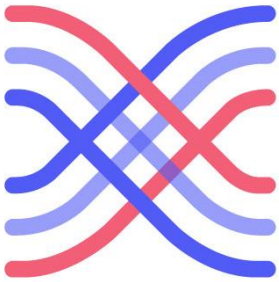

AI4Gov

Trusted AI for Transparent Public Governance
fostering Democratic Values

Deliverable 6.2

Specification of UC Scenarios and Planning of Integration and Validation Activities V2

30.06.2024

Version 1.0

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Abbreviations

Abbreviation	Description
AI	Artificial Intelligence
CSV	Comma-Separated-Values
DGF	Data Governance Framework
DPB	Diputación Provincial de Badajoz
DWTS (or EDAR in Spanish)	Decentralised Wastewater Treatment System
EU	European Union
GDPR	General Data Protection Regulation
GPS	Global Positioning System
HRF	Holistic Regulatory Framework
IoT	Internet of Things
JSI	Jozef Stefan Institute
MD	Markdown
MT	Ministry of Tourism
OECD	Organisation for Economic Cooperation and Development
OwiD	Our World In Data
PAYT	Pay As You Through
PDF	Portable Document Format
RFID	Radio Frequency Identification
SAX	Situation-Aware Explainability
SCADA	Supervisory Control and Data Acquisition
SDG	Sustainable Development Goal
SME	Small Medium Enterprise
UC	Use Case
URL	Uniform Resource Locator
US	User Stories
VVV	Vari - Voula - Vouliagmeni
WP	Work Package
WWTP (or ETAP in Spanish)	Wastewater Treatment Plants
XAI	EXplainable AI

Abstract

This document, D6.2 “Specifications of UC Scenarios and Planning of Integration and Validation Activities V2”, was developed in the context of WP6 “Use Case Implementation, Validation, and Evaluation”. WP6 is devoted to designing and implementing the AI4Gov piloting activities, leveraging the AI tools developed during the project. It includes the pilot methodology and the second version of the pilot descriptions, focusing on the progress that has been made since D6.1 was delivered.

In this project, three pilots will be implemented:

- Using AI for Sustainable Development and the European Green Deal (Slovenia/ International)
- Tourism-driven multi-domain policy management and optimisation (Greece/Athens)
- Policies for Sustainable Water Cycle Management at a Large Scale (Spain/Badajoz)

This deliverable is the second version of D6.1 “Specifications of UC Scenarios and Planning of Integration and Validation Activities V1” elaborating on the use cases and the first results of the WP6 activities. The first integration of the UCs has been completed and some first DEMOs have been produced, achieving also milestone 8 on “Use Cases integrated”. In addition, this version contains some reflections on the validation and evaluation of the activities, focusing on the timeline the partners need to follow, as well as the next steps towards the first phase of the implementation process.

Even though an overview of the evaluation methodology is presented in chapter 4, the full methodology will be presented in D6.4 “Stakeholders' Feedback and Evaluation of the AI4Gov Use Cases V1” in M24.

1 Introduction

1.1 Purpose and scope of the deliverable

This deliverable is the result of the work that has taken place under WP6 - Use Cases Implementation, Validation and Evaluation. This WP started in month 1 and ends in month 36, so it will run for the whole lifecycle of the project. The deliverable contains the outcomes of the piloting activities so far, from all tasks of WP6. Following up to D6.1, D6.2 is the second version of the specifications and requirements of the use cases, gathering all the developments in terms of the data used in each use case, the actors involved, the AI4Gov tools that will be utilised in each use case and the progress the pilots have done so far, along with the next steps in the implementation.

The purpose of D6.2 is to present the updated AI4Gov pilot cases, the scenarios themselves as they have been deployed up until this point. This information supported the deployment of the first DEMOs showcasing the integration of the use cases with the different components of the AI4Gov platform and will further guide the overall implementation and experimentation process of the project. In this document, there is no repetition of the datasets and the user stories presented in D6.1 and only new additions are included, following the aligned work between the pilots and the technical partners.

1.2 Document structure

The deliverable is structured as follows: **Chapter 1** introduces the document, including the purpose and scope, document structure, and any updates compared to the previous version, while it presents an overview of the pilot coordination, specifically focusing on the structure of WP6. The target audience of the deliverable is also identified in this chapter. **Chapter 2** describes the pilot methodology and the progress made in each methodological phase. **Chapter 3** provides detailed information about the pilots and their associated and integrated use case scenarios in terms of progress. **Chapter 4** focuses on the validation and evaluation, highlighting the necessary activities and measures to ensure the successful testing and assessment of the project outcomes. **Chapter 5** summarises the key findings and next steps. **Chapter 6** includes the reference list, and finally, **chapter 7** is the appendix.

1.3 Updates with respect to previous version

This is the second of the three versions of the deliverable on specifications of UC scenarios, integration and validation activities. The third and final version will be delivered on M30 (June '25). In this second version a more detailed description of the UCs is provided, along with some first DEMOs and a timeline of the implementation activities. In this version the authors focused on aligning their work with the comments they received from the review that took place in March 2024. To ensure the success and relevance of the AI4Gov UCs, several critical factors need to be addressed. The focus must be on aligning and better integrating the use cases UCs with AI4Gov's

tools, ensuring scalability, and incorporating essential aspects such as technological, legal, and ethical considerations. Below is a detailed and coherent plan addressing these requirements.

Refinement and Alignment of Use Cases with AI4Gov Tools (D6.2 – M18 & D6.3 - M36):

The UCs within AI4Gov require further definition and alignment to maximise their relevance and effectiveness. Each UC should clearly outline the stakeholders involved, the specific AI4Gov tools to be used, and the benefits these tools provide. This detailed connection will enhance the practicality and applicability of the UCs, ensuring that they address real needs and challenges faced by public sector stakeholders. This is achieved through D6.2 that provides a comprehensive description of each UC, focusing on stakeholders and the AI4Gov tools deployed. Also, the primary and secondary stakeholders for each UC will be identified, detailing their roles and expectations.

Scalability and Adaptability to Various Public Policy Areas (D6.2, D6.4, D6.5, D7.6):

To ensure that the developed solutions can be effectively integrated and scaled across different contexts and public policy areas, a clear focus on the potential of each UC is required. This involves evaluating the sustainability and adaptability of solutions, beyond their initial implementation. The steps to achieve this requires a collaboration among different tasks. First D6.2 demonstrates the potential for each UC to be applied in various public policy areas, highlighting success stories and potential impact. Also, the sustainability will be emphasised during the evaluation activities to assess the scalability and adaptability of UCs. In addition to the work under WP6, scalability will be supported by T7.2 focusing on the policy recommendations and the roadmap for the UC implementation, along with T7.3 which focuses on exploitation strategies to enhance the longevity and impact of the UCs. Finally, the community building activities in T7.4 will further boost the "advertisement" of AI4Gov to relevant stakeholders.

Incorporating Technological, Techno-Political, Legal, Policy, and Ethical Aspects (D6.2, D6.4, D6.5):

The technological, techno-political, legal, policy, and ethical aspects of the AI4Gov project are now being integrated into the evaluation methodology to ensure a comprehensive and responsible deployment of AI solutions. T6.5 is currently developing an evaluation framework that incorporates these aspects, ensuring they are considered at every stage of the UC development and implementation. This framework will be supported by different tasks such as the T1.5 which implements risk and threats analysis and the HRF that will guide the regulatory aspects of the project. Also, along with the theoretical work and the preconditions of the framework, the tools that are being developed under T5.4 will provide a holistic evaluation process, especially on the ethics and legal aspects. Detailed analysis and reporting will be included primarily in D6.4 and D6.5 that are dedicated to the evaluation, but also in the current D6.2, and then in D6.3.

Realistic Data Governance Models (D6.4):

The data governance models being tested need to be realistic and address privacy, ethics, and data ownership. Currently, none of the UCs sufficiently address these crucial aspects, which are essential for the scalability and replication of the UCs. However, following also the Data Governance Framework from T3.2, the UCs are going to include in their work the data governance

models they used, focusing on privacy, ethics, and data ownership. These models along with best practices for data governance that can be applied across different UCs and contexts will be specified in the period M18-M24 and will be added in D6.4.

By addressing these areas systematically, AI4Gov can enhance the relevance, scalability, and ethical grounding of its UCs, ensuring that the solutions developed are lawful, ethical, robust, adaptable, and beneficial across various public policy domains. The table below includes the most relevant comments the WP6 received and the mitigation measures.

Table 1 Review comments and mitigation measures

Recommendation	Mitigation measure	Timeline
The use cases need further definition and alignment with AI4Gov.	Elaborate more on D6.2 and focus on the **stakeholders and the tools** that will be used in each UC and how they benefit the UC. Clear connection between the UCs and the AI4Gov tools.	**D6.2 – M18** **D6.3 - M36**
…ensure that the developed solutions are based on real needs and can be effectively integrated into other use cases, thus ensuring scalability and adaptability to different contexts…for various public policy areas, beyond the current use cases…	Elaboration on UCs to show potential impact and wider adaptability. Focus on sustainability through evaluation Cooperation with T7.2 (policy recommendations – roadmap to the UC) Cooperation with T7.3 – Exploitation	**M18 – 36 (D6.2, D6.4, D6.5, D7.6)**
…special focus must be placed on the technological, techno-political, legal, policy, and ethical aspects.	These aspects are incorporated into the evaluation methodology	**M18 - M36 (D6.2, D6.4, D6.5)**
The data governance models being tested in AI4Gov need to be realistic and ensure privacy, ethics, and data ownership. None of the use cases developed address these important aspects, which are crucial for scaling up the use	The UCs follow the overall DGF developed under T3.2. More information about the data	**M24**

cases using similar replication and scalability procedures…	management in each specific UC are to be provided in D6.4.

1.4 WP6 Structure

WP6 is the WP associated with the piloting activities, devoted to deploying, operating, validating, and evaluating the use case scenarios with the active engagement of the public organisations and policy makers of the consortium. It breaks down into five tasks:

- **T6.1** Detailed Specification of Scenarios and Use Case Preparation
- **T6.2** Data-Driven Sustainability for a Liveable Badajoz
- **T6.3** Using AI for Sustainable Development and the European Green Deal
- **T6.4** Trustworthy Data-Driven Touristic Policies
- **T6.5** Stakeholders' Feedback and Evaluation

The first task is the preparatory task that supports the design and development of the Use Case Scenarios and the user requirements. Tasks T6.2, T6.3, and T6.4 correspond to the three pilots that will test the AI4Gov technologies. Finally, T6.5 is the task that will coordinate the evaluation of the pilot results and will map the gaps and needs that will arise. In total, the WP6 has 5 deliverables:

- **D6.1** - Specification of UC Scenarios and Planning of Integration and Validation Activities V1 (corresponding to T6.1)
- **D6.2** - Specification of UC Scenarios and Planning of Integration and Validation Activities V2 (corresponding to all WP6 tasks)
- **D6.3** - Specification of UC Scenarios and Planning of Integration and Validation Activities V3 (corresponding to all WP6 tasks)
- **D6.4** - Stakeholders' Feedback and Evaluation of the AI4Gov Use Cases V1 (corresponding to T6.5)
- **D6.5** - Stakeholders' Feedback and Evaluation of the AI4Gov Use Cases V2 (corresponding to T6.5)

As mentioned in the beginning, WP6 is active throughout the whole lifecycle of the project.

1.5 Relation to other WPs

WP6 is related to all WPs. Given the fact that it provides the user requirements from the pilots' side, WP6 supports the work of the technical tasks in WP2, WP3 and WP4. In addition, it takes feedback from them, in order to better specify the needs of the Use Cases. There is a close linking with T1.4 (Gender and ethics) and T1.5 (risks and threats of AI), in combination with the HRF, while it is also related to WP5, since the training courses that are to be developed, will support the capacity building of the people involved in the pilots and the assessment activities. Finally, WP6 will feed WP7 both in terms of communication and dissemination activities, but also with the final results to structure a solid exploitation and sustainability plan. More details on the linking among the tasks is presented in the pilot methodology in Chapter 2.

1.6 Target audience of the deliverable

This document constitutes the second version of the specifications of the UC Scenarios of the AI4Gov pilots, for the period M7-M18. It is an internal guide for the project's pilot manager and all project partners to use it as a reference point for understanding the UC Scenarios and the needs of the pilot partners. In addition, the document can be utilised as a practical tool for "Horizon Europe" pilot managers of on-going and future projects, who will be willing to explore the AI4Gov pilot strategy and capitalise on it, as well as a control point for the reviewers of the European Commission.

1.7 Data management

The building of the AI4Gov UCs involved a lot of data gathering from different actors such as the pilot partners themselves, their external collaborators or other publicly available data sources. In order to minimise any data related risks, the partners followed the Data Governance Framework (DGF) that was developed within the AI4Gov Project under T3.2. The DGF is a structured and comprehensive set of guidelines, policies, and procedures designed to manage, share, and protect data in alignment with the EU's legal and regulatory landscape, particularly concerning data protection and privacy. The framework ensures compliance with regulations such as the Data Governance Act, GDPR, AI Regulation, EU AI Act, and ALTAI for self-assessment. It emphasises compliance with data protection laws, clear data ownership definitions, data security through measures like encryption and access controls, and maintaining data quality through standards and validation processes. Privacy by design is integral, incorporating safeguards from the outset, and data sharing agreements are established to define the terms of data access and usage. The framework also involves structured data lifecycle management, ethical AI practices to prevent bias, accountability with designated Data Stewards and a Data Governance Committee, and continuous monitoring and compliance through regular audits and reporting mechanisms.

One of the pieces structuring the DGF is the Data Management plan (DMP) designed under WP1. The DMP outlines the overarching policy and strategy for data management within the AI4Gov project, addressing both administrative and technical aspects. It encompasses topics such as application reconfiguration logs, monitoring metrics collection, the publication and deposition of open data, details about the designated data repository infrastructure, and adherence to the Open Access Infrastructure for Research in Europe (OpenAIRE). In addition, it contains dedicated sections where it monitors the UCs to highlight the usability, purpose and collection procedures that should be implemented on these datasets.

With that being said, all data management processes in the UCs have been carried out based on these two tools: The DGF and the DMP.

2 The AI4Gov Pilot Methodology

To ensure a smooth implementation of the pilots and their UCs, specific steps were followed to guide the pilot partners throughout the entire process. Since this is an ongoing work, the pilot methodology is constantly being evaluated to better address the project's needs. The aim of the methodology is to develop, test and validate AI solutions that aim to improve e-government services that benefit both policy makers and citizens, and to ensure that AI solutions are ethical, legally sound and robust. Transparency, inclusiveness and respect for EU democratic values and human rights are also at the centre of the methodology.

This methodology has been customised on the AI4Gov needs and is influenced by the Living Lab methodologies. Although the scholars cannot easily agree to a common definition of the Living Labs methodology (Compagnucci, Spigarelli, Coelho, & Duarte, 2021), there is a common understanding on some basic principles including collaboration of multiple stakeholders and end-users in a real-life setting. This methodology aims to foster open innovation and co-creation processes, leveraging the collective intelligence of all participants to develop and test new solutions in a context that mirrors real-world conditions (Dekker, Franco Contreras, & Meijer, 2020). In the context of AI4Gov, the Living Lab methodology can be used to ensure that AI solutions are ethical, lawful, robust, human-centered, relevant, and capable of addressing the actual needs of public sector stakeholders. By engaging stakeholders in the development and testing phases within their real-life operational environments, the project can achieve more effective and impactful outcomes. It consists of five phases, as presented below.

Phase 1: Needs Assessment and Requirements Gathering

- Objective: Identify the specific needs of the pilots and define AI requirements.
- Activities:
    - Conduct surveys and interviews with professionals and citizens (T2.1-T2.2).
    - Analyse existing data and literature to identify common issues in the sector of e-Governance (T2.1-T2.2).
    - Mapping of both the future requirements of the pilots as well as the available data they can provide to the technical partners to build the AI4Gov solutions (T6.1-T6.2-T6.3-T6.4).
    - Adopting a co-creative approach to ensure the inclusion if the users in the UCs' design phase to ensure alignment.
    - Identify different UCs within the pilots.
    - Identify the User Stories to be translated into technical requirements.

During the first six months of the project, the first version of the pilot specifications was developed and delivered in D6.1.

The pilots identified and described the Use Cases (UCs) for the AI4Gov project using a value proposition-oriented approach (Rosário & Raimundo 2021). This approach focused on understanding and communicating the unique value that AI4Gov tools will bring to policymakers and citizens. It emphasised the specific needs and gaps that the AI4Gov solutions will address, highlighting their benefits and advantages. This approach aimed to demonstrate at an initial phase of the project, how AI4Gov tools can improve public processes and services, ultimately

enhancing ethical, lawful and robust AI solutions, democratic values and human rights by promoting equality, diversity, accessibility, and inclusivity.

AI4Gov created eight (and potentially 9) UCs through three different pilots, addressing various topics at both national and international levels. To achieve alignment between the technical partners and the pilot partners, a co-creative approach was adopted, also in line with milestones 5 and 11, indicating the need for co-creation sessions with the pilots. In addition, several other activities in the context of WP5 and WP7 such as workshops and panel discussions were held in cooperation with the pilots, in order to bring together AI4Gov and external experts to give a different perspective to the project and the UCs. This first phase had a first iteration from M1 to M6 and then a second iteration will last from M6 to M22. Any results or updates in the period M19-M22 will be included in the next deliverables.

Phase 2: Requirements integration to the AI tools

- Objective: Support the development of AI models tailored to the identified pilot needs in cooperation with the technical partners.
- Activities:
    - Collect and preprocess the pilot data.
    - Identify the most appropriate AI4Gov tools to serve the different UCs (in cooperation with T2.3, WP3, WP4).
    - Ensure compliance with EU data protection regulations to also ensure data anonymisation and secure storage (GDPR) (T3.2 - DGF), and ethical standards (T1.4, T1.5, T2.1, T2.2).
    - Collaborate with the polit partners and their external collaborators to access their data sets datasets.

The pilot partners fed the technical partners with the available data sets to start building the UC requirements during the past 18 months, to identify its potential and understand which of the AI4Gov solutions would be more suitable for each UC. This data was coming either from the pilot organisations themselves (like in the case of DPB), external collaborators (like in the case of VVV), or publicly available data sources (like in the case of JSI). All data sets were presented in detail in D6.1 and in this deliverable only the additional new data are included. In terms of data management, all partners are following the DGF to ensure alliance with GDPR and other related regulations. This is a live process since the pilots are still incorporating new data sets in their UCs to expand their scope and impact. In this deliverable, only the new data is presented, that have been added after M6. This second phase started in M3, and it will last until M24 where the fine-tuning process of the tools will be concluded and reflected in D6.4.

Phase 3: Pilot Implementation

- Objective: Test the AI4Gov solutions in the UCs.
- Activities:
    - Test the AI4Gov solutions in the UCs according to the scenarios that have been created.
    - Train the staff on using AI tools (T5.2, T5.3).
    - Monitor AI performance and collect feedback from users (T6.5, T1,5, T2.2, T5.4).

In terms of implementation, the technical partners, using the data provided by the pilots, started developing some first DEMOs to start testing the AI4Gov tools. Also, under T5.2 and T5.3 the consortium held some training activities both for the pilot partners and other external stakeholders as well. The implementation phase started with the designing of the DEMOs in M6 and will last until M33 and the finalisation of the piloting activities.

Phase 4: Evaluation and Optimisation

- Objective: Assess the impact of the AI solutions and refine models.
- Activities:
    - Evaluate AI performance based on accuracy, efficiency, and user satisfaction.
    - Optimise AI algorithms based on evaluation results and feedback (WP3, WP4).
    - Follow up with co-creation sessions with the pilots to discuss the feedback from the validation activities and propose improvements.

This phase is under development in T6.5. A first approach of how the evaluation will work will be provided is described in Chapter 4 but a more analytical methodology will be presented in D6.4. The evaluation will start in M20 with the fine tuning of the tools, and it will be concluded in M36 and the final evaluation deliverable, D6.5. During this phase the pilots will work closely with the technical partners to ensure that the final AI4Gov tools will address the objectives and needs of the pilots and are finalised in terms of technical development.

Phase 5: Dissemination and Scaling

- Objective: Share results and scale successful AI solutions.
- Activities:
    - Publish findings in scientific journals and present at conferences (T7.1, T7.2).
    - Engage stakeholders from different sectors (policy makers, public servants, citizens, AI researchers, private sector professionals) to disseminate the project's results and create an AI4Gov "community" of projects, organisations, and experts (T7.1, T7.4).
    - Attract potential "clients" and adopters to test the tools in different environments (T7.3).
    - Develop guidelines and best practises for AI adoption in e-Governance or other related fields.
    - Seek additional funding for wider implementation across the EU.

Last but not least, the fifth phase focuses on the dissemination of the results and the adaptability of the UCs. This is a phase started already in M6 and it will last until the end of the project in M36 and even beyond. For this phase the cooperation with WP7 is crucial, since it contains both the communication and dissemination strategy of AI4Gov, as well as the exploitation planning. The latter will boost scalability and help the UCs become more adaptable to create new UCs.

During the whole duration of the pilot implementation, from design to evaluation, it is important to involve professionals in all stages to ensure practicality and acceptance, while also engaging citizens to understand their perspectives and address concerns. Finally, collaborating with regulatory bodies to align with AI regulations is critical for the integrity of the overall process.

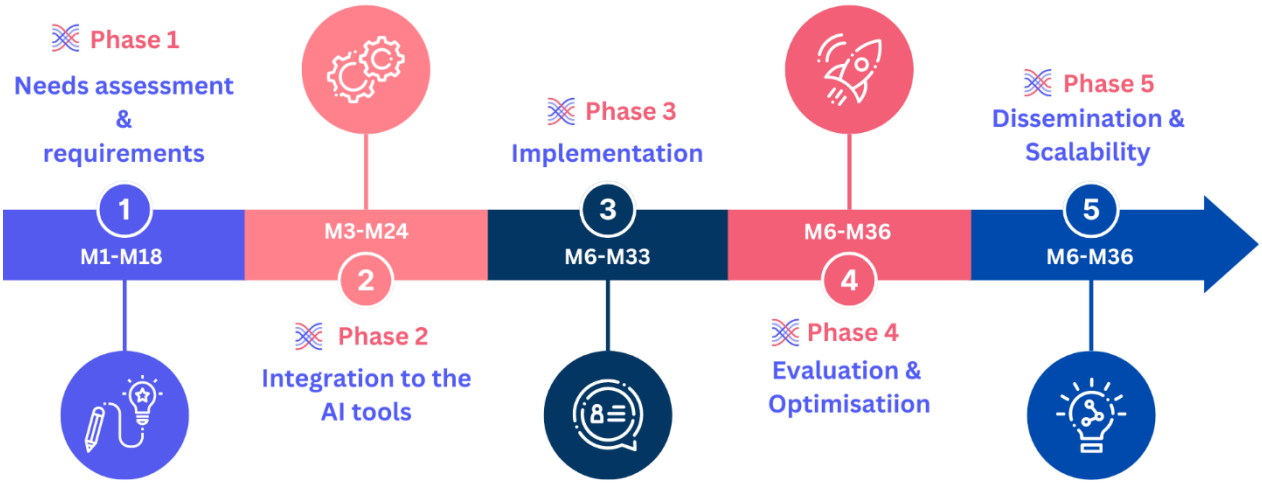

Figure 1 Pilot methodology

The progress of the methodology will be monitored and any updates will be presented and explained in the next WP6 deliverables.

3 Pilots and UC Scenarios

As stated in D6.1, the AI4Gov solutions will be tested by three (3) pilots, the Deputación Provincial de Badajoz in Badajoz, Spain, the Municipality of Vari-Voula-Vouliagmeni in cooperation with the Greek Ministry of Tourism in Athens, Greece and the Josef Stefan Institute in Ljubljana, Slovenia. The two pilots in Spain and Greece will be implemented locally, while the Slovenian one has an international application, exploiting resources like the SDGs and the OECD repository. More details are provided in the subsections below.

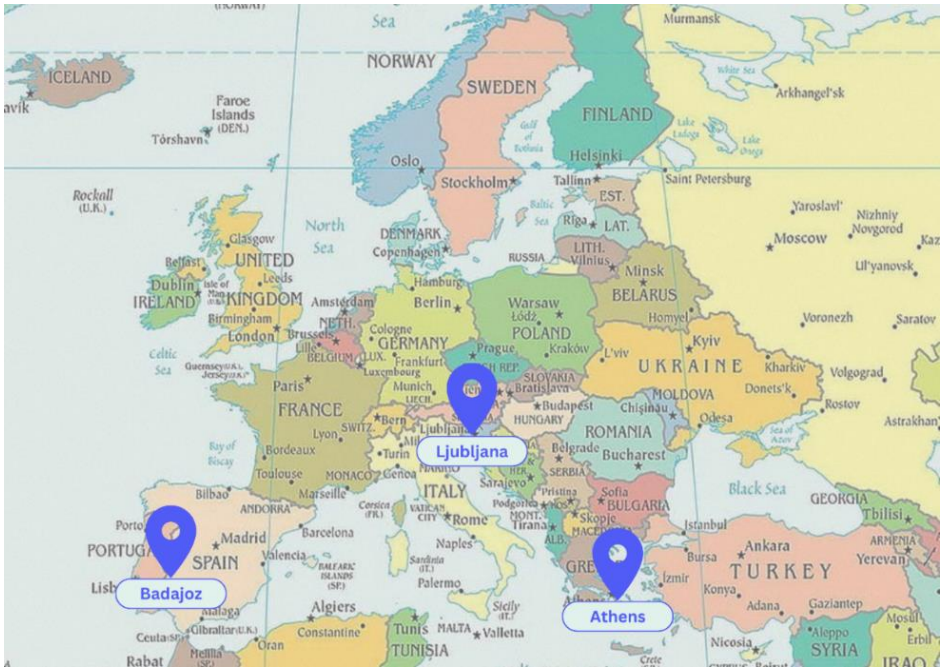

Figure 2 Pilot sites

Each pilot has a different focus in the field of policy making, adding value to the project. In the case of Spain, DPB is a local entity determined by the grouping of municipalities, with its own legal personality and full autonomy. The province is responsible for cooperation in the promotion of economic and social development and planning in the provincial territory, in accordance with the powers of the other public administrations in this area. The second pilot is led by JSI, a public research institute in Ljubljana, Slovenia. One of the JSI's departments involved is the International Research Centre on Artificial Intelligence (IRCAI) under the auspices of UNESCO and OECD. Lastly, in Greece, the pilot is led by the municipality of Vari-Voula-Vouliagmeni (VVV), in cooperation with the Greek Ministry of Tourism (MT). VVV is a Local authority governed by the Municipal Council and the Mayor, with about 600 employees. It provides services to 50.585 residents and visitors.

Eight (and potentially 9) UCs have been identified up to this point, covering a variety of topics. The JSI's pilot will implement four (4) different use cases. The pilot sites in Athens and Badajoz have identified two UCs each. The sectors which the pilots are covering are Sustainability/Health (2 UCs), AI Ethics & Policies (1 UC), Tourism (2 UCs), Security (1 UC) and Water Management (2 UCs). The aim of the UCs is to facilitate policymakers on the development of automated, educated and

evidence-based decisions and increase the trust of citizens in the democratic processes and institutions with the support of AI.

3.1 The AI4Gov Use Case Scenarios

This section provides an overview of the updated second version of the Use Case Scenarios. The following information was obtained from the pilots in cooperation with the technical partners. It includes updated descriptions, datasets, target stakeholders and the identified AI4Gov tools to be used in each UC, as well as some first DEMOs. The table below provides an overview of the UCs and the respective stakeholders and AI4Gov tools.

Table 2 UC overview

	Use Case	Sector	Stakeholders	AI4Gov tools
DPB	*Use Case #1 Water management cycle – drinking water* *Use Case #2 Water management cycle – Sewage water*	Water management	Technicians at the local Waste Management public consortium Policy-makers Consortium officials High-level public administration workers Citizens	• Adaptive Analytics Framework • XAI Library • Visualisation Workbench
JSI	*Use Case #1 IRCAI global top 100 projects* *Use Case #2 SDG Observatory*	Sustainability	Top100 reviewers Top100 applicants Policy makers Researchers Journalists General public	• Bias Detector Toolkit • Training materials • Organisational guidelines and blueprints for trustworthy AI. • Visualisation Workbench

	Use Case #3 Bias analysis in the area of alcohol abuse in traffic – Slovenia	Public Safety, security	Traffic police and traffic experts Policy makers Journalists General public	• Bias Detector Toolkit • Training materials • Organisational guidelines and blueprints for trustworthy AI. • Visualisation Workbench • Policy oriented analytics & AI algorithms
	Use Case #4 OECD policy documents analysis	AI ethics & Policies	Policy makers Legal and ethical experts interested in AI Journalists General public	• Visualisation workbench • Policy oriented analytics & AI algorithms
VVV/ MT	*Use case #1 Traffic violations monitoring*	Tourism	Municipal police staff and officers Policymakers - Municipal Council Citizens and visitors	• Policy-Oriented Analytics & AI Algorithms • Adaptive Analytics Framework • Visualisation Workbench
	Use Case #2 Waste management - Pay As You Throw (PAYT)			

It should be noted that the final version of the UC specifications (D6.3) is planned to be submitted due on M30, thus as the project progresses, so will the use cases.

3.2 Policies for Sustainable Water Cycle Management at a Large Scale (DPB)

The first pilot of the project, corresponding to T6.2, is based in Badajoz, Spain, and is led by the Diputación Provincial de Badajoz. This provincial council oversees 63 drinking water treatment stations, serving 137,910 inhabitants, and manages the treatment of wastewater. The pilot focuses on developing sustainable water cycle management policies for both drinking and sewage water. By harnessing intelligent tools, the aim is to enhance efficient water management using the extensive data collected from installed sensors and individual consumption records. These tools will integrate with the existing Water Cycle management system, leveraging the data it generates to boost overall system efficiency.

The pilot will develop and apply advanced technologies to identify predictive methods for improving the efficiency of water treatment, distribution, and consumption. The goal is to correlate the data with potential inefficiencies in the system, such as variations in water quality throughout the treatment cycle and off-hour electricity consumption. This approach aims to provide actionable insights to optimise the entire water management process, ultimately leading to better resource use and sustainability.

3.2.1 Use Case #1 Water management cycle – drinking water

Main sector of interest: Water Management | Keywords: water management, drinking water, sustainability, Water Cycle, Real-Time Data, Efficiency

Summary: This UC is dedicated to the drinking water treatment system of the municipalities supplied by DPB. Drinking water management in the Province of Badajoz is centralised on the Drinking Water Treatment Plants and its attendant facilities, which for the past few years have been outfitted with digital monitorisation technologies. The goal is to increase operational efficiency for Water Management. The UC is building a tool for technicians to predict possible sources of inefficiency within the system related to the quality of water and the energy consumption. In addition, the UC will create an executive Reporting system for Water Management, to identify recurring problematic areas within the system, imbalances among points of service, over-time evolution of relative efficiency, etc. By analysing the data over longer periods of time, the pilot would help policy-makers identify recurring problems and overall trends in Water Cycle management, to provide a tool for improving long-term investment strategies. A proper application of predictive analytics can be a useful tool for the local administration.

Target stakeholders/users:

- Technicians at the local Waste Management public consortium: these will be able to more easily access the information they use on the day-to-day management of the facilities.
- Policy-makers: Greater access to higher quality predictions and analytics will enable policy-makers to take better informed decisions on issues related to the use-case
- Consortium officials: In a similar way, high-level consortium officials can leverage these predictive capabilities for a better management of the project.
- High-level public administration workers: Proper visualisation tools will ensure that public administration workers can readily access the information they need for tasks such as reporting, resource-sharing, elaboration of open data packages, etc.
- Citizens: These will benefit both directly (greater transparency through said open data portals, eventual public dashboards, etc) and indirectly (through better management of the services they use).

AI4Gov tools to be employed

- Adaptive Analytics Framework
- XAI Library
- Visualisation Workbench

Progress & next steps

The user interface (UI) being developed in this UC is designed to simplify the input and analysis of drinking water data through an easy-to-use form. This form has two main sections:

- Time Range Specification: Users can select a start and end date to set the period for data analysis.
- Variable Entry: Users input a specific drinking water variable, such as pH levels, which are important for assessing water acidity or alkalinity.

After submitting this information, the system uses advanced forecasting algorithms to create a predictive chart. This chart shows the expected future values of the selected variable within the chosen time range. By examining historical data, the model identifies patterns, trends, and potential fluctuations, providing valuable insights into the likely future behaviour of the drinking water parameter.

This tool supports proactive decision-making for water quality management and resource planning. Its user-friendly design and advanced forecasting features make it a powerful resource for informed decisions based on past trends and predictive analytics.

3.2.2 Use Case #2 Water management cycle – Sewage water

Main sector of interest: Water Management | Keywords: water management, sewage water, sustainability, Water Cycle, Real-Time Data, Efficiency

Summary: The second UC is dedicated to the sewage water management, in the municipalities included in DPB's system. Similar to Use Case 1, sewage water management in the Province of Badajoz relies on data gathered at several Wastewater Treatment Plants, dependent on the local public environmental consortium. As a region with intense agricultural use, having a robust real-time monitorisation system may help prevent unexpected drops in water quality —with a corresponding increase in treatment necessary— due to agricultural use of water.

The objectives are similar to the first UC, meaning to increase operational efficiency Improvement for Water Management. Through the analysis of historical data for the different Sewage Water Treatment Plants, the UC will provide a tool for technicians to detect possible sources of inefficiency within the system related to the quality of water and the energy consumption. In addition to this, the UC will create an executive reporting system for Water Management, to identify recurring problematic areas within the system, imbalances among points of service, over-time evolution of relative efficiency, etc. By analysing the data over longer periods of time, the pilot would help policy-makers identify recurring problems and overall trends in Water Cycle management, to provide a tool for improving long-term investment strategies.

Target stakeholders/users:

- Technicians at the local Waste Management public consortium: these will be able to more easily access the information they use on the day-to-day management of the facilities.
- Policy-makers: Greater access to higher quality predictions and analytics will enable policy-makers to take better informed decisions on issues related to the use-case

- Consortium officials: In a similar way, high-level consortium officials can leverage these predictive capabilities for a better management of the project
- High-level public administration workers: Proper visualisation tools will ensure that public administration workers can readily access the information they need for tasks such as reporting, resource-sharing, elaboration of open data packages, etc.
- Citizens: These will benefit both directly (greater transparency through said open data portals, eventual public dashboards, etc) and indirectly (through better management of the services they use).

AI4Gov tools to be employed

- Adaptive Analytics Framework
- XAI Library
- Visualisation Workbench

Progress & next steps

In this UC, the user interface serves as a comprehensive tool for entering and analysing sewage water variables, which are essential for assessing wastewater quality. These variables include chemical oxygen demand (COD), total phosphorus (TP), nitrogen compounds (NT), and 5-day biochemical oxygen demand (BOD5).

Users follow two main steps:

- Specify a Time Range: Select the start and end dates to define the period for analysis.
- Input Sewage Water Parameters: Enter the values for COD, TP, NT, and BOD5.

Once the data is submitted, the system uses advanced forecasting algorithms to create a predictive chart. This chart visually displays future values of the sewage water variables within the chosen time frame. By analysing past data, the forecasting model identifies patterns, trends, and potential fluctuations in COD, TP, NT, and BOD5 concentrations.

This tool provides valuable insights, aiding proactive decision-making in wastewater treatment and environmental management. Its user-friendly interface and sophisticated forecasting capabilities make it a critical resource for understanding and managing sewage water quality based on historical trends and predictions. Figure 3 is a mock-up of how the results of the water management UCs will be visualised.

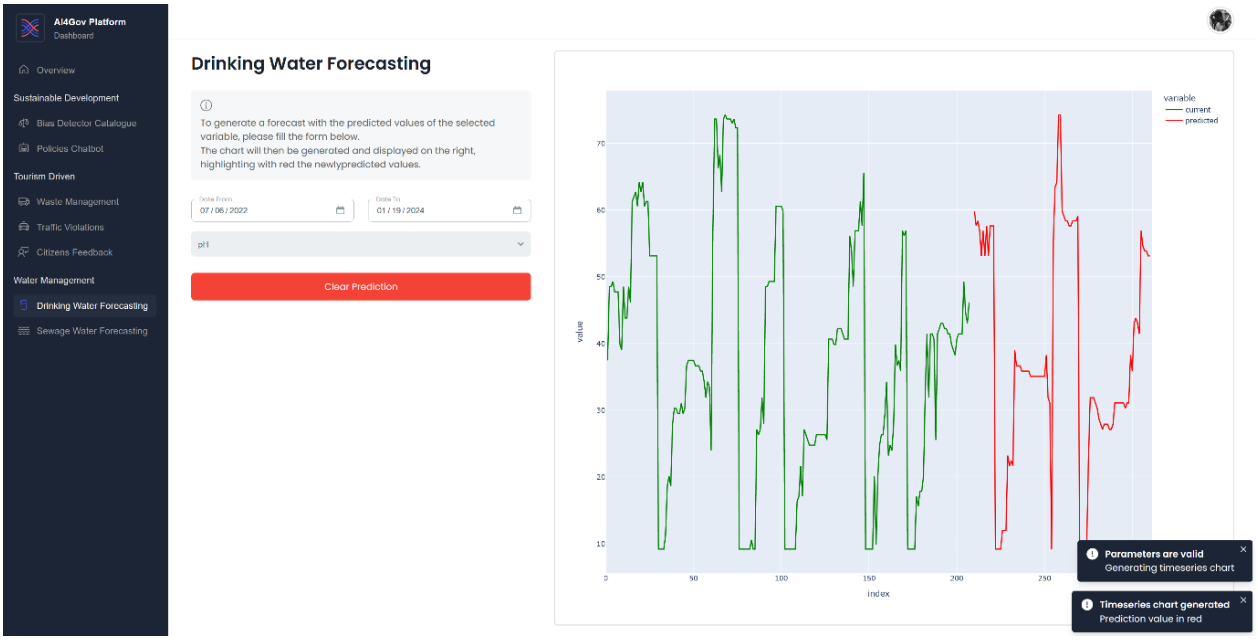

Figure 3 Water management UCs: General visualisation of results & data

By employing time series forecasting, the pilot will create predictions on two bases: the quality of water and treatment processes, and the energy consumption in the water cycle. The AI4Gov tools, including the adaptive analytics framework, XAI library, and visualisation workbench, will be utilised to enhance predictive accuracy and transparency. Additionally, the UCs will provide citizens with downloadable reports from the DPB website, detailing issues and proposed mitigation measures, including timelines and policy recommendations for the water management of both drinking and sewage water.

3.3 Sustainable Development and the European Green Deal (JSI)

The second pilot corresponding to T6.3 will be implemented by the partner JSI, and more specifically through its International Research Centre on Artificial Intelligence (IRCAI) under the auspices of UNESCO and OECD. IRCAI aims to promote international cooperation and collaboration in the development and deployment of AI for the benefit of humanity. The involvement in international organisations like UNESCO and OECD and their large-scale activities (e.g. Top100 projects) are employed in the AI4Gov pilot. IRCAI's vision is to bring AI solutions to Sustainable Development Goals. It wishes to create an international Network of AI experts in SDGs, promote research in AI for SDGs and make it possible for research projects to find specialised investors and make an impact with AI for specific problems such as climate, healthcare, education, economy, poverty, social injustice, etc. Currently, IRCAI is a part of Jožef Stefan Institute (JSI), which is the leading public research institute for natural and technical sciences in Slovenia with over 900 researchers within 25 departments working in the areas of information technologies and computer science, physics, chemistry, biology, nuclear engineering, and ecology. Their information technologies and computer science departments are specialised

in different areas of AI/ML, data mining, language technologies, semantic technologies, and sensor networks.

Additionally, to the existing three UCs identified already in D6.1, JSI is currently working on one more UC. In the sub-sections below, the updated version of the UCs is presented along with their achievements.

3.3.1 Use Case #1 IRCAI global top 100 projects

Main sector of interest: Sustainability | Keywords: SDGs, IRCAI, Top100 projects

Summary: Top100 projects is an IRCAI initiative, funding projects to address problems related to the SDGs by using Artificial Intelligence, from all five geographical regions: Africa, Europe and Americas, Asia and the Pacific, and the Middle East. The primary objective is to identify and present solutions worldwide, making a significant contribution to the SDGs through the creation of a vast platform for sustainable solutions. The aim is to enhance the effectiveness and impact of these solutions. Ethical considerations are important, in order to introduce a methodology for the evaluation of bias in project proposals and how the applicants address these issues.

Applicants provide information about their projects through the IRCAI website by filling out an on-line form. The reviewers, which are the members of the IRCAI Scientific Programme Committees, Scientific Journal Editorial Board, and Business and Impact Council evaluate all individual projects, and based on their reviews, the final report on the projects is prepared. Reviewers have already pointed out that the online form should be improved to collect more technical background information about the submitted projects, and to better understand how projects address ethical considerations and bias issues. IRCAI has also identified the need for an improved project evaluation methodology, especially for the evaluation of bias in data and models, and AI ethics concerns. This is strongly correlated with the application form design.

The aim of the UC will be to create a document-style framework with listed services and a set of rules for bias evaluation. If possible, there will be a toolkit that allows the applicants to assess the bias in their data and models in order to self-evaluate their projects. Alternatively, the UC will create a bias evaluation platform, an API or web application where the applicants would be able to test samples of their datasets and/or their models. That application would help to assess bias and provide a report that could be used in our Top 100 project. In the long run, the UC will establish a clearinghouse for bias evaluation and have a model, rules, and toolkit for bias evaluation of any AI solution in general.

Reviewers have already pointed out the need for ethical consideration and the existing bias issues in the proposed projects. The report from 2021 proposals pointed out that the result of the first call revealed a lack of substantive awareness and consideration for ethical criteria, either in the form of AI principles such as privacy and transparency or in terms of the ethical risks and trade-offs inherent to many of the proposed solutions. The report from 2022 proposals indicates the same problems, and showed that AI Ethics, in particular bias analysis in AI algorithms and data, is still incipient.

Target stakeholders/users:

- Top100 reviewers: The reviewers will have more guidance on how to evaluate bias and AI ethics concerns in submitted projects.
- Top100 applicants: The applicants will better understand the importance of bias problem and will receive feedback on how they can address those issues

AI4Gov tools to be employed

- Bias Detector Toolkit
- Training materials
- Organisational guidelines and blueprints for trustworthy AI.

Progress

During the past 12 months, the team prepared four additional questions for Top100 applicants. These questions were integrated into the on-line submission form, which is available at https://ircai.org/global-top-100/submission-form/ and were focused on human rights and ethical aspects of submitted AI solution.

The call for submissions ended in May 2024 and they are presenting the short analysis of the collected answers. Till the end of May, they received 26 submissions.

The four questions can be found in the section 3.3 in the online form, and they are presented below:

- **Ethical considerations and implications of the AI solution, both long and short term.**

  Is the application of the AI technologies ethical and equitable? Does it take consideration of potential impacts to Human Rights?

While some applicants just briefly answered that they considered ethics and human rights, the majority provided more detailed explanation and explained they were also auditing their solutions for bias. They claim they incorporated human oversight in decision-making processes, paid attention to data scarcity, respect user privacy, focused on mitigating gender biases and paid attention to marginalised groups. Many of them also stated they paid special attention to transparency, especially about AI functionalities. One of them also included redress mechanisms for corrective actions and the other a report on the interpretability of AI. Some of them also stated that they follow global guidelines for ethical AI and one of the applicants stated they signed a declaration for responsible AI.

- **Inclusiveness and fairness of the AI solution**

  To what extent does the proposal contain specific elements of added value, such as innovative approaches, models for good practice, promotion of gender equality, equal opportunities, etc.? To what extent does the initiative ensure that the AI solution does not create discriminatory or unjust impacts for different demographic and geographic groups?

Several applicants emphasised inclusiveness and fairness as their fundamental principles. They tend to apply AI solutions across all geographic regions and demographic groups without discrimination, ensuring equal access to information and opportunities. Some applicants answered that they have gender-balanced teams and several projects specifically aim to address

gender inequality and socio-cultural biases, incorporating these aspects into their AI solutions. Some of them are promoting fairness through collaboration with experts from different fields. Also, they claimed that they are ensuring the privacy and security of user data, and they are following various established guidelines to ensure responsible AI development (for instance "AI4People — Good AI Society", UNESCO's "Ethics of AI", etc.).

- **Addressing possible bias in your data**

  How has your project systematically considered and addressed potential biases in the data used, irrespective of whether it was collected or obtained from external sources? Please provide insights into the measures taken to analyse and ensure inclusivity across diverse demographic groups, outlining specific strategies implemented to identify and mitigate biases in the data. This information will help evaluate the robustness of your approach in promoting equity and minimising biases in the context of your AI solution.

The applicants answered that they are addressing potential biases in data by employing diverse datasets (to avoid reliance on a single biased source), by rigorous validation, by human oversight, and by continuous monitoring. Some of them claimed they implemented specific strategies to mitigate bias, such as random sampling and data cleaning techniques to remove inconsistencies, errors, or missing values that could introduce bias. They also included diverse stakeholders in the development process, auditing their algorithms, refining their AI models and even employing Bloom's taxonomy to minimise concerns about bias. Some applicants claimed they are adopting principles like Data-Centric AI (DCAI) and FAIR data principles.

- **Addressing possible bias in your models**

  In the process of training and evaluating your AI models - how did your project systematically account for and verify potential biases? Please elaborate on the specific steps taken to assess bias throughout the model development lifecycle, highlighting any strategies implemented to ensure fairness, transparency, and equitable outcomes. This information will help evaluate the effectiveness of your approach in addressing bias during the critical phases of AI model training and evaluation.

Respondents described that they are addressing bias in various phases of AI solution development. They used human oversight and involved different stakeholders to provide feedback during development and they also paid attention to the transparency of the solution and the whole development process. They utilised peer reviews, expert evaluations, and ethical checks to identify and mitigate biases. They also tried to include diverse datasets and non-person data, perform various data analysis and fairness metrics to evaluate outcomes, and performed cross-validation of results. One of the projects also implemented stratified sampling to ensure diverse data representation. They also reported they employed iterative testing with varied demographic groups, conducted regular audits to identify and remove sources of bias and applied statistical methods and post-processing adjustments to detect and correct biases. One applicant also reported they applied regularisation techniques to penalise biased features or decisions. Applicants also answered that they followed ethical guidelines and recommendations from established frameworks.

Conclusion

The analysis of the answers shows that most of the submitted projects are aware of the bias and ethical considerations of their AI solutions and that they try to address potential biases in their solutions with various approaches. However, in the second phase, the team will collect answers from the Top100 reviewers, in order to evaluate how the submitted solutions are actually successful in addressing bias.

Next steps

The next steps of this UC will be to prepare a similar questionnaire for the Top100 reviewers and perform the analysis of their answers.

Till the end of the project, the goal of this UC is to create a document-style framework with listed services and a set of rules for bias evaluation, so the applicants will be able to self-assess the bias in their data in more structured way. The team plans to open this toolkit to others too, so any developer of AI solution would be able to perform the bias evaluation.

3.3.2 Use Case #2 SDG Observatory

Main sector of interest: Sustainability | Keywords: SDGs, IRCAI, SDG achievements, bias

Summary: This UC aims to create a tool that will monitor the achievements of the SDGs, in order to support policymakers. The methodology for monitoring the achievement of all SDG's is still being developed, and the development team is evaluating additional data sources that should be included into the SDG Observatory. The development of the SDG observatory needs to address the problem of possible bias in data and in general as much as possible. This UC will develop tools to inform developers about the bias problem and tools and methodologies to detect and eliminate biases to make the data as unbiased as possible, while identifying the topics and themes that are more prone to bias. Bias could also be in not showing some data, that are otherwise relevant, so this UC is interested in the lack of data as well (for instance, because it is not available). The UC will describe the process of how the data set selection happens, in order to locate what is missing. The UC aspires to provide visualisation and analysis of achieving SDGs in an unbiased way, taking into consideration the issue of bias in data and models.

Target stakeholders/users:

- Policy makers in the EU/Global/National level: This group would be able to identify the best practices for solving SDG's and design policies to contribute.
- Researchers & General public/citizens interested in SDG's: They would be able to identify the best practices for solving SDG's and better understand if and how the policies they see being implemented are aiming towards the achievement of the SDGs. A more informed public will challenge and assess the decision makers pressuring them into a more sustainable policy making.

Updated related online infrastructure

Developers already included EventRegistry data, OECD AI policy documents and OpenAlex data.

AI4Gov tools to be employed

- Bias Detector Toolkit
- Training materials
- Organisational guidelines and blueprints for trustworthy AI
- Visualisation workbench

Progress

In the context of this UC, AI4Gov is developing a methodology regarding bias detection and prevention, however, the team is closely monitoring the progress of the development of the SDG Observatory. This work will be accessible to all, through a dedicated website.

SDG Observatory is providing visualisations of data about achieving SDGs. These aims address the world's most pressing challenges, such as poverty, inequality, climate change, and sustainable development, distinguishing specific targets for actionable resolutions since 2017.

SDG's provide a comprehensive framework for governments, organisations, companies and individuals to work together towards a more equitable and sustainable future for all. The aim of IRCAI's SDG Observatory is to provide the user with a shareable landscape of the impact of AI in the progress of SDGs, and with AI-based tools that allow the user to explore large open datasets and find insight with own observations. Currently, the IRCAI SDG Observatory website is under heavy development. It is available at https://sdg-observatory.ircai.org/, but several features are still not implemented or are implemented only partially. Please note, that various visualisations on this website are still just mock-ups.

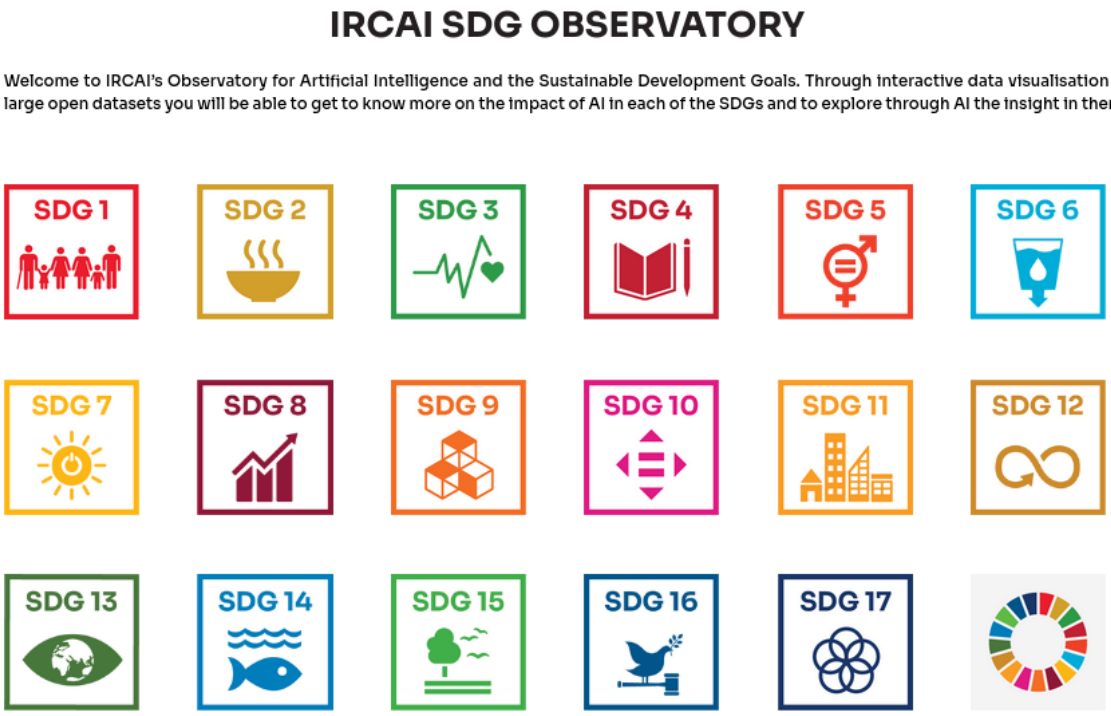

Figure 4 SDG Observatory website

Currently the developers are working on the backend infrastructure and the first focus will be on SDG 6 – Clean water and sanitation, because there is an existing user base available for this SDG.

Field study for SDG6 observatory

The goal of SDG 6 is to ensure availability and sustainable management of water and sanitation for all. Our Observatory for this SDG 6 is dedicated to clean water & sanitation and is based on the pilot NAIADES Observatory (http://naiades.ijs.si/) built with the European Commission under the NAIADES Project (http://naiades.ijs.si/) and was featured in the Smart Water Magazine. Due to the information provided by these sources, SDG 6 is the most developed goal on SDG Observatory and is already actively used by end users.

The team prepared a small field study for the SDG6 observatory on how the bias problem is approached by the developer, curator and user and currently they are collecting answers. The full questionnaire can be found in the Appendix (7.1).

EventRegistry data on SDG Observatory

A special part of the SDG Observatory is dedicated to the analysis of media articles all over the world to identify SDG-related events from millions of worldwide multilingual news, and to exhibit best practices towards solving SDG-related problems.

For ingesting news and extracting events, the team is using a tool, developed by JSI, called Event Registry (https://eventregistry.org/). Event Registry is able to process news articles published in different languages world-wide. It is used to identify the mentioned events in these articles and extract the main event information. Extracted event information is stored in a structured way that provides unique features such as searching for events by date, location, entity, topic and other event properties. Event Registry contains more than 15 million articles from which about 1 million events have been identified from January 2016.

The first step is to define concepts and keywords for monitoring news about specific SDG's. Developers are aware that this step can cause bias. The idea is to start with initial concepts and keywords and to develop the whole pipeline for news analysis and visualisations. However, after that, the developers will invite a group of experts for each SDG to review the initial concepts and keywords and to propose new ones, to reduce the bias. The media monitoring and analysis tool will then be using these new (revised) concepts and keywords, and the media analysis will be less biased.

After the initial concepts and keywords were selected, the developers defined the so called "topics of interest" for each SDG.

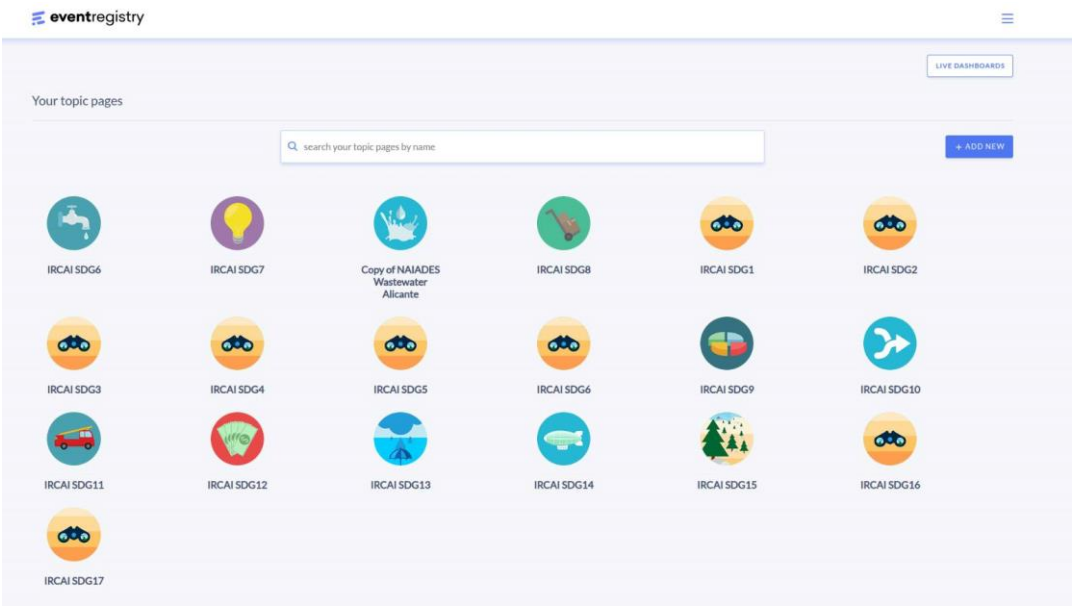

Figure 5 Topics of interest for each SDG

The specific topics then have defined categories, concepts, keywords and weights for them. EventRegistry then collects news relevant to these topics of interest and provides an analysis of that news in real time.

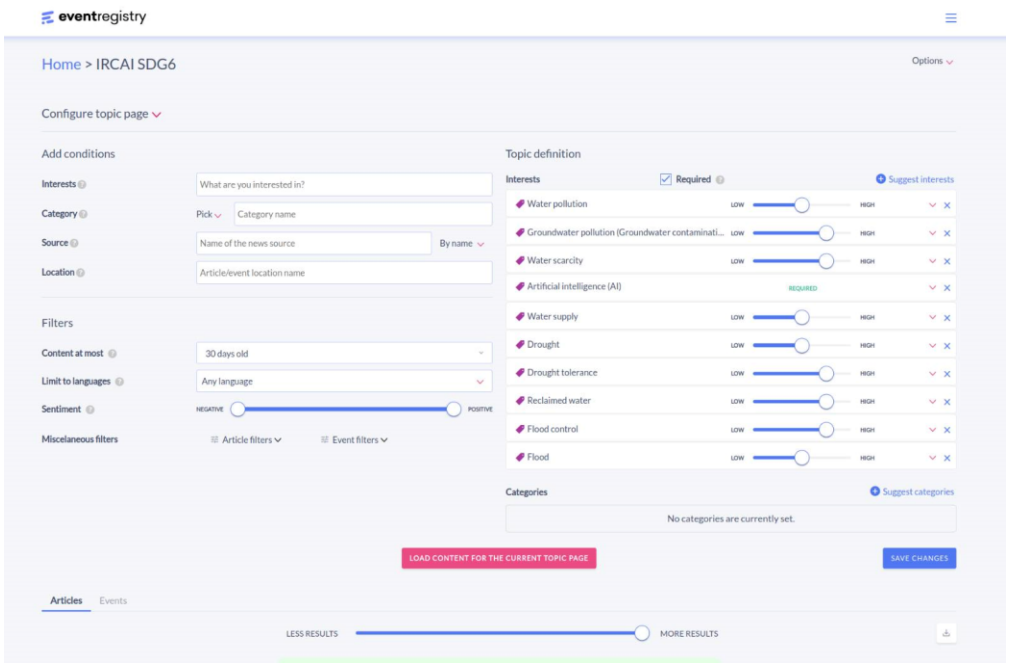

Figure 6 Example of SDG 6 (Clean water and sanitation) topic of interest definition

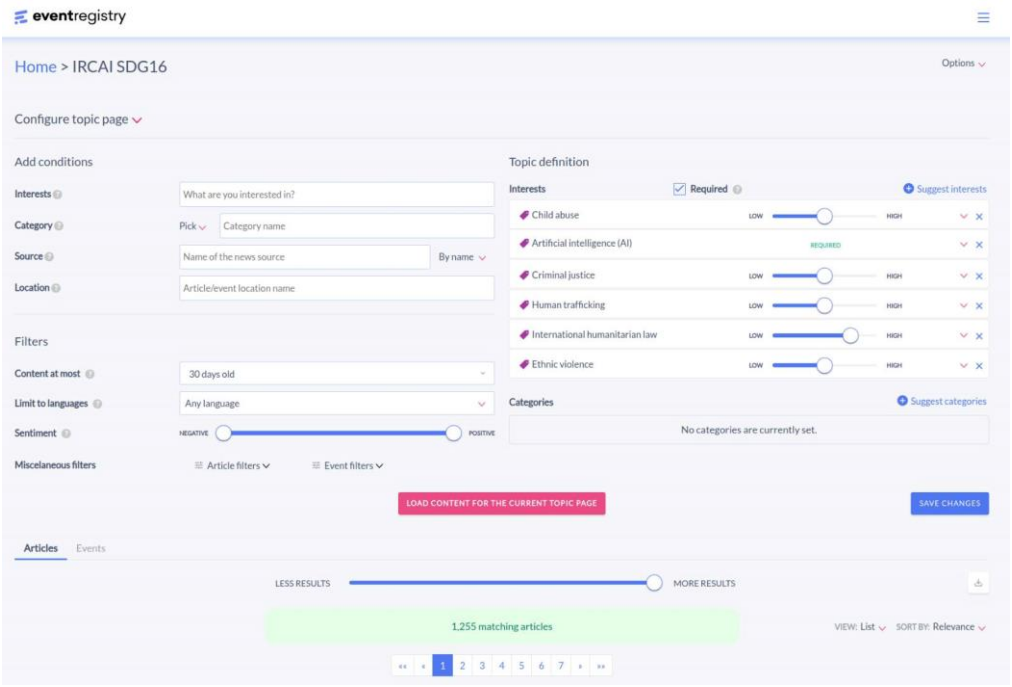

Figure 7 Example of SDG 16 (Peace, justice and strong institutions) topic of interest definition

This news is then collected by the SDG Observatory through the EventRegistry API and shown in real time. The SDG Observatory is currently showing just a live flow of news, a world map of identified events and a word cloud and sentiment analysis of news. In future releases developers plan to show additional visualisations of news articles under specific topics, for instance, the most prevalent topics, trends of reporting, etc.

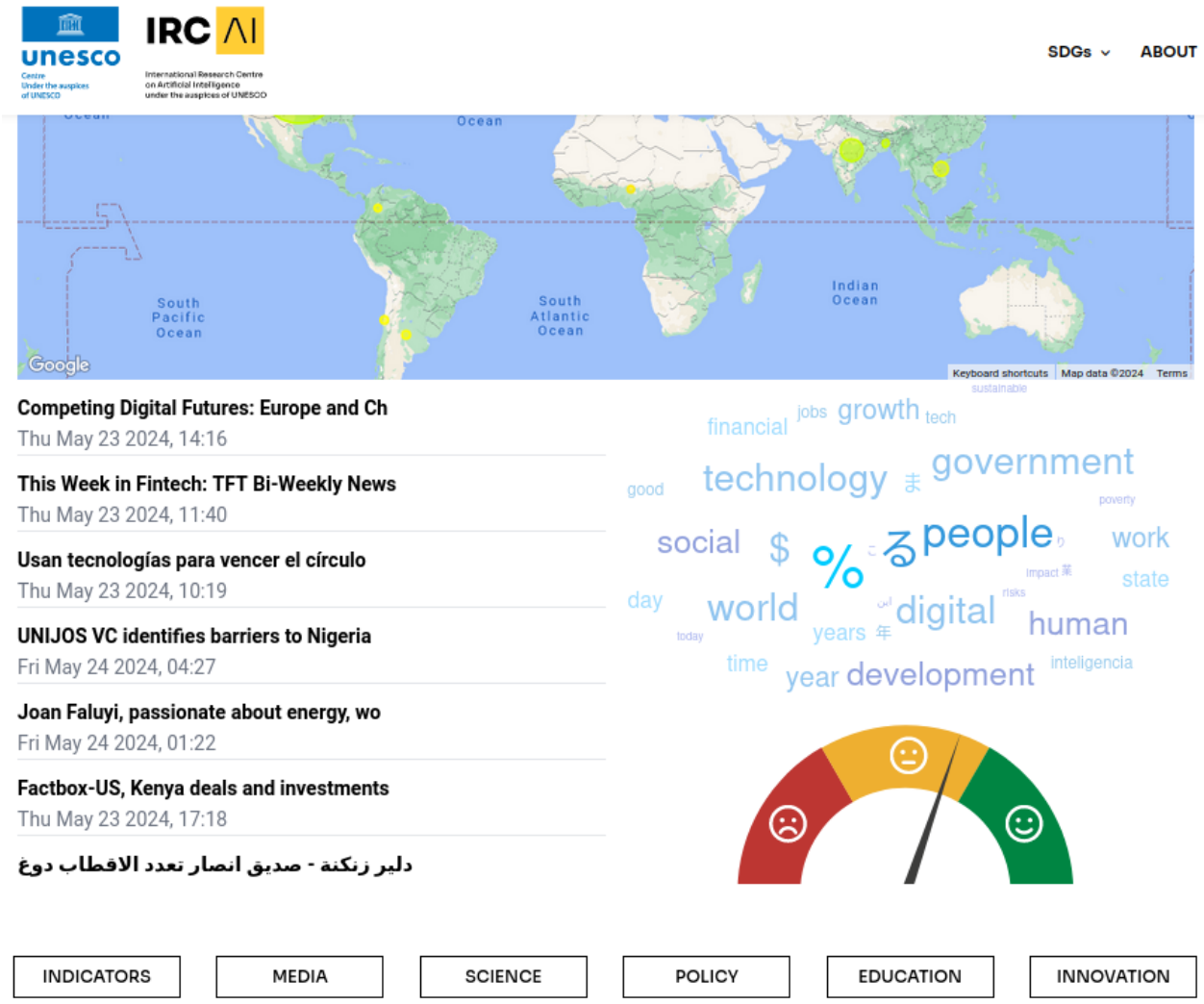

Figure 8 Media monitoring and media reports visualisation for SDG 1 (No poverty) in SDG Observatory

Missing data analysis in the area of rare diseases

One common bias in data sources is the lack of data itself. This refers to a situation where the training data used to develop an AI model does not adequately represent the diversity or full range of scenarios that the model will encounter in the real world. This can lead to systematic errors or unfair treatment of certain groups and poor performance of AI solutions. The focus in this specific use case is on missing data, which refers to a situation when specific categories or types of data are absent from the training dataset. In that case, the AI model can develop skewed or incomplete results and is therefore biased. There are several mitigation strategies to this problem. One example is data augmentation (increasing the amount of diverse data in the training set to ensure that all relevant scenarios and groups are well-represented), creating synthetic data that mimic the characteristics of underrepresented groups or scenarios to balance the training set, etc.

However, a scenario when data are simply not available, presents a significant challenge for unbiased AI solution. For this use case the team is developing a methodology for missing data analysis. The idea is to show where the problem of missing data is and then initiate more extensive data collection from those missing areas. This methodology has been implemented in the area of rare diseases which is facing a bias because of data incompleteness. Although a comprehensive understanding necessitates data from all corners of the globe, the reality is that more data predominantly originates from Western countries, where healthcare systems are more developed.

In this case they used patient-reported outcomes (PROs) repositories. Patient-reported outcomes are any report coming directly from patients about how they function or feel in relation to a health condition and its treatment, without interpretation of the patient's responses by a clinician, or anyone else. They include any treatment or evaluation outcome obtained directly from patients through interviews, self-completed questionnaires, diaries or other data collection tools such as hand-held devices and web-based forms. GenIDA is an international participatory database to gain knowledge on health issues related to genetic forms of neurodevelopmental disorders.

The team developed an advanced analytics pipeline explicitly designed to quantify and address the incompleteness of data originating from regions with less developed healthcare infrastructure. The analytics pipeline integrates statistical and machine learning methodologies to analyse those PROs and identify the residence (country) of the patient. In the pilot version, the pipeline is focused on the Kleefstra syndrome PRO data. Kleefstra syndrome is caused by a mutation in a specific gene or deletion of a specific region of chromosome that includes this gene. People with this syndrome usually have distinct facial features, developmental delay, intellectual disability, low muscle tone (hypotonia), and communication difficulties.

This data is then visualised in order to show the underrepresented regions. By quantifying and addressing the imbalances in data, our research aims to facilitate a more inclusive and equitable approach to rare disease research, ultimately leading to more effective interventions and improved outcomes on a global scale.

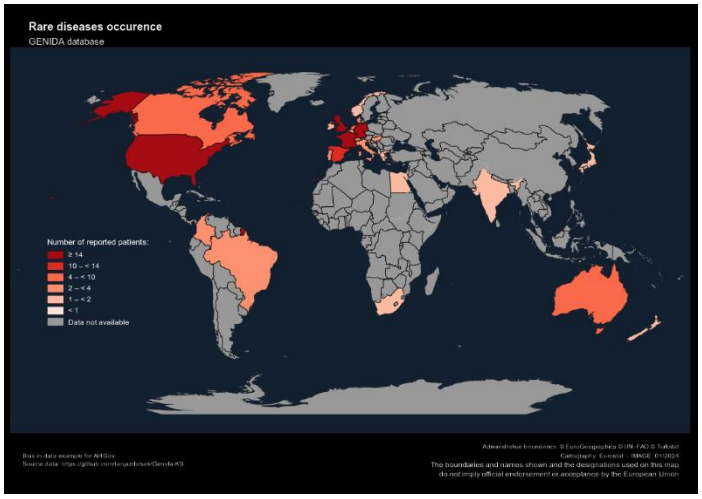

Figure 9 Visualisation of Kleefstra syndrome occurrence from PROs from GenIDA repository in the world

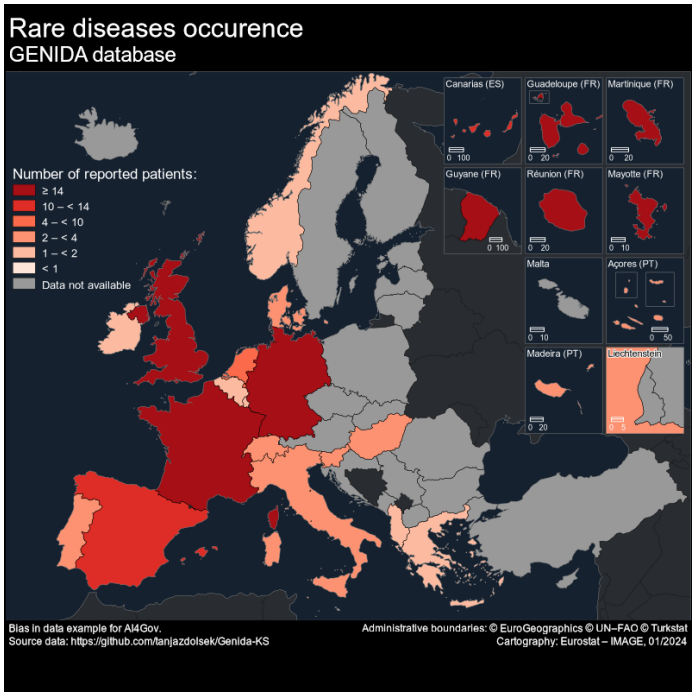

Figure 10 Visualisation of Kleefstra syndrome occurrence from PROs from GenIDA repository in European union only

The visualisation clearly shows that majority of data about Kleefstra syndrome predominantly originates from Western countries, where healthcare systems are more developed. However, similar trends could also be spotted in European union – more developed countries in the north and western part of Europe have more occurrences of Kleefstra syndrome reported than less developed countries from the eastern part of EU and the Balkans.

This analysis will be expanded to other rare diseases in GenIDA database. Currently the team is extending the analytics pipeline to other diseases and replanning to develop a web application that will enable the user to select a rare disease and see the visualisation of missing data.

One of the next immediate steps of this UC is to be integrated into the AI4Gov tools, especially into the Policy recommendations toolkit and the visualisation workbench.

3.3.3 Use Case #3 Bias analysis in the area of alcohol abuse in traffic – Slovenia

Main sector of interest: Public Safety | Keywords: traffic violations, bias, missing data

Since the goal is to generalise the approach of missing data that create bias, the team is also preparing an additional use case. In this use case they intend to implement the same methodology as in the 2nd UC to show data incompleteness in the area of traffic accidents and alcohol abuse by the drivers in certain parts of Slovenia

Slovenian police have a database of traffic accidents and a database of traffic offences. The team already has a database of traffic accidents, and they created a visualisation of the number of

traffic accidents in each administrative unit per 100.000 inhabitants, and the number of traffic accidents in each administrative unit per 100.000 inhabitants where alcohol has been involved.

In Slovenia, police are required to deal with all traffic accidents in which at least one person has been lightly or seriously physically injured, when someone has died as a result of the accident or when participants call the police (in case of traffic accident in which only material damage occurred). When police treat traffic accidents, they are also required to breathalyse traffic accident participants if there are physical injuries or death or if the police officer thinks that the participant is likely intoxicated. This means that in case of traffic accidents, the data incompleteness very likely does not occur. However, the police have different tasks, and one of them is also randomly checking for traffic violations, which includes breathalyse tests on drivers.

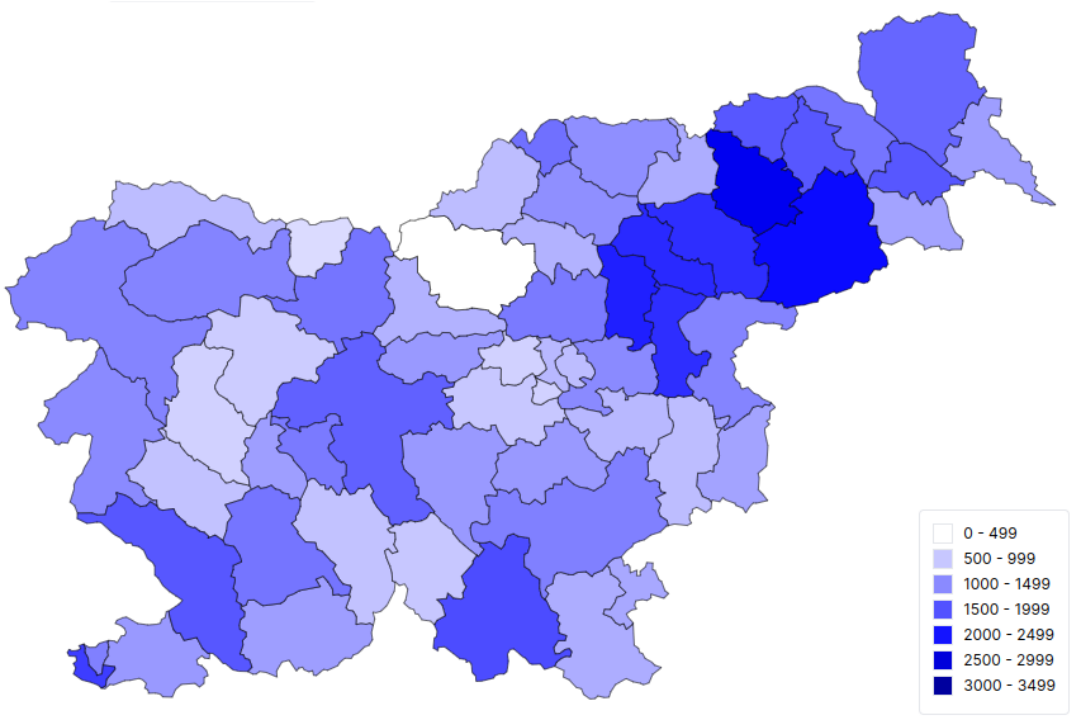

Figure 11 Visualisation of traffic accidents by administrative units per 100.000 inhabitants from January 2005 till November 2022 (93170 cases)

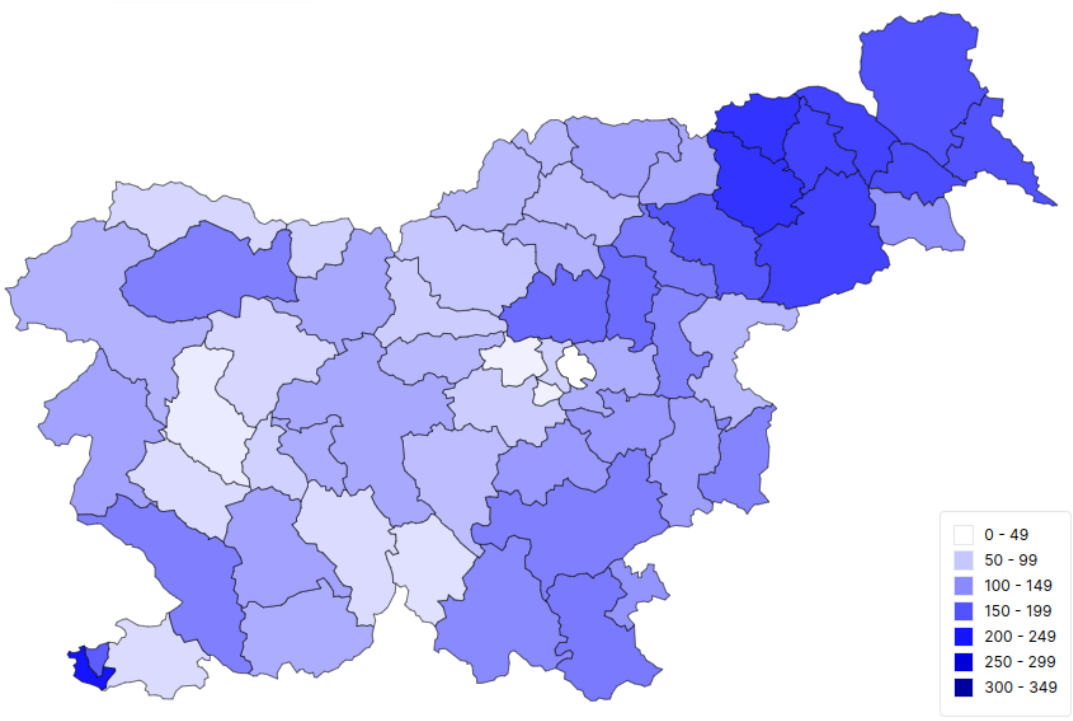

Figure 12 Visualisation of traffic accidents by administrative units per 100.000 inhabitants from January 2005 till November 2022 when breathalyser shown more than 0.24g/kg of alcohol in breath (8581 cases)

This visualisation already shows that alcohol abuse in traffic is more prevalent in eastern parts of Slovenia. However, the UC would like to test, if the number of breathalyse tests from random police stops is following these trends or if the police in certain parts of Slovenia are more tolerant of alcohol abuse (i. e. if they are doing significantly less random breathalyser checks than in other administrative units). For this the team needs a database of traffic offences, which also includes random police checks and information on how often police is testing drivers with a breathalyser. Currently they are in the process of acquiring these data.

Then they intend to create a visualisation of how often police check for alcohol in different administrative units and compare these data to number of traffic accidents where alcohol has been involved.

In case there are parts of Slovenia where the number of traffic accidents with alcohol involved is significantly higher, but the number of breathalyser tests performed by the police is significantly lower, that would indicate that police officers in those parts are more tolerant to alcohol abuse. That would also indicate that there is a bias in data collection by the police (i. e. random breathalyser's tests), because of biased tolerance to alcohol abuse.

Target stakeholders/users:

- Traffic police and traffic experts: This target group will be able to see if there is a bias towards alcohol abuse in traffic in specific areas of Slovenia and take the necessary measures to minimise incidents of neglect when this abuse happens.

- Policy makers: Policy makers will be able to enact new strategies for minimising possible bias towards alcohol abuse in traffic. This UC will allow them to make informed decisions and pay attention to the areas where most intense interventions are needed.
- Journalists and general public: This group will be able to see if there is a bias towards alcohol abuse in traffic and then facilitate their assessment of the policies enacted by the policy makers.

Table 3 Related online infrastructure

Relevant existing datasets		
Data Asset name		Police data about traffic accidents and traffic offences
Variety (pre-existing)	First-hand data	Police database of traffic accidents Police database of traffic offences Statistical data about number of inhabitants by administrative unit
	Second-hand data	
Velocity		Data are collected once per year.
Volume in project		Currently around 300 Mb, 10-12 Mb per year for traffic accidents. We are still waiting for data about traffic offences.
Streaming data		N/A
Historical data (if yes how long)		Data are available from 2005.
Existing Discrimination/underrepresentation		N/A
Relevant Existing Services		
Service name		**Online publication of data**
Description		Police is publishing data about traffic accidents online as a part of their annual report. Data of traffic offences needs to be acquired by access to public information request.
Type of user(s)		General public, researchers
Points to be improved		N/A, however we plan to propose the police to publish data about traffic offences automatically (and not just upon request).

Existing Discrimination/underrepresentation	N/A

AI4Gov tools to be employed

- Bias Detector Toolkit
- Training materials
- Organisational guidelines and blueprints for trustworthy AI.
- Visualisation workbench
- Policy oriented analytics & AI algorithms

Next steps

The next steps are to work on this additional use case, to apply missing data analysis methodology used in the area of rare diseases to the area of traffic safety.

3.3.4 Use Case #4 OECD policy documents analysis

Main sector of interest: AI Ethics & Policies | Keywords: OECD papers, AI policies, anti-bias strategies

Summary: OECD has a collection of various national AI policies and strategies. They have an online repository with over 800 AI policy initiatives from 69 countries, territories, and the EU. The UC will analyse these documents and map the chapters referring to bias. A visual summary of how these documents approach bias and what solutions they are providing to tackle the problem of bias will be created. This will facilitate the mapping of good practices.

This UC will provide visualisation and analysis of how different countries and international organisations are trying to tackle the problem of bias in AI, based on the content of the OECD policy documents. The team will analyse these documents and find the chapters presenting anti-bias policies and practices. Then a visual summary will be created presenting solutions and good practices. This UC will raise awareness of the importance of ethics in AI, and the importance of bias prevention approaches. Policy makers should be encouraged to address these issues accordingly and raise awareness among developers of AI solutions.

Target stakeholders/users:

- Policy makers: Policy makers would be able to identify best policy and legal practices dealing with bias in AI and AI ethics. Also, they can gain insights into the most effective policies that address bias in AI. This includes understanding which regulatory measures have been successful in other jurisdictions. As a result, they can integrate best practices for promoting AI ethics into the legislative process, ensuring that new regulations adequately address ethical concerns.
- Legal and ethical experts interested in AI: This group would be able to assess the current legal frameworks governing AI, identifying gaps and areas for improvement. This includes analysing existing laws on data protection, privacy, and anti-discrimination as they apply to AI technologies.

- Journalists and general public interested in AI: This group would be able to identify the current regulations and good practices, gaining a deeper understanding of the regulatory environment surrounding AI. This will enable them to report accurately and informatively on AI-related issues.

AI4Gov tools to be employed

- Visualisation workbench
- Policy oriented analytics & AI algorithms

Progress

Up to this point, the team has implemented and is continuously working on the backend infrastructure for the OECD documents analysis. They have developed tools for web scrapping these documents from the OECD website, convert them to Markdown format, ingest them into their platform and enrich them with the automatic classification and categorisation based on which SDGs they are addressing.

The platform in based on ELK – it is an acronym that refers to a set of three open-source tools: Elasticsearch, Logstash, and Kibana. Together, they provide a comprehensive solution for collecting, storing, and visualising log data. Elasticsearch is a distributed, RESTful search and analytics engine. It is used for storing, searching, and analysing large volumes of data quickly in near real-time. Elasticsearch is particularly well-suited for text-based data. Logstash is a server-side data processing pipeline. It is responsible for ingesting data from multiple sources, processing it, and then sending it to the desired output (in our case Elasticsearch). It provides a wide range of input, filter, and output plugins that allow it to handle various types of data and integrate with different systems. Kibana is a web interface for searching, visualising, and interacting with the data stored in Elasticsearch. It enables users to create and share dynamic dashboards and visualisations. It provides a user-friendly way to explore and understand the data stored in Elasticsearch.

The classification and categorisation of which SDGs the AI policy documents are addressing is done by semantic analysis, based on preselected keywords and concepts. Similar to the news analysis, the idea here is also to start with initial concepts and keywords, and then to review and update them, to reduce the bias.

OECD AI policy document sentiment analysis

In the initial phase the team also performed sentiment analysis of the ingested documents, in the SDG Observatory based on VADER methodology. These include news, scientific articles and policies. Since some documents are very large, they split each document into smaller parts (so called “chunks”), which can contain multiple paragraphs. They did this to prepare data for easier analysis with large language models, so called Retrieval-Augmented Generation (RAG). RAG is an advanced technique that combines retrieval-based methods with generative models to improve the performance of tasks such as question answering, text generation, and other natural language processing (NLP) applications.

For each chunk they then computed the sentiment. Since VADER is known to have weak multilingual capabilities, all the documents were machine translated into English first. They are aware that the results are reliant not only upon the accuracy of the sentiment analysis tool, but

also upon the accuracy of machine translation. However, sentiment analysis is less sensitive to common machine translation problems than other usages, because sentiment analysis usually focuses on identifying the polarity (positive, negative, neutral) of a text rather than understanding its full semantic content, and sentiments in text are often expressed redundantly, which can help mitigate the impact of translation errors. As a result, minor translation errors that do not alter the overall sentiment and do not significantly impact the sentiment analysis is possible.

For the purpose of this analysis, they computed the average sentiment of (chunks of) AI policy documents for each country. Since AI policy documents are mostly documents of legal nature (acts, policies, regulatory and governance frameworks), the sentiment should be mostly neutral. However, the analysis shows that there are country differences (and they cannot be explained solely by limitations of VADER analysis).

Figure 13 Sentiment analysis (positive, negative, neutral) of AI policy documents by country

They have also created visualisation of neutral sentiment of AI policy documents on a world map, showing which countries have most neutral AI policy documents.

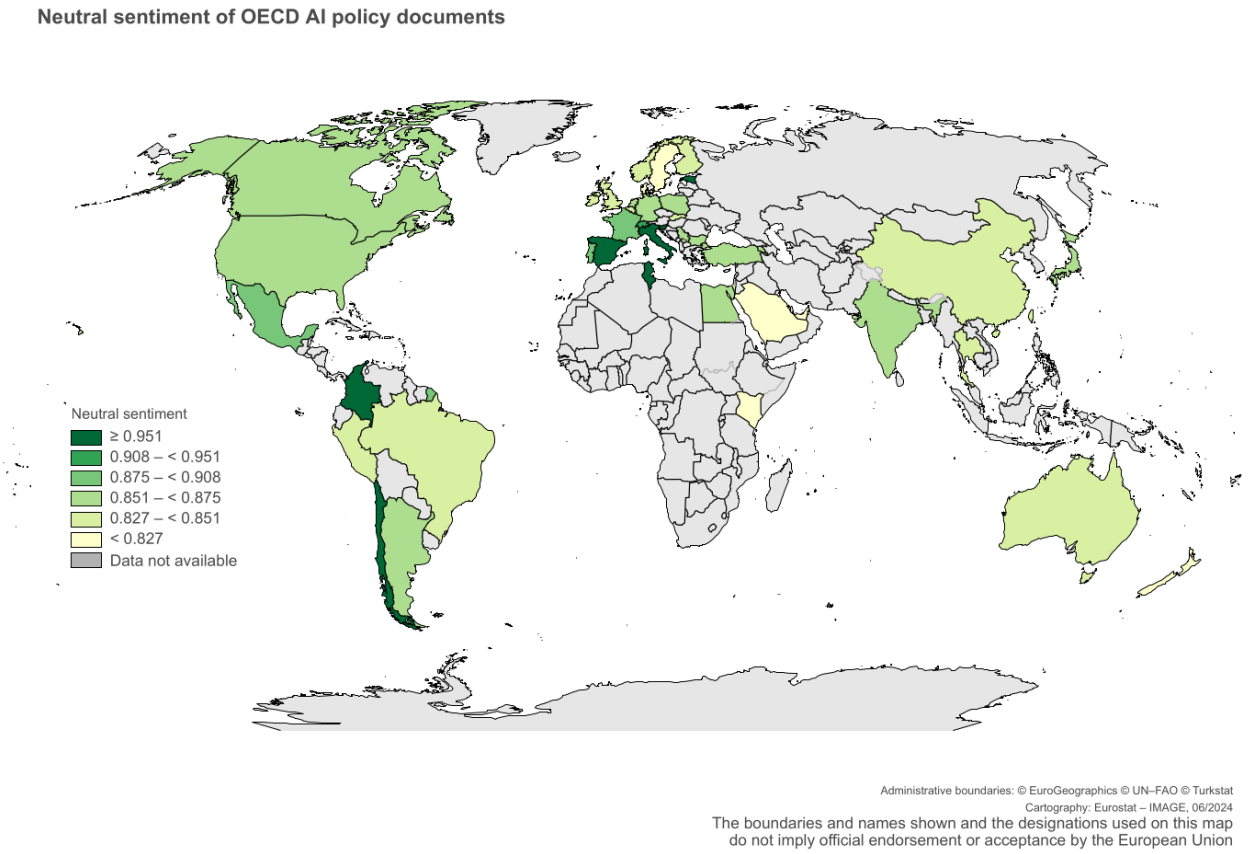

Figure 14 Visualisation of neutral sentiment values of AI policy documents by country

Policy Chatbot Interface

In the context of this UC, and using the OECD policy documents, the Policy Chatbot Interface was introduced in a DEMO format. It is a platform designed to provide comprehensive insights into AI advancements across different countries. This innovative interface functions as a chatbot, enabling users to effortlessly select a specific country and ask questions through an intuitive prompt. Users can explore the extensive collection of OECD AI papers related to their chosen country, gaining valuable insights and information. Upon receiving a user's question, the chatbot performs a sophisticated analysis of the relevant papers, using natural language processing and advanced data mining techniques to provide concise and accurate responses. The user experience is enhanced by the chatbot's ability to deliver not only straightforward answers, but also contextual details derived from the extensive information in the papers. This dual functionality ensures that users receive immediate, clear responses and gain a deeper understanding of the broader AI research and development landscape in the selected country. Whether users have inquiries about AI policy frameworks, technological advancements, or societal impacts, the Policies Chatbot serves as a powerful tool, bridging the gap between complex research and user-friendly accessibility.

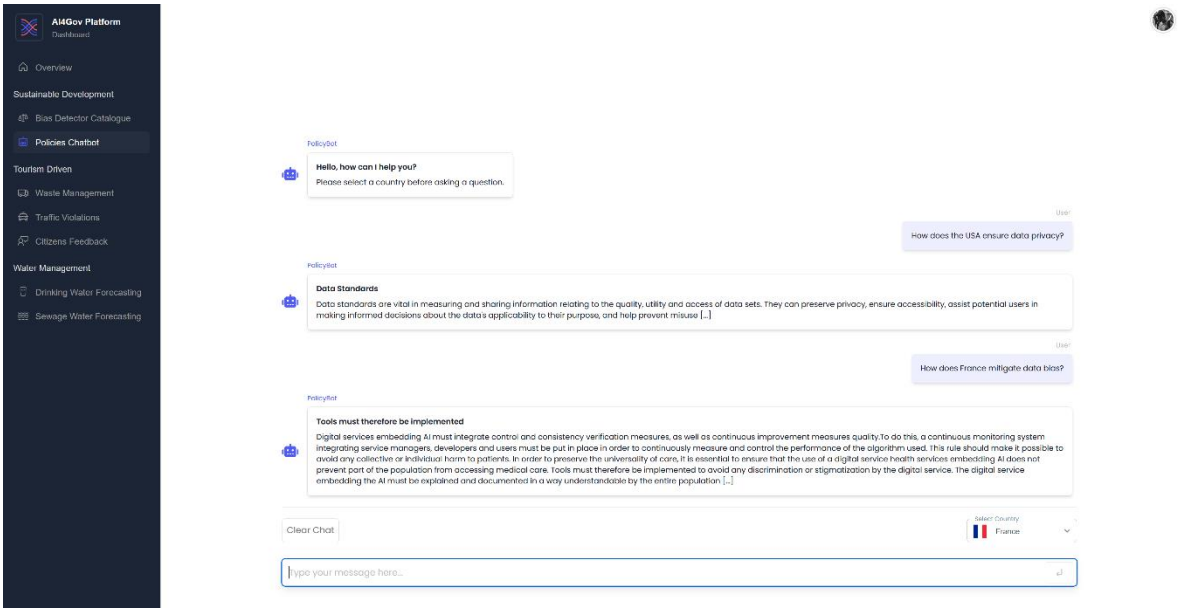

Figure 15 Policy chatbot interface

In the next steps this UC plans to identify documents and chapters of documents that talk about bias, to create a visual summary of how these documents approach bias and what solutions they are providing. They already performed a word cloud analysis of AI policy documents in different regions (continents) and the initial analysis shows that in documents from United States are more prevalent terms like “military”, “national”, “defence” and “security” than in EU. In EU the more prevalent words are “law”, “economic”, “human” and “development”. However, this is just preliminary analysis to be further explored and improved.

3.4 Tourism-driven multi-domain policy management and optimisation (VVV/MT)

The last AI4Gov pilot, corresponding to T6.4, will be implemented by the Municipality of Vari-Voula-Vouliagmeni (VVV) in Athens, in cooperation with the Greek Ministry of Tourism (MT). VVV lies in the eastern part of Attica region, with a long coastline, several sea-side restaurants and bars, as well as findings and archaeological sites. These attract several visitors, especially during spring and summer. The aforementioned visitors reflect four main types: (i) visitors from the wider Attica region that visit the municipality mostly in weekends, (ii) seasonal visitors that leave abroad, visit and stay in the municipality during spring and summer, (iii) tourists that visit Greece and aim at travelling on different areas (e.g., islands) but spend some days in Athens and visit the municipality and (iv) visitors that visit and/or participate to cultural and sport events organised by the Municipality, cultural and sport associations.

The touristic character of the municipality raises the need to alter and optimise the municipality’s policies in different domains, ranging from transportation, cleanliness, and sanitation to healthcare provision, security, and public works. The challenge refers to the adaptation of policies based on the visitors flows considering spatiotemporal elements (i.e., specific areas on specific timeframes) and ad-hoc scenarios (e.g., in the case of severe weather conditions). Furthermore,

the updates on specific policies (e.g., in the case of parking management) should account and should be accounted by updates on other policies (e.g., in the case of waste management) in a bi-directional way. Additional information regarding seasonal visitors and tourists - cases (ii) and (iii) above will be obtained by the Ministry of Tourism as an additional source of information on the expected citizens and the corresponding temporal aspects of their visits. In this context, the goal is to identify and predict specific citizen flows and propose efficient multi-domain policies to manage the citizens (and vehicles) flows in an optimum way.

The VVV has identified two (2) UCs, in the domains of traffic violations management and waste management. The UCs are presented in the sub-sections below. In terms of data sets, there will be some common and some separate data sets to be used. In table 8 the common data sets, related to the visitors' flows are presented.

Table 4 Greek pilot case – Additional Common data sets

Additional data sets		
Data Asset name		**Visitors & Tourists (1)**
Variety (pre-existing)	First-hand data	Number of visitors & Tourists: Beaches, Hotels, Marines
	Second-hand data	N/A
Velocity		N/A
Volume in project		Xls file (100 kb)
Streaming data		No Streaming data
Historical data (if yes how long)		2024-2025
Existing Discrimination/underrepresentation		No
Data Asset name		**Visitors and participants in sports and cultural events organised by private clubs and associations**
Variety (pre-existing)	First-hand data	Number of visitors and participants in sport and cultural events organised by private clubs and associations
	Second-hand data	N/A

Velocity	After the completion of events
Volume in project	Xls file (100 kb)
Streaming data	No Streaming data
Historical data (if yes how long)	Only for 2023
Existing Discrimination/under representation	No

Survey on tourist profiles in the municipality of VVV

Within the framework of Pilot #3, the Ministry of Tourism of Greece is conducting primary research to gather quantitative and qualitative data on tourism flows to the Municipality of Vari Voula Vouliagmeni.

The MT extended an invitation to the managers of the hotels located in the municipality of VVV to invite them to their interview. They prepared an email invitation explaining that the project and the UCs do and what is the point of the interview. The hotel managers had to confirm that they accept the interview by responding to the email. The email invitation can be found in the appendix in 7.2.1 in Greek with an English translation.

The aim of the research will be to support the Municipality's task, by providing the data needed to plan and implement policies for the use of AI in public services.

The key research questions are:

- *What are the key figures concerning inbound tourism and domestic visitor flows to the Municipality of Vari Voula Vouliagmeni?*
- *What are the key factors influencing tourists' satisfaction with tourism services provided at the Municipality?*
- *How do they assess the quality of public services provided by the Municipality?*
- *How do these factors influence the overall tourism experience?*

Research will be conducted in 2 stages:

At the **1st stage**, the Ministry is conducting qualitative research via a series of interviews with the managers of hotels at the municipality. The main scope of this stage is to gather information on the profile and the preferences of tourists staying at the hotels based on the input of key informants. Some of the topics of discussion will concern:

- Their demographic profile: age, sex
- Motivation of travel
- Duration of stay
- Activities chosen at destination.

- Concerns regarding the destination (i.e., safety)
- Places of visit
- How do they travel (solo travellers, couples, with their family etc.
- Travel seasons and months.
- Distribution channels
- Main sources of information

The second part of the interview will focus on hotel managers' rating of public services offered at the municipality, focusing on the topics of the two UCs, waste management – PAYT, and traffic), as well as on their feedback on how these services are assessed by visitors themselves.

The ministry will provide a full report of the results to be shared with VVV by end June.

At the **2nd Stage** quantitative research will be conducted on site by an experienced researcher who will assist participants in completing an online questionnaire. The target audiences are tourists during summer, domestic day visitors from other parts of Athens and Attiki, yachters, and attendees at the municipality's sports events. Visitors will be reached at places of interest and agglomeration such as:

- Beaches
- Vouliagmeni marina
- Vouliagmeni lake
- Hotels
- Public squares
- Other places of interest that will be identified during research.

The questionnaire will be based on the key insights provided by qualitative research (stage 1).

Primary Results from 1st stage research:

Invitations to this qualitative research have been sent to 16 Hotels (which is the total number of hotels operating in the area), 4 travel agencies, the President of the Athens, Attica & Argosaronic Hotel Association as well as the representatives of Astir Marina and Lake Vouliagmeni. Up to now, interviews have been conducted with 5 hotels of different sizes from various star categories (2*, 4*, 5*) located in the Municipality of Vari-Voula-Vouliagmeni as well as with the president of the Athens, Attica & Argosaronic Hotel Association. Three of the hotels are open all year and two are only during the touristic season.

An Interview Guide consisting of four parts (hotel identity, visitors' profile, tourism flows, municipal services and infrastructure) was used during the interviews, which were conducted online and lasted approximately 40 minutes each. The interview guide is available in the Annex. Key findings up to now include the following observations:

- Regarding the tourists' profile, during the summer months, most of the visitors travel for leisure, whereas in the off-season the hotels attract mostly business travelers, persons who travel for investment purposes or to participate in conferences. A considerable number of off-season visitors are members of the Greek diaspora. The main regions of origin are Europe, North America, the Middle East and the Arab countries. The number of repeat visitors is high. In many cases, the hotels serve as short term transit accommodations before or after the main destination. The average hotel price varies

significantly depending on the hotel star category. Moreover, the occupancy rate in all cases increases during the summer months.

- A considerable number of visitors book longer stays and staying in the municipality is part of their vacation. The main points of interest in the municipality are the beaches and the Centre of Vouliagmeni, where particularly high visitor flows are recorded during the tourist season. Other important points of interest in the municipality are Sounio (Temple of Poseidon) and Vouliagmeni Lake and in the greater area of Attika the Center of Athens, the Athens Riviera and the nearby islands.
- Participants were also asked to outline eventual challenges and concerns regarding public spaces in the area. The majority expressed their concern on road safety issues related to illegal street racing, noise pollution, the narrow sidewalks, parking management, clogged drains, lack of police stations, the protection of the surrounding environment, the lack of access by public means of transport and the unregulated urban development. Regarding waste management, most of the participants are satisfied with the Municipality's services, with only a few complaints in certain specific areas.
- Regarding the pilot application of the Pay As You Throw (PAYT) fee payment system, which aims at recording the volume and the special temporal concentration of waste, and the Novoville Application, where citizens can report issues they encounter in their neighbourhood, the majority of the participants were not aware of their existence but are well-disposed towards the project.
- Lastly, informants expressed the need to invest in the development of marinas' infrastructure to meet the growing demand for maritime tourism services.

The qualitative research is currently underway, and a full report is expected by September.

Finally, on July 2024 the Ministry of Tourism will provide to VVV updated data regarding arrivals & overnight stays in VVV hotels (year 2023).

3.4.1 Use case #1 Traffic violations monitoring

Main sector of interest: Tourism | Keywords: tourism, traffic violations, visitors

Summary: One of the most critical issues especially in Greek big cities is the traffic violations, and especially parking. In the pilot Municipality of VVV, the administration faces a significant problem with Parking, especially during the Summer and weekends due mainly to the flow of visitors and tourists. Through this UC, the Municipal administration is working on solving the parking issue of VVV by employing the AI4Gov tools to make informed decisions and to allocate staff and resources in an optimum way, with a view to increasing vehicles and pedestrians' mobility while decreasing traffic accidents and operational costs. Currently, the Municipal Police and Hellenic Police staff impose the fines and tickets for traffic violations such as speed limit violation, traffic light violation, parking violations, dangerous driving, alcohol abuse, etc, and the relevant data are entered manually by the municipal servants. The municipal

administration seeks to automate the process by using AI and exploiting the existing databases of their external collaborators, Alfaware and Novoville.

Target stakeholders/users:

This UC has different levels of stakeholders and users that are affected on different levels. The immediate operators of the municipal police, with the policy makers in the municipal council. Lastly, the UC will have positive effect on citizens and visitors.

- Municipal police staff and officers: The immediate group of stakeholders to use the AI4Gov tools in this UC are the officers of the municipal police that monitor the traffic violations in the municipality. As the responsible stakeholders for the operational part and the overall management of the day-to-day workload, the municipal police officers will be able to organise the staff's patrols in the most effective and timely manner.
- Policymakers - Municipal Council: The policymakers in the municipality will use the AI4Gov tools in the context of this UC to optimise their strategic planning and decision-making process. Through this UC, the policymakers in charge of the Municipal police will be able to have a clear view of the traffic violations in order to allocate the necessary funds and resources to address the problem.
- Citizens and visitors: The citizens and visitors are also a stakeholder group impacted by the optimisation of the municipal police operation leading to more effective monitoring of traffic violations. The end goal is behavioural change by raising awareness among citizens and visitors to better respect the traffic code. In addition, the flows of visitors to the municipality, especially during summer, will be better managed causing less trouble to the permanent citizens, enterprises and hotels. As a result, the municipality will be able to take informed decisions and offer higher quality of services, in a well organised environment.

AI4Gov tools to be employed

- Policy-Oriented Analytics & AI Algorithms
- Adaptive Analytics Framework
- Visualisation Workbench

Progress and next steps

The data are provided in a six-month base from a third-party company that technologically supports the VVV.

In this UC, a DEMO was prepared to showcase Unbiased Analytical Models and Tools integrated with the Visualisation Workbench. This platform efficiently predicts potential violations in the VVV municipality using a user-friendly interface. The interface allows users to input key details through four main fields:

- Month: Specify the time period.
- Weekday or Weekend: Refine the time frame.
- Time of Day: Indicate morning, noon, evening, or night.
- Violation Type: Choose from options like speed limit violations, traffic light violations, parking violations, etc.

After entering this information, the system uses advanced algorithms to analyse historical data and patterns specific to the municipality. The result is a dynamic map that visually highlights areas most at risk for the specified violations. The map uses color-coded or shaded regions to indicate high-risk areas.

This predictive map helps enhance proactive measures, such as increased surveillance or targeted awareness campaigns in identified zones. The interface simplifies the reporting process and provides valuable insights to local authorities and residents, promoting a safer and more compliant community. This innovative approach demonstrates the power of technology and data analytics in improving public safety and urban planning.

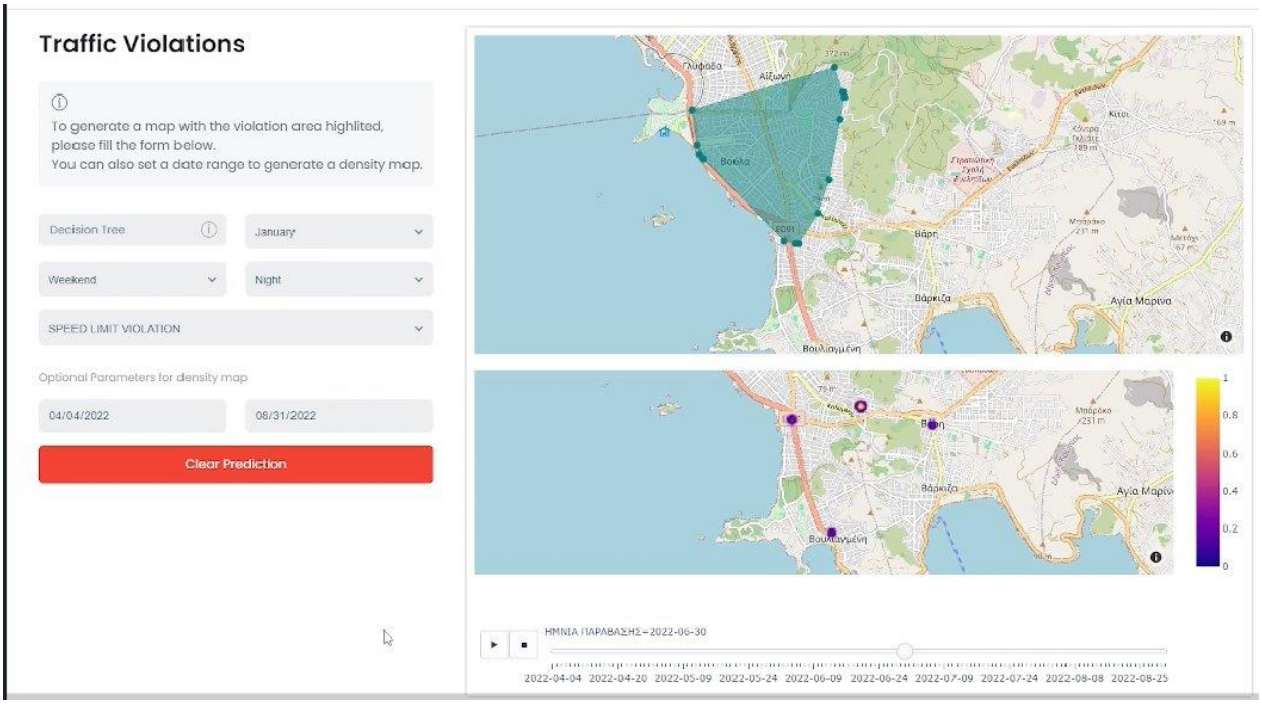

Figure 16 Traffic violations visualisation

The first parking violations system will be put in pilot operation during the summer 2024 in a restricted area in Vouliagmeni in order to be tested and validated. The full operation of the parking system will include 4 restricted areas of the Municipality (in Vouliagmeni, Varkiza, Kavouri and Voula) and is planned for year 2025. The operation of the system will be supported by procuring cars and sophisticated equipment for the Municipal Police while providing online services to the visitors, such as payment via mobile phone, multilingual support (Help Desk), and guidance to vacated parking spots via app. The fines and tickets for traffic violations will be entered online in the database thus providing real time data to the AI tools.

3.4.2 Use Case #2 Waste management - Pay As You Throw (PAYT)

Main sector of interest: Tourism | Keywords: tourism, waste management, visitors, PAYT

Summary: Waste management in Greece faces significant challenges, particularly with rising landfill costs. From 2028, municipalities will implement the PAYT (Pay-As-You-Throw) system, adhering to the 'polluter pays' principle, rewarding citizens who sort waste at the source. The Municipality of Vari-Voula-Vouliagmeni is pioneering a bio-waste collection program for organic waste, targeting businesses, large producers like restaurants and hotels, and some residential areas. Municipal fees are based on both the building's area and the waste produced, with 60% of the fee fixed and 40% dependent on waste quantity, incentivising waste sorting and reduction. An electronic platform called e-track supports the PAYT system, using RFID tags on bins and scales/scanners on garbage trucks to weigh and record waste during collection. This data is entered into the e-track platform to identify waste producers and ensure accurate fee assessments.

In parallel, a network of smart bins is being installed equipped with sensors, providing real time data regarding the fill level of bins facilitating the optimisation of garbage tracks' routing and bins' allocation.

In the context of AI4Gov, the second UC of the Greek pilot will automate the operational system of the waste management making it more efficient, in terms of cost and time, employing sensors and RFID tags on the bins as well as telematics, to design the most efficient waste collection plan. The goal is to manage the municipal resources of staff, vehicles, and fuel in a timely manner keeping the municipality clean without wasting resources.

Target stakeholders/users:

As in the first UC, the immediate operators of the municipal staff, this time in the waste management department, and the policy makers in the municipal council. Lastly, the UC will have positive affect on citizens and visitors.

- Municipal staff and officers: The immediate group of stakeholders to use the AI4Gov tools in this UC are the municipal staff and officers in the waste management department. As the responsible stakeholders for the operational part and the overall management of the day-to-day workload, the waste management staff and officers will be able to better organise the garbage collection system in the most effective and timely manner. The UC will provide them with a tool to monitor overall data from telematics sensors and RFID, recommend optimum areas and resource allocation, and predict financial outcomes.
- Policymakers - Municipal Council: The policymakers in the municipality will use the AI4Gov tools in the context of this UC to optimise their strategic planning and decision-making process. Through this UC, the policymakers in the Municipal Council will be able to allocate

the necessary funds and resources to efficiently monitor the overall waste management system including the implementation of the Pay As You Throw System so that they reduce the municipality's costs and assist the transition towards a more circular and sustainable economy according to waste management legislation. The UC is also working on a tool to suggest the optimum routing for collecting garbage, to facilitate the prediction of the financial outcomes regarding the expansion of the Pay As You Throw System, so that the necessary funds and resources are effectively allocated.

- Citizens and visitors: Citizens and visitors are another stakeholder group impacted by the UC. The optimisation of the waste management will lead to a cleaner municipality. Also, by using the PAYT system, the citizens, as well as local touristic businesses and hotels, have an incentive to produce less waste to enjoy the financial benefits. The end goal is the behavioural change of the citizens and visitors to litter less and at the same time to facilitate waste management for the municipality. As a result, the municipality will be cleaner and the negative impact of the visitors will be lower, while they will be more satisfied from their touristic experience as well. The municipality will be able to offer higher quality of services, in a well organised environment.

Table 5 Waste management – Additional related data

Data Asset name		**Telematic track and manage of municipality's vehicle fleet**
Variety (pre-existing)	First-hand data	Telematic track and manage of municipality's vehicle fleet
	Second-hand data	N/A
Velocity		Data are generated constantly, distributed and collected daily
Volume in project		Number of vehicles: 120
Streaming data		There are telematics devices in every vehicle and control through GPRS network in real - time
Historical data (if yes how long)		Data are available on a multiannual basis
Existing Discrimination/underrepresentation		N/A

AI4Gov tools to be employed

- Policy-Oriented Analytics & AI Algorithms
- Adaptive Analytics Framework
- Visualisation Workbench

Progress and next steps

Under this UC, a first DEMO has been prepared using Unbiased Analytical Models and Tools integrated with the Visualisation Workbench. The Municipality of VVV faces increased waste during summer and weekends due to many visitors and tourists. To address this, they need an innovative tool to monitor waste and optimise staff and resources. Additionally, with the planned implementation of the Pay As You Throw System, a predictive tool is needed to assess its economic impact.

The waste management interface for the VVV project offers a comprehensive solution for optimising waste collection. Users can select the type of waste bin to service: Brown for organic waste, Blue for recyclables, or Green for general waste. After selecting the waste type, the system generates an optimal path for waste trucks, minimising time and fuel consumption. It takes into account bin locations and historical waste generation patterns to create an efficient collection route.

The system also provides a list of bin IDs in the order they should be serviced. Real-time metrics, such as the estimated amount of waste to be collected and the total time required for collection, aid in resource planning. This ensures that waste trucks are appropriately equipped for the volume they will encounter and helps with better scheduling.

A live map shows bin locations within the VVV area, enhancing understanding and allowing for quick assessment of the collection route. This combination of route optimisation, real-time metrics, and a dynamic map creates an integrated and user-friendly waste management interface, significantly improving the efficiency and sustainability of the municipality's waste collection operations.

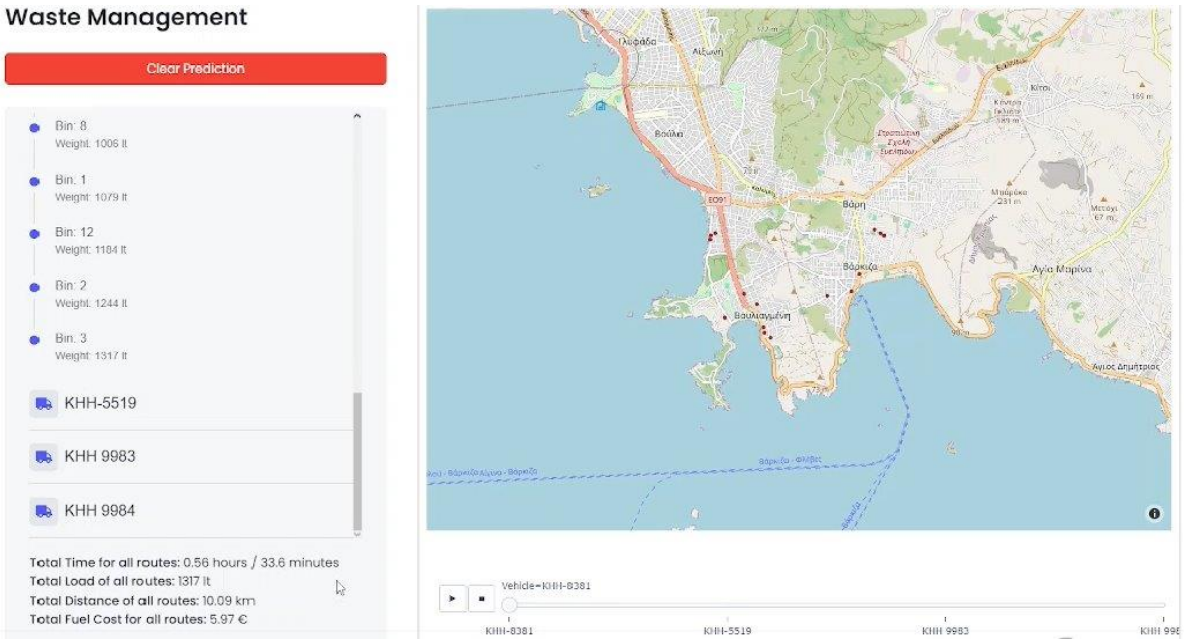

Figure 17 Waste management visualisation

In addition to the above-mentioned information, the team is working on the telematic tracking of municipality's vehicle fleet, since there are telematics devices in every vehicle and control through GPRS network in real – time. The AI4Gov platform will offer the capability of informing the citizens whether a specific bin has been scheduled to be emptied in the next garbage collection or not. More specifically, the citizens will be able to choose the bin that they are interested in through the Visualisation Workbench and then the Adaptive Analytics Framework will provide relevant information about the selected bin in a free text format, including an explanation regarding its inclusion or not in the next garbage collection, based on its forecasted fill level. As a result, the garbage collection procedure will be more transparent whilst the citizens will actively engage in it since they will not only have access to the predictions made by the ML models for specific bins but also this information will be available to them in a simple and understandable manner.

3.5 Future Use Cases

In order to enrich the AI4Gov pilots and exploit the project solutions to the highest level, the partners are also working on some additional UCs. In order not to introduce completely new information in D6.3 in M30, this section provides a preview of the ongoing work that can lead to potential new UCs.

A) LLMs and their influence on citizens' trust on political institutions

Citizen attitudes towards governmental institutions can be shaped by many factors, including trust in the institution. This trust can be influenced by the medium through which citizens interact with governmental entities. For example, Benbasat and Wang (2005) showed that users perceive online recommendation agents as "social actors" with human-like characteristics such as benevolence and integrity. This trust is crucial for the adoption of such technologies and can influence users' trust in the deploying institutions. Therefore, manipulating trust and user attitudes can affect trust in institutions. Consequently, the user experience with the interaction technology can influence the trust formed. Building on these findings, we aim to test this hypothesis in the context of the AI4Gov project, examining the use of state-of-the-art generative AI technology, such as Large Language Models (LLMs), to influence user experience and perceived trust in the interacting institution. We propose to pursue this work in two phases.

The first phase will involve analysing relevant datasets (e.g., voting) to identify characteristics that partition the population into distinguishable groups with different attitudinal distributions. This analysis will establish the case for the second experimental phase.

In the second phase, we intend to demonstrate that LLM technology can manipulate certain "cosmetic" characteristics of the content (e.g., sentiment, tone) presented to users, while keeping the core content intact, to intentionally affect their attitude towards the institution deploying the system. This will allow us to assess the extent of influence attainable through such manipulation and the associated risks.

Going beyond the issue of trust, we plan to demonstrate how citizens can directly participate in decision-making, by taking part in co-creative schemes of policy creation using blockchain technology. This new model of co-creation will be based on the technology of Decentralized Autonomous Organizations (DAOs) that will allow end users to suggest new policies and offer

their opinions by polling mechanisms. Although this capability will be demonstrated for the case of policy-making, the same mechanism can be re-used for other uses cases involving open democracy and self-governance.

4 Validation and Evaluation of the AI4Gov pilot activities

The validation and evaluation activities of the AI4Gov project correspond to phases 3 and 4 respectively in the pilot methodology presented in chapter 2. Phase 3 is the Pilot implementation spanning from M6 to M33 and the phase 4, evaluation and optimisation, began in M6 and will last until the end of the project (M36). In order to make sure that the pilot timeline is aligned with the progression of the technical WPs, all partners were involved in the design of the time plan of the AI4Gov pilot activities. In this chapter the overall timeline of the activities is presented, along with a brief presentation of the evaluation methodology.

4.1 Validation and Evaluation timeline

The AI4Gov pilot activities are structured on two evaluation cycles which determine their demonstration and validation activities timeline. A first testing to acquire some first feedback from the initial version of the AI4Gov tools' integration to the UCs, will last from M19 to M24. After this first testing, the pilots will organise feedback workshops to examine the usability of the tools. This feedback round will focus on potential technical issues, gaps, or other weaknesses of the tools, to provide the technical partners with enough information to support the fine-tuning process. The fine-tuning will last for three months, from M25 to M27 and after this period, the updated version of the AI4Gov tools will be available. Then, the second implementation phase will start, where the pilots will validate the AI4Gov tools through their UCs and proceed with the final evaluation and assessment. The validation phase will last six months, from M28 to M33 in combination with the second cycle of the evaluation activities and the final assessment. In the last three months, this information will be analysed according to the AI4Gov evaluation methodology, and the results will be presented in M36 in D6.5.

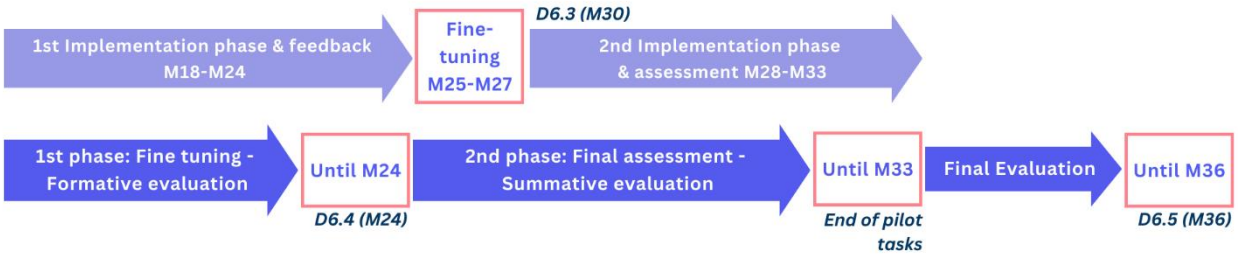

Figure 18 AI4Gov Piloting activities time plan

During this period, the pilot partners will organise several testing and feedback activities to ensure that they will have the highest reach possible and attract a sufficient number of users to test and assess the AI4Gov tools. These activities will have a variety of stakeholders according to each specific UC.

4.2 Evaluation methodology

Focusing more on T6.5 Stakeholders' feedback and evaluation, this section presents the pathway of collecting and analysing pilot results and feedback from stakeholders to assess the effectiveness of AI4Gov solutions. The feedback analysis will enhance and refine AI4Gov services, considering factors like efficiency, usability, and standards compliance.

A holistic approach is employed, covering political, technical, socioeconomic, legal, environmental, and organisational aspects. A well-defined evaluation methodology with relevant metrics and tools is established from the beginning, driven also by the pilot KPIs. Stakeholders' feedback will be prioritised throughout the implementation and execution of use cases, gathered through a series of workshops designed to engage stakeholders actively. By continuously involving stakeholders, their insights will shape and refine AI4Gov solutions, aligning them with real-world needs. The goal is to thoroughly evaluate AI4Gov solutions, using stakeholder feedback to drive continuous improvement and deliver impactful outcomes that meet the diverse needs and expectations of all stakeholders, especially those from underrepresented groups.

Evaluation has two dedicated deliverables, D6.4 in M24 (Dec'24), and D6.5 in M26 (Dec'25). These deliverables will contain the full methodology and the evaluation results of the AI4Gov project. In this section, an overview of the methodology will be presented, along with the tools and the KPIs of the activities.

Formative and Summative Evaluation

For the evaluation methodology of the AI4Gov activities, formative and summative evaluation methodologies have been chosen (Bhat & Bhat, 2019). They work complementary with each other, serving different stages of the project, and providing comprehensive insights into its development and effectiveness.

Formative Evaluation

Formative evaluation is conducted during the development and implementation phases of a project. Its primary aim is to monitor progress, provide ongoing feedback, and identify areas for improvement. It is an iterative evaluation, allowing adjustments to be made in real-time to enhance the project's design and implementation (Buelin, Ernst, Kelly, & DeLuca, 2019).

The formative evaluation will occur during the first demonstration of the AI4Gov solutions, providing the first feedback to the technical partners in order to be able to identify weaknesses and strengths in the tools and proceed with the fine-tuning and refinements. This formative evaluation will involve frequent interactions with stakeholders, including project team members, external participants, and other relevant parties, to gather feedback and insights. The objective of this phase is to adapt to new findings and ensure the project remains responsive to emerging needs and challenges.

To perform the formative evaluation surveys and questionnaires will be utilised to collect regular feedback from the users and reflect on their experiences and perceptions. This will be facilitated mainly by live demonstrations and follow-up focus groups and workshops.

Summative Evaluation

After the fine-tuning phase, the formative evaluation will be concluded, and the summative evaluation will be employed during the last year of the project. Its primary goal will be to assess the overall effectiveness and impact of the AI4Gov solutions, determining whether it achieved its intended outcomes and objectives. Summative evaluation provides a comprehensive summary of the project's success and areas for future improvement.

This second evaluation phase will emphasise the final outcomes of the project, providing performance analysis, including its strengths and weaknesses. Also, it will show the achieved results, along with the insights and lessons learned that can inform future projects and broader practices (Prince, 2015).

To perform the summative evaluation, the results from the formative evaluation will be used to showcase the advancements that happened after the fine-tuning phase and to monitor the improvement in knowledge, attitudes, and trust of the users. Additionally, the long-term effects of the project on the relevant stakeholders will be measured, using quantitative methods to analyse data and determine the significance of the results.

Both in formative and summative evaluation, the project results will be evaluated through the UCs that have been designed and presented in this deliverable in chapter 3, with the aim to achieve the dedicated pilot KPIs.

Using a combination of formative and summative evaluations provides a balanced approach to assessing a research project. Formative evaluation helps ensure the project stays on track and adapts to challenges, while summative evaluation provides a comprehensive assessment of its overall success and impact.

The results from the formative and summative evaluation, will then be translated into impact, following the six dimensions that have been identified. For each dimension, there are specific metrics and tools to measure these metrics, as well as target groups and some related tasks.

Table 6 Evaluation methodology elements

Dimensions	Metrics	Tools	Target groups	Related tasks
Political	Pilot KPIs	Workshops/ focus groups	Technical partners	T1.4
Socioeconomic		UEQ	Pilot partners	T1.5
Technological		Trust questionnaire	Citizens	T2.1
Environmental		Legal checklists	External experts	T5.4
Legal			Policy makers	WP3
Organisational			Public administration	WP4

			Researchers/ research organisations	

The AI4Gov evaluation methodology encompasses several key elements. It considers various impact dimensions, including **political, socioeconomic, technological, environmental, legal,** and **organisational** aspects. The methodology employs specific metrics, using the pilot Key Performance Indicators (KPIs), to measure success. It utilises a range of tools, including workshops, focus groups, User Experience Questionnaires (UEQ), trust questionnaires, and legal checklists, to gather comprehensive feedback and insights. The target groups involved in the evaluation process are diverse, comprising technical partners, pilot partners, citizens, external experts, policymakers, public administration, and researchers or research organisations. Lastly, the methodology is closely linked to related tasks such as T1.4 - *Gender and Ethical management*, T1.5 – *Unpacking a research methodology for identifying risks & threats,* T2.1 - *Qualitative Analysis on Fundamental Rights & Values*, and T5.4 - *Developments of (self)assessment tools on ethical and transparent AI,* ensuring a structured and integrated approach to evaluation. It is important to note that these tasks are mentioned because the methodology will use the tools and theoretical background that was produced under these tasks, but the linkage with other WPs' tasks is not limited to these three.

Political Dimension

The political dimension reflects the influence of the AI4Gov results on public policies, and regulations. This includes understanding the implications of local, national, and European policy making procedures. In this vein, the related KPIs are aiming primarily (but not solely) towards citizens' engagement in policy development, trust in the policy development process, and the optimisation of the policy development process.

Economic dimension

The economic dimension considers the broader economic benefits that can arise from the AI4Gov solutions in comparison to the solutions that are currently used. This can potentially affect the availability of resources of the pilot partners. In the context of the UCs, the KPIs related to the economic benefits refer to more efficient resource management in terms of financial, time, and personnel allocation.

Social dimension

The social dimension pertains to the cultural and demographic aspects that are integrated to the AI4Gov activities. This includes societal attitudes towards the current decision-making procedures aiming for behavioural change and public engagement. This will be achieved through an inclusive approach and a focus on underrepresented groups. Social acceptance and engagement of all relevant stakeholders are crucial for the success of the AI4Gov piloting activities, as they can affect participation rates and the dissemination of results as well.

Technological dimension

The technological dimension reflects the technological advantages the AI4Gov tools offer to the pilots. This includes advancements in research methodologies, data collection tools, and

analytical techniques. In addition, the UCs will provide user-friendly and understandable visualisations of their results to ensure accessibility form all relevant stakeholders.

Environmental dimension

The environmental dimension addresses the ecological and environmental considerations of the Ai4Gov project and the benefits it can provide. The implementation and integration of the AI4Gov platform offers a novel approach for the deployment, integration and utilisation of components and applications. More specifically, faster development cycles and collaboration between technical partners lead to a reduction in the time required for infrastructure provisioning and deployment, meaning also energy consumption.

Legal dimension

The legal dimension encompasses the legal and regulatory frameworks that govern AI4Gov. This includes intellectual property rights, data protection laws, ethical standards and ethics standards specifically for AI. Navigating these legal considerations is crucial to ensure compliance and avoid potential legal pitfalls. In this context, the project has created different tools to monitor the ethical and legal aspects of the activities and ensure compliance. From the HRF created in WP2 to the assessment tools that are being developed in WP5, AI4Gov has covered all the stages of its solution development from proper design to the final assessment. Also, the overall data management is guided by the Data Governance Framework (DGF), developed under T3.2.

Organisational Dimension

The organisational dimension mostly refers to the day-to-day work of the operational staff of the pilots and how the AI4Gov tools can accelerate their efficiency and minimise the time needed to complete certain tasks. This benefits both the staff, since their job will be completed easier, and the citizens since they will experience a smoother, and faster interaction with the services. By incorporating this methodology into the planning and execution of AI4Gov, the consortium provides a holistic view of the different dimensions that influence and are influenced by the project. By systematically evaluating political, economic, social, technological, environmental, legal, and organisational factors, partners can ensure the project's overall sustainability and impact.

In the design of this methodology, a critical part was to integrate and utilise the pilot KPIs, in order to ensure their achievement by the end of the project. These KPIs were then associated with specific impact aspects where they can contribute. Most of the KPIs were not associated with only one impact aspect, working as transversal indices and ensuring that these dimensions will not be studied separated put combined to create a more innovative evaluation approach. The pilot KPIs with their associated impact dimensions are presented in then table below. With pink is the prominent dimension of each KPI and with blue are the secondary dimensions:

Table 7 Pilot KPIs – impact dimensions

DPB	VVV/MT	JSI
integrated and correlated data sources: **technical**	integrated and correlated data sources: **technical**	integrated and correlated data sources: **technical**
increase of participation of younger individuals: **social**	visualisation dashboards: **technical**	visualisation dashboards: **technical**
increase citizens' engagement in policy development: **political / social**	reduced time in resolving reported incidents: **organisational / political/ social/ economic/legal**	increased communication and awareness among stakeholders: **social/ political**
increased trust in the policy development process: **political / social**	reduction of the average cost per incident for the city: **economic / political**	increase geographical inclusivity: **social / political**
increased number of algorithms / analytics used: **technical**	reduction of time to develop a policy: **political / organisational/ socioecon.**	increase gender representation: **social / political**
increase efficiency: Improve the success rate of new selected citizen groups: **technical / political/ social**	provide real-time calculation capacity to 20% of the data: **technical**	balance performance vs. explainability trade-offs: **technical**
detect "critical citizens" groups and increase their inclusiveness: **social/political**	reduced transport operational costs for the city: **economic/ organisational/ environmental**	
	reduced transportation cost for the citizens: **socioecon./ political/ environmental**	
	increased citizens' satisfaction: **social / political**	

In order to measure the KPIs, several tools are being developed at the moment. These include workshops, focus groups, User Experience Questionnaires (UEQ), trust questionnaires, and legal checklists, in addition to literature review and background theoretical work. The focus groups and workshops were selected as a direct way to approach the different stakeholders and acquire the necessary feedback from them. These activities are incorporated in different parts of the project, from T2.1 which organised focus groups targeting underrepresented groups of citizens to ensure inclusivity and support the creation of the HRF, to the validation and evaluation activities of the AI4Gov solutions in WP6. For the latter, the team will utilise the UEQ questionnaire, to cover the functionality and efficiency of the tools, while they are also developing a trust questionnaire to measure how these tools are perceived by the users, on the basis of comfort, and trust. In conclusion, the evaluation methodology will combine different tools, and stakeholders in order to showcase the multi-dimensional impact of AI4Gov. A first identification of the elements corresponding to the different dimensions is presented in the figure below:

Figure 19 Methodology overview

The full version of the methodology, the tools, and all the material that will be used during the evaluation activities will be provided in D6.4 in M24.

5 Conclusion and next steps

This deliverable has provided a comprehensive overview of the work conducted in the context of the piloting activities of AI4Gov so far, focusing on the progress and next steps of the UCs. In addition, it contained the methodology employed for the pilot phase, as well as an overview of the evaluation. The document provided the second version of the specifications of the Use Case Scenarios, an overview of the pilot sites and their respective use cases. Also, the deliverable provided a complete timeline of the validation and evaluation planning to be followed until the project's end.

Currently, some first DEMOs have been developed by the technical partners corresponding to the Use Cases and the consortium is preparing the ground for the first demonstrations. This will lead to the fine-tuning of the tools by M27 and the finalisation of all UC requirements by M30 (D6.3). The use case implementation is an ongoing process constantly being reviewed and evaluated to support the pilots' needs and provide the technical partners with appropriate information to enrich the AI4Gov solutions.

This deliverable serves as a guide and reference point for stakeholders involved in the project, providing valuable insights and setting the stage for successful implementation and evaluation of the pilots.

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7 APPENDIX

7.1 Pilot #2 - Sustainable Development and the European Green Deal: SDG observatory questionnaires

7.1.1 Questionnaire for Developer

Developer's Perspective on Possible Biases in Building an Observatory

- Background and Data Selection:

1. How do you decide which data streams to include in the observatory?

2. What criteria do you use to assess the quality and relevance of data sources?

3. Have you considered the potential for data streams to introduce bias? How do you address this?

- Data Integration and Processing:

4. How do you ensure that the integration process does not favour certain data streams over others?

5. What steps do you take to handle missing or incomplete data?

6. How do you manage data from heterogeneous sources to ensure consistency and fairness?

- Algorithm and Model Development:

7. What methodologies do you use to develop algorithms that process the data?

8. How do you test your models for bias?

9. Can you describe any measures taken to mitigate algorithmic bias?

- Validation and Verification:

10. How do you validate the accuracy and reliability of the observatory?

11. What procedures are in place to detect and correct biases that may arise during validation?

12. How frequently do you review and update the system to address potential biases?

- User Feedback and Continuous Improvement:

13. How do you incorporate user feedback to identify and correct biases?

14. What mechanisms are in place to continuously monitor and reduce bias in the system?

7.1.2 Questionnaire for Curator/Context Expert

Curator/Context Expert's Perspective on Possible Biases in Data Curation

- Data Source Selection:

1. What factors influence your decision to select specific data sources for the observatory?

2. How do you evaluate the credibility and reliability of these sources?

3. Are there any sources you deliberately exclude? Why?

- Data Curation Process:

4. How do you ensure that the data curation process is objective and unbiased?

5. What steps do you take to standardise data from different sources?

6. How do you handle conflicting data from multiple sources?

- Contextual Relevance:

7. How do you ensure that the data is contextually relevant and accurately represents the area of interest?

8. How do you address potential biases inherent in the data due to geographical, temporal, or cultural factors?

- Bias Detection and Mitigation:

9. What methods do you use to detect biases in the curated data?

10. How do you correct or mitigate identified biases?

11. How do you ensure transparency in your data curation practices?

- Collaboration and Feedback:

12. How do you collaborate with developers and users to identify and address biases?

13. What feedback mechanisms are in place to continuously improve the data curation process?

7.1.3 Questionnaire for User

User Perspective on Possible Biases in Using an Observatory

- User Experience and Perception:

1. How do you typically use the observatory and its data?

2. Have you encountered any data or results that seemed biased or unrepresentative? Can you provide examples?

3. How confident are you in the accuracy and fairness of the data provided by the observatory?

- Data Interpretation:

4. How do you interpret the data and results from the observatory in your work or research?

5. Have you noticed any patterns that suggest bias in the data or results?

6. How do you verify the information provided by the observatory?

- Feedback and Improvement:

7. Have you provided feedback on any biases or issues you've identified? If so, what was the response?

8. What suggestions do you have for improving the observatory to reduce potential biases?

9. How important is transparency regarding data sources and curation methods to you?

- Impact and Decision-Making:

10. How does potential bias in the observatory data impact your decision-making?

11. What measures do you take to mitigate the influence of potential biases in the observatory data on your work?

7.2 Pilot 3 "Trustworthy data-driven tourism policies" - Interview guide from the MT survey

7.2.1 Invitation to the hotel managers

Original (Greek)

Αξιότιμη/ε .....,

στο πλαίσιο του Έργου AI4GOV-Pilot 2 "Trustworthy data-driven tourism policies" του Προγράμματος Πλαίσιο της Ευρωπαϊκής Ένωσης Horizon Europe για τη χρηματοδότηση και την καινοτομία για την περίοδο 2021-2027, το Υπουργείο Τουρισμού διεξάγει πρωτογενή έρευνα με σκοπό τη συγκέντρωση ποιοτικών και ποσοτικών δεδομένων αναφορικά με τις τουριστικές ροές στο Δήμο Βάρης-Βούλας-Βουλιαγμένης.

Η έρευνα επιδιώκει να συνεισφέρει στη δημιουργία εφαρμογών με τη χρήση Τεχνητής Νοημοσύνης (Artificial Intelligence-AI) που θα συμβάλλουν στη βελτίωση των υπηρεσιών που παρέχει ο Δήμος Βάρης-Βούλας-Βουλιαγμένης προς τους δημότες και τους επισκέπτες. Κατά το πρώτο στάδιο της έρευνας, θα πραγματοποιηθούν συνεντεύξεις με Μάνατζερ-Υπευθύνους Ξενοδοχείων της περιοχής με σκοπό τη συγκέντρωση δεδομένων αναφορικά με το προφίλ και τις προτιμήσεις των επισκεπτών που διαμένουν σε αυτά.

Ως εκ τούτου, σας προσκαλούμε να συμμετάσχετε σε σύντομη διαδικτυακή συνέντευξη μέσω zoom την Τρίτη 28 Μαΐου ή την Πέμπτη 30 Μαΐου, σε ώρα επιλογής σας από τις 10:00 π.μ. έως 16:00 μ.μ.

Στην περίπτωση που δεν είστε διαθέσιμος σε καμία από τις εναλλακτικές ημερομηνίες και ώρες παρακαλούμε όπως προτείνετε μία εναλλακτική.

Κατά το πρώτο μέρος της συνάντησης θα συζητηθούν, μεταξύ άλλων, ζητήματα που αφορούν το προφίλ των επισκεπτών, τα ταξιδιωτικά τους κίνητρα, τη διάρκεια παραμονής, τις δραστηριότητες που επιλέγουν κ.α. Στο δεύτερο μέρος της συνάντησης, η συζήτηση θα επικεντρωθεί στην αξιολόγηση των παρεχόμενων δημοτικών υπηρεσιών τόσο από εσάς όσο και από τους επισκέπτες.

Παρακαλούμε για την απάντησή σας έως την Παρασκευή 17 Μαΐου στην κα [...].

Σας ενημερώνουμε πως στη συνάντηση θα συμμετάσχουν στελέχη από τη Διεύθυνση Έρευνας.

Σας ευχαριστούμε εκ των προτέρων για τη συμβολή σας στην επιτυχία του έργου.

Παραμένουμε στη διάθεσή σας για οποιαδήποτε περαιτέρω διευκρίνιση.

English translation

Dear……,

As part of the AI4GOV-Pilot 2 Project "Trustworthy data-driven tourism policies" under the Horizon Europe Framework Programme for funding and innovation for the period 2021-2027, the Ministry of Tourism is conducting primary research to collect qualitative and quantitative data regarding tourism flows in the Municipality of Vari-Voula-Vouliagmeni. The research aims to contribute to the creation of applications using Artificial Intelligence (AI) that will help improve the services provided by the Municipality of Vari-Voula-Vouliagmeni to residents and visitors.

In the first stage of the research, interviews will be conducted with hotel managers in the area to gather data on the profile and preferences of the visitors staying there.

Therefore, we invite you to participate in a brief online interview via Zoom on [*dates*].

If you are not available on any of the alternative dates and times, please suggest an alternative.

In the first part of the meeting, issues related to visitor profiles, travel motivations, length of stay, chosen activities, etc. will be discussed. In the second part of the meeting, the discussion will focus on evaluating the municipal services provided by both you and the visitors.

Please respond by Friday, May 17.

We inform you that the meeting will be attended by staff from the Research Directorate.

Thank you in advance for your contribution to the success of the project.

We remain at your disposal for any further clarification.

7.2.2 Interview structure

Hotel managers

[The Interview Guide follows the research questions that have been stated to the Consortium]

A. Hotel Identity

B. Customer's profile

Could you describe in a few words your customers' profile?

- Demographic profile: age, sex
- When they travel (winter / summer)
- Motivation of travel
- Duration of Stay
- Activities chosen at destination
- Concerns regarding destination (i.e. safety)
- Places of visit
- How do they travel? (solo travelers, couples, with their family etc.)
- Distribution channels
- Main sources of information

C. Characteristics of tourist flows in the Municipality

- *What are the main categories of visitors to the municipality? (e.g. foreign tourists staying in hotels, day visitors from Athens, yachts, etc.)*
- *How would you rank them in order of size? (from most populous to least populous category)*
- *Where are these flows moving? (points of interest)*
- *By what means do they travel? (rent a car, MMM, taxi, etc.)*
- *Have you identified spots that show an excessive concentration of tourist flows? – what season? what times of the day?*

D. Public services offered at the municipality

- *How do you personally evaluate the services offered by the municipality (cleaning, parking, traffic management, beach, etc.)?*
- *Where do you detect problems?*
- *Regarding parking, how do they rate the operation of controlled parking areas (if there are any)?*
- *Application Novoville: How do you rate effectiveness? Is it used by guests?*
- *Cleaning - Pay As You Throw (PAYT): Are they aware of this pilot? if they participate in the pilot? How do they evaluate effectiveness?*
- *Do you consider your customers are satisfied with the level of service?*
- *What are the key factors influencing their satisfaction?*
- *For which services are complaints recorded?*
- *Comment on marina infrastructure*