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# The use of digital communication technology in promoting archaeological tourism in Biskra

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Received: 09/09/2024

Accepted: 10/12/2024

Published: 23/03/2025

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## Abstract:

Archaeological tourism is a visit to the monuments or sites with a significant cultural or historical value and rich cultural history. In this context, the Biskra region, with its wealth of archaeological sites and historical monuments, serves as a prime example. This study seeks to answer the following question:

How can digital communication technologies be used to promote archaeological tourism in the Biskra region?"

This is explored through various digital blogs and websites, social media campaigns and a digital record linked to a digital map of archaeological sites of the region, digitization and database building of the archaeological sites.

**Keywords:** Biskra, digital communication technology, archaeological sites, 3D modeling, Digital Museum.

## 1. Introduction

In the late 20th and early 21st centuries, the world experienced a variety of significant changes that impacted various aspects of society, including social, economic, and cultural dimensions. It was marked by scientific and technical development, which led to the emergence of new trends. These trends contributed to the development of new production methods by introducing information as a key element, which has since become crucial to the success of the production process. In this field, the concept of digital communication technology has emerged. According to the British scholar Alan Kirby (2009, p. 273), this marks the end of Postmodernism as a cultural era and the rise of Digimodernism. This is to shape various fields and contribute to address the challenges of the modern era.

As a result of this development, various sectors, including tourism in general and archaeological tourism in particular, play an important role in contributing to the national economy, which is the case in Biskra region, rich in tourist attractions and facing changes based on the development of digital communication technology, which is done through knowledge, science, and the use of new information for various technologies.

## The problematic:

Focusing on what is said above, it was necessary to look for the best methods and techniques in using digital communication technology to promote archaeological tourism in Biskra

by introducing tourism and digital communication technology and learning about its characteristics and elements, so we should answer the following questions:

- What is tourism, and what are its components and types?
- What is digital communication technology?
- What are the different archaeological sites in Biskra?
- How can digital technology be used to promote archaeological tourism in Biskra region?

#### **The importance of the study:**

- To explore how digital technology can be utilized to manage archaeological sites and their touristic development.
- To provide accessible data and information on archaeological sites, giving administrators a clearer understanding to effectively manage and develop them.
- To employ various digital methods for the online promotion of archaeological sites in Biskra, facilitating the growth of electronic archaeological tourism.

#### **The objectives of the study:**

This study aims to achieve a number of objectives, the most important of which are:

- To identify the crucial role digital technology in the management of archaeological sites.
- To highlight the importance of digital technology in the development of the archaeological sites in Biskra.
- To create a geographical database covering all archaeological sites in Biskra.
- To identify the challenges associated with the use of digital technology to promote archaeological tourism in Biskra.

#### **The justification of the study:**

- To our knowledge, there are very few, if any, studies that have addressed the management of archaeological sites in Biskra using digital technology.
- The importance of using digital technology, which positively impacts the development of archaeological sites in Biskra.
- The importance of archaeological tourism in the local development of the region.

#### **Study methodology:**

This study explores a theoretical aspect that addresses related to tourism, archaeological tourism, and digital communication technology. Furthermore, it focuses on the various archaeological sites in Biskra, specifically geographically and historically, and examines the practical aspect to clarify the use of digital technology in the electronic promotion of various archaeological sites in Biskra.

Based on the above, this study is divided into the following topics:

## 2. The definition of tourism

First of all, we say that tourism is: a travel and touring,(originally from the Latin word Torn), for leisure,excursion, etc(Adrian, 2018, pp. 354-358).

The concept of Tourism was used for first time in 1643 to indicate travel or touring from one place to another (Adrian, 2018, pp. 354-358).

The first to define tourism was the German researcher Guyer Freuler in 1905, who described it as a phenomenon driven by the growing need for comfort and change the place to enjoy the beauty of nature. He also highlighted its role in fostering communication between people, individuals and different communities (Adrian, 2018, pp. 354-358). Notably, Freuler emphasized the social and psychological aspects of tourism, as well as the role of technology and communication in strengthening relationships between nations and individuals.

The Austrian scientist Van Schuller Herman defined tourism in 191 as "the term for all processes, especially the economic process related to the entry of foreigners, their temporary residence and their deployment within the borders of a particular region or a state" (Netto, 2009, p. 44). This definition refers to two types of tourism : domestic and foreign tourism, while focusing primarily on the economic aspect and neglecting other dimensions, such as social and cultural factors. Similarly, Burkart and Medlik (1981) defined tourism as "the phenomenon arising from temporary visits (or stays away from home) outside the normal place of residence for any reason other than furthering an occupation remunerated from within the place visited" (Leonard & Jenkins, 1997, p. 2).

The successive changes in the various components of the environment as well as individual needs, and desires have thus defined tourism as a human activity based on the movement of the individual or group of individuals from one place to another . This movement is for social purposes, leisure, attendance at conferences and festivals, or for treatment and hospitalization, not for work and permanent residence (Tessa, 1993, p. 21). Travel is considered as tourism if it is voluntary rather than compulsory, temporary rather than permanent, and not intended to generate profit an activity or serve as employment.

Tourism is an individual or collective phenomenon aimed at fulfilling different desires and needs through the process of moving from ones' permanent residence to other places. This can include domestic (within the country itself) or international tourism to other countries where individuals reside temporarily without a specific duration of stay (Netto, 2009, p. 45).

Tourism has also been defined by conferences and international organizations, such as the World Tourism Organization (WTO), as "Tourism comprises the activities of persons traveling to and staying in places outside their usual environment for not more than one year for leisure, business and other purposes" (World Tourism Organization, 1995, p. 10).

Canada Conference in Ottawa (1991) defines tourism as: "Activities carried out by the person travelling to a place outside his usual environment for less than a certain period of time and not with the purpose of gaining money from any activity" (Goeldner & Ritchie, 2009, p. 07). We conclude that all these definitions focus on the fact that tourism involves:

- Travel, transfer and residence in unusual places.
- Temporary travel and stay in a place, not for permanent residence or work.
- Tourism can be either domestic or foreign.

To sum up, we can define tourism as a human activity involving movement, carried out by an individual or group of individuals, who aim to travel from one place to another for social, economic, leisure, vacation or to attend conferences or festivals. This movement is not for the purpose of work, and permanent residence, military deployment, migration, temporary work, or for members of the diplomatic corps.

As for the tourist, the UN Conference on Tourism and International Travel in Rome (1963) defined a tourist as a person who travels and stays away from home for various reasons, such as entertainment or vacation, for a period of at least 24 hours at least, without the intention of permanent residence or engaging in profitable business. (UNCITT, 1963, p. 5). In this context, we can also define a tourist as “a person who resides outside their usual place of residence, not for business gains” (Adrian, 2018, pp. 354-358). Thus, tourists contribute in increasing the income of the host country.

In general, “Visitors who spend at least one night at any country are considered as tourists, so that they are considered hikers in the case of less than 24 hours, and tourists if they stay there from night to 03 nights (i.e. short stay residents [temporary residence or spend more than 03 nights and less than a year (i.e. Long stay residents)” (Barma, 2004, p. 03).

### **3. Tourism characteristics:**

Tourism, as an industry, is distinguished from other activities by a range of characteristics, including (Lickorish & Jenkins, 1997, pp. 03-04):

- \* Tourism is a complex industry based on a wide range of elements, including tourism components and resources, tourism equipment and services, local and international transport and communications services, tourism advertising and promotion, and tourist demand, among others.

- \* The tourism product: It is a combination of elements that are integrated together and affect other sectors in society. Tourists consume a range of goods and services provided by tourist establishments, such as food and transportation. Some of these services are offered by other businesses, while others are related to the availability of security, infrastructure facilities and other services in the host country. These products are interconnected, so if the quality of goods or services in hotels, restaurants, transportation, customs services or security decreases, tourism flow decreases. Conversely, tourism flow increases when security is improved and the quality of goods and services rises.

- \* The tourism product does not move to the consumer; rather, it requires the movement of the consumer (tourist) in search of the product or service. Unlike other industries, tourism is an export sector that does not require the shipment or transportation of the product.

- \* Like other service products, tourism product is indivisible, as it cannot be separated from the place where the service is provided. For example, one must go to the festival to attend it and to the tourist site to visit it.

- \* The tourism industry is a cultural and social incentive for creativity and an area for the application of advanced technology, which requires a higher level of competence and qualification due to international competition.

\* Tourism activity, in general, is seasonal due to factors such as seasonal school holidays and industrial schedules. Additionally, the impact of climatic and geographical factors in both exporting and receiving countries influences the seasonality of tourism activity.

\* Tourism is an effective factor for the development of other industries.

\* Except for some types of tourism (e.g., religious, therapeutic or conference tourism), tourism activity mainly focuses on satisfying a luxury need.

\* The tourism industry (as a productive activity) is closely linked to economic, social and political development issues in both developing and developed countries.

\* The tourism services market is expandable due to the multiple types of tourism, the nature and purposes of each type, as well as the diversity, difference, and complexity of tourism activity and services.

\* Tourism activity is affected by various factors, including travel prices, tourism services, the income level of individuals (tourists), security level and the location of the site.

\* The tourism industry requires relatively lower financial investments when compared to other productive sectors.

\* Unlike other service products, tourism products cannot be stored for sale (such as a doctor's appointment, booking a seat on a plane, a theatrical performance, visiting a tourist site, or a trip). These are non-material products and cannot be transported from one place to another. Tourism is one of the few industries where the consumer obtains the service themselves. Therefore, the country exporting the tourism product does not afford out-of-bounds expenses, unlike other material products that require extra costs as transportation, shipping, etc.

\* Tourism demand depends largely on the financial capacity of the tourist. The overall demand often linked to luxury needs rather than essential needs).

\* Tourism demand is highly flexible in most cases, as it is tied to resources and tourism services available in a country, which are self-motivated among tourists.

\* Tourism demand is influenced by the level of economic and technological progress, as well as economic volatility (such as recession), and other cultural and political factors, including media, infrastructure, religion, cultural development, political orientation, security, etc.

\* Tourism demand depends not only on the availability of resources and the diversity of tourism components, services and equipment, but also on other factors, such as the quality, prices and availability of provided services.

\* Tourism resources (natural, historical, archaeological, etc.) are only sold through tourism, i.e., sold in the form of a tourist product and with accompanying tourist facilities (infrastructures, accommodation, transport, etc.).

\* The tourism product that is offered or sold is based on intangible resources, such as climate, the beauty of nature, and the quality of historical and archaeological sites. Therefore, it can contribute to increasing financial returns if it is well planned and marketed.

\* The tourism components differ from one another; that is, the elements of the tourism are independent. For example, natural resources are separate from industrial components, and the latter is independent of other tourism services and facilities. This contrasts with other products, which exhibit complete integration of its various components.

#### **4. The components of tourism attraction**

The tourism product is a composite entity, distinct from other products, as it cannot be transported or stored. It consists of various components and factors that are integrated to form a homogeneous product. This product begins with travel or journey and culminates in the settlement at the destination. These components and factors are known as the elements of tourism attraction. So, what are these elements? And what are their types?

The components of tourism attraction are factors that influence and determine the tourist's decision to visit a specific location (Goeldner & Ritchie, 2009, p. 14). In other words, they represent all the fundamental conditions for tourism activities, including facilities, events and elements that attract tourists. These factors can be cultural, religious, human, therapeutic, or sports-related, among others. These components can be categorized as follows:

- Natural resources, particularly the site, landforms, climate, water, and other natural elements (Goeldner & Ritchie, 2009, p. 15)

- Human factors, including historical, archaeological, religious, and social motivations, transportation, the availability of information and knowledge, as well as the social, economic, and political stability of the country, and the facilities provided (Goeldner & Ritchie, 2009, p. 16).

#### **5. Definition of digital communication technology:**

Information technology and digital communication refer to a range of tools, techniques, and systems employed to process content for transmission in public, personal or organizational communication. This includes audio, written, audiovisual, print, or digital content (through electronic accounts) that is stored and retrieved. These communication materials, messages or contents can be audible or visible, printed or digital, and transported from one place to another. This process may be manual, automated, electronic, or electrical depending on the historical development of communication technologies and the areas they cover (Kattoush, 2005). Essentially, it relies on the use of computer technologies and software, with applications that go through several stages, starting with data collection and monitoring from the environment. This is followed by processing the data through organizing, tabulating, storing, encoding, and analyzing, ultimately leading to the results of the treatment phase for further utilization (Kattoush, 2005, pp. 04-05).

Digital communication technically refers to the conversion of letters, images and sounds into digital data (numbers) that can be manipulated, stored and processed, and then sent by computers. Kristi Aho defines Digital communication as: "Effective digital communication is the ability to create persuasive communication using different forms of media. Digital communication is a foundational skill for many careers today since most people will be involved in some form of conceptualizing, producing, delivering and receiving these communications in their jobs and personal lives" (Aho, 2005). In other words, digital communication is based on the use of digital systems, as they are the primary means of communication between individuals, where information is exchanged, encoded and processed by these systems. This

process involves: coding, processing, transmission, and reception, all of which are carried out via a computer to achieve specific objectives.

The rapid advancement of digital communication technology has significantly impacted societies, transforming lifestyle and expanding freedoms. Discoveries and innovations in digital communication have made it widely accessible to a large number of people, contributing to the diversification of knowledge sources and positively affecting various sectors, including the tourism sector, which became electronic, known as E-tourism, which is defined: "The use of electronic business in the field of travel and tourism, and the use of internet to activate the work of tourism suppliers and reach more effective facilities for tourist consumers" (Khanchouch, 2004). Another definition describes E-tourism as: "A tourist pattern that performs some of its transactions between a tourist agency and another or between a tourist agency and a consumer (tourist) through the use of information and communication technology... So, that it offers some tourism services online through the (Internet) wishing that tourists accept and enjoy them" (Kazandzhieva, 2019).

Based on these definitions, we can conclude that modern technologies play a crucial role in presenting tourism products online, covering all the tourist-related processes such as booking and organizing flights. Electronic tourism has also led to the emergence of a new type of tourism, virtual tourism, enabled by electronic devices such as mobile phones, electronic notebooks, etc. Through virtual tourism, tourists can explore the world's museums, galleries, monuments, paintings and palaces from the comfort of their homes, travelling virtually to distant destinations. This experience offers enjoyment and convenience without the challenges of traditional travel, no long queues for tickets, no travel expenses, and no physical strain. It is particularly beneficial for individuals unable to travel due to time constraints, financial limitations, or political, military, or health-related circumstances, such as the COVID-19 pandemic. What once seemed like a dream has now become a reality, bringing the world closer through modern technology.

As previously mentioned, traditional tourism is driven by natural and human attraction. In contrast, virtual tourism is based on three fundamental elements (Mekhlaf & Hadab, 2017, pp. 255-256):

- Creativity: Tourism is inherently competitive, which drives creativity and innovation in the delivery of tourism services. These services must be up-to-date and aligned with the modern technologies to ensure the tourist feels connected to the virtual environment, creating a sense of immersion that translates into reality.
- Fictional reality: It provides a walking inside a virtual place, accessed either by a room containing cameras that enable the tourist to see everything around him or by 3D glasses that enable him to enter a more accurate fantasy world similar to the real environment.
- The aesthetic experience: The virtual tourism user experiences the pleasure tied to a sense of discovery, reflection, cognitive change, astonishment, focus, curiosity, and learning.

## **6. The use of digital communication technology in promoting archaeological tourism in Biskra:**

The variety of archaeological sites and historical monuments in Biskra dates back to prehistoric times. One such site is the geological formation in the municipality of Ras al-Mead, located approximately 170 km southwest of Biskra, about 30 km along steep slopes. Its coordinates are (4.72° E, 34.01° N). This site, known as Wadi al-Katar, features numerous water springs that

create a stunning sight. Another notable site is located in the municipality of AinZaaout, situated in the southern foothills of the Aurass Mountains, about 35 km away from the state. It lies along the 87th main route linking Biskra and Batna, with coordinates (5.83° E, 35.14° N). This geological view presents a natural-open museum along the Mazer Valley consisting of rocks in different colors formed by what is known as chemical nudity. Additionally, in the municipality of Jamoura, located 38 km north of the state along the main route 87 (coordinates: 5.61° E, 35.06° N), the area is rich in animal fossils, including sea snails that likely emerged to the surface at some point in history:

- Due to vertical underground movements and twisting horizontal movements, most of the mountains in Biskra belong to the second and third geological eras, and therefore are part of the Hessian or Alpine folds (Stamp, 1964, pp. 84-86).
- Because of the climate, water in the desert has become scarce, leading to the extinction of many animals. Several studies have indicated the presence of cold-loving snails in North Africa during the late Pliocene age or early Pleistocene (Huzayyin, 1956, p. 306).

The rock drawings in the Oued Ettl, the bazinas graves, and the tumulus types in Oued Oued Mangoub, Oued Tamda and Oued el-Hamara, along with others dating back to the ancient historical period of the 3<sup>rd</sup> century. These are manifested in the sites of the Roman views in al Kantara with its bridge, castles and the forts of the Lims line, the third century AD. Additionally, there are Islamic sites and landmarks such as Sidi Okba Mosque, Sidi Moussa Al-Khoudhari Mosque and The Old Mosque of Burj ben Azzouz, The Mosque of Sidi Lembarak, the Zaouia of Ali Ben Omar, the Mukhtaria's Zaouia, the Nasiriyah school and the two mausoleums of Abu al-Muhajir Dinar and Khaled Ben Sinan, Dashra al Hamra in al Kantra and others. The historical sites and periods are not yet fully exploited to their potential. Therefore, the development of tourism in the Biskra region and beyond can only be achieved by highlighting its tourist attractions in a way that appeals to visitors. This involves showcasing sites and monuments effectively to attract as many tourists as possible. One effective method is leveraging digital communication technology, which has a significant impact on individuals, known as the digital traveler. This traveler's journeys are inspired by images and comments shared through social media and websites, which provide more information for those interested in visiting archaeological areas. Additionally, these platforms can guide tourists to the most prominent locations and offer services such as a list of tourist facilities and online hotel booking services: therefore,

\* Efforts should be made to establish or develop a digital or electronic code for each of the existing archaeological sites in Biskra by documenting the various ruins and monuments of various historical periods, from prehistoric times to the end of the Ottoman period. This documentation should include a detailed history of each site, when it was discovered, by whom, and its significance, through a unified digital record linked to a web-based map. This would allow tourists to easily access information about the sites and plan their visit.

\* Social media has become an integral part of people's lives, providing a platform for easy communication about events happening around the world. Facebook groups, particularly closed groups, have proven to be one of the most successful tools for promoting and raising awareness about archaeological sites in Biskra. For instance, a collection of archaeological mosques dating back to the Ottoman period, such as the ancient mosque in Burj ben Azzouz, urge visitors who are interested in this type of mosques to discover how they are built, their architectural characteristics and what distinguishes them from others. Such platforms



encourage tourists to visit and discover these remarkable sites (Trihas, Zouganeli, & Antonaki, 2011, p. 112).

\*Currently, audio and visual content have become essential elements for promoting tourism. Creating and sharing YouTube videos about archaeological sites in Biskra is an effective way to present information, as many travelers review videos and opinions before making their final decision to visit.

\*3D modeling of archaeological sites plays a crucial role in documenting the archaeological field (Remondino & Campana, 2014, pp. 7-8) and in digital tourism, as it enhances the understanding of relationships between site components. Additionally, it aids in the documentation of archaeological excavations, contributing to the creation of an archaeological information bank that helps tourists visiting the archaeological sites virtually (Remondino & Campana, 2014, pp. 8-9).

Archaeological documentation is achieved by identifying spatial data using traditional scanning techniques such as photography and aerial photography conducted by private aircraft equipped with cameras. Alternatively, modern techniques can be employed, including the use of 3D laser scanning technology, space images and (GPS) Global Positioning System (V. Savchuk, 2015, pp. 66-67), as well as Geographic Information Systems (GIS) (Kostas Tokmakidis, 2004). GIS is a system based on the availability of computers, software packages and data (maps, satellite images and schedules). Qualified individuals store and process geographical data through the following stages (Maschner & Herbert, 2015):

.. Data Collection Input and Correction Subsystem:

At this important phase, data on archaeological sites are inserted in their various images, painted or scheduled to the computer.

.. Data Storage and Retrieval Subsystem:

At this stage, geographical data is stored from its various sources, maps, digital, descriptive data and schedules which are linked to each other to make it easier to use them when needed.

.. Data Manipulation and Analysis Subsystem:

It is characterized by the change in the pattern and level of data such as identifying areas or distances and the identification of urban and other areas as well as decorating the map.

.. Data Display and Reporting Subsystem:

The original data is typically stored in the database in various formats, including composite maps, schedules, display edited data, graphs, images, videos and reports. Additionally, the system allows for dimensions, calculation of distances, spaces and spatial research. It also supports the use of mathematical equations, dissonance, correlation, scattering, working analysis, analysis of variability and separation of groups, among others. Once processed, the system can be displayed on screen, printer or painter, all outputs can be stored on disks, laser disks or strips.

All these processes play an important role in integrating measurement techniques with spatial and descriptive data management, expressing them in 3D which enables virtual visits and the creation of what is known as the Digital Museum (Dragicevic & Bagarić, 2019). This concept serves as a virtual exhibition for displaying archaeological collections in some museums like the Archeological Museum of Biskra, the museum of Antiquities or the Roman Museum of al

Kantra, the Museum of the Mujahid Colonel Si al-Hawass in Mchounech or the regional museum of mujaheed Colonel Shaabani. By converting these collections into 3D models using digital techniques represented by Augmented Reality technology of mobile phone processing by selecting the shape in front of the camera and identify it and then look for the shape corresponding to this image and take it out on a mobile screen. This process links virtual images to real-world artifacts, allowing users to view them in their natural form using digital glasses. By placing a mobile phone glasses after transferring from a 2 dimensional form to a 3D. Furthermore, Virtual Reality technology (Roussou, 2001) enables users to navigate the museum and see artifacts in their natural but virtual form, i.e. digital archaeological tourism, as well as the use of scanning techniques, and converting the image into digital models that can be used within Virtual Reality applications (Castagnetta, Gianninia, & Rivolab, 2017, pp. 639-645). Moreover, 360-degree imaging techniques allow for the recording of video presentations, which can be displayed on virtual reality headsets. Through these advancements, various archaeological sites can be effectively promoted, encouraging tourists to visit them. By simply wearing a VR headset and virtually exploring these sites, users can gain an immersive experience that may inspire them to travel and witness these historical locations in reality (Caciora & Herman, 2021).

\*Launching websites in Arabic, English, French, German and Chinese languages serves as a digital museum including various ruins in Biskra.

\*Digitize all archaeological sites helps protect them by using the 3D technology, which enables the inventory of each site's technical characteristics. This process facilitates the creation of a detailed technical card, allowing the creation of an archaeological information bank that can be utilized in digital archaeological tourism.

## **7. Conclusion**

In conclusion, using digital communication technology to promote archaeological tourism in Biskra can achieve the following objectives:

- Establishing a new strategy for promoting archaeological tourism in Biskra by moving away from the traditional methods and relying on digital communication technology, which has become a modern approach. Moreover, raising awareness among national authorities responsible for the implementing this strategy is essential.

- The use of digital communication technology to attract a large number of tourists.

- Accessing archaeological sites in Biskra involves obtaining descriptive and spatial data to guide tourists on how to reach each site, while also providing the opportunity for direct reservations.

- Presenting information and data that enable tourists to explore the archaeological areas of Biskra, such as prehistoric sites from the ancient and intermediate period, through satellite and surveillance camera, allowing them to view the sites from a full 360 degrees angle.

- Utilizing digital communication technology to effectively manage and develop the archaeological sites.

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