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## THE VIRTUAL REALITY AND ARTIFICIAL INTELLIGENCE USE IN RESTAURANT AND TOURISM SERVICE

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### ВИКОРИСТАННЯ ВІРТУАЛЬНОЇ РЕАЛЬНОСТІ ТА ШТУЧНОГО ІНТЕЛЕКТУ У РЕСТОРАННОМУ ТА ТУРИСТИЧНОМУ ОБСЛУГОВУВАННІ

Використання віртуальної реальності та штучного інтелекту в ресторанному та туристичному обслуговуванні може докорінно змінити спосіб, яким бізнес взаємодіє із клієнтами та яким створюються різні послуги. Зокрема, в туристичному обслуговуванні ці технології трансформують зміст подорожі, її інформаційне забезпечення, ефективність та цікавість для подорожніх. В ресторанному обслуговуванні ці технології змінюють спосіб, яким ресторани взаємодіють із клієнтами та надають послуги, що робить споживання та сервіс більш привабливими й конкурентоспроможними. Відтак, стаття спрямована на дослідження особливостей використання віртуальної реальності та штучного інтелекту у ресторанному та туристичному обслуговуванні. У межах дослідження автори наголошують на тому, що ресторанне та туристичне обслуговування, хоча і є різними сферами господарювання, але узагальнено вони спеціалізуються на наданні послуг гостинності та задоволенні потреб клієнтів у харчуванні та подорожах. За результатами дослідження доведено, що у ресторанному обслуговуванні технології віртуальної реальності та штучного інтелекту відкривають можливості до створення віртуальних меню та інтерактивних замовлень; створення особливої, унікальної атмосфери закладу; доповнення ресторанного досвіду елементами навчання; створення персоналізованих рекомендацій на основі даних; автоматизації процесів внутрішнього управління закладами. Синтез окреслених результатів дозволяє підвищити якість обслуговування, забезпечити цікавий клієнтський досвід і докорінно змінити специфіку візитів до ресторанів. За результатами дослідження доведено, що у туристичному обслуговуванні технології віртуальної реальності та штучного інтелекту продукують процеси віртуалізації турів та подорожей; покращення приймання замовлень та бронювань; виділення інтерактивної компоненти екскурсії, а також компоненти освіти та навчання; підвищення безпеки й зручності; оптимізації маршрутів; збільшення доступності інформації. Синтез окреслених результатів змінює загальний формат обслуговування клієнтів, розширює формат подорожі, а також розширює погляд на безпеку та зручність послуг для туристів.

Using virtual reality and artificial intelligence in restaurant and tourism services has the potential to fundamentally change the way businesses interact with customers and create various offerings. In the field of tourism services, these technologies are transforming the tourism industry by altering the content of travel, its informational support, efficiency, and appeal to travelers. In restaurant services, these technologies are changing the way restaurants interact with customers and deliver services, making the restaurant product more attractive and competitive. Therefore, the article is aimed at exploring the features of using virtual reality and artificial intelligence in restaurant and tourism services. Within the scope of the research, the authors emphasize that while restaurant and tourism services are two distinct sectors of the economy, they are fundamentally specialized in providing hospitality services and satisfying the needs of tourists and customers in the realms of dining and travel. According to the research findings, it has been demonstrated that in restaurant services, virtual reality and artificial intelligence technologies open opportunities for creating virtual menus and interactive orders; establishing a unique and special ambiance in the establishment; enhancing the dining experience with elements of education; generating personalized recommendations based on data; and automating internal management processes within the establishments. The synthesis of the outlined results enables an improvement in service quality, ensures an engaging customer experience, and fundamentally alters the nature of visits to restaurants. The research results demonstrate that in tourism services, virtual reality and artificial intelligence technologies contribute to processes of tour and travel virtualization; enhancement of order and reservation management; the incorporation of an interactive component into tours, as well as elements of education and learning; improved safety and convenience; route optimization; and increased accessibility of information. The synthesis of the outlined results transforms the overall customer service format, broadens the scope of travel experiences, and expands the perspective on safety and convenience for tourists.

*Ключові слова: персоналізовані рекомендації; атракції; туризм; інтер'єр; віртуалізація; віртуальне меню.*

*Key words: personalized recommendations; attractions; tourism; interior; virtualization; virtual menu.*

### TARGET SETTING

The use of virtual reality and artificial intelligence in restaurant and tourism services can fundamentally transform the way businesses interact with customers and create various offerings. Specifically, in the field of tourism services, these technologies are transforming the tourism industry by altering the content of travel (enabling travelers to virtually explore different corners of the world, and visit attractions, landmarks, and natural wonders), enhancing its informational support (expanding the possibilities for selecting travel routes and finding the best options for journeys), and increasing efficiency and interest for travelers. In restaurant services, these technologies are changing the way restaurants interact with customers and provide services (including the active use of virtual versions of restaurant menus, virtual tours of restaurant kitchens, and so on), making the restaurant product more attractive and competitive.

### ANALYSIS OF RESEARCH AND PUBLICATIONS

Currently, the characteristics and modern concepts in restaurant and tourism services are being researched by domestic scholars such as

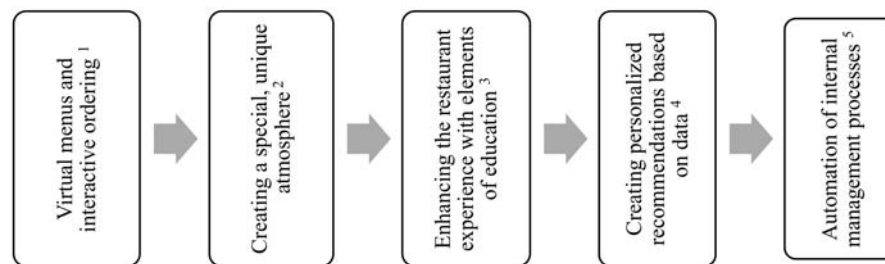
V. Tserklevych, A. Dil, A. Blauta, M. Dil, O. Maslyhan, E. Todierishko, S. Zhukov, and M. Kashka. Domestic scholars make a significant contribution to the development of travel organization theory, customer service concepts, and order processing, among other areas. However, the existing sources often lack sufficient attention to the changes in hospitality services and meeting customer needs in the realms of dining and travel that are occurring in the context of using virtual reality and artificial intelligence. Currently, the field of VR and AI in restaurant and tourism services is relatively new, and research in this area will help uncover their potential and identify key directions for their utilization.

### THE WORDING OF THE PURPOSES OF ARTICLE (PROBLEM)

The purpose of the article is to investigate the features of using virtual reality and artificial intelligence in restaurant and tourism services.

### THE PAPER MAIN BODY WITH FULL REASONING OF ACADEMIC RESULTS

Within the scope of the research, the authors emphasize that while restaurant and tourism services are two distinct sectors of the economy,



**Figure 1. Directions for the use of virtual reality and artificial intelligence in restaurant services**

Note:

1. Innovative approaches to restaurant service that utilize technology, including smartphones, and tablets, as well as virtual reality (VR) and augmented reality (AR), to facilitate food and beverage ordering.
2. The creation and selection of a range of elements contribute to defining the style and character of the establishment, making it attractive to customers, and shaping the overall restaurant visit experience.
3. Incorporating educational components into the customer's gastronomic visit to the restaurant. It may include educating customers about dishes, ingredients, and cultural aspects of gastronomy, as well as the history of food preparation and wine.
4. The practice of using customer information to provide individualized recommendations and offers that align with their preferences and needs.
5. Utilizing various information technologies, automation, and optimization systems for internal operational processes and restaurant business management.

Source: formed based on [1; 4–5].

they share a common specialization in providing hospitality services (related to serving tourists during their stays away from their permanent residences) and satisfying the needs of tourists and customers in the realms of dining and travel [1; 3–4]. According to the above, the outlined categories can be identified based on their common specificity.

Restaurant services encompass the operations of establishments that offer diverse food options to customers. This sector includes food and beverage preparation and serving, interior design and ambiance management of the establishment, customer service and order taking, inventory management, and product quality assurance [4].

Tourism services encompass activities related to hospitality and travel. This sector includes services provision such as temporary accommodation for tourists, organizing travel itineraries, booking tickets, hotels, and tours, offering guided tours and entertainment events, transportation services, and more [2-3].

Indeed, it is evident that both sectors work together to ensure the comfort and satisfaction of customers who are traveling or dining in gastronomic establishments. Therefore, the use of virtual reality and artificial intelligence in restaurant and tourism services leads to these sectors becoming more innovative and convenient for customers, ultimately improving the quality of service, and making travel and restaurant visits more interesting and efficient.

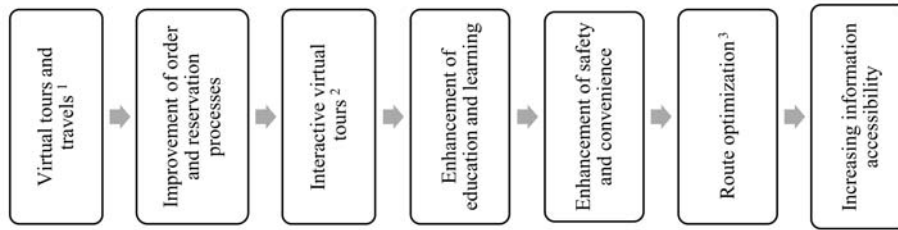
Indeed, the use of virtual reality and artificial intelligence in restaurant services opens numerous

opportunities for improving the quality of service and shaping a customer experience that is more interesting and engaging. Certainly, several ways in which these technologies can be utilized in restaurant services can be highlighted (Figure 1):

1. Virtualizing menus and promoting interactive ordering.
2. Creating a unique and special atmosphere (manifested through changes in style, interior and exterior design, concept, music, lighting, the temperature inside the establishment, and service professionalism [1]).
3. Enhancing the restaurant experience with elements of education.
4. Generating personalized recommendations based on data.
5. Automating internal management processes (using various information technologies and automation and optimization systems).

Considering the multifaceted nature, we have highlighted, let's examine the directions for using virtual reality and artificial intelligence in restaurant services in more detail.

Regarding virtual menus and interactive ordering, note that restaurant establishments can utilize formats that allow customers to view available order items on tablets or smartphones and make real-time adjustments to their orders. Among the advantages of such menus are their visually appealing appearance (achieved by adding 3D images of dishes and beverages to the virtual menu), optimization of waiter functions (as customers can place orders through a smartphone app without having to wait for a waiter),



**Figure 2. Directions for using virtual reality and artificial intelligence in tourism services**

Note:

1. Form of travel that takes place in a virtual environment using virtual reality (VR) or augmented reality (AR) technologies.
2. An innovative way for tourists to explore and study various places and attractions virtually using virtual reality (VR) and interactive technology.
3. The process of selecting the most efficient and convenient routes to reach specific destinations or accomplish tasks with minimal resource expenditures, such as time, fuel, and finances.
4. Providing travelers with the maximum amount of information about destinations and enhancing the convenience and educational options of the journey.

Source: formed based on [2–3].

interactivity and informativeness (by including additional information about dishes in the menu, such as ingredients and calorie counts, as well as options for filtering dishes by diet or allergens), and environmental friendliness (by replacing paper menus with their interactive counterparts). This allows for the addition of 3D images of dishes to the menu and presenting them as virtual previews at the tables. Customers can also place orders through a smartphone app, streamlining the ordering process and reducing wait times.

Regarding creating a special, unique atmosphere, VR and artificial intelligence use can help generate elements of style, interior design, exterior, and other components within the restaurant establishment (through virtual restaurant models and virtual displays, virtual entertainment during waiting times, etc.).

Customers can even be immersed in virtual worlds while dining, where they can enjoy delicious dishes and virtual reality experiences. For example, an Italian cuisine restaurant could offer customers the sensation of being in a picturesque Italian village. A specialized seafood restaurant can offer customers the opportunity to dive into the underwater world while dining. For example, upon entering the restaurant, customers can receive virtual glasses that transform their surroundings. During the meal, customers can be transported into the ocean depths (seeing marine corals and observing fish swimming alongside them).

Regarding expanding the restaurant experience with elements of education, AR and artificial intelligence can add educational elements to the dining experience. For example, smartphones or AR glasses can recognize dishes and wines, providing customers with information about their origins, preparation methods, and available wine

collections. It makes the selection and enjoyment of food more informative and educational.

Regarding creating personalized recommendations based on data, noted that artificial intelligence can analyze customer data, such as their preferences, allergies, and order history, and provide personalized recommendations for dishes and beverages.

Regarding the automation of internal management processes, noted that artificial intelligence can facilitate the automation of restaurant management processes such as:

1. Inventory management (specifically, artificial intelligence can analyze data on the demand for dishes and beverages ordered in the restaurant and use this information for automatic inventory planning).

2. Staff allocation (in particular, artificial intelligence can analyze data on the number of customers, schedules, and other parameters and provide recommendations).

3. Forecasting demand for dishes (specifically, artificial intelligence can analyze historical order data and consider factors such as weather, holidays, and events to forecast demand for specific dishes. This helps restaurants plan menus and inventory more effectively) and so on.

The synthesis of the outlined results allows for improving the quality of service, providing an engaging customer experience, and fundamentally changing the nature of restaurant visits (making them more interactive, interesting, and personalized for guests). Additionally, such technologies can help restaurants manage their operations more effectively and attract new customers through innovative approaches to gastronomic service.

The use of virtual reality and artificial intelligence in tourism services transforms the tourism

industry by altering the content of travel, enhancing information provision, improving efficiency, and increasing the appeal for travelers.

Several ways in which these technologies can be used in tourism services can be highlighted (see Figure 2):

1. Virtualization of tours and travels by creating immersive interactive experiences.
2. Enhancement of order and reservation processes.
3. Introduction of an interactive component into guided tours and virtualization of excursions.
4. Strengthening the educational component of tourism services.
5. Increasing safety and convenience.
6. Improving the optimality of routes.
7. Enhancing information accessibility.

Considering the existing diversity, let's explore the directions for using virtual reality and artificial intelligence in tourism services in more detail.

Regarding tours and travels, note that VR allows tourists to virtually visit different places, even if they cannot be there physically, thanks to the following advantages: access to remote locations (including distant exotic countries, deep underwater reefs, or even outer space), the opportunity to familiarize themselves with the culture and history in advance. Such virtual journeys can be created for well-known tourist attractions, cultural sites, and natural reserves. For example, thanks to VR, tourists can already visit the most remote and incredible natural reserves in the world, such as the Amazon Rainforest, the African savanna, or the Antarctic glaciers. Tourists can explore the jungles firsthand, observe wild animals, and experience the unique fauna and flora of these places.

Regarding improving order placement and reservations, note that artificial intelligence can analyze customer data and preferences, recommending ideal hotels, restaurants, and travel routes to them. It can also automate the booking and ticketing processes.

Regarding touristic activities, note that the use of VR allows for the creation of interactive virtual tours, during which tourists can interact with the surrounding environment and obtain more information about the visited places. This becomes possible through:

1. Immersive experience (allowing tourists to immerse themselves in the atmosphere of the visited place, feeling its reality and beauty).
2. Virtual guides (providing information and narrating the history of the visited place).
3. Interaction possibilities (through which tourists can interact with objects in the virtual

environment, such as exploring museum exhibits in 3D format or even conducting virtual experiments).

4. Educational aspects and the flexibility of individual experience (tourists can choose paths and objects for exploration, creating an individualized experience).

Regarding enhancing education and learning, it's evident that VR can be used to impart knowledge about the history, culture, and nature of the place's tourists visit. This makes travel more educational and informative.

Regarding improving safety and convenience, virtual reality can be used to train tourists on safety procedures, such as emergency training. This technology can also provide safety information and aid in navigating unfamiliar places more conveniently.

Regarding tourist routes, artificial intelligence can analyze data on traffic flows and provide recommendations for optimal travel routes, saving tourists time and money.

Regarding increasing information accessibility, the use of VR and artificial intelligence provides tourists with access to additional information about destinations, local traditions, restaurant recommendations, and shops, helping them better plan their trips and feel more confident.

The synthesis of the outlined results changes the overall format of customer service, expands the format of travel, and broadens the perspective on safety and convenience for tourists.

#### **CONCLUSIONS FROM THIS STUDY AND PROSPECTS FOR FURTHER EXPLORATION IN THIS AREA**

In accordance with the above-mentioned provisions, it can be concluded that the results of using virtual reality (VR) and artificial intelligence (AI) in restaurant and tourism services can be diverse. In particular:

1. In restaurant services, these technologies open opportunities for creating virtual menus and interactive ordering systems; establishing a unique and special ambiance within the establishment; enhancing the restaurant experience with elements of education; providing personalized recommendations based on customer data; and automating internal management processes. The synthesis of these outlined results allows for improved service quality, an engaging customer experience, and a fundamental transformation of the restaurant visitation experience.

2. In tourist services, these technologies produced by the processes of virtualizing tours and journeys; improving the ordering and booking

processes; adding an interactive component to tours, as well as elements of education and learning; enhancing safety and convenience; optimizing routes; and increasing the accessibility of information. The synthesis of these outlined results transforms the overall customer service format, expands the travel format, and broadens the perspective on safety and convenience for tourists.

Overall, the use of virtual reality (VR) and artificial intelligence (AI) is transforming the processes of restaurant and tourism services, making them more innovative and appealing to customers. Accordingly, the prospects for further research in this field involve a deeper exploration of how the use of these technologies affects customer satisfaction and the level of accessibility and inclusivity of services. Understanding these aspects will help improve the use of technology in restaurant and tourism services and ensure maximum benefit for customers and businesses.

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