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Application of Interactive Media Techniques in Virtual Reality in the Marketing of Tourist Trails in Jordan

Ibrahim ALKURDI
University of Jordan, Jordan
i.bazazo@ju.edu.jo

Omar A. ALANANZEH
Yarmouk University Jordan
o.ananzeh@yu.edu.jo

Ranea Mohammed QADDHAT
University of Jordan, Jordan
r.qaddahat@ju.edu.jo

Lubna S. HAIJAWI
University of Jordan, Jordan
l.hiajawi@ju.edu.jo

Sami A. ALHASANAT
Al-Hussein Bin Talal University, Jordan
samihasanat@gmail.com

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Abstract:

Virtual Reality Technology (VRT) has many advantages that contribute to many electronic applications in the marketing of tourist sites. In recent times, VRT has witnessed a huge development in electronic tourism. This study is conducted to identify the enormous potential provided by technology in marketing virtual tourist trails in Jordan through an electronic application interface that contains information on virtual tourist trails within the tourist and archaeological sites within a two- and three-dimensional display mechanism. As well as the possibility of displaying pictures of tourist and archaeological sites in different dimensions and drawing scales, which contributes to identifying the geographical pattern in the distribution of tourism services within tourist attractions using spatial analysis based on techniques, applications, and computer systems for the virtual world. The study relied on neighbourhood analysis, which relies on Virtual Reality technologies, hotspot correlation analysis, and other mapping tests within the ARCGIS 10.3 spatial analyser extension. The study aims to connect the virtual tourist trails within the tourist and archaeological sites to each other, providing the possibility of interactive navigation according to the predefined scenario.

Keywords: virtual reality, electronic tourism marketing, tourism media, spatial analysis, panoramic image, digital map.

JEL Classification: C30; L83; N95; O18; Q56; R11; Z33.

Introduction

The emergence of interactive technologies for Virtual Reality in the field of tourism media led to a qualitative leap in the fields of electronic marketing for tourist and archaeological sites (Armstrong 2020; Coppock & Rhind 2020, Maaiah *et al.* 2019). In addition to the technological revolution represented in the use of computers and various software to carry out many studies interested in highlighting tourist and archaeological sites and determining their

characteristics and advantages, through a series of digital maps with the aim of enhancing the promotional role of tourist sites based on providing virtual tourist itineraries (Bazazo *et al.* 2022; Berry 1991). This contributes to enhancing the competitive environment for tourism and archaeological sites in Jordan, marketing them in an attractive manner, and increasing the volume of tourism movement in Jordan (Alananzeh *et al.* 2015).

The study attempts to discover and identify information technologies related to building virtual electronic models for tourist and archaeological sites, and to simulate them through electronic, two- and three-dimensional models (Mousa *et al.* 2023; Jahmani *et al.* 2023; Saleh *et al.* 2023; Jawabreh *et al.* 2023a). The aim is to embody the environment of tourist sites using attractive digital designs based on technical software, which contribute to the interpretation of the spatial distribution pattern of the tourism phenomenon and help to provide virtual working environments for vanished tourist sites, or existing tourist sites, depending on the virtual environment and live it virtually (Jawabreh *et al.* 2023c; Al Fahmawee *et al.* 2022; Alananzeh *et al.* 2023).

For this purpose, the study attempts to answer the following questions:

1. How can interactive technologies such as: digital modeling, digital robot techniques, artificial intelligence and nanosatellites be used for Virtual Reality in the tourism field?
2. How do we design virtual tourist itineraries within the tourist and archaeological sites based on interactive technologies?
3. What is the shape of the spatial relationships of the application interfaces for the virtual tourist tails using the Neighborhood Analysis (which is based on Virtual Reality techniques, and hotspot analysis).

Accordingly, the scientific importance of the study lies in the field of benefiting from the applications of interactive technologies in the tourism media for Virtual Reality in the marketing of e-tourism. Learn how to develop virtual tourist itineraries that contribute to identifying the structure of tourist and archaeological sites. Providing electronic tourism distribution channels for tourist and archaeological sites in Jordan. Enriching tourism awareness and promoting the concept of tourism education, in addition to identifying the components of the tourism industry in Jordan.

Study Justifications

The most important justification of this study was to show the importance of technology based on interactive technologies in providing attractive and pioneering tourism products. Enhancing the concept of e-tourism in marketing virtual tourist itineraries for tourist and archaeological sites in Jordan. The proposed system based on the marketing of virtual tourist tails is not implemented in Jordan. The presence of shortcomings in the traditional methods used in tourism marketing, and the need for modern means that reduce time and effort.

1. Literature Review

The studies that dealt with tourism marketing are mostly characterized by their interest in studying the traditional aspects of marketing tourist sites. As for studies related to the marketing of virtual tourist tails using interactive techniques for virtual reality, the research topic is still few, including a study (Godovykh *et al.* 2022) entitled Electronic Modelling of Tourist Sites in Norton Province, Canada, the study dealt with how to take advantage of the successive technological developments in modeling design. Websites for tourist sites that can be used in the marketing of tourist sites in Norton County.

The study (Mango *et al.* 2021) dealt with the importance of using (ARCGIS 10) software in tourism marketing, considering that the tourism sector is one of the economic sectors with complex structures, so it requires many highly efficient tools in the process of marketing and managing tourist sites, and the study indicated the inability to use traditional marketing means, hence the importance of using the (ARCGIS 10) program in tourism marketing.

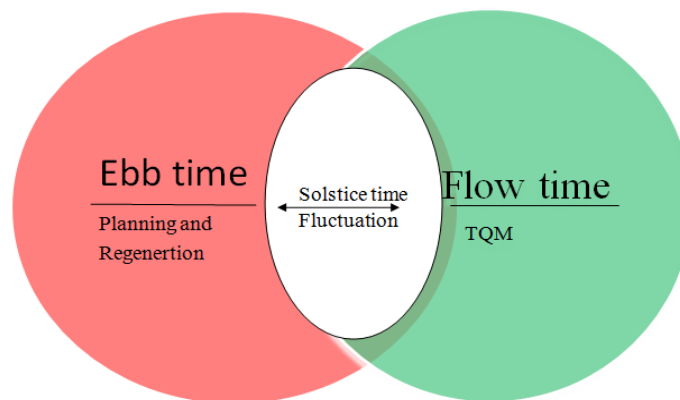
He also conducted (Streimikiene & Korneeva 2020) a study that provided an explanation of the interactive techniques of Virtual Reality in the field of tourism and tourism marketing, and the use of satellite visuals in this field as a marketing tool for tourist sites. Google Earth (Virtual Reality) technologies in the representation of many tourist and archaeological sites in the world, by building electronic systems that help the tourist to identify the structure of tourist sites in three dimensions. The study also presented the trends through which these techniques can be used in tourism marketing.

Magige *et al.* (2020) addresses the importance of using technologies based on remote sensing and GIS in developing tourist sites. The study indicated the importance of the tourism database that includes all the data related to tourism marketing, by enabling the tourist to get to know the tourist sites comprehensively, and thus the ability of electronic tourism marketing to achieve the best results, with reference to the importance of the

database (Data Base) in providing consumers Resolution of all information related to the marketing and optimal management of tourist sites.

The tourism and hospitality industry is one of the intangible service industries that depends highly on marketing methods. Seasonality affects this industry in a very large way, which witnesses a high and low season, and demand for one tourist destination rather than the other. This requires decision-makers and the industry to focus on marketing in the process of attracting tourists during the Ebb period, in addition to making optimal use of the latest technological means to improve the product. As well as providing a competitive high-quality product in Flow period (Alanzeh *et al.* 2023).

Figure 1. Ebb and Flow Theory and its implementation



Source: Alanzeh *et al.* 2023b

This study comes as a continuation of previous studies conducted by researchers in an attempt to take advantage of interactive techniques of Virtual Reality in marketing virtual tourist tails, with the aim of providing a comparative and competitive advantage in marketing tourism sites in Jordan comprehensively.

2. Study Methodology

The study focused on the use of the systems method, as an integrated method for research and study, because of its great importance in the marketing of virtual tourist tails, where phenomena and variables are complicated, and relationships are intertwined and overlap with each other, in a way that makes it difficult to diagnose these relationships and study their mutual impact. The methodology for creating virtual tourist itineraries includes a number of stages, which are collecting information and data for these trails, then entering geographical data and its descriptive information, building an information base, and then managing and processing information bases using Virtual Reality technologies.

The study methodology is as follows:

1. Nearest Neighbourhood Analysis, which is based on the ARCGIS 10.0 program, which is used to determine the distribution pattern of virtual tourist tails, and the shape of their distribution on the landscape of the tourist site.
2. Analysis of satellite imagery that represents a tourist site captured by satellites.
3. Using the Hotspot-based spatial analysis method as one of the Virtual Reality techniques to determine the trends of the distribution of virtual tourist tails on the landscape.
4. Collecting available data from various sources such as: (maps, tables, metadata, satellite images, and digital data through the Global Signature System (GPS).
5. Arranging, classifying, and converting data into digital data that can be dealt with by computer and displayed electronically.
6. Conducting analytical processes based on interactive techniques for virtual reality, and the most prominent analytical processes are:

Building points and linear and spatial layers that represent the virtual tourist tails, in terms of the projection system used and the reference of geographical coordinates, in addition to calculating the lengths and areas for their need in the analysis and geographical distribution, with the ability to display all the data related to all the data that represent the tourist tails, matching, modifying and interpreting them with the captured satellite images via satellite for the tourist site.

Information Technology based on Virtual Reality seeks to provide databases that represent tourism tails in a comprehensive and integrated manner, start the process of studying the spatial distribution of tourism services, and analyze the shape of the spatial spread of tourist tails in the tourist. The site, making comparisons and presenting the competitive advantages of tourism services and their compatibility with the nature of the tourist site. All this is done using the Arc Toolbox.

Spatial Analysis operations using Virtual Reality techniques include all forms of query, analysis and metadata processing of tourist tails, including making calculations related to proximity analysis, in addition to making calculations related to distances, and identifying phenomena that contain a particular phenomenon that contains criteria and that ends with another phenomenon in the criteria And analysis using weighted values, by giving one of the elements that affect planning more weight than the rest of the other elements (Goodchild *et al.* 2021).

The tourism media industry is currently experiencing the greatest existential challenge since the beginning of this century, due to the emergence of recent trends in virtual digital tourism media, and the emergence of e-marketing in the midst of successive digital revolutions. Therefore, it has become necessary for the Jordanian tourism marketing makers to keep pace with the rapid technological developments, by adopting and adopting many means and tools to transform into a complete mechanism in the virtual tourism media industry process, according to the latest methods. It is used internationally to provide tourists with the ability to visually obtain information and data about tourist sites. Virtualization through modern digital platforms keeps pace with all the data and requirements of digital transformation at the present time through the online information network and electronic press, in addition to a set of features represented in interaction, attractiveness, speed, and timeliness in attractive tourism marketing.

Digital Modeling Applications in Tourism Marketing (DEM) is a digital elevation model based on the use of satellite imagery in 3D ground modeling. This means making three-dimensional digital maps (contour maps) through which it is possible to study all forms of the Earth's surface and the factors affecting it within tourist sites. Modeling aims to simulate reality or create simplified models of the world.

Virtual Reality Modeling Language (VRML) is used in many applications (Loureiro *et al.* 2020). One of these applications is the applications in risk management in adventure tourism. For example, any adventure tourism path is represented so that the tourist, before the visit, can know it, know the natural and vital components available in the tourist site, and the services provided before going to it. The representation of the model depends on how well the designer represents the area, and the materials he uses, in order for the prepared model to become more realistic.

These technological means are also used to know the future of tourist trails in adventure tourism sites, by building conceptual models for the establishment of tourist trails. These systems provide the possibility of visualizing the tourist path in a stereoscopic way before using it, as well as representing the infrastructure and how it is formed and the extent of its impact on the structure of the ecological tourist site.

3. Nanosatellites: A New Horizon for Entrepreneurship in Virtual Tourism Media

The international tourism industry in this century is directly dependent on digital technologies (Melović *et al.* 2023). The World Tourism Organization (WTO) launched the theme of smart digital tourism in 2018; This shows the importance of digital technology in the tourism industry at an international level. Therefore, all those responsible for marketing the Jordanian tourism product must keep abreast of the rapid technological developments in the modern tourism industry worldwide, especially in the style of adventure tourism. In light of the foregoing, the launch of the SAT-JYI satellite came as a culmination of enabling the capabilities of the digital media sector to market Jordanian digital tourism, which is a pioneering and innovative step in developing the Jordanian tourism sector system and raising marketing capabilities according to international standards. data in the current era, and to achieve a competitive and comparative advantage for Jordanian tourism.

The advantages of the Jordanian satellite are the management and development of tourism sites, especially the World Heritage sites in Jordan, which are registered with UNESCO, by linking these sites with digital marketing platforms and international search engine sites. This contributes to linking these Jordanian tourist and archaeological sites with international tourism offices and international airlines and providing direct broadcasting capabilities on a sustainable basis, facilitating the optimal marketing process for these sites and increasing their ability to network with international sites through the direct broadcast service.

Nano-satellites are new, which opens a wide field in developing the capabilities of the tourism industry in Jordan, by providing three-dimensional images, and providing interactive digital maps of topographic and geomorphological tourist maps based on GIS technologies and remote query (Cowen 2021). This contributes to

the continuous development and deepening of artificial intelligence concepts and their integration into the Jordanian tourism industry using the space technology system. One of the most prominent programs that work according to artificial intelligence data and rely on nano-satellites is the Earth Viewer program, which depends on providing us with 3D panoramic tourist images with 360-degree viewing angles, and enables the tourist to learn more. The structure of the Jordanian tourist and archaeological sites at different times, especially the period of sunset and sunrise, and the tour guide helps in explanation and clarification.

The nanosatellites contribute to supporting, supporting, and enabling tourism institutions to carry out their work with superior capabilities through the GNSS system, which works to provide digital platforms for young people and develop electronic games. In addition, it is working to develop the capabilities of the Jordanian tourist guide according to the latest international standards and technological requirements in managing the movement of tourist groups within archaeological and heritage sites, in addition to providing an electronic marketing guide for the Kingdom in temporal and spatial sequence, in addition to many other countless applications.

Therefore, work must be done to enhance and raise the level of digital tourism cybersecurity in all sectors of communications and information technology in the modern tourism industry. It is also necessary to identify the most prominent technical, procedural and technical means to confront cyber-attacks and strengthen the information security policy in the modern tourism industry. In the era of digital virtual tourism, cybersecurity has become the largest role in repelling and preventing any electronic attack on digital databases.

4. Techniques of Digital Robots and Artificial Intelligence in The Marketing of Tourist Sites

The current century is characterized by the emergence of digital robotics and artificial intelligence techniques and their applications in the tourism media industry. There are many applications of artificial intelligence in all parts of the modern tourism, hospitality, and aviation industry. The most prominent applications in this field are the integrated digital management of archaeological and heritage sites, which contributes to increasing the development, marketing, and sustainable development of these sites.

Artificial intelligence techniques rely on digital simulation and modeling directly in managing archaeological and heritage sites, in addition to successive technologies in displaying digital tourist sites, many of which have become dependent on these techniques. This aims to increase supply opportunities, diversify the tourism product, and obtain a larger market share in the global tourism map, which has earned it many comparative and competitive advantages in the modern tourism industry based on modeling techniques, glasses based on virtual reality, multilingual digital tourist guidebooks, iris scans, photo, and others. It is one of the many digital means and tools based on artificial intelligence techniques, which have become essential in the modern adventure tourism industry. It is not limited to large tourist facilities, but extends to medium, small, and micro tourist facilities, which contributes to achieving significant economic savings in addition to the ability to get rid of value chain problems, achieve high added value and activate the networking system.

There are many applications of artificial intelligence in adventure tourism, and one of the most prominent applications in this field is the simulation of archaeological and heritage sites in an integrated digital comprehensive manner, which contributes to increasing the sustainable development of these sites and providing optimal digital platforms to identify the tourist site electronically; With the aim of achieving sustainability in optimal marketing, management and development processes.

AI in the tourism industry has a tremendous ability to instantly interact with data and link it to heritage and archaeological sites, tour group members, and tour guides. Getting to know the environment of tourist sites using traditional media is no longer acceptable at the present time, which is characterized by the limited capabilities that can be provided to tourists and tourist offices in a comprehensive manner and the multiple options available through multiple technologies (Shniekat *et al.* 2021; Al-Rawashdeh *et al.* 2023).

With the growing entry of artificial intelligence applications in the tourism media industry and other creative fields in the digital tourism industry, and despite the many advantages it offers in this field, it is still in the early stages in Jordan and has not reached the required maturity stage due to the limited digital data that deals with sites tourism within databases available in Jordan (Jawabreh, O., Masa'deh 2023; Jawabreh *et al.* 2023b).

Artificial intelligence techniques can provide the tourist guide and tourist with tourist content and information according to interests and preferences, and this is done based on the search algorithm. Artificial intelligence systems can help tourism offices that work in the field of diving tourism and rely on digital artificial intelligence techniques by doubling their profits and achieving economic savings; that is through its ability to distinguish the tourist and tourist offices and their ability to register in tourism programs on its electronic platform and notify him with advertisements tailored to his interests in order to pay and subscribe again.

5. The Application Interface of the Proposed System for Marketing Virtual Tourist Trails in Jordan: Planning Parameters

To access the proposed platform, several separate subsystems are built and perform one function, i.e. the input is a single digital map, and one operation is performed on it (Buffer), and these systems comply with the previously mentioned schematic systems and standards.

5.1 The Stage of Assembling the Sub-Systems into One Comprehensive and Integrated System

This stage is concerned with integrating and installing the single sub-systems, into one comprehensive and integrated system, with the aim of designing an electronic interface to display the virtual tourist trails, consistent with the design elements of the electronic map, and containing several elements as shown in Figure (1), which are:

- 1- The panoramic view of the virtual tourist path (Panorama Image).
- 2- Data and information about virtual tourist tracks (Tour Information Tracks Image).
- 3- The name of the default tourist path (Tour Name Tracks).
- 4- List of panoramic images of all parts of the virtual tourist trails (Thumbnail).
- 5- Tourist track control buttons through the availability of a number of commands represented in increasing, minimizing, previous, and next (Tour Tracks Image Control).
- 6- A digital map showing all parts of the virtual tourist tails.

Figure 2. The proposed system for virtual tourist itineraries

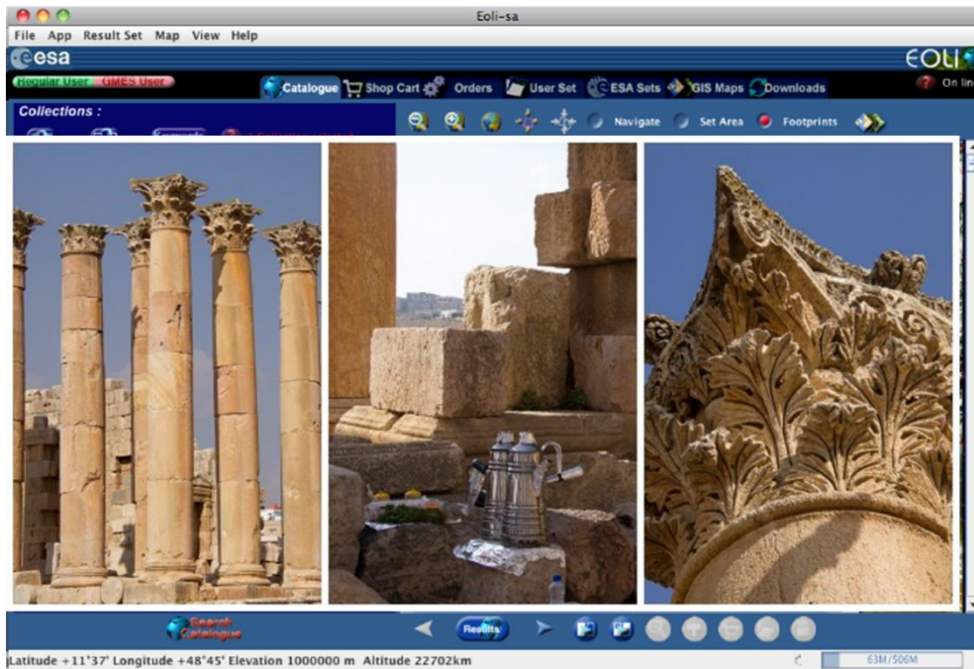


Source: Created by researchers using ARCGIS 10.3

5.2 Characteristics of Panoramic Images Representing Virtual Tourist Itineraries

The natural and human components of the tourist sites play a major role in shaping the urban mass, visually and functionally, represented in the visual formation. The virtual panoramic images representing the surface features also have a major role in helping the tourist direct the vision axes towards desirable tourist scenes, making use of the three-dimensional representation. The tourist can move and move within the tourist sites at a horizontal angle of 360 degrees and a vertical angle of 180 degrees, which provides a wide image representative of the tourist site, by merging a group of panoramic images merged together, allowing the possibility of roaming through the tourist site with flexibility and freedom of choice, and in all geographical directions, with the possibility of adding sound effects, and this is illustrated in Figure (2).

Figure 3. Characteristics of the panoramic images representing the virtual tourist tails

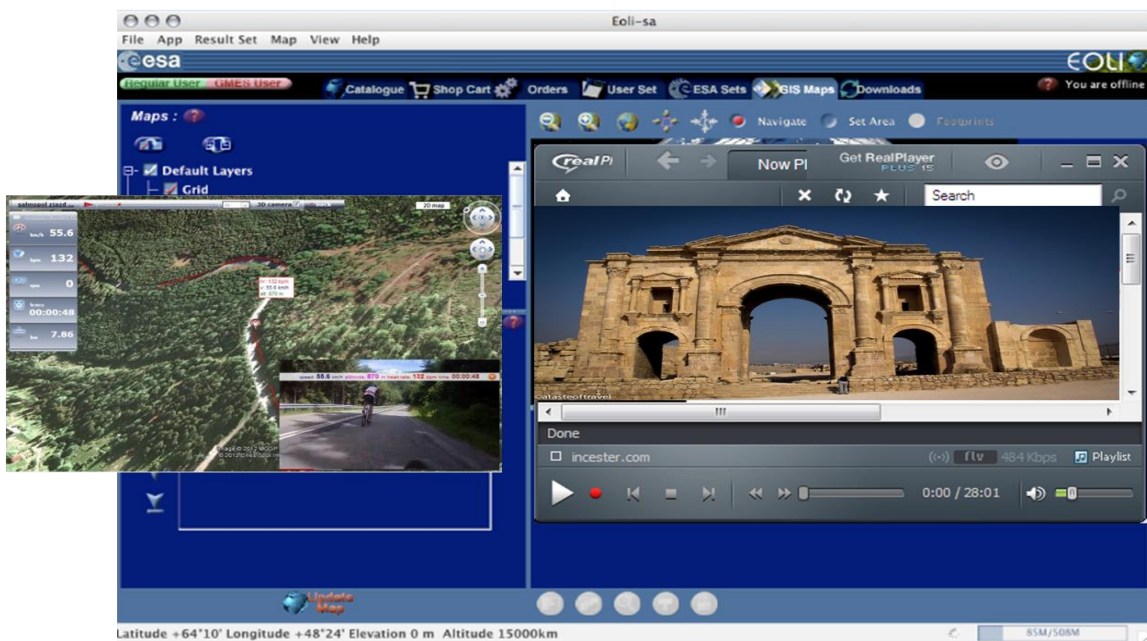


Source: Prepared by the researchers using ARCGIS 10.3

6. Advantages of Virtual Tourist Tails that Represent the Tourist Site

Interactive Virtual Reality technologies contribute to providing several alternatives to roaming within tourist sites through multiple links called hotspot links (Fischer *et al.* 2022). Hotspot links point to several guideposts for navigating between parts of a tourist path; With the aim of providing the possibility of interactive transition according to a predetermined scenario and providing accompanying information in the form of video films and sound effects, and this is evident in Figure (3). The tourist tails are also characterized by the presence of a number of symbols in the form of points that show the beginning and end of the tourist path in an interesting way that depends on the element of excitement, which contributes to the optimal tourism marketing of the tourist sites.

Figure 4. Possibilities of creating objects to provide information in the form of videos and sound effects



Source: Prepared by the researchers using ARCGIS 10.3

6.1 Hyperlinks between Virtual Tourist Trails and the Digital Map

The proposed system for marketing virtual tourist trails for tourist sites in Jordan links the virtual tourist trails of the most prominent tourist sites in Jordan with the website of the Jordanian Ministry of Tourism (www.mota.gov.jo) linked to software technologies (ARCGIS 10) and is based on the electronic tourism map. The system signs all the locations of the virtual tourist tracks on the three- and two-dimensional digital map, with the addition of icons on the map showing the tourist and archaeological sites that contain the main and secondary tourist tracks, providing search alternatives, displaying images and metadata (attributes data), as shown in Figure (4).

Figure 5. Providing search alternatives, displaying images and metadata (Attributes Data)

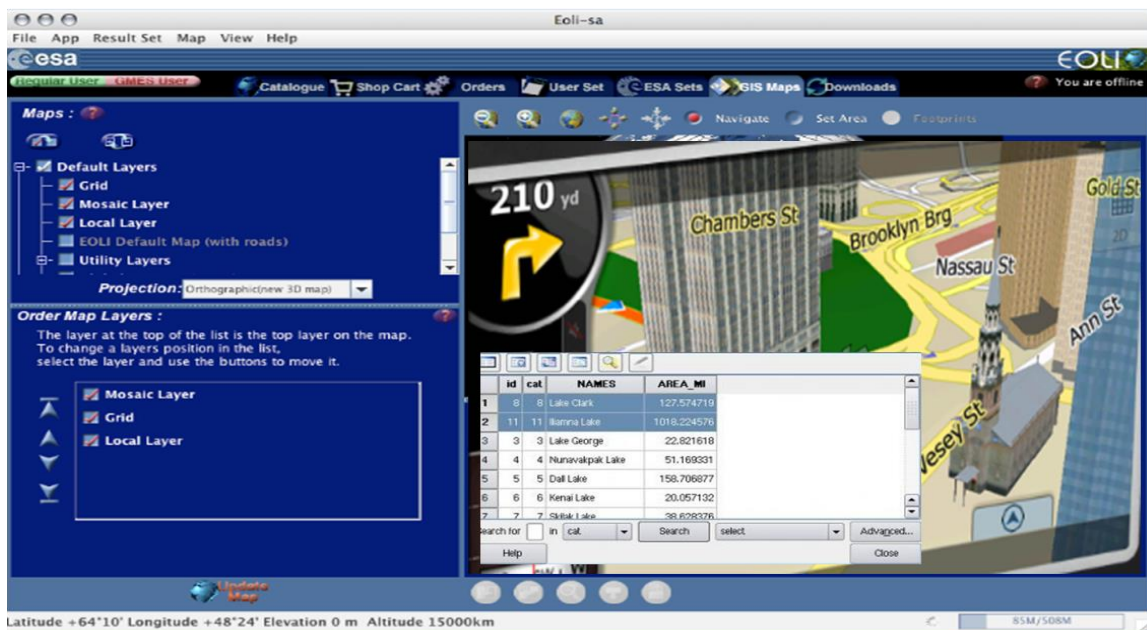


Source: Prepared by the researchers using ARCGIS 10.3

The virtual tourist trails can be accessed using the search icon in the electronic tourist map, within the main menu, which provides a wide-view imaging system and location using (GPS) techniques, taking real measurements of the components of the tourist sites, and measuring the distances between the parts of the tourist site, as shown in the figure. (5).

The interactive environment of the virtual tourist trails allows the integration of all institutions based on the management and development of the tourism sector from the possibility of exchanging data and information electronically, as shown in Figure (6).

Figure 6. Provides the possibility of measuring the real distances and measurements of the virtual elements



Source: Prepared by the researchers using ARCGIS 10.3

Results

The findings of the study revealed that there are many uses of interactive techniques for virtual reality, according to the multiplicity of applied fields used in tourism marketing. These uses depend on the different points of view on identifying and categorizing the objectives of their application, and this is what was shown through the study. In addition, the marketing of virtual tourist tails for tourist sites in Jordan using interactive Virtual Reality techniques is characterized by saving time and effort, conducting analyzes, and reaching accurate results. Moreover, Virtual Reality techniques can perform many tasks in electronic tourism marketing, including the ability to use multi-purpose maps, in addition to the system's ability to perform various spatial analyzes. The application of Virtual Reality techniques in marketing virtual tourist tails for tourist sites in Jordan is also characterized by the availability of a huge amount of information and therefore needs unconventional ways to deal with it, and by defining specifications and criteria operating the electronic tourist map, which made it possible to obtain several alternatives for tourist sites. It is possible to set priorities and arrange the alternatives in an automated manner according to the percentages of their achievement of the required specifications. Thus, the proposed system for virtual tourist tails supports the marketing strategies of the Jordanian tourism product.

Recommendations

Therefore, the study recommends the necessity of establishing a special unit in the Jordanian Ministry of Tourism to develop a comprehensive plan for the virtual tourist tails in light of the integrated electronic programs to determine the priorities of the marketing process for the tourist sites. Additionally, it is suggested to expand the use of Virtual Reality technology in the marketing operations of tourist sites in Jordan. Also, the study recommends developing a clear methodology (Terms of Reference) for the use of Virtual Reality technologies in the marketing and development processes of tourist sites, to create virtual tourist itinerary applications for devices (I phone and I pad), the expansion of 3D imaging of tourist sites in Jordan, and to providing the ability to view virtual tourist tracks on CDs that can be viewed and played without an internet connection.

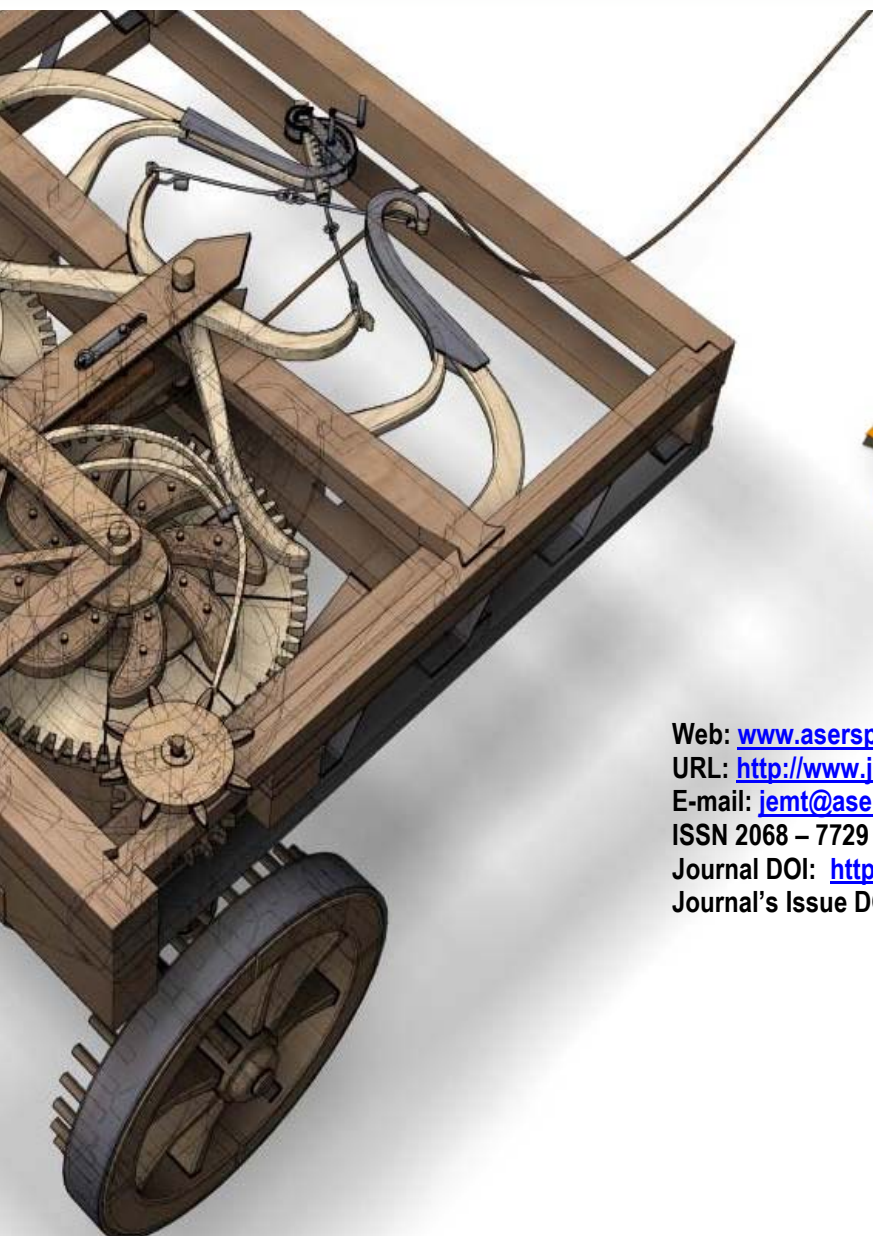
References

- [1] Al Fahmawee, E., and Jawabreh, O. 2022. Narrative architectural interior design as a new trend to enhance the occupancy rate of low-class heritage hotels. *New Design Ideas*, 6(2): 207-228.
- [2] Alananzeh, O. A., et al. 2015. Managing promoting tourism products of the golden triangle in Jordan. *International Journal of Humanities and Social Science*, 5(9): 197-207.
- [3] Alananzeh, O., et al. 2023. The Impact of Job Stability, Work Environment, Administration, Salary and Incentives, Functional Justice, and Employee Expectation on the Security Staff's Desire to Continue Working at the Hotel, *J. Stat. Appl. Pro.* 12(2): 425-439. DOI: <http://dx.doi.org/10.18576/jsap/120209>
- [4] Alananzeh, O.A., Masa'deh, R., and Bazazo, I.K. 2023b. *Ebb and Flow Theory in Tourism, Hospitality, and Event Management*. In: Alshurideh, M., Al Kurdi, B.H., Masa'deh, R., Alzoubi, H.M., Salloum, S. (eds) *The Effect of Information Technology on Business and Marketing Intelligence Systems. Studies in Computational Intelligence*, vol 1056. Springer, Cham. DOI: https://doi.org/10.1007/978-3-031-12382-5_130
- [5] Al-Rawashdeh, O., and Jawabreh Ali, B. 2023. Supply Chain Management and Organizational Performance: The Moderating Effect of Supply Chain Complexity. *Inf. Sci. Lett.* 12(3): 1673-1684. DOI:<http://dx.doi.org/10.18576/isl/120351>
- [6] Armstrong 2022. *Emerging Technologies and the Changing Nature of Work in GIS*. In Proceedings of GIS/LIS'97, Cincinnati, Ohio. pp. 800-807.
- [7] Bazazo, I.A. and Alananzeh, O.A. 2020. Developing Geomorphologic Tourism in the Valleys of the Eastern Coast of the Dead Sea. *Journal of Environmental Management and Tourism*, (Volume XI, Fall), 6(46): 1416 - 1426. DOI: [10.14505/jemt.v11.6\(46\).12](https://doi.org/10.14505/jemt.v11.6(46).12)
- [8] Bazazo, I.A. and Alananzeh, O.A. 2020. The Implementation of international standards' and specifications (ISO-SCUBA) on improving the quality of diving tourism in aqaba, Jordan. *GeoJournal of Tourism and Geosites*, 33(4). DOI: [10.30892/qtg.334spl](https://doi.org/10.30892/qtg.334spl)
- [9] Bazazo, I.K.; Alananzeh, O.A. and Alrefaie, S.A. 2022. Applications of digital models in integrated management in smart tourist cities: Aqaba city of Jordan as a case study. *GeoJournal of Tourism and Geosites*, 40(1): 313-318. DOI: <https://doi.org/10.30892/qtg.40137-833>

- [10] Berry, J. K. 1991. *GIS in island resource planning: A case study in map analysis*. Geographical Information Systems. Harlow, Longman
- [11] Coppock, J. T., and Rhind, D. W. 2022. *The History of GIS*. In D. J. Maguire, M. F. Good child, & D. W. Rhind (editors), *Geographical Information Systems: Principles and Applications* (Vol. 1). Harlow, U.K.: Longman Group. pp. 21-43.
- [12] Cowen, D. J. 2021. *GIS versus CAD versus DBMS: what are the differences?* In D. J. Peuquet, & D. F. Marble (editors), *Introductory Readings in Geographic Information Systems*. London: Taylor & Francis. pp. 52-61.
- [13] Fischer, M. M., Scholten, H. J., and Unwin, D. J. 2022. *Geographic information systems, spatial data analysis and spatial modelling: an introduction*. In M. Fischer, Henk J. Scholten, David Unwin: *Spatial Analytical Perspectives on GIS*, Routledge. DOI: <https://doi.org/10.1201/9780203739051>
- [14] Godovykh, M., Baker, C., & Fyall, A. 2022. VR in Tourism: A New Call for Virtual Tourism Experience amid and after the COVID-19 Pandemic. *Tourism and Hospitality*, 3(1): 265–275. MDPI AG. Retrieved from DOI:<http://dx.doi.org/10.3390/tourhosp3010018>
- [15] Goodchild, M. F., Haining, R., and Wise, S. 2021. Integrating GIS and spatial data analysis: problems and possibilities. *International Journal of Geographical Information Systems*, 6(5): 407-423.
- [16] Haines, Y. 2022. Countryside Information System: An information System for Environmental Policy Development and Appraisal. *Geographical Systems*, 1(4): 329–345.
- [17] Hanna, and. Millar 2021. Promoting Tourism on the Internet. *International Journal of Tourism Management* 18(7): 469-470.
- [18] Jahmani, A., Jawabreh, O., Abokhoza, R., and Alrabei, A.M. (2023). The Impact of Marketing Mix Elements on Tourist's Satisfaction towards Five Stars Hotel Services in Dubai during COVID-19. *Journal of Environmental Management and Tourism*, (Volume XIV, Spring), 2(66): 335 - 346. DOI:[10.14505/jemt.v14.2\(66\).04](https://doi.org/10.14505/jemt.v14.2(66).04)
- [19] Jamal, and. Getz 2021. "Collaboration Theory and Community Tourism Planning. *Annals of Tourism Research*, 22: 186-204.
- [20] Jawabreh, O., Mahmoud, R., Alananzeh, O. and Ali, B. 2023c. An Empirical Analysis of the Factors Influencing Online Meal Delivery Services, *J. Stat. Appl. Pro.*, 12(2): 415-423. DOI:<http://dx.doi.org/10.18576/jsap/120208>
- [21] Jawabreh, O., Masa'deh, R. 2023. *The Impact of Marketing, Technology and Security Orientations on Customer Orientation: A Case Study in Jordan*. In: Alshurideh, M., Al Kurdi, B.H., Masa'deh, R., Alzoubi, H.M., Salloum, S. (eds) *The Effect of Information Technology on Business and Marketing Intelligence Systems*. Studies in Computational Intelligence, vol 1056. Springer, Cham. DOI: https://doi.org/10.1007/978-3-031-12382-5_131
- [22] Jawabreh, O., Masa'deh, R., Bqaa'een, Y., and Alshurideh, M. 2023a. *Pricing Policies and Their Impact on Customer Satisfaction*. In: Alshurideh, M., Al Kurdi, B.H., Masa'deh, R., Alzoubi, H.M., Salloum, S. (eds) *The Effect of Information Technology on Business and Marketing Intelligence Systems*. Studies in Computational Intelligence, vol 1056. Springer, Cham. DOI: https://doi.org/10.1007/978-3-031-12382-5_138
- [23] Jawabreh, O., Masa'deh, R., Yassen, T., and Alshurideh, M. 2023b. *The Impediments of the Application E-Business to Classified the Restaurants in the Aqaba Special Economic Zone*. In: Alshurideh, M., Al Kurdi, B.H., Masa'deh, R., Alzoubi, H.M., Salloum, S. (eds) *The Effect of Information Technology on Business and Marketing Intelligence Systems*. Studies in Computational Intelligence, vol 1056. Springer, Cham. DOI:https://doi.org/10.1007/978-3-031-12382-5_41
- [24] Loureiro, S. M. C., Guerreiro, J., and Ali, F. 2020. 20 years of research on virtual reality and augmented reality in tourism context: A text-mining approach. *Tourism Management*, 77, 104028 DOI:<https://doi.org/10.1016/j.tourman.2019.104028>

- [25] Maaiah, B., Al-Shorman, A., Alananzeh, O. and Al-Badarneh, M. 2019. The dynamic role of augmented reality in tourism. *Tourism Culture & Communication*, 19(1): 43-53. DOI:<https://doi.org/10.3727/109830419X15489421397255>
- [26] Magige, J.M., Jepkosgei, C., and Onywere, S.M. 2020. *Use of GIS and Remote Sensing in Tourism*. In: Xiang, Z., Fuchs, M., Gretzel, U., Höpken, W. (eds) *Handbook of e-Tourism*. Springer, Cham. DOI:https://doi.org/10.1007/978-3-030-05324-6_118-1
- [27] Maguire, D. J. 2021. *An overview and definition of GIS*. In D. J. Maguire, M. F. Good child, & D. W. Rhind (editors), *Geographical Information Systems: Principles and Applications* (Vol. 1). Harlow, UK: Longman Group. pp. 9-20.
- [28] Mango, J., Çolak, E., and Li, X. 2021. Web-based GIS for managing and promoting tourism in sub-Saharan Africa. *Current Issues in Tourism*, 24(2): 211-227. DOI: [10.1080/13683500.2019.1711028](https://doi.org/10.1080/13683500.2019.1711028)
- [29] Marble, D. F. 2021. *Geographic information systems: an overview*. In D. J. Peuquet, & D. F. Marble (editors), *Introductory Readings in Geographic Information Systems*. London: Taylor & Francis. pp. 8-17.
- [30] Marina T. 2020. *Development & Potentials of Ecotourism on Balkan Peninsula* In D. J. Peuquet, & D. F. Marble (editors), *Introductory Readings in Geographic Information Systems*. London: Taylor & Francis. pp. 30-51.
- [31] Melović, M., Baynazoğlu, M.E. and Šerić, N. 2023. Family businesses in tourism – the use of digital technologies in times of uncertainty and crisis. *Journal of Family Business Management*, 13 (1): 185-209. DOI: <https://doi.org/10.1108/JFBM-06-2022-0086>
- [32] Saleh, M., Jawabreh, O., Al-Amro, S. and Saleh, H. 2023. Requirements for enhancing the standard of accounting education and its alignment with labor market requirements a case study hospitality and industrial sector in Jordan, *Journal of Sustainable Finance & Investment*. DOI: [10.1080/20430795.2021.1891781](https://doi.org/10.1080/20430795.2021.1891781)
- [33] Saleh, M.M.A., Omar Jawabreh, O. and Abu-Eker, E.F.M. 2023. Factors of applying creative accounting and its impact on the quality of financial statements in Jordanian hotels, sustainable practices. *Journal of Sustainable Finance & Investment*, 13(1): 499-515. DOI: [10.1080/20430795.2021.1962662](https://doi.org/10.1080/20430795.2021.1962662)
- [34] Shniekat, N., Saleh, M., Jawabreh, O. and Al Omary, R. 2021. Artificial Intelligence (AI) and the impact of enhance the consistency and interpretation of financial statement in the classified hotel in Aqaba, Jordan. *Academy of Strategic Management Journal*, Volume 20, Special Issue 3.
- [35] Smriti Kumari. 2021. *Remote Sensing and GIS Based Ecotourism Planning: A Case Study for Western Midnapore, West Bengal, India*. Columbus: Merrill Publishing Company.
- [36] Streimikiene, D. and Korneeva, E. 2020. Economic impacts of innovation in tourism marketing. *Terra Economicus*, 18 (3): 182-193.
- [37] Tomlinson, R. F. 2021. *Geographic Information Systems - a new frontier*. In D. J. Peuquet, & D. F. Marble (editors), *Introductory Readings in Geographic Information Systems*. London: Taylor & Francis. pp. 18-29.

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