INTELLIGENT MANAGEMENT AND THE ROLE OF ARTIFICIAL INTELLIGENCE: APPLICATIONS IN TOURISM, FOOD SERVICE, AND LANDSCAPE MANAGEMENT

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RESEARCH ARTICLE

Abstract

Artificial Intelligence (A.I.) is increasingly influencing management practices in the hospitality industry, helping managers make decisions based on data and improving operational efficiency. This paper analyzes the role of intelligent management supported by A.I. in the fields of tourism, food services, and landscape management. It highlights how technologies such as machine learning, automation, and data analysis help improve customer experience, optimize resources, and support sustainable practices. The study emphasizes the growing importance of AI-based solutions in improving service quality and in the future development of the hospitality industry.

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INTRODUCTION

In recent years, artificial intelligence (AI) has become increasingly important in many fields, including the hospitality industry. New technologies allow companies to collect and analyze large amounts of data, helping managers make better decisions and improve the way businesses operate. For this reason, intelligent management based on artificial intelligence is becoming increasingly used in areas such as tourism, food services, and landscape management.

In the tourism and hospitality industry, companies need to quickly adapt to customer needs and market changes. Artificial intelligence can help organizations better understand customer preferences, improve service quality, and use resources more efficiently. For example, AI can be used for reservation systems, customer services, activity planning, and operations management. At the same time, the fields of food services and landscape management can also benefit from the use of intelligent technologies. AI-based tools can contribute to process optimization, waste reduction, and the support of more sustainable practices. These solutions can make businesses more efficient and improve the overall customer experience.

The purpose of this paper is to present the role of artificial intelligence in intelligent management and to analyze how it is used in tourism, food services, and landscape management. Furthermore, the study highlights the benefits of these technologies and their importance for the future development of the hospitality industry.

MATERIALS AND METHODS

The bibliographic analysis method was used for the development of this paper. The information was collected from scientific articles, books, and other academic sources presenting the use of artificial intelligence in management and the hospitality industry. The analyzed materials include studies on the application of artificial intelligence in tourism, food services, and landscape management. These sources were selected to highlight the role of technologies such as machine learning, automation, and data analysis in improving management processes. The research method consisted of reading, analyzing, and synthesizing relevant information in order to highlight the main applications and benefits of artificial intelligence in the studied fields.

RESEARCH RESULTS

The research results highlight the fact that artificial intelligence plays an increasingly important role in the development of intelligent management within the hospitality industry. The analysis of specialized studies shows that the use of AI-based technologies contributes to improving the decision-making process, increasing operational efficiency, and providing services that are better adapted to customer needs.

Applications and benefits of artificial intelligence in tourism, food services, and landscape management Tabel 1.

Fields	AI applications	Benefits
Tourism	Applications: Online booking systems, virtual assistants, tourist recommendations	Benefits: Improved customer experience, faster services, better understanding of tourist preferences |
Food services	Applications: Order automation, sales data analysis, inventory management, robots	Benefits: Reduction of food waste, better menu planning, increased operational efficiency
Landscape management	Applications: Intelligent irrigation systems, environmental monitoring, data analysis	Benefits: Efficient use of resources, improved maintenance of green spaces, support for sustainable practices

Artificial intelligence has become an essential tool in transforming service-based industries such as tourism and hospitality. AI-based systems enable the personalization of customer experiences, the optimization of operations, and the anticipation of consumer behavior through the analysis of large volumes of real-time data. Applications include chatbots for tourism assistance, destination recommendation systems, dynamic pricing management in accommodation units, and process automation in food service operations.

In the field of tourism, artificial intelligence is used for analyzing data regarding tourist behavior and preferences. Digital platforms and online applications can collect information about users' searches and provide personalized recommendations regarding destinations, accommodation, or tourist activities. In addition, intelligent booking systems and virtual assistants can quickly respond to tourists' inquiries and provide useful information about services, thus contributing to improved customer experience. Another important outcome is related to the use of artificial intelligence in data analysis within the tourism industry. By analyzing large volumes of data, organizations can identify consumption trends, anticipate tourism demand, and adjust marketing strategies according to customer preferences. This enables companies to optimize their activities and improve their competitiveness on the market. Specialized digital tourism platforms use artificial intelligence to personalize the entire travel planning experience.

The concept of intelligent travel planning is increasingly illustrated through modern digital solutions such as the Travely AI Trip Planner, developed within the Figma platform.

Figure 1 **Figma platform**

This type of application reflects the integration of artificial intelligence technologies in tourism, providing users with advanced tools for efficient travel planning. Through an intuitive interface and automated functionalities, the system demonstrates how A.I. can support decision-making and personalize the tourist experience.

Platforms such as Visits.ai collect information about destinations and users' personal preferences, using this data to refine recommendations and plan travel itineraries, saving time and ensuring a personalized experience. Similarly, Trip.com has launched TripGen, a chatbot powered by OpenAI technology, which offers users recommendations regarding flights, destinations, and tourist activities directly within the mobile application. A concrete example of an A.I. application in destination discovery is the TripAdvisor platform, which has developed voice-guided virtual tours using A.I. technology.

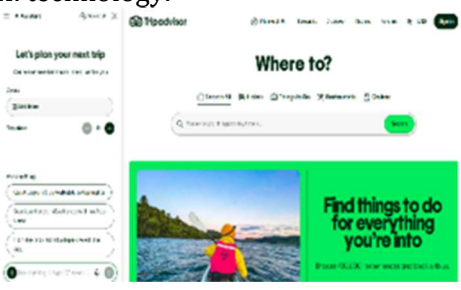

Figure 2 **TripAdvisor platform**

The project, compatible with virtual assistants such as Amazon Alexa and Google Assistant, allows users to explore destinations such as Orlando or Abu Dhabi through an interactive voice-based guide covering restaurants, cultural attractions, and popular tourist landmarks.

The use of AI in analyzing tourist behavior is also supported by recent statistical data. According to a Global Rescue survey, between October 2024 and July 2025, the number of travelers using AI for travel planning doubled, from 11% to 24%. The most common uses include itinerary planning (75%) and destination research (71%), followed by restaurant recommendations and visa information. At the same time, A.I. technologies, through machine learning and natural language processing, facilitate travel planning and booking via recommendation systems based on the analysis of large volumes of data, enabling tourism organizations to anticipate demand and adapt offers according to the preferences of each individual tourist. Food services represent one of the most dynamic yet also most vulnerable sectors to economic, social, and technological pressures, and the integration of artificial intelligence into the management of this field has brought significant transformations across the entire operational chain.

The global market value of artificial intelligence in the restaurant industry reached 9.68 billion USD in 2024, with projections indicating growth up to 49 billion USD within the next five years. This reflects a profound paradigm shift: A.I. is no longer an experimental tool, but an essential component of modern management in food services. Applications are diverse and cover all stages of restaurant or food service operations, from customer interaction to kitchen management and supply chain coordination. Chatbots rank first among adopted solutions, being used as interactive interfaces for order placement, reservations, and customer service issue resolution, with 60% of operators reporting daily use, while machine learning is used by more than half of respondents. A concrete example of robotics application in food

services is the Servi robot, developed by the American company Bear Robotics.

This is an autonomous waiter robot capable of delivering food to tables, collecting dirty dishes, and transporting multiple trays simultaneously. Navigation is carried out using LiDAR technology and 3D cameras, which enable obstacle detection and real-time route recalculation even in crowded environments. The robot is not designed to replace human staff, but to take over repetitive transportation tasks, freeing employees to focus on direct customer interaction, an essential principle of intelligent management in modern food services.

Figure 3 **Modern food services**

Another area in which major restaurant chains have invested in artificial intelligence is automated order taking. A relevant example is McDonald's, which tested an AI-based voice ordering system at drive-thru locations between 2021 and 2024.

The McDonald's case thus illustrates that the adoption of artificial intelligence in food services is a gradual process involving testing, adaptation, and continuous improvement.

At the level of kitchen operations and inventory management, the impact is equally significant: AI systems analyze historical sales data, current trends, and external factors such as weather conditions to accurately forecast demand, helping restaurants reduce food waste by up to 20%. This is particularly important considering that many food service units lose between 8% and 15% of revenue due to inaccurate demand forecasting, food waste, and disconnected ordering systems, while AI contributes to integrating ordering, kitchen operations, inventory, and customer data into a single intelligent system. One of the most well-known examples in this regard is the Starbucks chain, which developed the Deep Brew platform—a system that personalizes drive-thru recommendations based on day of the week, time of day, outside temperature, and traffic patterns. In 2025, the company also introduced Green Dot Assist, a generative A.I. assistant integrated into barista devices, which provides real-time guidance for beverage preparation and sales suggestions without affecting the quality of human customer interaction.

A complementary aspect is intelligent inventory management, where A.I. systems can monitor in real time the quantities of products available on shelves or in refrigerators, automatically generating alerts or replenishment orders when a product is about to run out, thereby reducing both losses and service interruptions.

In addition, artificial intelligence can contribute to the automation of certain restaurant processes, such as order processing or analysis of customer feedback. By analyzing online reviews and customer ratings, managers can more easily identify the strengths and weaknesses of the services provided and take measures to improve them.

Overall, artificial intelligence is becoming a strategic management tool that enables food service units to become more efficient, more adaptable, and more customer-oriented, thereby redefining standards of quality and competitiveness in this sector.

Landscape management is a field in which artificial intelligence brings important contributions both in the design phase and in the maintenance and administration of green spaces. Regarding design, A.I. allows designers to work faster and more efficiently by generating multiple design variants in a much shorter time than traditional methods.

A relevant example is the use of generative adversarial networks (GANs), which can produce realistic images of virtual landscapes, helping designers visualize concepts and solutions before they are implemented in the field.

Regarding the maintenance of green spaces, the use of sensors and intelligent monitoring systems enables the collection of data on soil moisture, temperature, and plant health status. Smart irrigation systems automatically adjust the amount and frequency of watering in order to conserve water and optimize vegetation growth, and according to industry reports, this integration has contributed to reducing water consumption by up to 25%. Based on this data, managers can better plan maintenance activities and utilize resources in a more efficient and sustainable manner. In addition, AI can identify and monitor plant pests and diseases, providing early warnings as well as precise prevention and control measures.

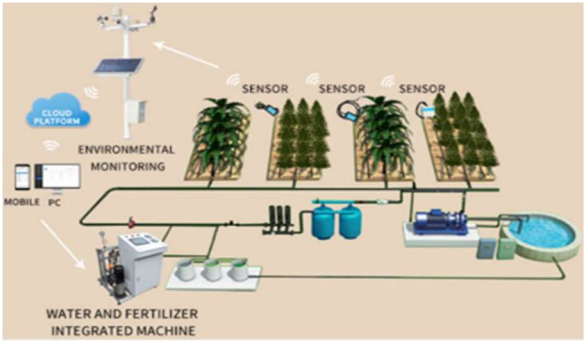

Figure 5 **Modern landscape management**

Another tool increasingly used in modern landscape management is the A.I.-powered drone. Drones equipped with sensors can collect real-time data on temperature, humidity, and soil moisture, making them valuable for land analysis and vegetation monitoring. A.I.-enabled drones can assess plant health and water distribution, contributing to resource conservation in parks and urban green spaces.

Figure 4 **Modern landscape management**

Overall, artificial intelligence is transforming landscape management from a process based on manual inspection into one driven by data, prediction, and automation, contributing to the more sustainable management of green spaces. Beyond landscape management, these trends are evident across all three fields analyzed in this paper. The table below summarizes the main advantages and challenges associated with the implementation of artificial intelligence in tourism, food services, and landscape management.

Table 2 highlights the main advantages and challenges associated with the implementation of artificial intelligence in hospitality management. It can be observed that the benefits are numerous, including increased operational efficiency, enhanced customer experience, and support for sustainable practices. At the same time, there are significant challenges, such as the initial costs of implementation, the need for staff training, and concerns related to data security and privacy. This table helps illustrate that, although the adoption of AI brings clear advantages, its success depends on how effectively organizations manage these challenges. Therefore, careful planning and appropriate staff training become essential factors for the successful integration of artificial intelligence into tourism, food service, and landscape management operations.

Advantages and Challenges Tabel 2.

Aspect	Description
Advantages	Rapid data analysis and improved decision-making
Advantages	Enhanced customer experience through personalized services
Advantages	Resource optimization and reduction of operational costs
Advantages	Support for sustainable practices and more efficient planning

Challenges	High implementation costs for certain businesses
Challenges	The need for trained personnel to effectively use AI technologies
Challenges	Issues related to data privacy and security

CONCLUSIONS

In tourism, intelligent platforms have changed the way travelers plan and book their vacations. In food services, robotics and predictive systems have improved both the customer experience and the operational efficiency of restaurants. In landscape management, sensors, drones, and smart irrigation systems have transformed the maintenance of green spaces into a process driven by data and automation. However, the adoption of artificial intelligence is not without challenges. High implementation costs, the need for trained personnel, and concerns related to data security remain significant obstacles, particularly for small and medium-sized organizations. Therefore, the success of AI integration largely depends on careful planning, investments in staff training, and a gradual approach tailored to the specific needs of each organization.

In conclusion, artificial intelligence does not replace the human factor in the hospitality industry; rather, it complements and enhances it. Organizations that succeed in finding the right balance between technology and human interaction will be best positioned to face future challenges and to deliver superior-quality services.

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