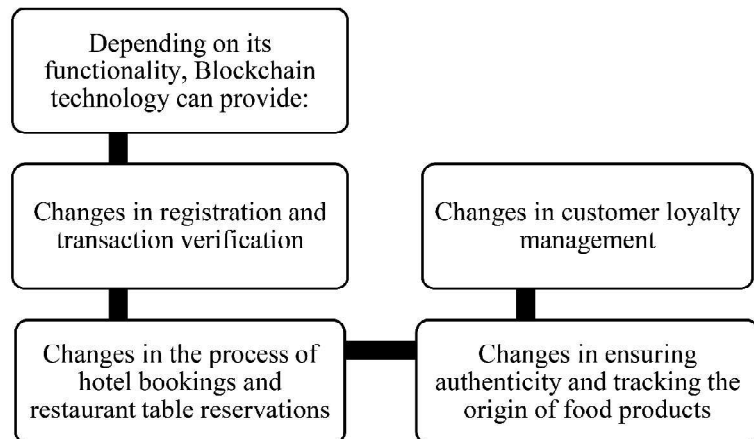


Figure 4. Directions for forming the potential of Blockchain technology from changes in data security and integrity approaches and the use of distributed data storage technology

Source: Compiled based on [1–2; 5].

transportation tickets, tours, and other services. The nature of the changes in restaurant management is focused on modifying the processes of confirming table bookings, payment, and exchanging information about reservations [2].

3. Ensuring the authenticity and traceability of food products. The nature of the changes is focused on creating systems that record information about the origin of products, such as collection dates, processing and transportation details, packaging, quality certificates, and more. It will allow customers and restaurant staff to verify the authenticity of the products and ensure their quality [1; 5].

4. Customer loyalty management. The nature of the changes is aimed at creating digital tokens or payment systems that enable customers to accumulate bonuses or take advantage of special offers and discounts. It will improve customer engagement and incentivize repeat visits [5].

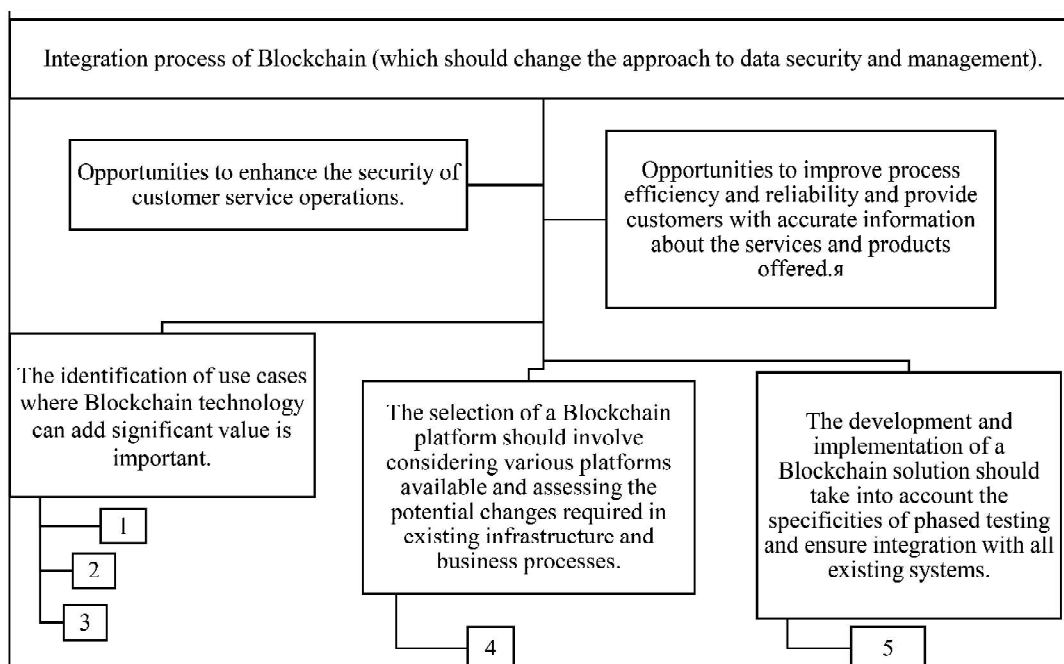


Figure 5. General process of integrating Blockchain technology into domestic tourism and restaurant management

Note: (1) Value-added scenarios in supply chain tracking. (2) Value-added scenarios in customer data management. (3) Value-added scenarios in additional transaction security. (4) Selection of platforms that best suit business needs, considering speed, scalability, and security. (5) Consideration of limitations on the number of transactions that can be processed per unit of time.

Source: Created by the author based on data from RestoCoin, [1—2; 5]

Some companies have already begun experimenting with and implementing this technology, and their experience proves that it enhances the security of customer service operations (ensuring data integrity and trust in remote service), improves the efficiency and reliability of processes, and provides customers with reliable information about the services and products being offered. For example, a business entity like RestoCoin utilizes blockchain technology in restaurant management. They have created an ecosystem where users can order dishes, reserve tables, and receive rewards in cryptocurrency for their actions. Based on the experience gained, it is evident that the potential of blockchain technology in the domestic tourism and restaurant management sector can be realized by adhering to a common framework for integrating these technologies (Fig. 5). It is crucial to change the approach to data security and management to fully leverage the benefits offered by blockchain. However, it is evident from the nature of integrating blockchain technology that this process is quite lengthy and complex. It involves the integration of blockchain platforms with existing systems, which requires changes in the existing infrastructure and business processes. During the initial stages, integration is the most time and resource-intensive due to the need for developing new solutions, creating a network, implementing security measures, and providing personnel training. There are also costs associated with the development, auditing, and technical support of the updated data security system and its operation. It is important to consider that the decentralized nature of blockchain can impact the

performance and scalability of the data management system. Some blockchain platforms may have limitations on the number of transactions that can be processed within a given time frame. Such limitations restrict its usage in Ukraine.

The potential of Big Data and AI technologies stands out in their ability to change approaches to performing tasks and actions across multiple processes, particularly in handling large volumes of data that cannot be efficiently processed using traditional methods and tools. In the context of tourism and restaurant management, the potential of using these technologies is shaped by:

1. Personalization of services. Utilizing these technologies allows for the collection and analysis of historical data and other factors to make forecasts. This enables managers to ensure optimal resource planning and adapt pricing and marketing strategies to changing market conditions and customer feedback. Based on this data, personalized offers and recommendations can be created for each customer, enhancing their experience and increasing satisfaction [5].

2. Supply chain management: The use of Big Data enables the accumulation and collection of data about suppliers, their availability, product quality, and prices. The application of AI allows for the optimization of supplier management processes by automating the ordering process, forecasting demand, and optimizing inventory [2].

3. Analytics and forecasting: The use of Big Data and AI technologies enables the analysis of data using various tools such as data mining, classification of large data sets, social media analytics, demand forecasting, price analysis,

and other factors influencing the tourism and restaurant market. It also includes data visualization and report generation, analysis of textual data such as customer reviews, comments on social media, and other forms of feedback (Table 3).

The combination of Big Data and AI technologies empowers managers to gain a better understanding of their customers, enabling them to make more informed decisions regarding marketing strategies, pricing, resource management, and the development of innovative strategies for achieving a competitive advantage. By leveraging the vast amount of data and utilizing AI algorithms for analysis and insights, managers can uncover valuable customer insights, identify patterns, trends, and preferences, and tailor their business approaches accordingly. This comprehensive understanding of customers facilitates the development of targeted and personalized marketing campaigns, improves customer satisfaction, and drives business growth.

4. Improving service quality: AI can be utilized to implement automated customer query handling systems, chatbots, and virtual assistants that can respond to inquiries and provide real-time information. The use of Big Data enables the collection of customer feedback and satisfaction data, which allows for continuous improvement of service quality and timely response to issues. By analyzing customer data

Table 3. Characteristics of Big Data and AI Tools for Analytics and Forecasting

Tools for Big Data analysis and AI	Characteristics of the tool	Functionality of the tool
Tools for analyzing and classifying large volumes of data	enable the detection of patterns, trends, and correlations among various factors that impact the tourism and restaurant business.	One can forecast demand for specific services, understand the factors that influence customer satisfaction, and develop personalized recommendations to enhance user experience.
Social media analytics	enable the identification of customer sentiments and opinions.	One can track user reactions to specific events, services, or brands and identify trends and patterns in user behavior. This information can be used to adapt marketing strategies and improve services.
Predictive models	allow for demand forecasting, pricing predictions, and other factors that impact the tourism and restaurant market.	One can make forecasts based on historical data and other factors, allowing managers to ensure optimal resource planning and adapt pricing and marketing strategies to changing market conditions.
Business Intelligence (BI)	facilitate data visualization and report generation, aiding in accessing key information.	It allows for efficient analysis of results, identifying areas of concern and finding opportunities for business improvement.
Natural Language Processing (NLP)	enable the analysis of textual data, such as customer reviews, social media comments, and other forms of feedback.	It enables understanding of customer sentiments and needs, identifying key issues, and proposing appropriate solutions.

Source: Compiled based on [3; 2; 5].

and feedback, businesses can identify areas for improvement, personalize customer experiences, and enhance overall service quality. This leads to enhanced customer satisfaction, increased loyalty, and improved business performance.

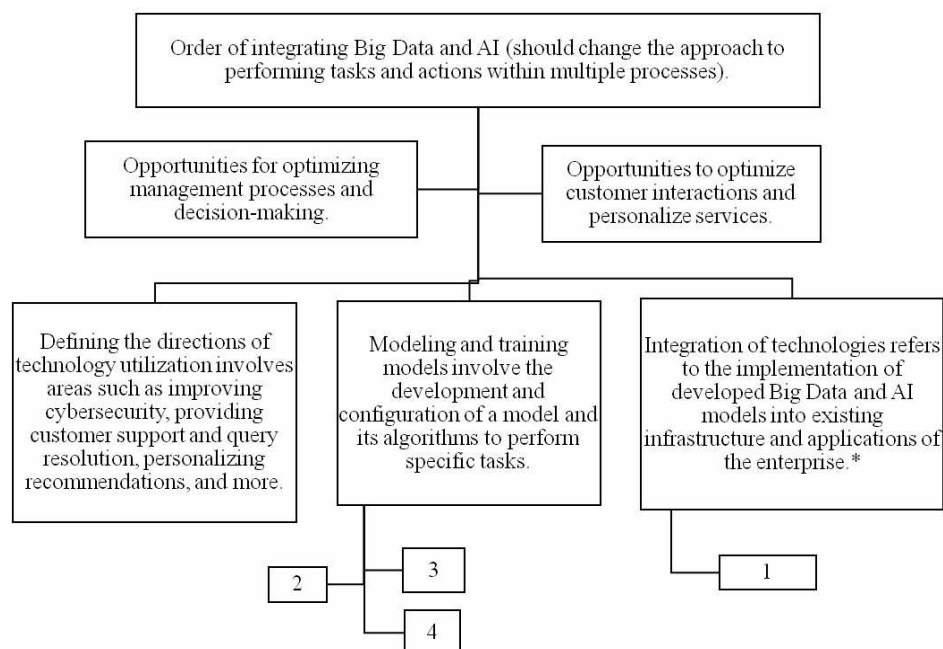


Figure 6. General sequence of integrating Big Data and AI technologies into domestic tourism and restaurant management

Note: (1) Adaptation of Big Data and AI models to existing infrastructure and enterprise applications can be automated. (2) Configuration of machine learning models for specific tasks. (3) Configuration of neural network models for specific tasks. (4) Configuration of other Big Data and AI algorithms for specific tasks.

Source: Compiled by the author based on data from RestoCoin, [4; 5]

Overall, Big Data and AI are being actively utilized in various industries. A notable example is the experience of "Kayak Travel Agency," which uses these technologies for analyzing and forecasting tourism trends and demand. The company's managers gather and analyze data on bookings, transportation, hotels, tours, and other aspects of travel to understand customer needs and identify new opportunities. It allows them to offer personalized travel packages and efficiently allocate resources. The popularity of these technologies is driven by their relatively straightforward integration into the tourism and restaurant management processes (Figure 6).

User experience and the specific nature of integration demonstrate that this process expands the possibilities for optimizing management processes and decision-making. Moreover, integrating this technology into tourism and restaurant management can bring significant advantages in customer interaction and service personalization.

Conclusions from this study and prospects for further exploration in this area. Within the research, it has been proven, that the potential of utilizing Cloud Computing, Blockchain, Big Data, and Artificial Intelligence in the field of tourism and restaurant management is not equal, as they offer diverse opportunities. Based on this, the following conclusions can be drawn:

1. The potential integration of Cloud Computing into domestic tourism and restaurant management provides opportunities for gaining competitive advantages (through cost reduction on equipment) and a wide range of possibilities for optimizing business processes (through automation and improved data accessibility). In doing so, it is important to change approaches to storing, processing, and analyzing large volumes of data (by integrating them with scalability processes and utilizing remote computing resources), as well as accessing programs and services (which become available from any location with an internet connection).

2. The potential of Blockchain technology stands out for its changes in security approaches and data immutability, as well as the adaptability of businesses to utilize distributed data storage technology, albeit dependent on the chosen technical solution (which is more effective with higher service quality enhancement and business process optimization). The use of Blockchain can provide trust and security for transaction processing, customer data storage, and contracts. In doing so, it is important to change the approach to data security and handling.

3. The potential of Big Data and AI technologies stands out for the changes in the execution of tasks and actions within various processes (company managers gather and analyze data on bookings, transportation, hotels, excursions, and other aspects of travel to understand customer needs and identify new opportunities). With the help of these technologies, tourism and hotel companies can gain insights into customer behavior, identify trends and patterns, and develop personalized recommendations and forecasts. In doing so, it is possible to change the approach to the execution of tasks and actions within various processes.

The research prospects lie in utilizing the obtained results to develop and implement intelligent management systems for tourism and hotel complexes that leverage data from cloud resources to optimize bookings, inventory management, personnel, and other business processes.

Література:

1. Garzoni A., De Turi I., Secundo G., Del Vecchio P. Fostering digital transformation of SMEs: a four levels approach. *Management Decision*, 2020, vol. 58 (8), pp. 1543—1562.
2. Kitsios F., Kamariotou M. Artificial intelligence and business strategy towards digital transformation: A research agenda. *Sustainability*, 2021, vol. 13 (4), p. 20—25.
3. Lambropoulos, G., Mitropoulos, S., Douligeris, C. A Review on Cloud Computing services, concerns, and security risk awareness in the context of Digital Transformation. In 2021 6th South-East Europe Design Automation, Computer Engineering, Computer Networks and Social Media Conference (SEEDA-CECNSM), (2021, September 24—26), IEEE, Preveza, Greece. 10.1109/SEEDA-CECNSM53056.2021.9566267
4. Maslyhan O., Bannikov V., Lobunets T., Buriak I., Shevchuk L. On the question of the role of project management in the digital transformation of small and medium-sized businesses: essence and innovative potential, *Revista Amazonia Investiga*, 2022, Vol. 11(55), pp. 334—343.
5. Services sphere cluster management: virtualization and methodological aspects: монографія / [Authors team: Mashika Hanna, Zelic Victoria, Kiziun Alla, Maslyhan Roman et al.]. — Odesa: KUPRIENKO SV, 2023, 131 с.

References:

1. Garzoni, A., De Turi, I., Secundo, G., and Del Vecchio, P. (2020), "Fostering digital transformation of SMEs: a four levels approach", *Management Decision*, vol. 58 (8), pp. 1543—1562.
2. Kitsios, F. and Kamariotou, M. (2021), "Artificial intelligence and business strategy towards digital transformation: A research agenda", *Sustainability*, vol. 13 (4). <https://doi.org/10.3390/su13042025>
3. Lambropoulos, G., Mitropoulos, S., & Douligeris, C. (2021), "A Review on Cloud Computing services, concerns, and security risk awareness in the context of Digital Transformation", 6th South-East Europe Design Automation, Computer Engineering, Computer Networks and Social Media Conference (SEEDA-CECNSM), IEEE, Preveza, Greece. 10.1109/SEEDA-CECNSM53056.-2021.9566267
4. Maslyhan, O., Bannikov V., Lobunets, T., Buriak I., and Shevchuk, L. (2022), "On the question of the role of project management in the digital transformation of small and medium-sized businesses: essence and innovative potential", *Revista Amazonia Investiga*, Vol. 11 (55), pp. 334—343.
5. Mashika, H. Zelic, V. Kiziun, A. and Maslyhan, R. (2023), *Services sphere cluster management: virtualization and methodological aspects*, KUPRIENKO SV, Odesa, Ukraine.

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