PASTORAL / RURAL SMART TOURISM

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Abstract: *This paper is an attempt at establishing the features of a new type of tourism – pastoral / rural smart tourism. The authors present concepts such as smart, smart tourism, and smart tourism destination. They also show how to shift from smart city tourism to pastoral / rural smart tourism by using, just like in smart city tourism, innovation and technology to enhance tourist experience and promote sustainability – augmented reality, chatbots, digitisation, Internet of Things, and mobile applications. Great attention is also paid to pastoral / rural smart tourism variables. The materials used in this paper are from the last decade, which points to the increasing interest of researchers in smart tourism.*
Keywords*: smart, smart tourism, smart tourism destination, pastoral / rural smart tourism*

INTRODUCTION

Smart means "(of a device) controlled by a computer, so that it appears to act in an intelligent way" (Oxford Learner's Dictionary). It relies on abilities to infer and reason; big data ("large datasets" – Britannica); new ways of connectivity and exchange of information – Internet of Things, near-field communication, radio frequency identification; open data ("data that **can be freely used, modified, and shared by anyone for any purpose**" – Democracy Technologies); and sensors ("devices which detect or measure a physical property and record, indicate, or otherwise respond to it" – Oxford Languages),

Smart tourism is "tourism supported by integrated efforts at a destination to collect and aggregate/harness data derived from physical infrastructure, social connections, government/organizational sources and human bodies/minds in combination with the use of advanced technologies to transform that data into on-site experiences and business value-propositions with a clear focus on efficiency, sustainability and experience enrichment" (Gretzel et al., 2015, 181, Petroman I. & al 2010, 2013). It is based on four elements: businesses (tourism businesses, businesses from other industries), consumers (tourists, residents), digital technologies, and tourism destination (space governed by destination marketing organisation, government). It should not be confused with **e-tourism** (Table 1).

Table 1. Differences between e-tourism and smart tourism (after Gretzel et al., 2015, 182; Gajdošík, 2018, 27)

	e-Tourism	Smart Tourism
Core activities	booking, searching	co-creation, co-decision, product personalisation
Core technology	websites (Common Reporting Standard, Global Distribution System, Over-the-air, Property Management Software, social media, websites)	sensors and smartphones (including cloud computing, Internet of Things)
Lifeblood	information	big data
Paradigm	interactivity	technology-mediated co-creation
Sphere	digital	bridging digital and physical
Structure	value chain / intermediaries	ecosystem
Travel phase	pre- (dreaming, searching) & post-trip experiences	during trip

Smart tourism destination is derived from the concept of **smart city**, where "smartness is incorporated in mobility, living, people, governance, economy, and environment" (Lopez de Avila, 2015, in Gajdošík, 2018, 29). It is "an innovative tourism destination built on an infrastructure of the state-of-the-art technology, which guarantees the sustainable development of tourist areas, facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life" (Gajdošík, op. cit., 29-30). The concept of tourism destination has evolved from traditional to smart as shown in Table 2 below.

Table 2. Evolution of the concept of tourism destination (after Jovicic, 2017, 5, in Göktaş Kulualp & Sarı, 2020, 380)

Traditional Tourism Destination	Systemic Approach in Tourism Destination	Smart Tourism Destination
- Gathering places and services interest - Lacking cooperation in tourism destination - Lacking tourist role in tourism destination	- Interacting with tourists, service providers and local people in the destination - Keeping contact with the macro-environment - Lacking linear links between stakeholders	- Combining digital and real fields - Cooperating with public and private services - Involving the government - Involving creative and sophisticated people, - Valuing creation and personalized services

Pastoral / rural smart tourism is not yet practiced but, *mutatis mutandis*, it could copy the features of **smart city tourism**, a type of tourism that has enjoyed the attention of researchers in the last decade as shown by the references at the end of this paper. This approach / shift is supported by Gretzel et al. (2015), Aïdi & Fabry (2022), Piras (2024), Petroman & Văduva (2011), Rosário & Dias (2024), and Wu et al. (2024) who claim that "Smart tourism involves multiple components and layers of smart that are supported by ICTs [Figure 1]. On one hand, it refers to Smart Destinations, which are special cases of smart cities: **they apply smart city principles to urban or rural areas** and not only consider residents but also tourists in their efforts to support mobility, resource availability and allocation, sustainability and quality of life/visits."

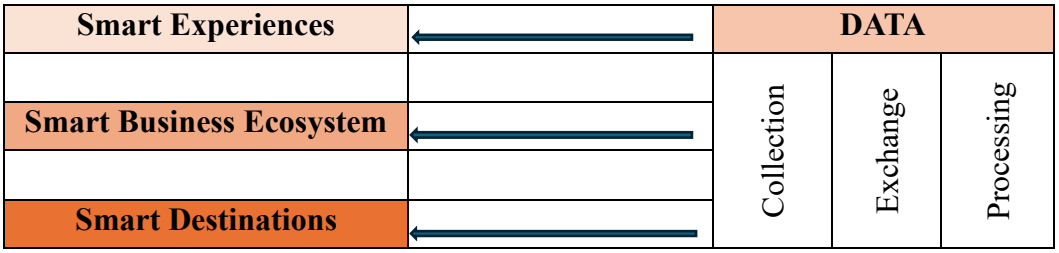

Figure 1. Components and layers of smart tourism (after Gretzel et al., 2015, 3)

MATERIAL AND METHOD

The material used in this study consists of articles on smart cities / concepts / destinations / development / technologies / tourism. The research method consists of analysing the content of the results presented in the researches presented in these articles.

RESULTS AND DISCUSSION

Pastoral / rural smart tourism could be, following the features of **smart city tourism**, a ***form of rural tourism*** that uses innovation and technology to enhance tourist experience and promote sustainability, a way to valorise local specificity and provide tourists an interactive personalized experience to contribute to the sustainable development of rural communities. It includes:

- **Augmented reality to supply supplementary information on buildings and places** (AR – "a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view" – Oxford Languages) (Amanda, Santosa & Rizal, 2018; Gajdošík, 2018; Lee, Cannon Hunter & Chung, 2020; Sabou & Maiorescu, 2020; Nafrees & Shibly, 2021; Aïdi & Fabry, 2022; Liu et al., 2023; Biasin & Delle Foglie, 2024; Chen, Tian & Pei, 2024; Florido-Benítez, 2024; Florido-Benítez & del Alcázar Martínez, 2024; Rosário & Dias, 2024; Wu et al., 2024; Zhang & Deng, 2024);

- **Chatbots to answer tourists' questions and facilitate reservations** (C – "a computer program designed to simulate conversation with human users, especially over the internet" – Oxford Languages) (Gajdošík, 2018; Liu et al., 2023; Florido-Benítez & del Alcázar Martínez, 2024; Rosário & Dias, 2024; Zhang & Deng, 2024);
- **Digitization to digitise tourism offers** ("adapting a system, process, etc. to be operated with the use of computers and the internet" – Oxford Languages) (Gajdošík, 2018; Göktaş Kulualp & Sarı, 2020; Aïdi & Fabry, 2022; Hu, 2022; Biasin & Delle Foglie, 2024; Piras, 2024; Wu et al., 2024; El-Alaloui, Lali & Farhaoui, 2025);
- **Internet of Things to interact with other sources of information** (IoT – "vast array of physical objects [animals, appliances, irrigation systems, lighting systems, localities, phones, security cameras, speakers, thermostats, transponders, vehicles, watches] equipped with sensors and software that enable them to interact with little human intervention by collecting and exchanging data via a network" – Britannica) (Gretzel et al., 2015; Lee, Cannon Hunter & Chung, 2020; Sabou & Maiorescu, 2020; Nafrees & Shibly, 2021; Aïdi & Fabry, 2022; Hu, 2022; Liu et al., 2023; Biasin & Delle Foglie, 2024; Chen, Tian & Pei, 2024; Florido-Benítez, 2024; Florido-Benítez & del Alcázar Martínez, 2024; Rosário & Dias, 2024; Wu et al., 2024; Zhang & Deng, 2024);
- **Mobile applications to enjoy self-guided tours** (MO – "software programs that run on a mobile phone" – Cambridge Dictionary) (Gretzel et al., 2015; Amanda, Santosa & Rizal, 2018; Gajdošík, 2018; Jasrotia & Gangotia, 2018; Göktaş Kulualp & Sarı, 2020; Lee, Cannon Hunter & Chung, 2020; Sabou & Maiorescu, 2020; Nafrees & Shibly, 2021; Aïdi & Fabry, 2022; Hu, 2022; Liu et al., 2023; Chen, Tian & Pei, 2024; Florido-Benítez, 2024; Florido-Benítez & del Alcázar Martínez, 2024; Piras, 2024; Rosário & Dias, 2024; Wu et al., 2024; Zhang & Deng, 2024; El-Alaloui, Lali & Farhaoui, 2025).

Pastoral / rural smart tourism should include the initiatives presented in Table 3.

Table 3. Smart initiatives in tourism destinations (after Gajdošík, 2018,37)

Initiatives	Examples
Attractions	- audio guide - iBeacons - info kiosk - mini-zoo - sensors for crowd monitoring
Accessibility	- 4G internet connection in the pastoral village centre - bike sharing - digital bus stops - free Wi-Fi in pastoral village bus stops / public areas - parking system Sheep Farms - real-time monitoring of public transport
Amenities	- Common Reporting Standard-destination booking engine - energy management system - tourist board
Ancillary	- centre of sheep-farming culture - smart community focused on culture and history - smart pastoral village
Activities	- management of activities in a collaborative-participatory way - quick access to third party leisure source - use of Document Management System
Available packages	- invisible accommodation - smart tourist card - tourist mobile app

Below is a list of **pastoral / rural smart tourism variables** with operational definitions about how they could be used in this new type of tourism (Table 4).

Table 4. Pastoral / rural smart tourism variables with operational definitions (adapted after Amanda, Santosa & Rizal, 2018, 4-5)

Variable	Operational definition
Augmented reality	used to search information
E-commerce	used to buy tourism products
E-complain	used to handle complaints and to give feedback
Emergency system	used to connect security equipment with service facilities at the tourism destination

E-parking system with radio frequency identification	used to pay parking tickets
E-ticketing with radio frequency identification	used to buy tickets
Free Wi-Fi	used to connect to the Internet via wireless connections
Information guidance service (combining GIS and local services)	used to get better travel experience and deeper understanding of the views
Mobile apps	used to search booking places and right locations and to estimate waiting time at tourist attractions
QR code	used to access information about interesting places
Service centre call	used to search information for the travel plan
Signal coverage	used to connect to the Internet
Smart card with radio frequency identification	used to search personal information
Smart education	used to access new technologies and to educate tourists on how to use them
Smart environment	used to optimize energy
Smart guidance system	used to search information
System of electronic entrance security (including Internet of Things systems – security systems, ticketing systems with radio frequency identification)	used to search information
Touch screen devices	used to search information and as an interactive medium of educational games
Tourism destination blog	used to post reviews
Website of tourism destination	used to search information and communicate

These variables can be grouped depending on tourists' preference towards services (Amanda, Santosa & Rizal, 2018, 7):

- **Mobile services**: augmented reality, electronic entrance security system, electronic touch screen, e-parking system, e-payment, e-ticketing, smart card, tourism destination blog,
- **Self-services**: free Wi-Fi, mobile apps, QR code, tourism destination website; (Văduva & Petroman, 2011)
- **Service centre**: service centre call, smart guidance system;

- **Smart services**: e-complain handling, information guidance services, signal coverage, smart education, smart environment.

Of course, the variables presented above are not all compatible with **pastoral / rural smart tourism**, but most of them are, particularly those used to ***search information*** (augmented reality, free Wi-Fi, information guidance service, mobile apps, QR code, service centre call, signal coverage, smart card, smart guidance system, system of electronic entrance security, touch screen devices, website of tourism destination), to **buy tourism products** (e-commerce, e-ticketing), to **give feedback** (e-complain, tourism destination blog), or to **pay services** (e-parking, e-ticketing). In brief, a smart pastoral village should have the dimensions shown in Figure 2.

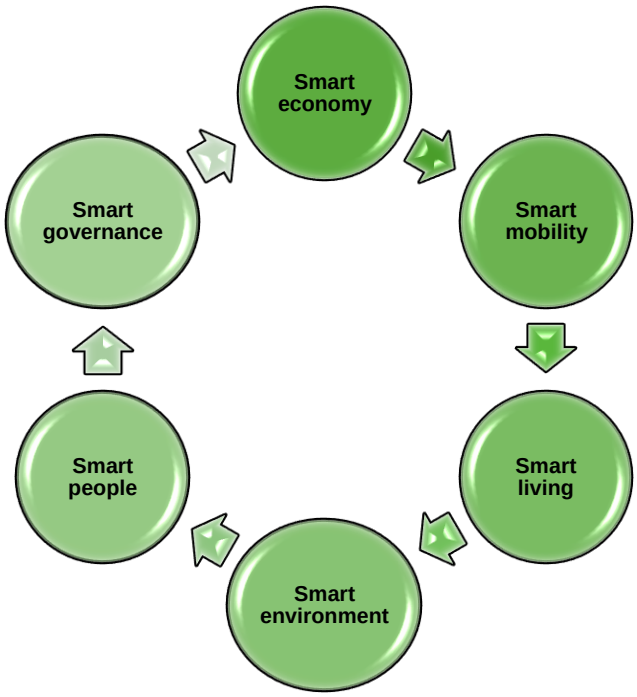

Figure 2. Dimensions of a smart pastoral village (after Rudolf *et al*., 2007, 12)

Figure 3 shows what both public and private sectors of smart tourism and what both public and private sectors of smart pastoral village can offer to (young and adult) tourists interested in **pastoral / rural smart tourism**.

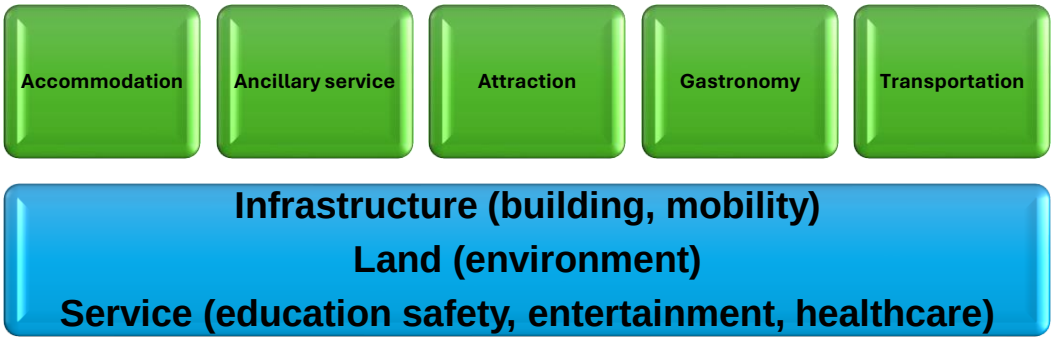

Figure 3. Components of a smart tourism pastoral village
(adapted after Lee, Cannon Hunter & Chung, 2020, 7)

CONCLUSIONS

The following conclusions could be drawn from the presentation above:

- The concept of "smart" relies on abilities to infer and reason; big data; new ways of connectivity and exchange of information; open data; and sensors;
- The concept of "smart tourism" relies on businesses, consumers, digital technologies, and tourism destination;
- "Smart tourism" should not be confused with "e-tourism";
- The concept of "smart tourism destination" is derived from the concept of "smart city";
- The concept of "pastoral / rural smart tourism" could arise from the concept of "smart city tourism" and rely on augmented reality, chatbots, digitization, Internet of Things, and mobile applications, as well as on smart initiatives;
- Pastoral / rural smart tourism variables are used to search information, to buy tourism products, to give feedback, and to pay services;
- There is a minimum of components of a smart tourism pastoral village to be successful.

REFERENCES

Aïdi, N. & Fabry, N., Beyond the certification of smart tourism destination: insights from the city of Medellín in Colombia. *International Journal of Tourism Cities*, 10(2), 1-27. DOI: 10.1108/IJTC-03-2022-0056, 2022.

Amanda, R., Santosa, P. I. & Rizal, M. N., Analysis of Tourists Preferences on Smart Tourism in Yogyakarta (Case Vredeburg Fort Museum). *Journal of Physics: Conference Series*, 1007, 1-8. **DOI:** 10.1088/1742-6596/1007/1/012040, 2018.

Biasin, M. & Delle Foglie, A., Blockchain and Smart Cities for Inclusive and Sustainable Communities: A Bibliometric and Systematic Literature Review. *Sustainability*, 16, 1-21. https://doi.org/10.3390/su16156669, 2024.

Britannica. Available at: https://www.britannica.com/. Accessed on 14.02.2025.

Cambridge Dictionary. Available at: https://dictionary.cambridge.org/. Accessed on 14.02.2025.

Chen, S., Tian, Y. & Pei, S., Technological Use from the Perspective of Cultural Heritage Environment: Augmented Reality Technology and Formation Mechanism of Heritage-Responsibility Behaviors of Tourists. *Sustainability*, 16, 1-23. https://doi.org/10.3390/ su16188261., 2024.

Democracy Technologies. Available at: https://democracy-technologies.org. Accessed on 14. 02.2025.

El-Alaoui, A., Lali, K. & Farhaoui, Y., Smart Tourism for Competitive Territories: Enhancing Marketing Strategies with Intelligent Digital Technologies. *Salud, Ciencia y Tecnología - Serie de Conferencias*, 4, 1-5. https://doi.org/10.56294/sctconf20251351, 2025.

Florido-Benítez, L., The Use of Digital Twins to Address Smart Tourist Destinations' Future Challenges. *Platforms*, 2, 234–254. https://doi.org/10.3390/ platforms2040016, 2024.

Florido-Benítez, L. & del Alcázar Martínez, B. (2024). How Artificial Intelligence (AI) Is Powering New Tourism Marketing and the Future Agenda for Smart Tourist Destinations. *Electronics*, 13, 1-20. https://doi.org/10.3390/ electronics13214151.

Gajdošík, T., Smart Tourism Concepts and Insights from Central Europe. *Czech Journal of Tourism*, 7(1), 25-44. DOI: 10.1515/cjot-2018-0002, 2018.

Giffinger, R., Fertner, C., Kramar, H., Kalasek, R., Pichler-Milanović, N. & Meijers, E., *Smart cities – Ranking of European medium-sized cities*. Vienna: Centre of Regional Science, 2007.

Göktaş Kulualp, H. & Sarı, Ö. (2020). Smart Tourism, Smart Cities, and Smart Destinations as Knowledge Management Tools. In E. Çeltek (ed.), *Handbook of Research on Smart Technology Applications in the Tourism Industry* (37-390). Hershey, PA: IGI Global. DOI: 10.4018/978-1-7998-1989-9.ch017.

Gretzel, U., Sigala, M., Xiang, Z. & Koo, C., Smart tourism: foundations, and developments. *Electronic Markets*, 25, 179-188. DOI: 10.1007/s12525-015-0196-8, 2015.

Hu, X., Optimization of rural smart tourism service model with Internet of Things. *Security and Communication Networks*, 1, 1-10. https://doi.org/10.1155/2022/6004728, 2022.

Jasrotia, A. & Gangotia, A., Smart Cities to Smart Tourism Destinations: A Review paper. *Journal of Tourism Intelligence and Smartness*, 1(1), 47-56, 2018.

Lee, P., Cannon Hunter, W. & Chung, N., Smart Tourism City: Developments and Transformations. *Sustainability*, 12(10), 1-15. https://doi.org/10.3390/su12103958, 2020.

Nafrees, A. C. M. & Shibly, F. H. A., Smart technologies in tourism: a study using systematic review and grounded theory. *2021 International Research Conference on Smart Computing and Systems Engineering (SCSE), Colombo, Sri Lanka* (8-13). DOI: 10.1109/SCSE53661.2021.9568338, 2021.

Petroman I., Petroman Cornelia, (2010), *Agritourism and its forms*, Lucrări Științifice Seria AGRONOMIE, ISSN 1454-7414;

Petroman I., Petroman Cornelia, Marin Diana, Gabris Delia Ramona, Ciolac Ramona, Văduva Loredana, (2013), *Kitsch and cultural tourism*, Scientific Papers: Animal Science and Biotechnologies, 46(2).

Petroman I.M. Văduva Loredana, (2021), *Forms of active tourism*, Ouaestus 271-279;

Piras, F., A Systematic Literature Review on Technological Innovation in the Wine Tourism Industry: Insights and Perspectives. *Sustainability*, 16, 1-16. https:// doi.org/10.3390/su16229997, 2024.

Oxford Learner's Dictionary. Available at: https://www.oxfordlearnersdictionaries.com/. Accessed on 14.02.2025.

Rosário, A. T. & Dias, J. C., Exploring the Landscape of Smart Tourism: A Systematic Bibliometric Review of the Literature of the Internet of Things. *Administrative Sciences*, 14(22), 1-26. https://doi.org/ 10.3390/admsci14020022, 2024.

Sabou, G.-C. & Maiorescu, I., The Challenges of Smart Tourism: A Case of Bucharest. *Studia Universitatis – Vasile Goldiș, Arad. Economics Series*, 30, 70-82, 2020.

Wu, W., Xu, C., Zhao, M., Li, X. & Law, R., Digital Tourism and Smart Development: State-of-the-Art Review. *Sustainability*, 16, 1-19. https://doi.org/10.3390/su162310382, 2024.

Zhang, Y. & Deng, B., Exploring the Nexus of Smart Technologies and Sustainable Ecotourism: A Systematic Review. *Heliyon*, 10, 1-21, 2024.
Văduva Loredana, Petroman I.M., *Forme alternative de turism*, Editura Eurospampa, 2021.

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