

The role Artificial intelligence applications in developing smart tourism

دور تطبيقات الذكاء الاصطناعي في تطوير السياحة الذكية

BIDI Said¹, Dr/ RADJEF Nacera ²

بيدي السعيد¹، راجف نصيرة²

U C Tipaza/Algeria, Laboratory of Entrepreneurship and tourism development , bidi.said@univ-tipaza.dz

U C Tipaza/Algeria, Laboratory of Entrepreneurship and tourism development, radjef.nacera@univ-tipaza.dz

Received: 02/09/2026 ; Accepted: 05/09/2026 ; Published: 13/09/2026

Abstract:

This research deals with artificial intelligence and its applications in the field of tourism by studying artificial intelligence technology characteristics and applications like big data processing and analyzing trends to develop the tourism sector and quality of services provided. Using the descriptive analytical approach we realize the necessity of applying artificial intelligence to develop tourism sector.

Keywords: Intelligence; Tourism; Digitization; Artificial Intelligence; Smart Tourism.

JEL classification: O31 ; O32 ; Z32.

المخلص:

يتناول هذا البحث الذكاء الاصطناعي وتطبيقاته في مجال السياحة من خلال دراسة خصائص تقنية الذكاء الاصطناعي وتطبيقاته، مثل معالجة البيانات الضخمة وتحليل الاتجاهات لتطوير القطاع السياحي وجودة الخدمات المقدمة. وباعتماد المنهج الوصفي التحليلي، نخلص إلى ضرورة تطبيق الذكاء الاصطناعي لتطوير القطاع السياحي.

الكلمات المفتاحية: الذكاء؛ السياحة؛ الرقمنة؛ الذكاء الاصطناعي؛ السياحة الذكية.

تصنيفات JEL : O31؛ O32؛ Z32

¹ Corresponding author: BIDI Said; e-mail: bidi.said@univ-tipaza.dz

Introduction:

Tourism as a fundamental pillar in services sector needs continuous development to improve service quality. In the era of artificial intelligence, it is necessary to provide tourism with artificial intelligence that revolutionized various fields.

Research problem: Accordingly, we pose the main question: What is artificial intelligence and what are AI applications to develop tourism sector?

Research hypotheses:

- Artificial intelligence is characterized by superior abilities to analyze data and even interact and learn.
- Activating smart tourism impacts services quality.
- AI applications improve tourism development.

Research objectives: This study seeks to highlight the reality of artificial intelligence, tourism, importance to develop tourism using AI.

Importance of the research: This study derives its importance from the need to highlight the important role of AI in tourism development.

Research methodology: We used descriptive analytical approach to analyze the study elements.

Previous studies:

- "Adalberto Santos-Júnior & al ", "2017", titled "Smart Tourism Destinations": Objectives: analyze experts view in tourism, geographic information system, spatial planning of smart tourism destinations; result: better information management as a strategic tool for tourism;
- Study "Ahlam Zaid, Kamal Zamouri", "2021", titled "Artificial Intelligence and its Applications in the Tourism Sector": objective: defining the role of artificial intelligence in developing the tourism sector; results: Artificial intelligence contributes to analyzing tourist data, which increases the efficiency of the sector;

What distinguishes the current research from previous studies?:

- The integrated view of artificial intelligence and tourism that includes the mutual influence between them, as each contributes to the development of the other.
- Adopting the principle of accurate understanding of artificial intelligence and tourism technologies before searching for the most appropriate technologies to develop the tourism sector with an integrated view.

The first section:

Concept and Basics of Artificial Intelligence

AI is a new technology with unique characteristics

Title: *The role Artificial intelligence applications in developing smart tourism*

Part One: Concept and types of AI:

Artificial intelligence is an important concept.

The first branch: AI Concept, characteristics:

A. Concept of artificial intelligence:

- The Encyclopedia Britannica defined it as: ability of digital computers or computer-controlled robots to solve problems of human thinking processes.
- Ertet defined it as a scientific system that includes methods of manufacturing and engineering what are known as intelligent devices and programs.ⁱ

B. Characteristics of Artificial Intelligence:

AI has the following characteristics:

- **The ability to represent knowledge:** Artificial intelligence programs can represent information due to their use of a special structure to describe knowledge. This structure includes facts and relationships between them, rules for linking these relationships...etc., cognitive structures together forms a knowledge base that provides the largest possible amount of information about the problem.
- **Using an interactive experimental method:** It works to solve complex problems that do not have a known general solution method by finding a specific method for the solution that appears to be appropriate while maintaining the possibility of changing the solution method if it becomes clear that the first choice does not lead to a quick solution. An example of this is the game of chess.
- **The ability to deal with a lack of information:**

The ability of artificial intelligence programs to find solutions even though the information is incomplete and incomplete at the time required.

- **The ability to learn:** means learning from previous experiences, practices, and improving performance by taking into account previous mistakes, and ability to generalize information, infer similar, selective cases, neglect excess information.
- **The ability to infer:** the ability to deduce possible solutions to a specific problem based on known data and previous experiences, especially problems for which it is not possible to use the known traditional means of solution.ⁱⁱ

The second branch: Types of AI:

Artificial intelligence is divided into 2 Types:

A. Weak Artificial Intelligence: used daily in all aspects of life. For example, when you buy a book about agriculture from Amazon, a suggestion system built into the site will suggest more books on the same topic. Weak Artificial Intelligence refers to the use of software to search for or complete a solution to a problem, or to extract tasks that human capabilities may not be able to handle.

B. Superior AI: it is close to human intelligence as it includes the processes of adaptation, awareness, perception, logic, understanding, self-learning, planning, and communication. It seeks to develop AI completely imitate an intelligent human being.ⁱⁱⁱ

The second part: AI Components, and applications:

The first branch: Components of AI:

AI consists of three basic components:

A. Knowledge base: it often represents a measure of the level of performance of the system according to the size and quality of its knowledge base that it includes and contains the following:

- Absolute facts that describe the logical relationship between elements, concepts and facts based on the experience and practice of experts in the system.
- Ways to solve problems and provide advice.
- Rules based on mathematical formulas.

B. The inference mechanism system: programmed process leads to solution by linking the rules, facts, forming line of deduction and inference.

C. User interface: It is a procedure that gives the user appropriate tools to interact with the system during the development and use stages.^{iv}

The second branch: Artificial Intelligence applications, techniques, and fields:

A. Artificial Intelligence applications:

Artificial intelligence has several applications:

Design of expert systems, Logical inference, Games, Knowledge representation, Learning, Robotics vision, image, Speech and writing recognition, Interaction between person and machine, Understanding natural languages, Multi-talented system, Planning, Getting rid of restrictions, Computational linguistics, Neural networks.

AI applications have 3 main areas: Natural Interface Applications, robotics applications, cognitive science applications (figure 1).^v

B. Artificial Intelligence Techniques: These techniques are classified into two types:

- **Techniques that make the system's behavior appear intelligent:** such as goal summarization, description and matching, tree search, rule systems, satisfaction condition, production and testing.
- **Techniques that use biology:** such as neural networks, genetic algorithms, and deep learning

C. Artificial Intelligence Fields:

- **Natural Language:** in which branches of computational linguistics appeared
- **Computer Vision:** developed fingerprint recognition techniques, simulate human vision.
- **Robotics:** specialized in branches of mechanical engineering and industrial robotics.
- **Game Playing:** developed intelligence by integrating the user's intelligence into the program.

- **Theorem Proving:** enabled the development of mathematics, logic and even philosophy.
- **Theory of Computation and Automatic**
- **Programming:** develops of computer science.
- **Heuristic Search:** formed by search mechanism and its types, development of expert systems.
- **Programming Language and Systems:** introduced languages and relationships to computer enabling creation of new and innovative systems.
- **Engineering Knowledge, Expert Systems:** developed medicine, chemistry, management, research, engineering using information systems.
- **Problem Solving:** enabled the development of mathematics and psychology.
- **Knowledge Presentation:** developed philosophy, systems theory, computer science.
- **Cognitive Modeling:** developed genetics, skills, neuroscience, physiology, arts, and philosophy.^{vi}

Adoption of AI by Companies (figure 2) and governments (table 1) witnessing a quick growth.

Section Two:

Artificial Intelligence and Tourism Sector Development: Smart Tourism

AI characteristics serve tourism development.

Part One: Basic concepts about tourism:

The first branch: The concept of tourism:

A. The definition of tourism:

- International Tourism Academy: "A term that refers to recreational trips and all related activities and satisfaction of the tourist's needs^{vii}."

The second branch: characteristics and types of tourism:

A. Characteristics of tourism:

- Tourism is considered an intangible product.
- The tourism product is complex, i.e. it consists of a mixture of elements, the overlap of several sectors.
- The tourism product cannot be stored, the solution is to lower prices, improve service quality.^{viii}

B. Types of tourism:

* According to geographical scope:

- Domestic tourism: (not less than 40 km).
- Regional tourism: (to neighboring countries).
- External tourism: (leave the country for tourism).

* According to the goal or purpose:

- Religious tourism: (such as Hajj for Muslims).
- Medical tourism: (to treat diseases in hospitals).

Title: *The role Artificial intelligence applications in developing smart tourism*

- Sports tourism: (practicing or watching sports).
- Cultural tourism: (to know the culture).^{ix}

The second part: Digital and smart tourism

The first branch: Digital tourism:

Tourism using technology is digital tourism.

A. Definition of the digital tourism:

-It is defined according to (Breeds, 2001) as: a type of tourism in which some of its transactions are carried out information and communications technology.^x

The second branch: Smart Tourism:

A. The definition of smart tourism: According to Gretzel, it is: "Tourism supported by integrated efforts in a destination that collect and aggregate data from physical infrastructure, social connections, government/regulatory sources, and human bodies/minds, along with the use of advanced technologies to transform that data into valuable on-site experiences and business offerings with a clear focus on efficiency, sustainability, and enrichment of experience".^{xi}

B. Smart Tourism Destinations:

B. 1 smart tourism destinations Concept:

Lopez de Avila defines it as "an innovative tourism destination, built on the best possible infrastructure in terms of modern technologies that ensure the sustainable development of tourist areas, accessible to everyone, facilitating the visitor's interaction with his surroundings or integration with him, which increases the quality of the experience in the destination and improves the quality of life of the residents"^{xii}.

B. 2 Dimensions of the smart tourism destination: it has four dimensions as follows:

Governance and Leadership: refers to the stakeholders in tourism: public-private partnerships, government, destination management organizations, community. Variables to analyze: transparency, communication, leadership, decision-making, management, strategy, data protection.

Sustainability: Although it includes economic, environmental and socio-cultural factors, it is being more related to environmental issues: energy efficiency, green spaces, waste management, pollution control, carrying capacity.

Accessibility: the effort to integrate and adapt tourism infrastructure to the needs of people with disabilities, the elderly, pregnant women and children, includes both public and business services.

Innovation and entrepreneurship: creation of new businesses, companies' modernization, operations' efficiency, new products and services, startups, innovation, entrepreneurship spirit.

Human capital: knowledge, skills and attitudes generated in a tourist destination. In this case, vocational training of population, adaptation to new technologies, language skills and access to information are elements to be considered.

Culture and Creativity: it is cultural heritage of a tourist destination, cultural identity, history, creative industry, creative economy, entertainment offerings, and modernization of cultural heritage.^{xiii}

Conclusion:

In summary, artificial intelligence has contributed to the emergence of smart tourism characterized by its great ability to analyze tourism data and extract results related to tourists' trends, desires, attracting methods, raising management efficiency, services quality, reducing costs, time, resources, increasing income, and development.

Based on the above, we concluded the following results:

- AI improves development of smart tourism.
- Smart tourism revolutionized tourism services.
- AI applications push tourism development.

Based on the above results:

- Hypothesis 1: Confirmed; Hypothesis 2: Confirmed; Hypothesis 3: Confirmed.

Accordingly, we put these recommendations:

- Accelerating the teaching of AI technologies.
- Encouraging research, innovation and creativity.
- Benefiting from the experiences of developed countries in applying artificial intelligence
- Generalizing smart tourism and its technologies.

Research sources and references:

Books:

- 1) Alaa Taaima (2024): The book Artificial Intelligence and its Uses in Scientific Research and Publishing (translation of the book: Zohery, M ChatGPT in (Academic Writing and Publishing, link: <https://www.researchgate.net/profile/>;
- 2) Iman Youssef Ahmed (2021): Modern Technology Techniques, Amman - Jordan, Ibn Al-Nafis Publishing.
- 3) Kafi, Mustafa Youssef and Abu Rahma, Marwan Muhammad and Al-Alwan Hamza Abdul Razzaq and Daradkeh, Hamza Abdul Halim (2014): Principles of Tourism and Hotel Marketing, First Edition, Amman-Jordan, Arab Community Library for Publishing;
- 4) Mai Al-Abdullah, Haitham Qutb, Fadia Boumajid (2021): AI and the Stakes of Communication and Development in Arab World, Beirut-Lebanon, AACs.
- 5) The book of the United Nations Survey Report for the year 2022 on e-government (period 2020-2022), p. 63, link: <https://desapublications.un.org/sites/default/files/publications/2023-02/>;

Magister Theses

- 6) Al-Dhafri, Abdul-Jabbar (2022): Hussein Artificial Intelligence (Master's Thesis), Faculty of Education, Department of Educational and Information Technology, Ebb University, Yemen;
- Link: <https://oercommons.org/courseware/lesson/93266/student/?section=1>;

Articles

- 7) Adalberto Santos-Júnior,al: (2017) " Smart Tourism Destinations: a study based on the view of the stakeholders", Revista Turismo em Análise, Cidade Universitária (Brasil), V.28, N° 03, 2017,P.667available on the link: <https://www.researchgate.net/publication/356286662>;
- 8) Ahlam Zaid, Kamal Zamouri (2021): Artificial Intelligence and its Applications in the Tourism Sector - The United Arab Emirates as a Model -, Al-Bishr Economic Journal, University of Bechar - Algeria, pp. 1-20, Volume 7 - Issue 1; Link: <https://www.researchgate.net/profile/Ahlem-Zaid/publication/370044969>;
- 9) Balasal Bint Nabi Yasmine, Amrouch El Hassan (2022): Artificial Intelligence and its Role in Achieving Sustainable Development, Journal of Secondary and Economic Studies, Pages: 1153-1177, Volume 5, Issue 1, Link: <https://www.asjp.cerist.dz/en/downArticle/649/5/1/191618>;
- 10) Ben Lakhel, Nawal and Agha Taghreed (2018): Tourism in Algeria: Its Components and Obstacles, Journal of Scientific Research Notebooks, University Center of Tipaza, Algeria, pp. 269-286, Volume 03- Issue02; Link: <https://www.asjp.cerist.dz/en/downArticle/595/3/2/112919>
- 11) Borana, J, "Strong A.I Applications of artificial intelligence & Associated technologies". Science [ETEBMS-2016], N° 6, 2016, P. 64, available on the link: https://www.cs.buap.mx/~aolvera/IA/2016_Applications;

Title: *The role Artificial intelligence applications in developing smart tourism*

- 12) Chaki Hisham, and Bukhari Samia (2015): Artificial intelligence techniques and their role in activating the digital tourism industry, an analytical vision of the case of Algeria during the period (2000-2020), Horizons Journal of Economic Studies, pages: 213-229, University - Algiers, Volume 6- Issue 2, ; link: <https://www.asjp.cerist.dz/en/downArticle/311/6/2/172720> ;
- 13) Essebti, Wasila and Sahrawi, Mohamed Taj El-Din (2018): The contribution of traditional industries and crafts to the promotion of the tourism sector - a comparative study between Algeria and Tunisia, Horizons 2020, Journal of Business and Trade Economics, pp. 291-310, Volume 3- Issue 1, link: <https://www.asjp.cerist.dz/en/downArticle/480/3/1/70203>
- 14) Femenia-Serra, F., & Neuhofer, B, "Smart tourism experiences: Conceptualisation, key dimensions, Journal of Regional Research, N° 42, Pages 129 to 150, 2018, P.137, link: <https://www.researchgate.net/publication/330578356> ;
- 15) Jubail, Samir and Lakhdari, Nasima (2023): Smart Tourism Destinations and the Adoption of Artificial Intelligence Applications (Dubai Case Study), Journal of Management and Development for Research and Studies, pp 342-363, Vol 12- Iss 01; Link: <https://www.asjp.cerist.dz/en/downArticle/273/12/1/225767>
- 16) Lrabaa, Al-Hadi (2015): Artificial Intelligence Systems to Assist in Knowledge Management Processes, International Journal of Islamic Economics, Publisher: Islamic Transactions Jurisprudence Research Center - Syria, pp. 18-24, Volume 2015, Issue 32, Link: https://kantakji.com/files/Vol_32TzqRI.pdf;
- 17) Othmaniya Amina (2019): Basic Concepts of Artificial Intelligence -Collective Book Entitled: Artificial Intelligence as a Modern Trend to Enhance the Competitiveness of Business Organizations, Arab Democratic Center for Strategic, Political and Economic Studies, First Edition, Pages: 9-22, Berlin, Germany, Link: <https://democraticac.de/wp-content/uploads/2019/09>;
- 18) Zamouki Salem, and Marzouq Fatih Habali (2023): Artificial Intelligence and its Economic Implications on the World, Al-Turath Magazine, pp 35-49, Volume13-Issue4, Link: <https://www.asjp.cerist.dz/en/downArticle/323/13/4/238970>;

Conference papers:

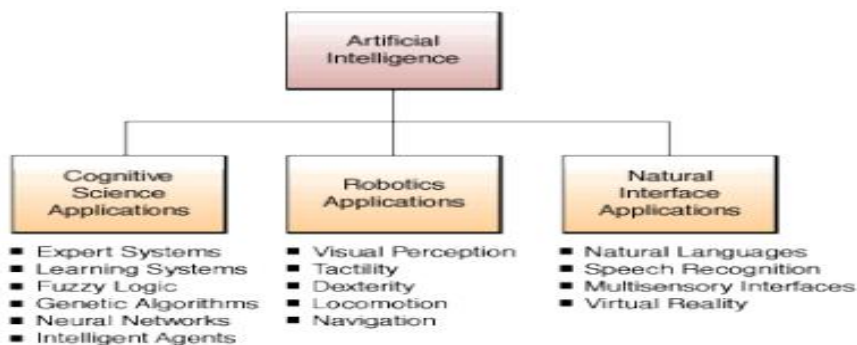
- 19) Tsaih, Rua-Huan & Hsu, Chih Chan (2018): Artificial Intelligence in Smart Tourism: A Conceptual Framework, ICEB Proceedings of 18th International Conference on Electronic Business, (PP124-133), ICEB, Guilin, China;

Scientific Reports and Documents:

- 20) Document of the report of the Oxford Insight Foundation and the International Development Research Center, available on: <https://almalnews.com>;

Research Appendices:

Figure 1: Artificial Intelligence Applications



Source: (Borana, 2016, P. 64)

Figure 2: Use of AI by companies in the world

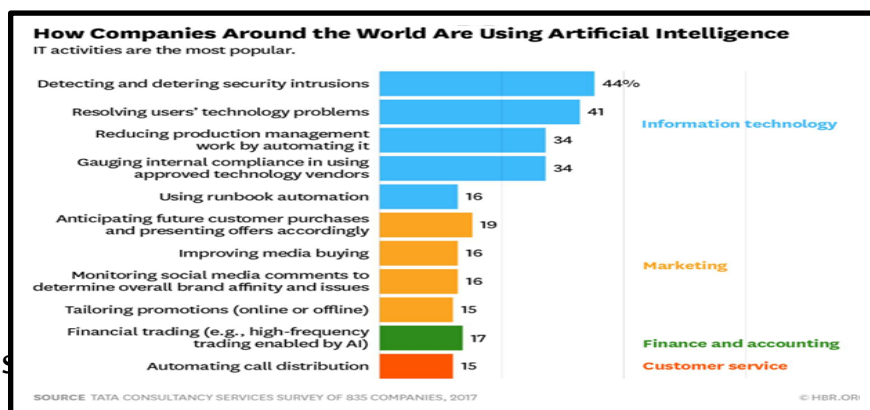


Table 1: World Governments ranking of AI

Application 2020											
Ranking	1	2	3	11	16	37	38	40	43	54	56
Country	USA	UK	Finland	France	UAE	Qatar	KSA	India	Bahrain	Kuwait	Egypt
Total Points	49.1	50.6	54.7	55.9	56.2	56.8	72.4	73.8	79.2	81.1	85.5
Ranking	67	69	79	99	101	116	117	118	144	171	172
Country	Turkey	Tunisia	Jordan	Morocco	Lebanon	Iraq	Pakistan	Algeria	Mali	Syria	Yemen

Title: The role Artificial intelligence applications in developing smart tourism



Total	19.1	19.3	30.02	33.4	33.4	33.8	35.9	36.4	41.8	44.4	46.01
Points											

Source: (OIIDRCentre report, <https://almaalnews.com>)

Search Margins:

- ⁱ Chaki Hisham, and Bukhari Samia (2015): Artificial Intelligence Technologies and Their Role in Activating the Digital Tourism Industry, An Analytical View of the Case of Algeria During the Period (2000-2020), Al-Afak Journal of Economic Studies, pp 213-229, Volume 6- Issue 2, p.216;
- ⁱⁱ Othmaniya Amina (2019): Basic Concepts of Artificial Intelligence, a collective book entitled Artificial Intelligence as a Modern Trend to Enhance the Competitiveness of Business Organizations, First Edition, Publisher: Arab Democratic Center for Strategic, Political and Economic Studies, pp 9-22, Berlin, Germany, pp 13-14;
- ⁱⁱⁱ Chaki Hisham, and Bukhari Samia (2015): previous reference, pp. 216-217
- ^{iv} Othmaniya Amina (2019): previous reference, P. 15;
- ^v The same reference, pp 15-16;
- ^{vi} Zamouki Salem, and Marzouk Fateh Habali (2023): Artificial Intelligence and its Economic Implications on the World, 2023, Page 37, Journal of Heritage, pp 35-49, Volume 13, Issue 04), p. 42;
- ^{vii} Essebti, Wasila and Sahrawi, Mohamed Taj El-Din (2018): The contribution of traditional industries and crafts to the promotion of the tourism sector - a comparative study between Algeria and Tunisia, Horizons 2020, Journal of Business and Trade Economics, pp. 291-310, Volume 3- Issue 1, p. 293;
- ^{viii} Ben Lakhel, Nawal and Agha Taghreed (2018): Tourism in Algeria: Its Components and Obstacles, Journal of Scientific Research Notebooks, University Center of Tipaza, Algeria, pp. 269-286, Volume 03- Issue 02, p. 270;
- ^{ix} Ben Lakhel, Nawal and Agha Taghreed (2018): previous reference, p. 271;
- ^x Chaki Hisham, and Bukhari Samia (2015): previous reference, p. 218;
- ^{xi} Jubail, Samir and Lakhdari, Nasima (2023): Smart Tourism Destinations and the Adoption of Artificial Intelligence Applications (Dubai Case Study), Journal of Management and Development for Research and Studies, pp 342-363, Vol 12- Iss 01, p. 348;
- ^{xii} Tsaih, Rua-Huan & Hsu, Chih Chan (2018): Artificial Intelligence in Smart Tourism: A Conceptual Framework, ICEB Proceedings of 18th International Conference on Electronic Business, (PP 124-133), ICEB, Guilin, China, p. 130;
- ^{xiii} Adalberto Santos-Júnior, al, " Smart Tourism Destinations: a study based on the view of the stakeholders" , Revista Turismo em Análise, Cidade Universitária (Brasil), V.28, N° 03, 2017, P.667.