



# **DIGITAL TRANSFORMATION SUMMIT - FUNCHAL** (MADEIRA), OCTOBER 2022

BODAH had a dissemination opportunity at the Madeira Island International Summit in October 2022. Cybersecurity, e-learning, Big Data, Health, Energy, Smart Cities, Tourism, and Manufacturing were among the topics discussed. The event was an opportunity of joining policy makers, authorities, industry, researchers, and the community of users in a uniquely high-level discussion and networking forum supported by research and innovation cooperation mechanisms that will pave the way for the next digital generation.



Figure: The BODAH project was presented by Pedro Pereira.

Professor Pedro Pereira presented the BODAH project's objectives, goals, and pilot sites to the audience. Then he describes how the data was collected, analyzed, and presented the BODAH project output, "BODAH Dashboard," which allows the visualization of datasets provided by BODAH's four pilot sites. Finally, the future application of data processing via machine learning was presented.

For detailed information click here

## **BODAH FINAL EVENT AT GLASGOW, NOVEMBER** 2022

BODAH project organized the Final Meeting in England, held on November 17th, 2022, at the Hamish Wood Building, Glasgow School of Business and Society, Glasgow Caledonian University, where project partners participated physically and virtually. All project members presented their work progress and discussed what was accomplished in this project. The next day on November 18th, the BODAH project hosted a workshop titled "Tourism Management and Performance in a Post-Covid Environment," to which project partners and special guests were invited.



Figure: All the participants at the final event of the BODAH project in Glasgow.

### **BODAH'S PILOT SITES DISSEMINATION WORKSHOP**

#### **Pilot site: Pau**

The ITEM laboratory of the Université de Pau et des Pays de l'Adour has organized a workshop at the National Museum and estate of the Castle of Pau (Musée National et Domaine du château de Pau) on 29th November 2022 as part of the work package devoted to the public sector upskilling. In the BODAH project, Prof. Laurent Jalabert, Director of the ITEM laboratory, introduced the workshop by contextualizing the BODAH project.

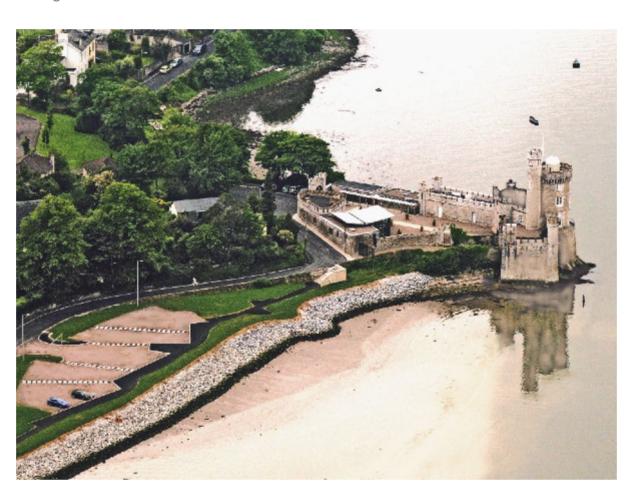


Figure: Showing BODAH project's clip during the workshop at the castle of Pau.

Dr. Dénes Harai presented BODAH's objectives and methodology for sustainable tourism before showing the clip of the project partners as well as that of the pilot site of Pau recorded in the spring of 2022 by ARTICE (service dedicated to audiovisual at the University of Pau) with the participation of the ITEM laboratory and of the National Museum and estate of the Castle of Pau. In the remaining part of the workshop, Dr. Dénes Harai summarized some of his findings regarding the number of visitors to the Castle of Pau and the impact of new technologies on the pilot site. Besides him and Prof. Jalabert, Kheira Hamidi and Joëlle Saucès attended the event from the University of Pau. The National Museum and estate of the Castle of Pau were represented by Karine Leboucq, Chief Conservator; Diane Delmas, Head of the service for public relations, and Vincent Nicolas, Head of the service for visitors, whose offices provided data for BODAH's research in Pau. Émilie Alonso represented the Nouvelle-Aquitaine Region, Jacques Pedehontaà the department of Pyrénées- Atlantiques; Giovanna Hendel, the European university UNITA and Étienne Lassailly, the Society of the Friends of the Castle of Pau. The participants took part in the extended discussion that followed the presentations and the showing of the clips. The impact of COVID on tourist flow in Pau and possible ways of increasing and optimizing tourist flow at the Castle of Pau has been evoked.

#### **Pilot site: Cork**

MTU (Munster Technological University) operated a BODAH pilot site at Blackrock Castle Observatory in Cork. The technology deployed by MTU consists of a LoRaWAN sensor network. Each sensor records various data points such as temperature, noise, movement, etc. A graphical dashboard was built to depict the various data collected from the network over time, and a heatmap was produced. This enables users to visualize the relative activity of visitors at different points throughout the test site.



Coupled with the sensors, the project also explores the use of imported data such as airport and cruise arrivals, weather conditions, data on booking, and other factors linked to specific dates, such as Bank Holidays. This data is combined in an effort to provide basic early predictive information on the likely levels of activity within the test site. The predictive element can be significantly advanced through machine learning models, which can be built by combining the imported data with the activity-related data from the sensors. The model can be applied to different applications and include the management of outdoor areas, such as city streets, forest parks, or large venues.

As part of the project, MTU was required to conduct dissemination and awarenessraising activities among relevant stakeholders - this was done at a meeting at TEAMS on Wednesday, December 14, 2022.

#### Pilot site: San Sebastain

On 15th December 2022, local stakeholders participated in a "Smart Kalea stakeholder workshop" organized by Fomento de San Sebastian, BODAH's pilot partner. The following topics were discussed during the workshop:

- BODAH project: general presentation & visualization tool
- SmartKalea monitoring and platform integration in the BODAH framework: SmartKalea: overview and local context
  - People and vehicle counting. Visualization tool
  - Air Quality Monitoring and visualization tool
  - Energy efficiency in local commerces and visualization tool
- Integration platform and public website
- Conclusions and questions.



#### Pilot site: Santiago de Compostela

Santiago de Compostela, the pilot partner of BODAH, hosted the "BODAH Final workshop" on December 15th, 2022. The subjects below were covered during the workshop:

- Indicators and KPIs for the sustainable management of cultural tourism.
- Methodology for collecting, measuring, and analyzing tourist flow management indicators as a part of the BODAH project.
- Conclusion of the report on tourist flows and the flow management model presentation.
- BODAH Upskilling Course: Using Big and open data for Tourist & Citizens Flow Management.



### **BODAH: UPSKILLING COURSE**

Using Big and Open Data for Tourists and Citizens Flow Management

The aim of this course is to provide an upskilling and knowledge dissemination platform, centered around the innovations in the BODAH project. The material provided covers subjects that correspond to the BODAH work packages, presented in a manner that allows self-study. In each section, we provide additional references, from the scientific domain, to enhance the understanding of the main concepts.

The learning objectives of this course are:

- LO1 Acquire an understanding of the implications of using data in tourism
- LO2 Explain the opportunities and challenges of visualizing data
- LO3 Distinguish different levels of engagement with data, required in this context
- LO4 Outline strategies for utilizing data successfully in future systems and services

For detailed information click here

## **BODAH: VISUALIZATION** DASHBOARD

One of the main outputs of the BODAH project was a Dashboard that allows the visualization of datasets provided by the pilot sites.

The primary purpose of the Dashboard, within the BODAH data processing pipeline, is to offer a powerful tool for the assessment of the pilot site's data, towards the identification of patterns, trends, and outliers.

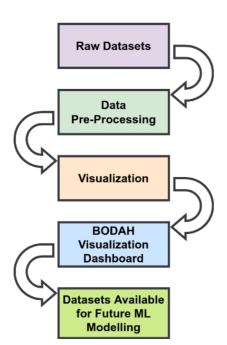


Figure: Data processing pipeline of BODAH visualization dashboard.

Our system primarily uses Vega-Lite, a Web-based visualization authoring system suitable for visualizing the types of data collected during the project. Vega-lite is one of the most influential tools created by the academic community. We have tailored visualizations to each data type.

Vega-Lite specifications are written in JSON and if another project supplies data in the same format as the data types we already support, then our existing library of Vega-Lite specifications can be used, importantly without the need to design new ones.

The Dashboard allows the visualization of BODAH datasets, in varying levels of granularity. We provide multiple views of the same dataset at different temporal resolutions (when the data supplies time-series data). Most charts in the dashboard are interactive, allowing filtering and brushing operations to drill into data trends over time.

**VISUALIZATION DASHBOARD** 

BODAH Project finished on December 31, 2022.



European Regional Development Fund