

Developing a Smart Destination: Insights From Slovakia

Vanda Maráková, Lenka Dzúriková and Martin Timko

Matej Bel University in Banská Bystrica, Faculty of Economics, Banská Bystrica, Slovakia

vanda.marakova@umb.sk

lenka.turkova@umb.sk

martin.timko@umb.sk

Abstract: Incorporating smart tourism into development priorities is the key aspect for tourism destinations and therefore, it should be approached accordingly. In theory, smart tourism development is considered as a factor in achieving sustainable competitiveness of tourism destinations. The application of smart destination shifts the destination development; however, the progress is under-researched so far. The efficient destination management requires tools for measuring smart tourism development. For that reason, the aim of this paper is to apply the methodological framework for measuring smart tourism development in a selected Slovak destination (the Banská Bystrica region). We have applied the methodology based on the Valencian Network of Smart Destination Indicators. The methodology was adapted to the availability of the input data at a regional level in Slovakia and tested in the Banská Bystrica region (NUTS 3). The obtained findings reveal that the Banská Bystrica region is aware of the need to implement smart solutions to improve the quality of life in the region for its residents, as well as visitors. The paper provides recommendation on what data needs to be collected and how these data can be obtained at a regional level in order to assess smart tourism development. The research conducted has further applicability in different destinations and on different levels. However, it is limited by the availability of the input data, which can determine the applicability of the indicators in Slovakia.

Keywords: smart tourism, indicators, smart destination development, Valencian Network of Smart Destination Indicators

1. Introduction

The dynamic environment associated with technological development, climate change and growing uncertainty has a major impact on tourism development (Gajdošík, 2017). These factors influence visitor behaviour in tourism and increase competition between tourism businesses as well as tourism destinations. At the same time, the need for flexibility and resilience in tourism development is gaining more and more prominence (Wang et al., 2016; Xiang, Fesenmeier, 2017; Jovicic, 2016). The concept of smart tourism development was created in response to these changes, while prioritizing information technology and the need for a sustainable approach. The development of information technology makes it possible to make smart decisions based on the information obtained and analysed in real time, thus optimizing processes in businesses and tourism destinations. At the same time, information technology is a driving force for innovation and the factor in competitiveness and sustainable development. The smart development of tourism thus becomes a tool for achieving sustainable competitiveness (Gretzel et al., 2016; Khan et al., 2017; Buhalis, 2019; Ivars-Baidal et al., 2021; Chung et al., 2021). The World Tourism Organization (UNWTO, 2009) has particularly emphasized the adoption of intelligent tourism development as a way of promoting and offering ethical, clean, environmentally friendly and high-quality tourism products. However, achieving sustainable competitiveness requires tools to assess and measure the smart development of tourism. Therefore, this paper aims to present a methodology for monitoring of the smart destination development on a regional level. The approach of the Valencian Network of Smart Destination Indicators is adapted to the availability of the input data at the regional level and applied in one of the destinations of Slovakia, in the Banská Bystrica region. The Banská Bystrica region has prepared a concept for smart tourism development, which should become operational in 2022. The destination management organization takes measures to develop tourism in connection with this concept, so it is a suitable candidate for researching the development of smart destinations. The article addresses the following research questions: (RQ1) Which indicators are suitable for monitoring of the smart destination development on the regional level? (RQ2) What is the current state of smart destination development in the selected region?

2. Theoretical framework of developing a smart destination and its measuring

The concept of smart destinations, inspired by smart cities discourse (Boes, Buhalis, Inversini, 2016; Ivars-Baidal et al., 2017; Tran et al., 2017; European Commission, 2018; Ivars-Baidal et al., 2021; Gretzel, 2021; Chung et al., 2021), has gained recognition as a useful destination management approach to meet the needs and impacts of digitalisation on tourism. Smart tourism development is based on sustainable development goals (UN, 2015) and has become an important concept on how to meet these goals. It is widely used in the planning and construction of smart cities, which arise in response to increasing urbanization and the problems caused by sustainable urban development (Gretzel, 2021). In order to respond to the growing demand of visitors in tourism and due to the

fact that traveling is an important part of people's lives, the representatives of several cities also focus on smart tourism development (Boes, Buhalis, Inversini, 2016). Smart cities have thus become smart tourism destinations. While smart cities focus on the needs of local people, smart destinations also focus on visitors who, through technology and data, build closer relationships with residents, businesses, local authorities and tourism attractions so that they can better communicate and get to know the destination (Gretzel et al., 2016). However, other types of tourism destinations can also be smart. Recreational destinations are often an alternative to already crowded urban centres (Coca-Stefaniak, Seisdedos, 2020).

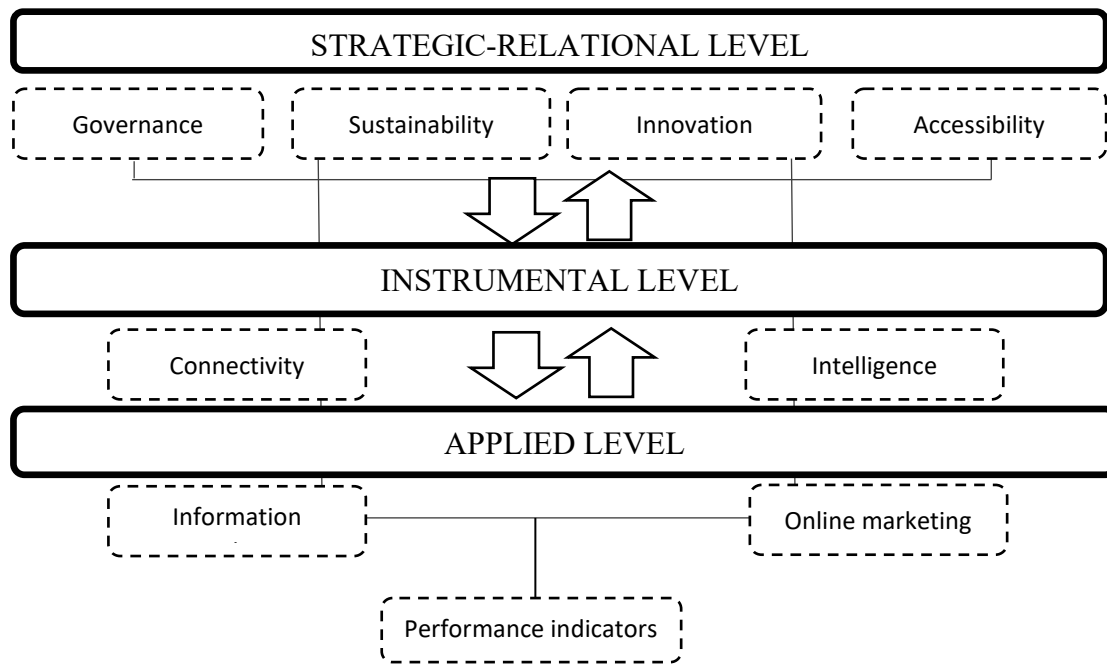
Mehraliyev, Choi and Köseoglu (2019) point out that although the definition of smart tourism development has not been formally settled, the concept of smartness is generally consulted in tourism on two levels: the use of technology and ensuring sustainability (Buhalis, Amaranggana, 2013; Boes et al., 2015; Lamfus et al., 2015; Lopez de Avila, 2015). The term smart is associated with the development of information, communication and smart technologies. At this level, smart technologies are perceived as effective tools for destination management, attractions, organized events and hospitality. The second aspect is related to sustainability in terms of "smart" people dealing with primary supply. The World Tourism Organization (UNWTO, 2009) has particularly emphasized the adoption of smart tourism development as a way of promoting and offering ethical, clean, green and high-quality services. The ecosystem of smart tourism development proposes and emphasizes the interrelationship between technologies and sustainability rather than accentuating them specifically.

We can define a smart tourism destination as "an innovative place that uses the latest information technologies to ensure the sustainable development of tourism, make it easier for visitors to stay, increase the quality of their experience and improve the quality of life of local people" (Xiang, Tussyadiah, Buhalis, 2015). The smart tourism destination is also seen as an innovative location built on the infrastructure of state-of-the-art technologies guaranteeing sustainable tourism development. It is accessible to everyone, supports the integration of visitors into the environment, increases the quality of experience and, at the same time, improves the quality of life of local people (Segittur, 2020). Although, in theory, the smart destination development brings significant benefits, its contribution to real changes in tourism destinations has not yet been sufficiently assessed (Ivars-Baidal et al., 2021).

Smart destinations are missing a comprehensive model of indicators that consider the performance of destinations in a variant range which they are expected to take into account, such as connectivity, big data sharingness, technology utilization, accessibility or sustainability (Gunn, 1988; Werthner et al., 2013; Lamfus et al., 2015; Gretzel et al., 2015). It is appropriate to use them to evaluate the smart development of tourism destinations as well as specific criteria related to tourism development.

The Valencian Network of Smart Destination Indicators (Ivars-Baidal et al., 2021) is based on the evaluation of smart cities (Giffinger et al., 2007), sustainable tourism destinations (European Commission, 2016) and the competitiveness of tourism destinations (WEF, 2019). This model is one of the latest and most applicable on the regional level. The structure of The Valencian Network of Smart Destination Indicators is presented in Figure 1. At the strategic-relational level, smart destination is based on governance, public-private collaboration and coordination in administration with purpose to achieve a sustainable tourism development. The instrumental level is built on digital connectivity, sensorisation and big data, which provide predisposition for information and intelligent system. This system contributes to the interaction between the physical and digital worlds, a key factor of smart tourism. Lastly, the applied level generates smart solutions for marketing and management of destinations and also tourist experience enhancement (Ivars-Baidal et al., 2021).

The system applies 72 indicators, which reflect 9 main criteria (Governance, Sustainability, Innovation, Accessibility, Connectivity, Intelligence, Information system, Online marketing, Evolution of tourism activity). The value of the indicators is obtained by a primary survey of the representatives of tourism management organizations on a scale 0 - 100. In 2018, this approach was applied in the standard UNE 178502: 2018 Indicators and tools of smart tourism destinations.



Source: Ivars-Baidal et al., 2021.

Figure 1: Smart destination model structure: Levels and dimensions

The purpose of the paper is to contribute to the academic discussion and to test the applicability of selected smart destination development indicators at the regional level. The paper does not seek to propose new indicators, it only presents the methodology for monitoring smart destination development on a regional level, based on the available indicator system.

3. Research approach

Smart destinations are of interest to technology and consulting firms, academic research and attract public investment (Johnson, Samakovlis, 2019). Nevertheless, theoretical research does not consider the real contribution of smart tourism development to destination development. It is therefore important to clearly specify the concept of smart destination and assess the real effects of implementing smart projects (Femenia-Serra, Ivars-Baidal, 2020). To address the first research question (RQ1), we compiled a set of indicators in eight dimensions, based on the secondary and primary data. Once this was done, we consulted the selection of indicators with the regional tourism organization in the Banská Bystrica region. The preliminary set of indicators was pre-tested with the selected organization in 2021. After the preliminary test, the indicators were refined, reformulated and adjusted to the regional level, according to the observed results and feedback provided by the organization's managers. Feedback from the organization included suggestions on how to modify some indicators or delete those that could not be identified, mainly due to unavailability of data from the statistical office and the public sector bodies. Indicators, for which there was no adequate and up-to-date information, were discarded. Following this process, we compiled a final set of 70 indicators (Table 1).

Table 1: Smart destination indicators

Dimension 1: Governance
1.1 Implementation of a strategic tourism plan
1.2 Coordination mechanisms between local administration departments for smart destination project development
1.3 Implementation of a smart destination project
1.4 Existence of a smart destination coordinator (responsible technician)
1.5 Existence of an annual operations plan for the destination
1.6 Mechanisms to facilitate public-private partnership
1.7 Development of E-Government/open government strategies

1.8 Implementation of quality management systems with a destination approach
1.9 Development of tourism impact awareness campaigns aimed at the residents
1.10 Application of ROI analysis on tourism initiatives
Dimension 2: Sustainability
2.1 Implementation of urban planning regulations adjusted to sustainability principles
2.2 Implementation of specific plans for sustainable tourism development
2.3 Public promotion of sustainable mobility (transport)
2.4 Enhancement of energy efficiency strategies (public lighting)
2.5 Collection and treatment of waste
2.6 Efficiency in water supply, purification and re-use of wastewater
2.7 Implementation of tourism indicators for sustainable destination management
2.8 Development of sustainability awareness campaigns targeted at the residents
2.9 Creation of climate change adaptation programmes
2.10 Use of ethical codes in tourism (regulation of activity, governance, impacts)
2.11 Legal provisions and environmental or quality certifications implemented in tourism resources
2.12 Companies awarded with environmental certifications (standards)
2.13 Development of sustainability awareness campaigns targeted at tourists
2.14 Surface of green areas per de facto population
Dimension 3: Accessibility
3.1 Accessibility of tourism resources and attractions
3.2 Information services technically adapted to the needs of people with disabilities
3.3 Compliance of content accessibility with the Web Accessibility Initiative (WAI) (https://www.w3.org/WAI/)
3.4 Initiatives for promoting accessible tourism
3.5 Public transport system technically adapted to the needs of people with disabilities
3.6 Existence of a dynamic inventory of tourism resources, companies and accessible services for tourists
Dimension 4: Innovation
4.1 Existence of innovation support programmes in the tourism sector
4.2 Implementation of innovation management systems in companies and public bodies
4.3 Development of innovation projects in collaboration with universities and R&D institutions
4.4 Promotion of collaborative innovation between agents (events and joint activities)
4.5 Local entrepreneurship
4.6 Educational level of the population and job opportunities in highly innovative sectors
Dimension 5: Connectivity
5.1 Internet connection quality at the destination
5.2 Free Wi-Fi availability in tourist information office(s)
5.3 Free Wi-Fi availability in tourist points of interest (POI) (main attractions)
5.4 Proportion of tourism businesses providing free Wi-Fi to tourists
5.5 Implementation of sensors for data collection at the destination
Dimension 6: Intelligence
6.1 Implementation of a barometer to measure the level of the business owner confidence
6.2 Analysis of tourism demands (trends, markets) – business intelligence
6.3 Development of social media networks and website traffic analysis
6.4 Implementation of a digital platform for data integration and information management
6.5 Existence of community management (professionalised)
6.6 Existence of open data on tourism activity (available online to everyone)
6.7 Mechanisms for monitorization and constant evaluation of points of interest (POI) situation

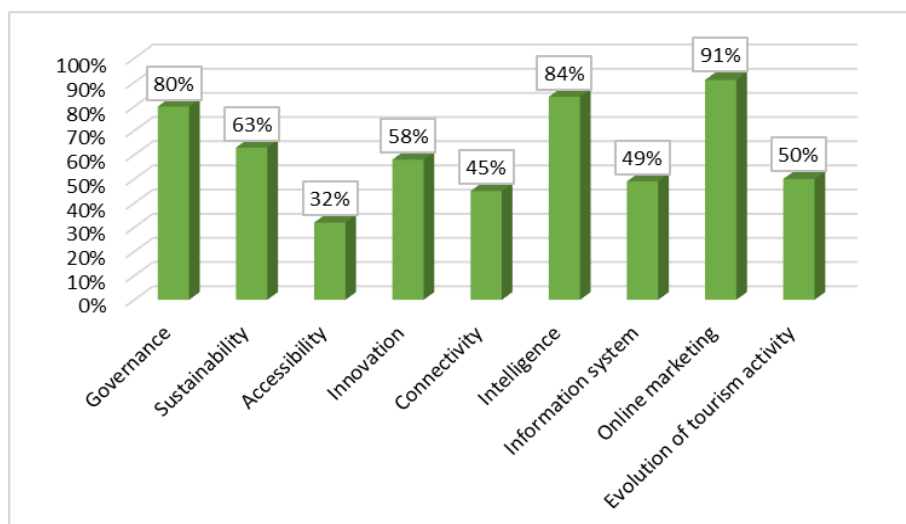
6.8 Implementation of georeferencing systems for tourist resources
Dimension 7: Information system
7.1 Existence of digitised promotional material
7.2 Existence of a 24/7 information point (touchscreen or similar)
7.3 Implementation of virtual assistance
7.4 Adaptation of DMO website to any device
7.5 Active presence on social media by DMO to provide information
7.6 Destination certified by the quality mark
7.7 Availability of information on connectivity and public Wi-Fi networks
7.8 Implementation of sensors in tourist signage
7.9 Existence of an official destination mobile app
Dimension 8: Online marketing
8.1 Development of brand monitoring and reputation analysis
8.2 Implementation of social media plan
8.3 Development of SEO positioning and actions
8.4 Investment in online advertising - SEM
8.5 Implementation of CRM & email marketing strategy
8.6 Existence and application of an online marketing plan
8.7 Investment in social media advertising
8.8 Commercialization through own website (DMO site)
Dimension 9: Evolution of tourism activity
9.1 The level of visitors' satisfaction with the tourism demand
9.2 Evolution of accommodation occupancy rate in tourism
9.3 Evolution of tourism expenditure at destination
9.4 Level of seasonality of tourism demand

Source: Own elaboration based on Ivars-Baidal et al., 2021.

To address the second research question (RQ2), the set of indicators was sent to the DMO. The representatives of the DMO evaluated the performance of their organization with all indicators, expressing the performance with percentage value ranging from 0 (non-compliance) to 100 (full compliance with the indicator). Most indicators consist of several sub-indicators, while others are one-dimensional. The Valencian Network of Smart Destination Indicators provides a detailed guide for destination management organisations where the data are obtained from first-hand information. In comparison with other approaches, this one is supported by providing evidence of specific data, attached documents and information that proves their fulfilment degree. In addition, according to the Smart destination model structure (Figure 1), the analysis of indicators was furthermore performed at three levels: strategic-relational, instrumental and applied.

4. Results

The performed analysis allows evaluation of the degree of fulfilment of selected indicators, i.e., the current level of smart tourism development in the selected region in the examined dimensions (Figure 2). These results show the activity of the DMO in all indicators and the aggregated results for each dimension. The level of smart tourism development in the region is expressed as a percentage, which is displayed on the scale from 0% to 100%. The results were obtained from the data provided by the DMO representatives and the analysis of secondary sources. When evaluating the indicators, the DMO representatives needed to demonstrate how they achieved the final evaluation of the indicators. The research team verified these results, thus ensuring the objectivity of the results.



Source: Own elaboration.

Figure 2: Level of smart destination development: Aggregated mean (%) by dimension

The overall average of all indicators in the nine surveyed dimensions is 63%, which proves that smart tourism development in the surveyed region is on the rise, but there is still much room for improvement. The standard deviation reaches the level of 43.51, which shows a large variability between the examined groups of indicators. The dimensions with the highest fulfilment rate are online marketing, intelligence and governance, with an average of 85%. The lowest performance rate is shown by the dimensions accessibility, connectivity and information system (an average of 44%).

According to the Smart destination model structure (Figure 1), the analysis of indicators was performed on strategic-relational (Table 2), instrumental (Table 3) and applied level (Table 4). Each level is composed of several dimensions: the strategic-relational level includes the indicators for governance, sustainability, innovation and accessibility; the instrumental level is made up of connectivity and intelligence indicators; and the applied level consists of the indicators for information system and online marketing.

Table 2: Aggregated mean for the strategic-relational level of Smart destination model structure

Governance	80%
Implementation of a strategic tourism plan	100%
Coordination mechanisms between local administration departments for smart destination project development	100%
Implementation of a smart destination project	0%
Existence of a smart destination coordinator (responsible technician)	100%
Existence of an annual operations plan for the destination	100%
Mechanisms to facilitate public-private partnership	100%
Development of E-Government/open government strategies	100%
Implementation of quality management systems with a destination approach	0%
Development of tourism impacts awareness campaigns aimed at residents	100%
Application of ROI analysis on tourism initiatives	100%
Sustainability	63%
Implementation of urban planning regulations adjusted to sustainability principles	62%
Implementation of specific plans for sustainable tourism development	100%
Public promotion of sustainable mobility (transport)	75%
Enhancement of energy efficiency strategies (public lighting)	15%
Collection and treatment of waste	70%
Efficiency in water supply, purification and re-use of wastewater	0%
Implementation of tourism indicators for sustainable destination management	75%

Development of sustainability awareness campaigns targeted at residents	100%
Creation of climate change adaptation programmes	100%
Use of ethical codes in tourism (regulation of activity, governance, impacts)	0%
Legal provisions and environmental or quality certifications implemented in tourism resources	80%
Companies awarded with environmental certifications (standards)	0%
Development of sustainability awareness campaigns targeted at tourists	100%
Surface of green areas per de facto population	100%
Innovation	58%
Existence of innovation support programmes in the tourism sector	100%
Implementation of innovation management systems in companies and public bodies	0%
Development of innovation projects in collaboration with universities and R&D institutions	100%
Promotion of collaborative innovation between agents (events and joint activities)	100%
Local entrepreneurship	50%
Educational level of the population and job opportunities in highly innovative sectors	0%
Accessibility	32%
Accessibility of tourism resources and attractions	0%
Information services technically adapted to the needs of people with disabilities	0%
Compliance on content accessibility with the Web Accessibility Initiative (WAI) (https://www.w3.org/WAI/)	0%
Initiatives for promoting accessible tourism	60%
Public transport system technically adapted to the needs of people with disabilities	54%
Existence of a dynamic inventory of tourism resources, companies and accessible services for tourists	80%

Source: Own elaboration.

Looking at the resulting values of the strategic-relational level indicators for the governance dimension, we observe exceptionally good results in the implementation of the strategic plan for smart tourism development, in the cooperation between the private and public sectors, and in planning of the development of smart tourism with regard to residents. On the contrary, the region has not designed and applied a smart tourism development project, and no quality management system is in place. However, the implementation of a smart destination project is planned. It will be part of the SMART concept of the Banská Bystrica region and during its preparation it will be decided whether some principles need to be implemented in the Sustainable Tourism Strategy in the Banská Bystrica region by 2030. The DMO has not yet applied for a quality system registration as the original intention was to build Green Destination. This, however, is perceived as inadequate by the DMO representatives. According to the previous attempts, Destination of Excellence cannot be applied in the region.

In terms of sustainability indicators, the destination takes a responsible approach to the development of sustainable tourism. The DMO is implementing strategic plans for the development of sustainable tourism, developing campaigns aimed at raising the residents' and visitors' awareness of sustainability, and the region has a sufficient amount of green space. On the other hand, there are no strategies in the region to improve energy efficiency, or to regulate the collection and treatment of waste as the DMO has no competence to do so. It was impossible to obtain the data on efficiency in water supply, purification and re-use of wastewater, as the statistical office refused to provide this information to the DMO. There are no ethical codes on tourism (regulation of activity, governance, impacts) in Slovakia and the DMO does not know whether the members of the organization have environmental certifications.

The innovation dimension indicators have achieved good results in programs for innovation in the tourism sector, development of innovation projects in collaboration with universities and R&D institutions and in promotion of collaborative innovation between agents. The DMO does not have information about awarding of innovation certificates to companies in the region but within the ECO-TANDEM project, which is currently underway, companies will be awarded. According to the data from the statistical office, less than 10% of local workforce (active workers) are entrepreneurs and company owners, less than 20% of local population hold a university degree, less than 15% of local population work in innovative companies or organizations and less than 3% of local population work in high technology sectors or research and development activities.

The accessibility dimension is the one with the lowest indicator value (32%). Within these indicators, we observe one that shows better results – the existence of a dynamic inventory of tourism resources, companies and accessible services for tourists. Public transport system is technically adapted to the needs of people with disabilities at 54%. The DMO seeks to improve the accessibility of destination attractions, in particular through accessible local travel guides and the implementation of accessibility awareness campaigns among companies and residents of the region.

Table 3: Aggregated mean for the instrumental level of Smart destination model structure

Connectivity	45%
Internet connection quality at the destination	100%
Free Wi-Fi availability in tourist information office(s)	0%
Free Wi-Fi availability in tourist points of interest (POI) (main attractions)	100%
Proportion of tourism businesses providing free Wi-Fi to tourists	25%
Implementation of sensors for data collection at the destination	0%
Intelligence	84%
Implementation of a barometer to measure the level of business owners' confidence	0%
Analysis of tourism demand (trends, markets) – business intelligence	75%
Development of social media networks and website traffic analysis	100%
Implementation of a digital platform for data integration and information management	100%
Existence of community management (professionalised)	100%
Existence of open data on tourism activity (available online to everyone)	100%
Mechanisms for monitorization and constant evaluation of points of interest (POI) situation	100%
Implementation of georeferencing systems for tourist resources	100%

Source: Own elaboration.

The instrumental level of the model contains the dimensions of connectivity and intelligence. The Internet connection quality at the destination is at a very good level, as well as free Wi-Fi availability in tourist points of interest. However, less than 95% of hotels, hostels and camping sites, less than 50% of restaurants/bars/cafes, and not all of the tourist information offices offer free Wi-Fi to their visitors. On the other hand, at least 70% of tourist apartments/villas/rentals offer free Wi-Fi to their guests. The DMO has no impact on the implementation of the sensors for management and efficiency improvement. These outcomes reflect the existing constraints on the integration of the physical and digital spheres for more integrated management of smart destinations and improved visitor stay.

The region shows very good results in most indicators related to intelligence dimension, with the exception of the tourism demand analysis and the implementation of a barometer to measure the level of confidence of business owners in the region. Satisfaction surveys among visitors to the region are so costly that their regularity is unrealistic. Surveys are conducted once every 4 years and selected products offered by the organization are evaluated every year.

Table 4: Aggregated mean for the applied level of Smart destination model structure

Information system	49%
Existence of digitised promotional material	70%
Existence of a 24/7 information point (touchscreen or similar)	0%
Implementation of virtual assistance	50%
Adaptation of DMO website to any device	100%
Active presence on social media by DMO to provide information	100%
Destination certified by the quality mark	100%
Availability of information on connectivity and public Wi-Fi networks	0%
Implementation of sensors in tourist signage	20%
Existence of an official destination mobile app	0%

Online marketing	91%
Development of brand monitoring and reputation analysis	100%
Implementation of social media plan	100%
Development of SEO positioning and actions	100%
Investment in online advertising - SEM	100%
Implementation of CRM & email marketing strategy	80%
Existence and application of an online marketing plan	100%
Investment in social media advertising	100%
Commercialization through own website (DMO site)	50%

Source: Own elaboration.

Finally, the applied level of the model includes the dimensions of information and online marketing. It should be noted that both dimensions mainly depend on the destination management organizations, while the other examined dimensions depend, partially or completely, on the activities of various local government departments. The information dimension demonstrates good results in the activities of the DMO on social networks and in the adaptation of the DMO website to any device. Although the DMO itself does not have its own information office, most of the information offices in the region are certified by the quality mark. On the other hand, the information system dimension indicators show gaps in information provision. There is no 24/7 information point in the region, there is no official destination mobile app and the DMO website does not offer connectivity information at the destination. However, the DMO effectively uses the Outdoor Active worldwide platform, which also has its own application. The implementation of the integrated transport is going through the approval process within the transport service plan. It is assumed that it will take at least 2 years until it is fully implemented in the region.

The online marketing dimension is the dimension with the highest value of indicators (91%). It shows excellent values in all indicators, except for the implementation of CRM and email marketing strategy, as well as commercialization through own website. The DMO offers the option to subscribe to the newsletter but does not issue it on regular basis, and the DMO website does not provide the possibility of direct booking of accommodation.

Finally, the activity performance indicators aimed at measuring the year-on-year development of the main tourism performance indicators reflect the positive trend in the recent years, with an increasing year-on-year visitor spending in the region and a high level of visitor satisfaction. It is important to point out that the year-on-year occupancy rate in all types of accommodation facilities increased each year until the COVID-19 pandemic, when it began to decline. The pandemic also affected seasonality, which was previously reduced, but has deepened lately as a result of the pandemic.

5. Conclusions

Regional monitoring of smart tourism development has been under-researched so far. The study presents the regional monitoring system applied to one of the selected regions in Slovakia, based on The Valencian Network of Smart Destination Indicators. The aim was to apply the methodological framework for measuring smart tourism development to a selected Slovak destination (the Banská Bystrica region). We have addressed two research questions: (RQ1) Which indicators are suitable for monitoring of the smart destination development on a regional level? (RQ2) What is the current state of smart destination development in the selected region?

The used smart tourism development evaluation system has only been used in selected regions of Spain so far (Ivars-Baidal et al., 2021). The author proposes that the model should be applied in other countries in order to develop and improve the system of indicators. We believe that the findings of our study can contribute to the assessment of the adequacy of the system of indicators at the regional level and can thus contribute to its improvement. The selected model can be applied to all regional management organizations in Slovakia and based on the results of individual dimensions, evaluate the DMO, which can be afterwards used as a benchmark for other DMOs. Since the definition of smart tourism development is not generally unified, we cannot claim to what extent smart tourism in the Banská Bystrica region is developed, but through the used model we can evaluate in which dimensions it lags or makes progress. The model can serve as a useful tool in creating,

implementing and monitoring smart destination development strategies. It can also serve as a benchmark for international comparison of destinations that implement a smart tourism development strategy.

Limitations. The data used in the model were obtained mainly by the primary survey, and supplemented by the secondary sources. In Slovakia, it is challenging to obtain the data for the indicators that are in the competence of the local government and the statistical office, and their analysis is time-consuming. Providing primary data is time consuming for the DMOs, but it is not expensive. The advantage is that the data are relevant and reflect the real state of smart destination development. Due to availability of data at a regional level, after compiling we have 70 indicators instead of the 72 original indicators. The two indicators were excluded because it was not possible to obtain the necessary data from the Statistical Office. The potential for smart destination development may vary across the regions. Therefore, monitoring the smart destination development will require the use of various indicators, which are available and fit the specificities of the destination.

Acknowledgements

The research was supported by the research project VEGA 1/0237/20 Tourism 4.0: Smart and sustainable tourism development in competitive environment.

References

- Boes, K., Buhalis, D. and Inversini, A. (2016) "Smart tourism destinations: Ecosystems for tourism destinations competitiveness", *Journal of Tourism Cities*, Vol 2, No. 2, pp 108-124.
- Boes, K., et al. (2015) "Conceptualizing smart tourism destination dimensions", *Information and Communication Technologies in Tourism*, Switzerland: Springer, pp 391-403.
- Buhalis, D. (2019) "Technology in tourism-from information communication to eTourism and smart tourism towards ambient intelligence tourism: a perspective article", *Tourism Review*, Vol 75, No. 1, pp 267-272.
- Buhalis, D. and Amaranggana, A. (2013) "Smart tourism destinations", *Information and Communication Technologies in Tourism*, Switzerland: Springer, pp 553-564.
- Coca-Stefaniak and J., Seisdedos, G. (2020) "Smart urban tourism destinations at a crossroads", *Routledge Handbook of Tourism Cities*. London: Routledge, pp 354-371.
- European Commission. (2018) "European capital of smart tourism", Luxembourg: Publications Office of the European Union.
- Femenia-Serra, F. and Ivars-Baidal, J. A. (2020). "Do smart tourism destinations really work? The case of Benidorm", *Asia Pacific journal of tourism research*, Vol 26, No. 4, pp 365-384.
- Gajdošík, T. (2017) "Smart tourism destination? The case of Slovakia", *6th Central European Conference in Regional Science Engines of Urban and Regional Development Banská Bystrica*, Slovak republic, pp 217-225.
- Gretzel, U. (2021) "Smart tourism development", *Tourism in development: Reflective Essays*. Oxford: CABI, pp 159-168.
- Gretzel, U. et al. (2016) "Application of smart tourism to cities. (Editorial)", *International Journal of Tourism Cities*, Vol 2, No. 2, pp 104-107.
- Gretzel, U. et al. (2015) "Smart tourism: foundations and developments", *Electronics Markets*, Vol 25, No. 3, pp 179-188.
- Gunn, C. A. (1988) "Tourism planning", NY: Taylor and Francis
- Chung, N. et al. (2021) "Smart Tourism Cities' Competitiveness Index: A Conceptual Model", *Information and Communication Technologies in Tourism*, pp 433-438.
- Ivars-Baidal, A. J. et al. (2017) "Smart destination and the evolution of ICTs: a new scenario for destination management?", *Current Issues in Tourism*, 2213, pp 1581-1600.
- Ivars-Baidal, A. J. et al. (2021) "Measuring the progress of smart destinations: The use of indicators as a management tool", *Journal of Destination Marketing and Management*, Vol 19, No. 3, pp 100531.
- Johnson, A. G., Samakovlis, I. (2019). "A bibliometric analysis of knowledge development in smart tourism research", *Journal of Hospitality and Tourism*, Vol 10, No. 4, pp 600-623.
- Jovicic, D. Z. (2016) "Key issues in the conceptualisation of tourism destinations", *Tourism Geographies*, Vol 18, No. 4, pp 445-457.
- Lamfus, C. et al. (2015) "Going mobile defining context for on-the-go travellers", Switzerland: Springer, pp. 363-375.
- Khan, M. S. et al. (2017) "Smart city and smart tourism: a case of Dubai", *Sustainability*, Vol 9, No. 12, pp 2279
- Lopez de Avila, A. (2015) "Smart destinations : XXI century tourism", *Conference on Information and Communication Technologies in Tourism*.
- Mehraliyev, F. Choi, Y., Koseoglu, M. (2019) "Progress on smart tourism research", *Journal of Hospitality and Tourism Technology*, Vol 10, No. 4, pp 522-538.
- Segittur, (2020) "Smart tourism destinations", [online], SEGITTUR, <https://www.destinosinteligentes.es/>
- Tran, H. et al. (2017) "(SA)⁶: A new framework for the analysis of smart tourism destinations. A comparative case study of two Spanish destinations", *Sant Vicent del Raspeig: Publicacions de la Universitat d'Alacant*, pp 190-214.
- UN. (2015) "Transforming our world: The 2030 agenda for sustainable development", UN: Geneva, pp 41.
- Wang, X. et al. (2016) "How smart is your tourist attraction? Measuring tourist preferences of smart tourism attraction via a FCEM-AHP and IPA approach", *Tourism Management*, Vol 54, pp 309-320.

- WORLD TOURISM ORGANIZATION (2009) "Tourism Resilience Committee Stresses Need for Smart Tourism", [online], WTO, <http://sdg.iisd.org/news/unwto-tourism-resilience-committee-stresses-need-for-%E2%80%9Csmart-tourism%E2%80%9D>
- Werthner, H. et al. (2015) "Future research issues in IT and tourism", *Information Technology in Tourism*, Vol 15, No. 1, pp 1-15.
- Xiang, Z., Magnini, V. P., Fesenmaier, R. D. (2015) "Information technology and consumer behavior in travel and tourism: Insights from travel planning using the internet", *Journal of Retailing and Consumer Services*. Vol 22, pp 244-249.
- Xiang, Z., Fesenmaier, D. R. (2017) "Big data analytics, tourism design and smart tourism", *Analytics in Smart Tourism Design*, Switzerland: Springer, pp 299-307.