

The power of digitalisation in relation to the sustainable tourist development of Black Sea coastal areas

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"Tourism 4.0 for the Black Sea - T4BS" is an innovative and cutting-edge project, being one of the first tourism projects funded by the European Maritime and Fisheries Fund (EMFF). T4BS aims to demonstrate the potential of big data analytics for the sustainable development of tourism, so that, with their help, the negative impact of tourism on coastal areas to be reduced while local authorities and communities or entrepreneurs are supported in taking data-driven decisions related to the benefits generated by tourism, but without endangering the environmental resources of future generations.

"Tourism 4.0 for the Black Sea" project pays special attention to the European Union's new strategic challenge for Blue Growth, as more than 5.4 million jobs at EU level depend on the development of coastal and marine areas, while economic activities in these areas generate revenues of over 500 billion euros per year. The results of the project highlight the cost of tourism in relation to the benefits that it generates and thus they mitigate the conflicts between environmental protection and conservation and the growth of tourism revenues.

In this context, "Ovidius" University of Constanţa, through the Faculty of Natural and Agricultural Sciences, and the private company Marketing Development S.R.L. from Bucharest, that runs the Sano Touring tour operator, implement, as local partners for Romania, the project "Tourism 4.0 for the Sea Black - T4BS", funded by the European

Commission through the European Maritime and Fisheries Fund (EMFF).

Even if the objectives of the project seem clear enough, their achievement requires many adjustments in order to arrive to testable models. The project seeks to create data-driven premises for the decision-makers who are aware of the impact of tourism on the environment, but who, unfortunately, often ground their decisions on imperfect information, because, even if there is a plenitude of data and the ability to analyse them, in most cases these data are difficult to access.

Let's imagine how tourism could be managed in sensitive areas such as the Danube Delta, if local authorities knew in real time how many tourists are present, what are the attractions they visit, when they visit them, what is their financial behaviour or what is the impact of the number of visitors on the environment or on the economic sector, what is the reaction of the locals to these phenomena, what is the impact on the local demand for electricity, or drinking water, or the amount of waste that tourism generates additionally in that real-time or near-real-time at that location.

We live in times when technology, without considering for the moment its positive or negative aspects, is an integral part of our daily lives. The relatively general easy access to an internet-connected phone makes instant video communication possible with someone in the opposite part of the

world. Fifteen years ago, this possibility existed only in science fiction movies. Technology is in our pocket for 24 hours a day, in our smart watches, in our wallets, in our cars, not to mention in our offices or homes. Technology, in its many forms, shapes an important part of our daily lives.

And if we can't dispute this, why can't we use technology to improve various problems that Geography, as a science, has been trying to solve for a long time: the overcrowding of roads in and out of cities, of public spaces, of natural or anthropic tourist attractions; the management of tourist flows in protected natural areas or other areas sensitive to tourism pressure; the management of parking lots in crowded tourist resorts; the optimization of municipal waste planning and management (especially in crowded cities); the real-time quantification of the number of people/tourists in a given area, while then accordingly adapting the measures of the public authorities or of the manager of the respective space - in other words, technology is currently essential for urban planning based on (almost real-time or even real-time) information for managing the difficult aspects inside cities or intensely frequented tourist areas.

Local, county, or national public authorities often develop strategies or urban development plans based on poorly available data, and, in the best case, the data are only one year old. Frequently, the data is incomplete, as the multi-annual series or certain types of data are non-existent or very difficult to access. Thus, the decisions taken in the framework of development strategies or within the spatial planning process are not directly and in real-time connected with the territorial issues. This situation is anachronistic for the third decade of the 21st century, even more so as technological progress is so present and relatively accessible.

The process of including technology in spatial planning is not easy at all, but technology is currently

in our pockets, often literally. There are algorithms that can anonymize a person's digital identity so that not to be known that a certain person is in a certain place, but only that one person, or a group of people, is in a certain place. Yes, no one disputes the issues related to the security of personal data, or the fact that they can be used for purposes other than those originally stated, but if the legislative framework is well harmonized, such anonymised information could provide enough data to make it relevant for any future development strategies or spatial planning regulations. For example, let us just think about how many extra minutes of time in traffic an application like Waze saves us each day. In a proper legal framework that strongly protects personal data, these new technologies can help in solving community problems.

So that, in the "Tourism 4.0 for the Black Sea" project, we aim to demonstrate the usefulness of new technologies, which, at least theoretically, should be relatively accessible, for urban planning or for managing tourism destinations. The project seeks to develop two components that complement each other. The first component, named "the tourism impact model - TIM", provides a static image, but, if there is real-time data, it is able to provide also an analysis of the situation at the time, and it quantifies the socio-economic and environmental impacts generated by tourism for the analysed location. In this sense, within the project, we conducted two pilot studies in Romania, for Sfântu Gheorghe rural locality (within the Danube Delta), situated in Tulcea county, and for Constanța municipality, a tourist space representative for seaside tourism at the Black Sea. The results of the analysis provide an image of the benefits of tourism to the detriment of the (socio-economic or environmental) costs that it generates and they thus help the local authorities to observe through data the advantages and disadvantages of

current tourism practices in these two different coastal areas.

The second component of the project is based on the big-data analysis performed by the supercomputer of the project leader - the private company Arctur from Slovenia. Unfortunately, for this project objective, the multiple attempts to discuss the availability and the purchase of big-data sets from the authorities and national companies that manage the road, rail and aeronautical traffic, or from telephone companies operating in Romania, from the companies that provide bank cards and holiday vouchers, and from the institutions that centralize statistical data at national level (plus other data-holding institutions), failed to generate the necessary data for a big-data analysis. Instead, our lead-partner and Ukrainian colleagues succeeded in producing a big-data analysis and their case study on tourism in Odessa is an example of good practice in our field of research.

While analysing the data from a Ukrainian telephone company and extracting data from different online tourism related platforms, like Booking and TripAdvisor, they were able to detect behaviours such as: how long before visiting Odessa tourists start looking for their plane ticket and how long before their trip they buy it, as well as in the case of hotel accommodation (by hotel category); the degree of customer satisfaction in relation to the length of stay; the time spent at a tourist destination and the evaluation mark they give to a certain tourist objective - all these are partial results, as the lead-partner and the Ukrainian partners are in the process of writing a paper on their big-data analysis.

In other words, the feasibility of artificial intelligence, the possibility of collecting real-time information from different sensors or smart devices and blockchain technologies, and their analysis through a supercomputer were being tested in pilot studies for Sfântu Gheorghe commune in the Danube

Delta and for Constanța municipality, but the use of such results require larger scale confirmation and big-data testing.

Nevertheless, with all these obstacles specific to the pilot case studies in Romania, the "Tourism 4.0 for the Black Sea" project is at the forefront testing of 4.0 technologies with direct application for tourism, but also for spatial planning, based on these technologies capable of providing detailed information, almost in real time or even in real time.

Legal issues, as well as the ethical ones, related to the use of sensitive data regarding the presence of personal data in the online environment, must be judged very carefully. In a way, we already live in an Orwellian world, as big IT companies already collect massive data with every click we make, or every time we activate our GPS on the phones, and they manage information about our online or mobility behaviours. So that, along with the very careful regulation on who and what can be collected and who and in what form can use the data, the state should assume a role in centralising this data in order to solve, or at least to improve, a good part of the problems we have inside our cities regarding the urban mobility, the dynamics of tourist flows, and the logistical/municipal problems related to the additional use of resources that come with the increase of the population or the number of tourists. Could this be done without becoming a totalitarian or police state?

Time is the only one that will answer this question. It should depend on each of us what and how we allow our devices to convey about us and how much Orwellian the world we live in will be. In a more or less conscious way, we already decide this from the second we open our mobile phones or a website. We are interested to highlight the degree in which this information and the 4.0 technologies can also be used to solve community problems. The "Tourism 4.0 for the Black Sea" project seeks to raise awareness on

this huge potential of data sources that exist today and on the multiple ways in which they could be used to develop sustainable tourism and to enhance the advantages of tourism for all stakeholders - the locals, the public authorities and the tourists can all be better satisfied with the tourist use of coastal areas at the Black Sea.

This material was developed within the project: "Tourism 4.0 for the Black Sea", funded by

the European Maritime and Fisheries Fund (EMFF). The contents of this paper are the sole responsibility of "Ovidius" University of Constanța - The Faculty of Natural and Agricultural Sciences, and of Marketing Development S.R.L., as Romanian local partners of the "Tourism 4.0 for the Black Sea - T4BS" project funded by the European Maritime and Fisheries Fund (EMFF), and they do not necessarily reflect the opinion of the European Union.
