BUCOVINA TOURISM IN THE AGE OF DIGITIZATION

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Abstract
Tourism in the age of digitalisation or Tourism 4.0 is an important element for the competitiveness, growth and sustainability of tourism enterprises. Digitisation and technological development helps tourism enterprises to be competitive in the global market. Therefore, the topic provides an analysis of the concept of tourism 4.0 and digital technologies such as artificial intelligence, virtual reality, augmented reality, big data, Internet of Things, blockchain, mobile technologies, cloud computing, robotics and social media in tourism. The insights analysed bring to the fore the ability of digitisation to add value to tourism products and experiences, provide many new opportunities for business and contribute to customer satisfaction and sustainable tourism development. This highlights the potential of Tourism 4.0 to make a decisive contribution to the sustainable development of tourism. Tourism 4.0 technologies offer many facilities as well as those that contribute to personalising the customer experience, obtaining information on traveller preferences and behaviour; flexibility in booking and cancellation policies and not least tourists use technology and mobile applications to search for up-to-date information.

Key words: *Bucovina, technology 4.0, tourism 4.0, artificial intelligence, virtual reality.*

JEL Classification: *L83, O14, Z23.*

I. INTRODUCTION

The increased interest in tourism in Bucovina can be seen from the fact that there are currently 1420 companies operating in the HoReCa sector (www.antena3.ro) according to the Executive President of the Suceava Chamber of Commerce and Industry. It should be noted that Bucovina is the first Tourism Destination Management Organization (DMO) which aims to develop tourism by associating all entities working in the field of tourism. The launch of the Bucovina Tourist Resort also aims to increase the offer for visitors to the area: "Snow Train", extension of the ski programme in Vatra Dornei, Câmpulung Moldovenesc and Gura Humorului, "Mocănița" train excursions in Vatra Moldoviței, etc.

An important player in this WCO is the municipality of Suceava. It has been selected among the 100 smart cities in Europe. One of the pressing needs of the area is the construction of high-speed roads and motorways, which would allow easy access for tourists and the development of localities at risk of depopulation.

Technology is an important asset for promoting tourism. The launch of Romanian satellites, etc. An important aspect is also the possibility of attracting funding both for investment in renovation and restoration and for funds to develop tourist infrastructure.

Bucovina has a special natural and cultural heritage which helps to develop tourism. These elements have helped to create 25 tourist resorts (of local, national or international interest) at county level.

The benefits brought to tourism in the current context - of the digitalisation era - are translated by the introduction of elements such as:

- posting tourist information plaques with QR code in the online environment (historical monuments plaques; plaques in the North-East region of Romania; tourist resorts plaques; plaques with churches; plaques with monasteries; plaques with leisure parks; plaques with dendrological parks; plaques with fortresses, etc.). The physically mounted plaques also have a QR code in their content. The plaques are protected by the O.S.I.M. against copying. Through the QR code the tourist will have a better understanding of what Romania has to offer and, at the same time, an unforgettable experience. The tourist is sent to a website where he can read about the tourist attraction or historical monument and find interesting information (in several international languages)...
- Information such as legends, stories, living treasures from each region of Romania can be accessed via the internet (https://www.travellerinromania.com/). This has been achieved with the help of European projects.
- Through the implementation of projects by associations, organisations, institutions, economic agents, etc., both domestic and international tourists are presented with traditional dishes from each region of Romania, folk costumes, tourist attractions, etc. These actors encourage tourism, save heritage and help to discover Romania.
- Blogs where travel experiences are shared and prepare you for your next adventure: Răzvan Pascu's blog, Imperator Travel blog, Daily Travel Pill

blog, etc. (www.recenziidetop.ro/bloguri-de-calatorii/).

- Social networks that bring new opportunities, which offer increased customer satisfaction and competitive advantage.

II.METHODOLOGY USED

The purpose of the paper derives from the particular importance given to performance within economic entities in the tourism industry and the need to adapt them to the new trends and challenges imposed by Industry 4.0. Exposure to Industry 4.0 specific technologies and their ability to create an advanced tourism environment by improving the traveller experience and streamlining operations in the tourism industry. Review literature and available media resources to develop a solid theoretical foundation and understanding of key concepts related to Industry 4.0 performance. The objectives of our paper are concretized by describing and defining the contribution of Industry 4.0 in creating tourism business performance and enriching customer experience; implementing 4.0 technologies and investigating tourism consumer behaviour.

III.TECHNOLOGY 4.0 IN TOURISM

Bucovina is a region with countless tourist attractions - historical monuments, churches, cathedrals, monasteries, ethnographic collections, monuments, house museums, museums, CFR railway stations, traditional factories, pottery workshops, stud farms, heritage buildings, zoo, tourist resorts of local / national and international interest, Bucovina folk costume, Bucovina gastronomy, accommodation - villas, holiday homes, pensions, motels, hotels, various Bucovina traditions (winter holidays, festivals on the occasion of local days, cultural events dedicated to Bucovina Day; Easter in Bucovina; Hora Bucovina; Stefananian Festival - 2 July at Putna Monastery; International Folklore Festival "Bucovina Encounters" - European event organized every year from May to October in five European countries Poland, Hungary, Ukraine, Republic of Moldova and Romania; Pilgrims in Bukovina - 15 August in Putna the feast of the Assumption of the Virgin Mary, in Cacica the Catholic faithful celebrate the Virgin Mary and in Hagigadar the Armenian community honours the Mother of God; the Fair of Folk Craftsmen: 22 - 24 June in Suceava "Lume, lume...hai la târg"; "Ștefan cel Mare" Medieval Art Festival in Suceava; National Trout Festival in Ciocănești - fishing competition, cooking demonstrations, rafting demonstrations on the Bistrița Aurie, shows, etc. ; Mountain Festival; Rock Fortress of Suceava; Autumn Fair "Produced in Bucovina" in Suceava; "Ciprian Porumbescu" Festival - various artistic events; Christmas in Bucovina - with the aim of promoting winter traditions and customs in Bucovina etc.).

However, nowadays, changes in tourist destinations occur as a result of the life cycle of commercial products, the carrying capacity of the territory and the evolution of tourist destinations. Therefore, in the course of time tourist destinations have gone through a development process by going through stages (exploration, involvement, development, consolidation, stagnation, decline or stagnation), regarding accommodation units, regarding the number of tourists, regarding the type of holiday, regarding the supporting interventions for tourism development.

Industry 4.0" is now also being applied to tourism, where "Tourism 4.0" is an innovative and promising approach. It is defined by access to advanced technologies, improved added value in the tourism industry, efficiency in the tourism sector, professional development of staff and collaboration between stakeholders (Goriup & Ratkajec, 2021).

At the same time we show that "Tourism 4.0" is more than e-Tourism and m-Tourism. "Tourism 4.0" focuses on the massive use of data collected from travellers to create personalised experiences, integrating advanced and innovative technologies into tourism processes and services (Manjari, 2018). In other words, E-Tourism refers to the digitisation of tourism establishments and the use of the internet to deliver tourism services, and M-Tourism involves the use of mobile devices for tourism-related interactions. These insights highlight the potential of Tourism 4.0 in a real-world environment showing that technologies such as virtual and augmented reality can be used to help potential visitors make informed decisions about tourist destinations and to provide additional experiences in places of historical value.

Industry 4.0 is therefore a key contributor to the sustainable development of tourism, a goal pursued by both the World Tourism Organisation (UNWTO) and the United Nations (UN). Technologies used by Industry 4.0 include the Internet of Things (IoT), data analytics, artificial intelligence, collaborative robots and others that are integrated to form cyber-physical systems (CPS) - Figure 1

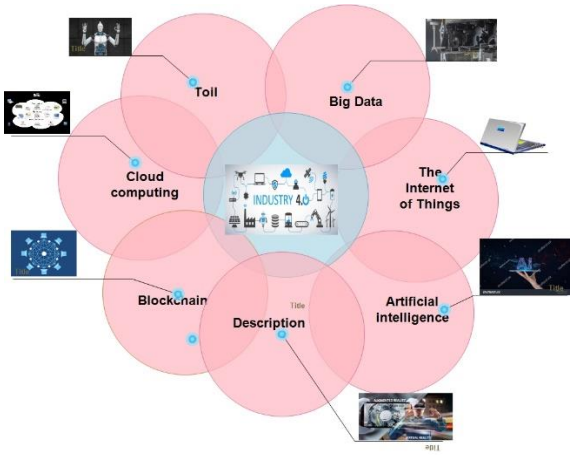


Figure 1 – Industry 4.0 technologies
Source: author's

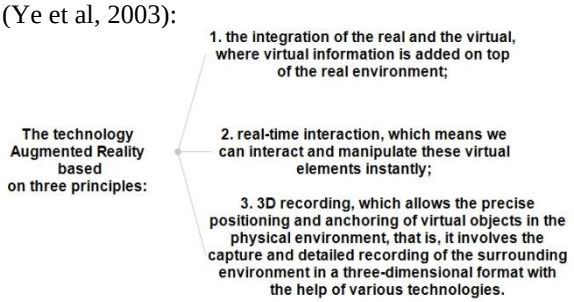
All Industry 4.0 technologies help to create an advanced tourism environment by improving the traveller experience and streamlining operations in the tourism industry.

The key technologies of Industry 4.0 offer many conveniences:

- The Internet of Things (IoT) and its implications for the tourism sector: Personalising the guest experience through centralised control of tech and services in hotels, planes and trains; Facilitating seamless travel by sending information to passengers' smartphones, allowing them to quickly locate luggage or check in at hotels (Revfine, 2020);
- Contributing to smart energy savings by adjusting temperature and lighting according to actual needs; Providing location-specific information, providing tourists with relevant messages about nearby attractions and services available; Enabling real-time monitoring and maintenance of devices, avoiding breakdowns and ensuring optimal device operation.
- Artificial Intelligence (AI) provides an accurate interpretation of external data as follows: it involves the development and implementation of algorithms and computational models that can perform specific tasks, mimicking human cognitive abilities such as learning, problem solving, natural language and image recognition and interpretation (Dwivedi et all, 2019). There is Artificial Intelligence in software (AI applications that are implemented and used in software programs: virtual assistants, image analysis tools, search engines, and voice and facial recognition technologies) and Embedded Artificial Intelligence (the integration of AI into devices and systems: Robots with advanced functionalities, autonomous vehicles, autonomous drones and the Internet of Things (IoT) concept involving interconnected and intelligent objects - all of which become able to collect and interpret data, learn from experience and make autonomous decisions or perform specific tasks without human intervention) (www.europarl.europa.eu). Artificial intelligence helps to gain insights into travellers' preferences and behaviour; security and fraud detection; ensures the security of online transactions and detects potential fraud; ensures travel-related issues are resolved.
- Virtual reality (VR) and augmented reality - is about using computer simulated environments to create interactive and intensive experiences (Gutiérrez et al, 2008). So VR helps the tourism industry, marketing, planning management and education (Takada et al, 2022) by providing direct information and personal experiences for customers. Through VR tourists can explore tourist sites, discover inaccessible places or travel to fantasy worlds. The use of VR can have a negative impact on countries dependent on tourism revenues.

Augmented Reality (AR) superimposes virtual objects over the real world, creating a composite perspective. This is made possible when using smart glasses, mobile phones or tablets - through these devices virtual information, images or objects are added to the real view.

This technology is based on three principles (Ye et al, 2003):



The accessibility of AR technologies are beneficial for tourism as they allow for the development of enhanced experiences. The following benefit from these technologies: monuments, historical sites and artefacts; tourist guides by providing relevant real-time information about attractions, interactive maps and restaurant recommendations; in museums interactive 3D models, videos and detailed explanations are added to enrich visits; in eco and adventure tourism information about the natural environment is provided and tourists are guided along different routes (Hassoune & Schneider, 2021).

- Blockchain is a global concept that refers to ledgers that allow data to be stored in an interconnected blockchain, the chain continues to expand and grow as new blocks are added.

Features of blockchain technology are (Zbeng et al, 2018) :

- decentralisation;
- persistence;
- anonymity;
- auditability.

This technology eliminates intermediaries and increases the efficiency of transactions; is efficient in tourism, allowing secure recording and storage of tourist information to avoid manipulation and falsification of data; provides a secure environment for online

payments and prevents financial fraud (Wei , 2022); gives tourists greater control over personal data and efficient management of tourist activities (Pranita, 2023); provides information on the origin and quality of tourist products and services (Puri, 2023).

- Robots have the potential to revolutionise any industry and bring significant benefits in terms of efficiency, performance and competitiveness (Javaid, 2021). In the tourism industry they can perform repetitive and monotonous tasks, allowing staff to focus on customer interaction and the more complex aspects of tourism services. Robots are used in airports; they are used in keeping health measures safe; they are used by companies in the tourism and hospitality industry (Hilton, Worldwide and Starwood) to provide services: concierge robots, waiter robots and butler robots that can deliver goods and facilitate communication with the hotel system (Park, 2020).
- Cloud computing - The National Institute of Standards and Technology (NIST), defines cloud computing as: "a model that enables on-demand, universally accessible, convenient and configurable shared computing resources (such as networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or interaction with the service provider" (Mell & Grance, 2011). There are three cloud computing service delivery models (Birje et al, 2017): figure 2

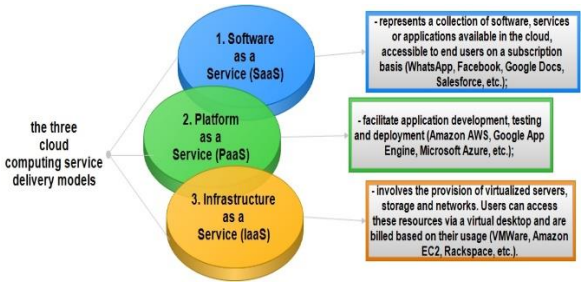


Figure 2 – The three cloud computing service delivery models
Source: author's

Through cloud computing and virtualisation tourists can explore tourist destinations through virtual tours, 3D virtual tours, video presentations or interactive photos.

- Big data is characterised by the continuous generation of large volumes of data/information from different sources: mobile devices, social networks, sensors, machines and more.

According to the Asian Development Bank and the World Tourism Organization (2021), there are 9 major types of data in the tourism industry:

In some situations the benefits of Big Data are costly and challenging because it may be held by third parties, and privacy, data security, oversight and appropriate regulation in tourism are still limited.

Note that most travel agencies in the Bucovina region use 4.0 technologies. In this respect we mention Acces Travel, Bilco Travel, Bucovina TravelHello Bucovina Travel & Tours, Ramona Tourism & Travel, Campion Tour etc.

IV. CONSUMER BEHAVIOR IN TOURISM 4.0

Industry 4.0 has brought about significant changes in tourist behaviour with regard to tourism services. These aspects are drawn from research and literature.

First we show that from the definitions provided in the literature (Kotler & Keller, 2012). Consumer behaviour refers to the process by which individuals make selections, purchases, uses and disposes of products, services, ideas or experiences to fulfil their needs and wants.

At the same time we see that interest in the study of travel behaviour or tourist behaviour is growing in both the marketing and tourism fields. From these studies it is clear that there are a number of factors that influence consumer behaviour in tourism: figure 3.

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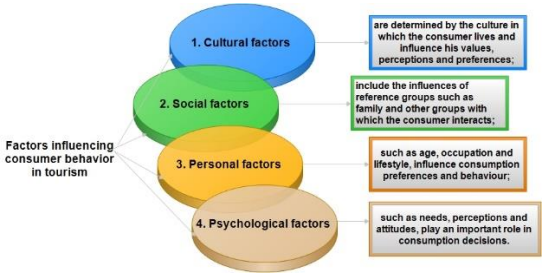
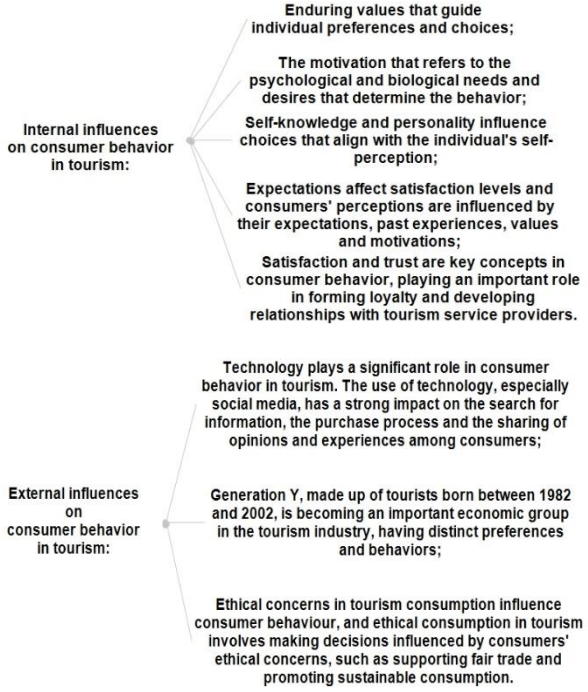


Figure 3 – Factors influencing consumer behaviour in tourism
Source: author's

In the same context we can identify another approach in which the influences on consumer behaviour in tourism are of two kinds: internal influences and external influences (Cohen et al, 2014)



Over the last decade consumer behaviour in travel has changed significantly in terms of travel decision-making. Tourists are becoming more informed about their safety and health, they want real-time information and express a need for benefits in terms of convenience and enjoyment, they value flexibility in booking and cancellation policies, and last but not least, tourists are using technology and mobile apps to seek up-to-date information about destinations, safety measures, booking and contactless payments.

In recent years, tourists have been purchasing travel insurance and cancellation insurance out of a desire to feel safe in case of health problems or unforeseen circumstances that could affect travel plans.

Another defining element of consumer behaviour in travel is defined by requests for personalised travel, such as city-breaks or package holidays made up of combined services - out of a desire for a personalised and satisfying travel experience.

A different situation is also seen in the travel consumer's desire to explore and experience new destinations. These trends are important for tourism service providers who understand that they need to maintain relationships with existing customers and attract new customers through new methods and technologies available in the tourism industry. Industry 4.0 technologies provide tourism service providers with more efficient, personalised and customer-friendly services. Thus, through the use of mobile apps, artificial intelligence they can improve the travel experience and communication with customers, offering them faster and more convenient support.

V. CONCLUSION

We note that the tourism industry is currently facing significant challenges with changing consumer behaviour and adapting to new consumer demands and expectations. Providers and suppliers of tourism services are considering the implementation of Industry 4.0 in order to increase efficiency, innovation and productivity.

In this context, travel agencies are implementing eTrip Agency booking operation systems (it is a software based on Industry 4.0 technology and adopts a cloud deployment model) that can be accessed from anywhere, regardless of location, through internet connected devices (etrip-agency.ro, 2023). This software brings with it digital and automated technologies for efficient management of reservations, customer and supplier relations, invoicing, financial and operational reporting.

The maintenance of travel agency sites can also be done through the Travel Fuse Platform (www.travelfuse.ro/ro_ro, 2023) with which all travel agency suppliers can be integrated. This platform offers the possibility to identify the most suitable holiday packages; to efficiently manage offers and relevant information on the website; to enable customers to book their holidays online directly from the agency website.

Another platform that plays a crucial role in optimising internal processes is Google Drive. It is a cloud-based document storage and sharing platform offered by Google. It is a practical and efficient solution for managing information, eliminating the need to use expensive physical infrastructure for storing and managing documents. This platform allows quick and easy access to essential information and documents anytime, anywhere; facilitates communication and collaboration between team members as well as with customers and business partners; and integrates other useful tools from the Google system such as Google Docs, Google Sheets and Google Slides. Another tool used by tour operators and service providers is Google Maps - which provides detailed information about locations, routes and traffic in real time; it allows you to identify tourist attractions, hotels, restaurants and other relevant services;

We can show that to improve the security system effective monitoring of tourist locations/agents must be implemented Internet of Things (IoT) technology; Artificial Intelligence (AI) must be implemented to provide personalized services and relevant recommendations based on customer preferences and history; a chat-bot on an agency's Facebook page that is available 24/7 can be used

(customers can receive instant assistance and updated information in real time).

All these tools show that the appropriate application of key technologies can help to increase competitiveness and adapt to new market requirements. Studies carried out on the Romanian tourism market show positive financial results for travel agencies as a result of the successful adaptation and integration of advanced technologies into the business.

In conclusion, we show that the emergence and development of 1.0; 2.0; 3.0 and 4.0 technologies have fundamentally changed tourists' perception of the possibilities of information on the tourism market. Due to the fact that access to information is open to everyone and is quick and easy for providers in the tourism industry it is important to create a good reputation in the online environment. This is why tourism companies need to build their marketing strategies around social media. Therefore, travel companies are obliged to evolve and grow online, evolving with society.

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