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Cloud for Data-Driven Policy Management

CLOUD FOR DATA-DRIVEN POLICY MANAGEMENT

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Abstract: This document provides the details of the End-to-End scenarios that were used in the implementation and experimentation of the PolicyCLOUD platform. The scenarios focus specifically on the user's requirements and include configuration parameters, analytical tools and KPIs needed for the validation of each scenario which create the overall E2E story. Moreover, the details about the co-creation workshops are provided, including the agenda, list of participants, and a short summary of the general impressions and feedback.



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Abbreviations and Acronyms

Abbreviation/Acronym	Definition
DT	Design Thinking
EC	European Commission
E2E	End to End
GDT	Global Terrorism Database
KPI	Key Performance Indicator
PDT	Policy Development Toolkit
PME	Policy Modelling Editor
RDWTI	RAND Database of Worldwide Terrorism Incidents

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Executive Summary

This document is the final update of deliverables D6.4 [1] and D6.12 [2] and provides a description of the end-to-end (E2E) scenarios that explored how policy makers effectively used PolicyCLOUD platform as a part of the experimentation process. The given scenarios encompass the different steps required to perform the modelling, implementation and validation of the policies and include details of the necessary configuration settings needed in order to determine the output for the visualisation.

The E2E stories were used to experiment the adaptability of the PolicyCLOUD platform in conjunction with several use case-based scenarios. This document describes all the workshops organized by the pilot users and all the scenarios integrated in the platform for each Use Case during the last months of the project (January 2022 – December 2022).

The experimentation process for software usually consists of four phases definition, planning, operation and interpretation. Therefore, this approach was adopted for the design, implementation and experimentation of the E2E stories. Taking these four phases into consideration the E2E scenarios description has been used to implement the definition and planning stages. The E2E scenarios help to explore how well the PolicyCLOUD platform can be adapted for various situations.

Finally, this deliverable describes the experimentation methodology adopted and how it has been applied to each use case. In particular, the details about the co-creation workshops are provided, including the agenda, list of participants, and a short summary of the general impressions and feedback.

1 Introduction

1.1 Purpose and Scope

The purpose of this document is to provide an overview of the implementation and experimentation methodology used for the PolicyCLOUD platform. The deliverable describes the E2E user scenarios with the necessary configuration settings. This includes, how the modelling of the policies has been performed through the Policy Model Editor (PME) and how the Policy Development Toolkit (PDT) was configured (which datasets, analytical tools and KPIs were used), to provide at the end the expected output in the visualisation module.

1.2 Summary of changes

The main changes included in this third and final version of deliverable D6.4 Use Case Implementation and Experimentation (2020) [1] are summarised below:

- Revision/update of the E2E scenarios
- Exclusion from the Deliverable of the LONDON Use Case, caused by the partner leaving the consortium
- Description of additional E2E scenarios (at least one more per each use case)
- Description of the co-creation workshops organised in the three pilots (section 6.2)

1.3 Structure of the document

The document has one chapter devoted to each use case, with the following structure: a short introduction of the E2E story, overview of the relevant use case scenario, description of the scenario, and the configuration settings for the PME and PDT.

Section 5 describes the experimentation methodology adopted and how it has been implemented in each use case. In particular, the details about the co-creation meetings are provided, covering the agenda, list of participants, and a short summary of the general impressions and feedback.

Finally, section 6 concludes the document.

2 MAGGIOLI - Use Case 1

The overall goal of Use Case 1 (**UC1 - Participatory policies against Radicalization**) is to develop a collaborative data-driven analysis for policies against radicalization based on a participatory review of data coming from social media and other public datasets. In addition, it provides useful insights and valuable information to policy makers at any level (local, regional, national, and international) to validate existing policies and revise them (when necessary) or create new ones, while at the same time allow them to interact with other relevant stakeholders during the design and modelling phase, ranging from early detection methodologies to measures for the monitoring and management of domestic radicalization.

Maggioli Use Case has four scenarios defined: A, B, C and D. As of December 2022, scenarios A and B are fully implemented and running. Scenarios C and D are implemented but with limited connection with Twitter data, due to the constraints imposed by the free licensing scheme of Twitter. For this reason, synthetic data generated by the project partners (simulating Twitter data) have been used.

The following sections describe the End to End (E2E) scenarios from the point of view of a policy maker.

2.1 Scenario A. Radicalisation incidents

2.1.1 Overview

By using the PolicyCLOUD platform, this scenario explores the occurrence of radicalization incidents in the geographic proximity of a city/region. The purpose is to produce useful insights to help policy makers to understand the impact of radicalization in the territory and evaluate whether there is a need to create new policies and/or update the existing ones.

2.1.2 Description of Scenario

The main objective of this scenario is to validate existing policies to counter radicalization and violent extremisms and to investigate if there is a need to update them or create new ones based on the information extracted from open data. Specifically, two datasets have been used for this purpose: the Global Terrorism Database (GTD) and the RAND Database for Worldwide Terrorism Incidents (RDWTI).

The results are being presented to the policy maker using a heatmap that illustrates the occurrence of radicalization incidents in a given area. The policy maker will have the possibility to filter the extrapolated data based on time and location. The user can also download the retrieved information in different formats.

2.1.3 Policy Modelling Editor

For this scenario, the following parameters were used:

1) Relevant **KPIs** (as specified in D6.11 [3]):

- **MAG-KPI9**: Number of identified occurrences of radicalization incidents in a given area.

2) Name of the selected **Analytical tool**: uniGeographicalDistribution

- Data Visualisation
 - Type: Heatmap

3) **Additional parameters** to be specified:

- “**iyear**”, the year when the incident occurred. The policy maker can select a unique value (type:EQUAL): 2017, or a set of values (type:GREATER_OR_EQUAL): 2017 [2017, 2018, 2019, 2020]
- “**region**”, the geographic area where the incident occurred. It can have a unique value (type:EQUAL): Lombardy, or a set of values (type:IN): [Milan, Bergamo, Brescia]

Once the policy maker has reviewed and submitted the Policy Model, he/she will be redirected to the PDT to evaluate the submitted Policy Model.

2.1.4 Policy Development Toolkit

For scenario A, the policy maker will need to select the Policy Model defined previously and specify the relevant KPIs for its evaluation, which again will be MAG-KPI9.

In the properties of the KPI, the policy maker needs to specify the data source that he/she would like to use: GTD or RDTWI. Depending on the dataset selected, the user will be presented with the following visualizations:

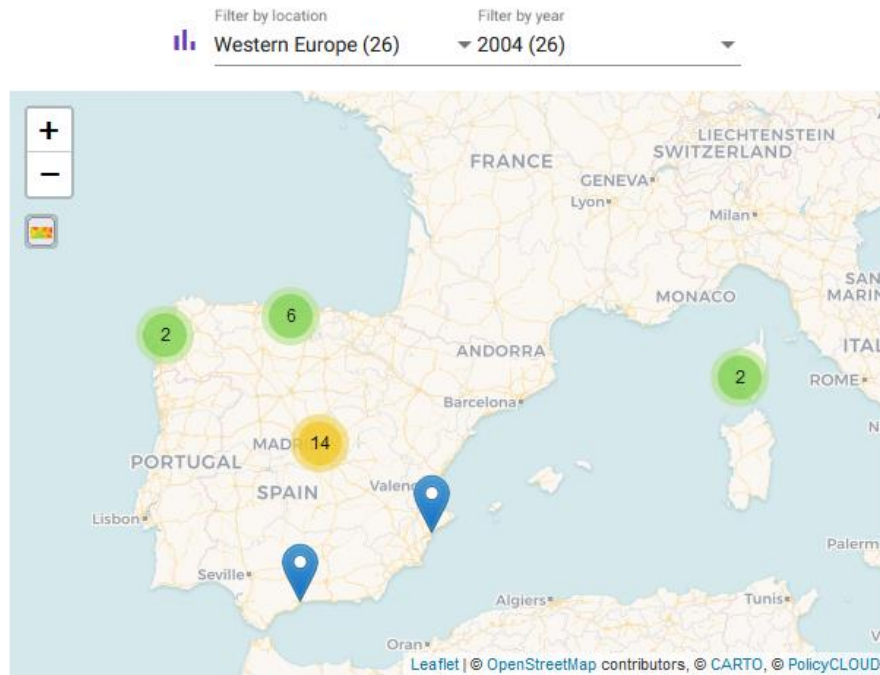


FIGURE 1 - HEATMAP WITH DATA FROM GTD

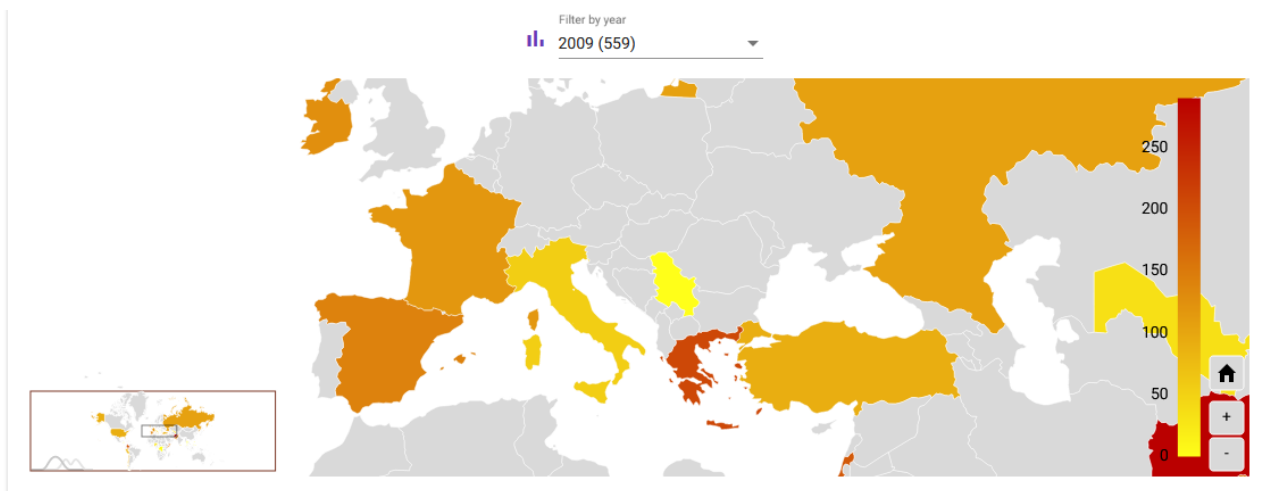


FIGURE 2 - HEATMAP WITH DATA FROM RDWTI

2.2 Scenario B. Radicalised groups and individuals

2.2.1 Overview

This scenario is using the Politika tool implemented by the consortium in order to simulate results of restrictive measures applied on Radicalised groups and individuals. The goal is to give policy makers a tool allowing them to understand the most effective (and also the most cost efficient) way to deal with a certain amount of radicalized people in their area.

2.2.2 Description of Scenario

The main objective of this scenario is to help in the creation of new policies to counter radicalization and violent extremisms. Specifically, the Politika tool will be used in order to select the best approach to take in a given area with a given percentage of radicalized individuals. The policy maker will be able to insert numerous parameters such as cost of the policy, cost of restrictive measures etc (please see section 2.2.3) in order to have the most precise prediction possible.

The results will be presented to the policy maker using a table chart that illustrate the different rounds of simulations performed by the system and the different results extracted. The policy maker will have the possibility to filter the extrapolated data.

2.2.3 Policy Modelling Editor

For this scenario, the following parameters will be used:

1) Relevant **KPIs** (as specified in D6.11 [3]):

- **MAG-KPI10**: Number of identified groups/individuals in a given area.

2) Name the selected Analytical tool: Policy-Simulator-Radical-UJ

- Data Visualisation
 - Type: Table

3) **Additional parameters** to be specified:

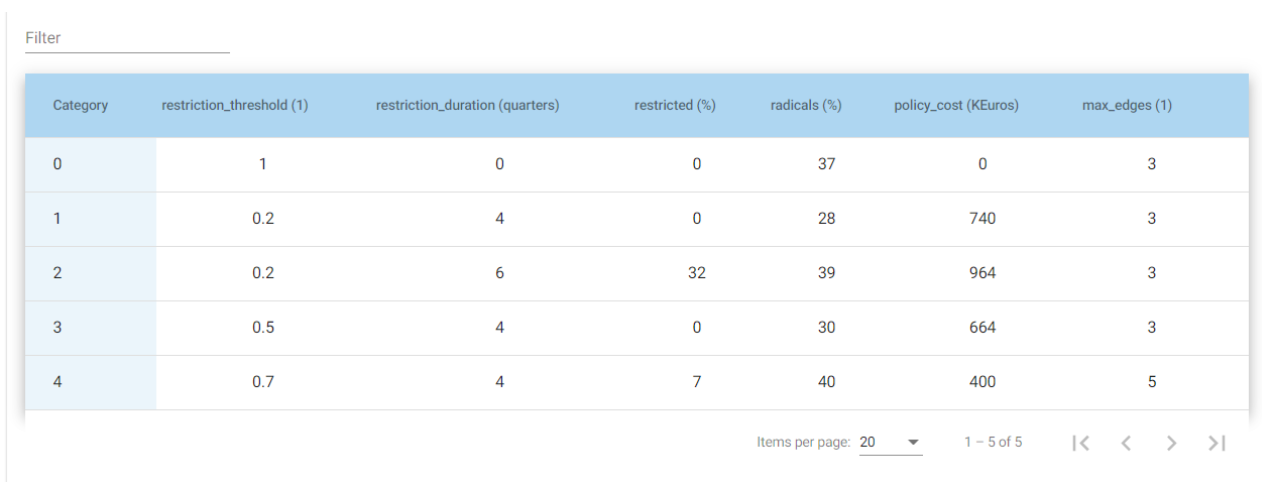
- “radicals”, the percentage of radicalized individuals in a given area
- “restriction threshold”, the threshold for the restrictive measures
- “restricted”, number of individuals on which to apply restrictive measures
- “restriction duration”, the duration of the restriction for each individual
- “radicalization threshold”, the threshold for the radicalization in order to be sanctioned
- “policy cost”, the cost of the overall policy
- “restriction cost per head”, the cost of each individual restriction

Also, the user is able to add “**Alternatives**” in these parameters, in order to run simulations on the best approach to take.

Once the policy maker has reviewed and submitted the Policy Model, he/she will be redirected to the PDT in order to evaluate the submitted Policy Model.

2.2.4 Policy Development Toolkit

For scenario B, the policy maker will need to select the Policy Model defined previously and specify the relevant KPIs for its evaluation, which again will be MAG-KPI10. The user will then be presented with the following visualization:



Filter

Category	restriction_threshold (1)	restriction_duration (quarters)	restricted (%)	radicals (%)	policy_cost (KEuros)	max_edges (1)
0	1	0	0	37	0	3
1	0.2	4	0	28	740	3
2	0.2	6	32	39	964	3
3	0.5	4	0	30	664	3
4	0.7	4	7	40	400	5

Items per page: 20 1 – 5 of 5

FIGURE 3 - TABLE CHART FOR RADICALISED INDIVIDUALS OR GROUPS

Thanks to this table, the user can both review the parameters inserted in the Policy Model (restriction threshold, restriction duration, max edges) and in the same visualization view the results of the algorithms in terms of % of restricted individuals, % of radicals in the population and policy cost.

2.3 Scenario C. Trend analysis

2.3.1 Overview

The scenario allows policy makers to understand current and future trends of radicalisation actions by using social networks data (e.g., Twitter) and filtering them to retrieve useful information for the policy makers.

2.3.2 Description of Scenario

The main objective of this scenario is to identify the most relevant trends that will allow to identify emerging threats and issues and policy makers will be able to provide support by adjusting their policies or creating new ones considering all possible parameters.

2.3.3 Policy Modelling Editor

For this scenario, the following parameters will be used:

1) Relevant **KPIs** (as specified in D6.11 [3]):

- **MAG-KPI11**: Number of new terms/keywords identified from the policy maker

2) Name the selected **Analytical tool**: tweet-annotation-terrorism

- Opinion mining
 - Functionalities: keywords detection, new entity recognition, new terms identification
- Data Visualisation
 - Type: Tagcloud (types 1, 2, 3,4)

3) **Additional parameters** to be specified

- Set of initial keywords to perform the analysis
- Initial Date and End Date for the investigation

Once the policy maker has reviewed and submitted the Policy Model, he/she will be redirected to the PDT in order to evaluate the submitted Policy Model.

2.3.4 Policy Development Toolkit

For scenario C, the policy maker will need to select the Policy Model defined previously and specify the relevant KPIs for its evaluation, which again will be MAG-KPI11.

In the properties of the KPI, the policy maker needs to specify the data source that he/she would like to use. The user will then be presented with the following visualizations, where he/she can choose to filter the information by Location, Person or Terrorist Organization and download the results in different formats:

2.4.3 Policy Modelling Editor

For this scenario, the following parameters will be used:

1) Relevant **KPIs** (as specified in D6.11 [3]):

- **MAG-KPI12:** Number of negative opinions on social networks from the different groups / individuals

2) Name the selected **Analytical tool:** sentimentAggregatorAbsa

- Sentiment analysis
- Opinion mining
- Data Visualisation
 - Type: Heatmap for the Geographical Location of the person/organization
 - Type: Gauge and Line chart for the sentiment analysis

3) **Additional parameters** to be specified

- Set of initial keywords to perform the analysis
- Initial Date and End Date for the investigation
- Periodicity of the Analysis

Once the policy maker has reviewed and submitted the Policy Model, he/she will be redirected to the PDT to evaluate the submitted Policy Model.

2.4.4 Policy Development Toolkit

For scenario D, the policy maker will need to select the Policy Model defined previously and specify the relevant KPIs for its evaluation, which again will be MAG-KPI12.

In the properties of the KPI, the policy maker needs to specify the data source that he/she would like to use. The user will then be presented with the following visualizations, where he/she can choose to filter the information by Location, Person or Terrorist Organization and download the results in different formats:

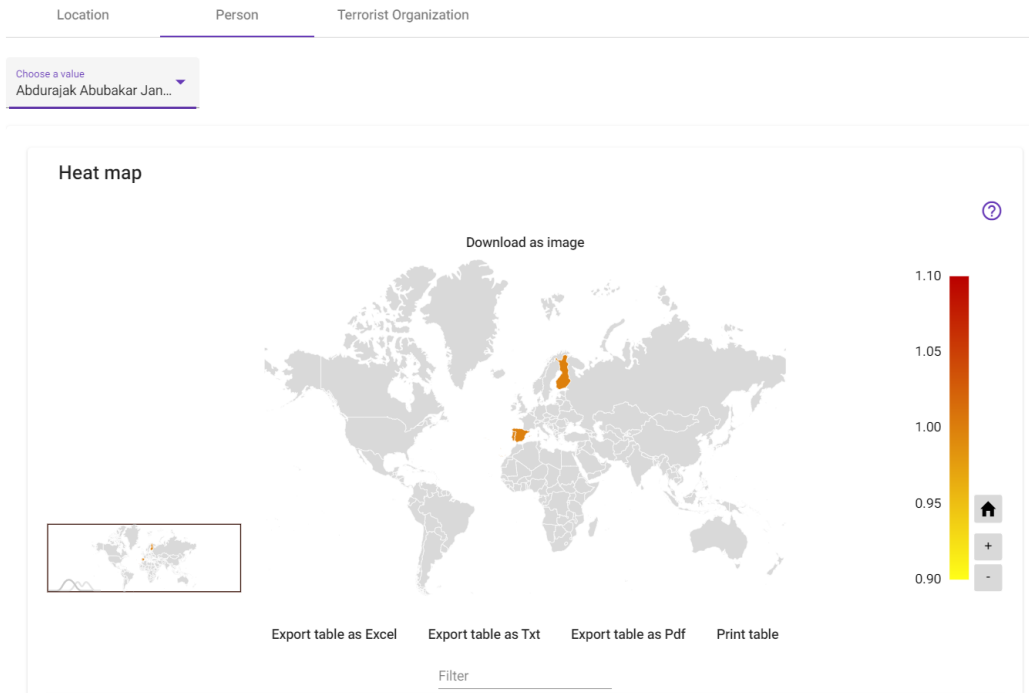


FIGURE 5 - HEATMAP FOR ONLINE ACTIVITIES LINKED TO MAJOR EVENTS

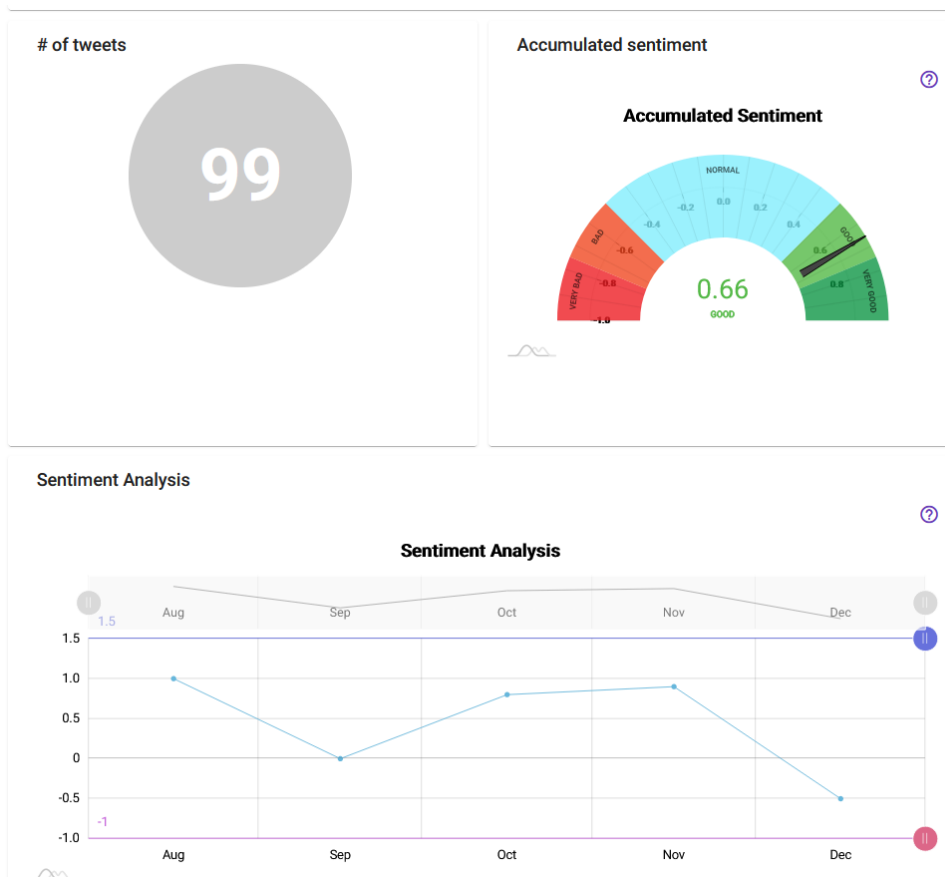


FIGURE 6 - GAUGE AND LINE CHART FOR SENTIMENT ANALYSIS

3 SARGA - Use Case 2

The overall goal of the Use Case 2 (**UC2 - Intelligent policies for the development of agrifood industry**) is to support the wine sector of Aragón through a series of scenarios which could contribute to the definition of what is the impact of the wines and Denomination of Origins, what trends are present in the world of wine, how to direct marketing efforts and campaigns in different countries, and how to control the distribution channel so that prices are within established limits.

The objective is to provide both policy makers and private actors with effective data-driven tools to understand consumer demands, for example, by analysing emerging markets with specific demand for Aragonese products, identifying trends in the world of wine, assessing the perception of Aragonese wineries and Designations of Origin, consumer opinions on products, and so on.

The idea of this use case is to use the tools provided in the project to be able to carry out advertising campaigns, investments and food promotion policies (based on data & evidence) in order to promote the regional wine sector by providing support and aid for investment in wineries and by promoting wines in third countries.

The Aragón Use Case has successfully defined and presented three scenarios: A, Ab, B, and C. By December 2022, the visualizations of these scenarios have been implemented and showcased during several co-creation workshops, receiving positive feedback from workshop attendees. We are confident that these scenarios will serve as valuable tools for a future. The following sections describe the E2E scenario from the point of view of a policy maker.

3.1 Scenario A. Price monitoring

3.1.1 Overview

This scenario intends to monitor the sale prices of different wine references on specialized websites to generate alarms if there are significant changes on wine prices. The main objective is to avoid penalties in contracts with large distribution groups if wine prices fall below a minimum price.

3.1.2 Description of Scenario

Visualize the sale price of wine on the different specialized websites, with automatic warning systems that avoid penalties for contracts with large distributors. The main goal is the control of distribution prices of both its own products and those of the competition, allowing to improve commercial policy.

3.1.3 Policy Modelling Editor

This scenario monitors the sale prices:

1. Monitoring the sales price of different wine references on specialized websites to generate alarm systems if prices fall below a minimum price

2. Benefit: avoid penalties in contracts with large distribution groups

For this scenario, the following parameters will be used:

1) Relevant **KPIs** (as specified in D6.11 [3]):

- **SAR-KPI12:** increment price in the last month

2) **Analytical tools:**

- Data visualisation
 - Type: Time evolution chart for the visualization of the price (see Figure 7)

3) **Additional parameters to be specified:**

- We must take into account the temporal sequences for the correct analysis of the scenario.
- Definition of geographic areas according to Market to be determined.
- Analysis by policy makers of the different strategies to adopt.
- Select type of wine (e.g., red, white, rose) from the brand.

3.1.4 Policy Development Toolkit

For this scenario, the policy maker will need to select the Policy Model defined previously and specify the relevant KPI for its evaluation and the terms and concepts to be monitored.

In the properties of the KPI, the policy maker needs to specify the data source, web, so the toolkit will perform the analysis and it will show the visualization results of the concepts for a specific time.

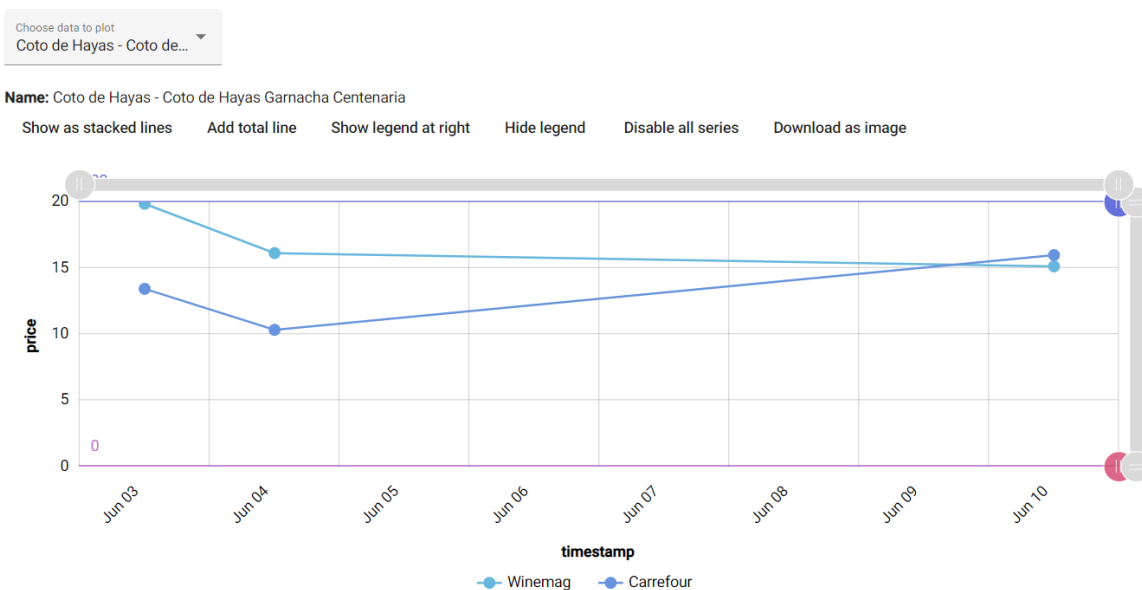


FIGURE 7 - PRICE EVOLUTION SCENARIO VISUALIZATION

3.2 Scenario Ab. Politika Price analysis

3.2.1 Overview

This scenario intends to identify the optimum sale prices of different wine references.

3.2.2 Description of Scenario

In this scenario, a wine seller is trying to determine the optimal prices for the various types of wine in their inventory. The seller may consider factors such as market demand, competition, and cost of production in order to identify the prices that will maximize their profit while still remaining competitive. The seller may use data and market research to inform their pricing decisions, and may also experiment with different pricing strategies to determine which ones are most effective. Ultimately, the goal of this scenario is to determine the best prices for the wine references to maximize sales and profit. The goal of this study is to identify the optimal pricing and advertising intensity ratios for an Aragon wine compared to a competitor to increase purchase motivation for the Aragon wine. We will assume that purchase motivation is influenced by factors such as price, quality, ad intensity, and social influence. In order to accomplish this goal, we will conduct market research and analysis to gather data on these factors and their impact on purchase motivation. This data will be used to develop a model that can predict the optimal pricing and advertising strategies for the Aragon wine in order to outperform its competitor. The results of this study will provide valuable insights for the wine seller and can be used to inform their pricing and advertising decisions.

3.2.3 Policy Modelling Editor

In this all configuration of Politika is inserted. It will be assumed that a wide range of factors influence purchase motivation, including the price of the wine, its perceived quality, the intensity of advertising, and social influence from peers and critics. Other potential factors may include the reputation of the wine brand, the availability of the wine at different retail outlets, the packaging and labelling of the wine, and the overall market conditions for wine sales. By considering all of these factors and their potential impact on purchase motivation, we can develop a more comprehensive understanding of the factors that drive consumer behaviour and can use this information to inform our pricing and advertising decisions.

1) Relevant **KPIs** (as specified in D6.11 [3]):

- **SAR-KPI12:** increment price in the last month

2) **Analytical tools:**

- Data visualisation
 - Type: optimum price

Name: Multi-factor Pricing Discovery for Aragon vs Competitor Wine: Ignacio Marin vs Gran Sangre de Toro
Description: Find pricing and ad intensity ratios for an Aragon wine vs a competitor that can provide higher purchase motivation for the Aragon wine than its competitor. Assume that purchase motivation depends on price, quality ad intensity and social influence.

[Flip X Y axis](#) [Enable color scale](#) [Enable border squares](#) [Download as image](#)

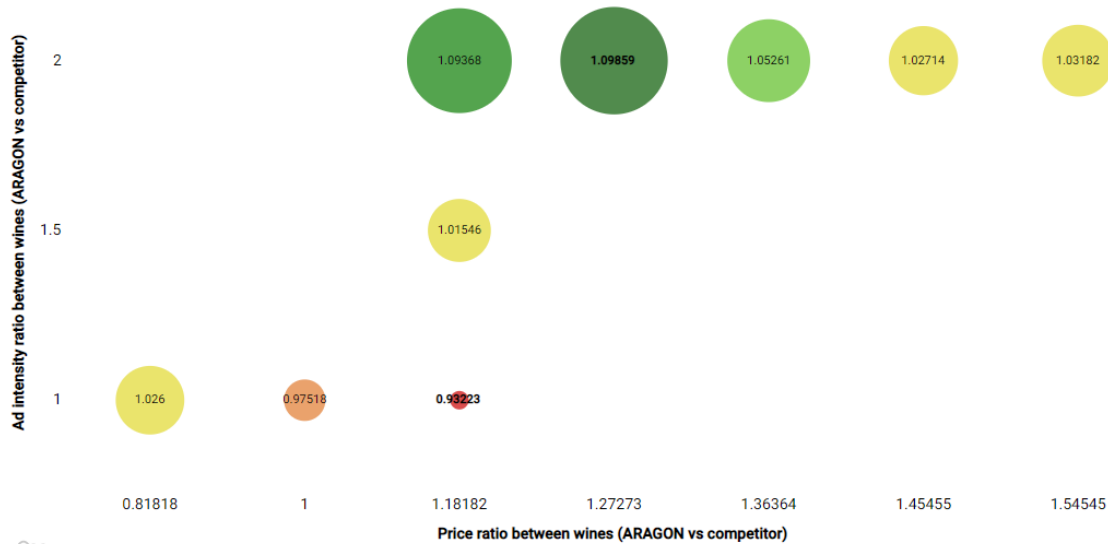


FIGURE 8 - PRICE RATIO VISUALIZATION

3) Additional parameters to be specified:

- We must take into account all parameter of external tool Politika.

3.2.4 Policy Development Toolkit

For this scenario, the policy maker will need to select the Policy Model defined previously and specify the relevant KPI for its evaluation and the terms and concepts to be monitored.

In the properties of the KPI, the policy maker needs to specify current price, quality, regional aspects and the competence parameters.

3.3 Scenario B. Opinions on social media

3.3.1 Overview

To understand this scenario, it is important to realize that wineries devote a lot of effort to analysing and understanding the key factors influencing consumers purchasing decision. One of these factors is the influence of the opinion or recommendations that are made about wine brands and this fact is especially significant since the boom experienced by social networks.

3.3.2 Description of Scenario

Due to the rise of social networks, consumers interact with brands and give their opinions on different types of wines and can have a great level of influence on potential consumers.

For these reasons, it is important in this context to know the perception of the wines produced in Aragón and having a tool that monitors opinions about the wines in Aragon region could be very useful. And not only to know how Aragonese wineries are perceived and therefore be able to devise marketing campaigns to deepen or modify this perception, but also to monitor and mitigate the effects of negative opinions about the brands.

To face this scenario, it is necessary to have a hierarchy that allows incorporating the Denomination of Origin and expanding it through the wineries, different brands and wines to be able to cover from a more sector-wide vision to a more specific one.

To analyse the wine sector, information about their designation of origin for the different wineries and wine brands is needed, to build an ontology which allows to gather information from different non-structured and structured data sources, classify gathered information, and filter and display on decision support systems.

The focus of the ontology has been the wine sector which comprises of:

- 4 names of designation of origin (the names of the area where the wine is produced)
- More than 70 wineries and 750 brands of wines

To collect this information, datasets fed by the various social networks, for example: Twitter, will be generated to store, in this case, the corresponding tweets labelling and tagging Denomination of Origins, wineries, brands, etc.

Once the process of data capture has been explained, details are provided how to use the policy modelling editor and the development toolkit for this scenario.

3.3.3 Policy Modelling Editor

The first scenario tries to identify negative and positive opinions that the customers and competitors have about different products (D.O, wineries, brands) gathered in social networks.

All this information allows to:

- Determine the impact of a campaign on consumers
- Identify the profile of consumers based on demographic and social factors
- Evaluate competitor's strategies

For this scenario, the following parameters will be used:

1) Relevant **KPIs** (as specified in D6.11 [3]):

- **SAR-KPI10**: percentage of positive opinions versus negative ones in a time interval for one specific wine, brand, Denomination of origin

2) **Analytical tools**:

- Sentiment analysis
- Data Visualisation
 - Gauge Chart and heatmap for the evolution opinion for the selected concept: Denomination of Origin, specific winery, specific brand, etc.

3) **Additional parameters to be specified**:

- "date", period to be evaluated
- "region", the geographic area of interest
- "wine", brand or Origin Denomination

Once the policy maker has reviewed and submitted the Policy Model, he/she will be redirected to the PDT in order to evaluate the submitted Policy Model.

3.3.4 Policy Development Toolkit

For this scenario, the policy maker will need to select the Policy Model defined previously and specify the relevant KPI for its evaluation and the terms and concepts to be monitored.

In the properties of the KPI, the policy maker needs to specify the data source, Twitter, so the toolkit will perform the analysis and it will show the visualization results for the specific Denomination of Origin, winery or brand and analyse how the opinion varies over time as well as to evaluate it the present time, as it is shown in the following picture.

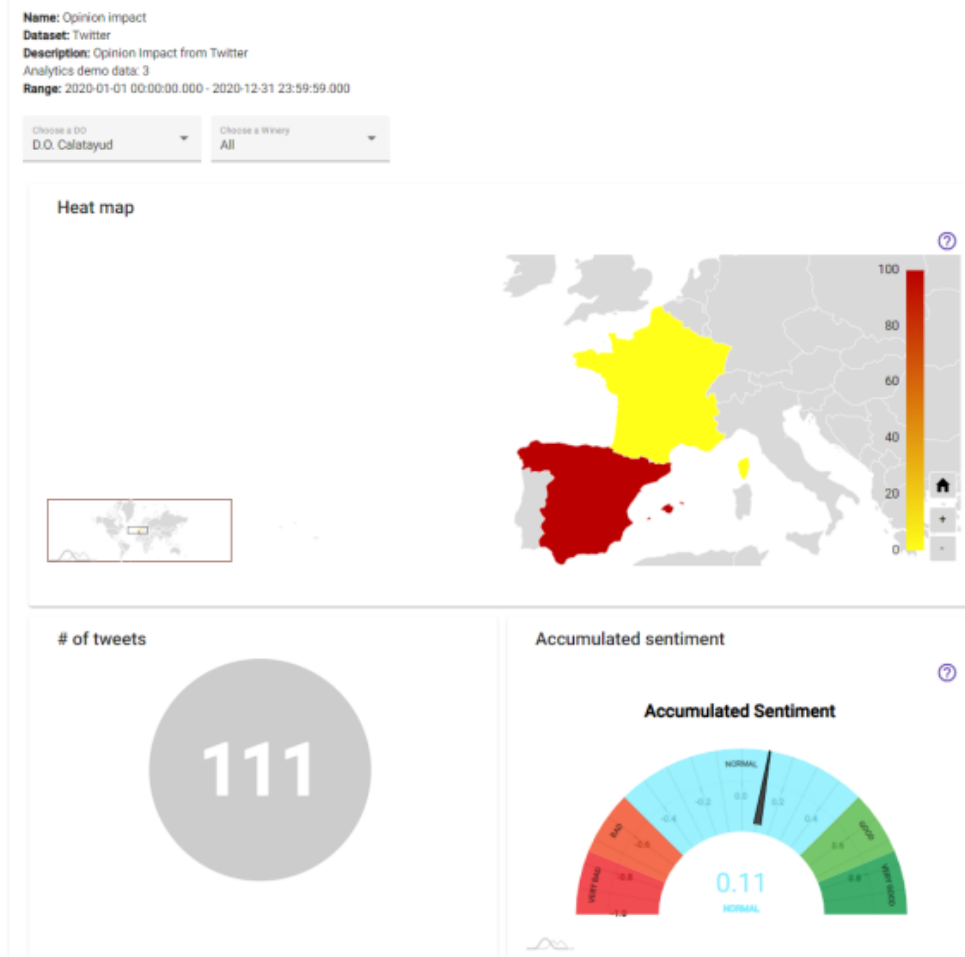


FIGURE 9 - VISUALIZATION OF OPINION ANALYSIS

3.4 Scenario C. Trend analysis

3.4.1 Overview

The third scenario allows to analyse not only social networks but specialized websites around the wine sector to identify which are the main topics and terms and perform comparison over time. The main objective of this scenario is to identify the most relevant trend which allows to identify emerging markets, so policy makers will be able to provide support in the right direction.

3.4.2 Description of Scenario

This action will allow to know the trends in each of the markets that are of interest, knowing the trends in the sector it will be possible to adjust the diffusion policies considering all possible parameters.

3.4.3 Policy Modelling Editor

This scenario tries to identify trends in the wine sector through specialized websites. Identifying which topics and terms are being discussed and compare them over time.

1. Which are the most relevant trends in the world of wine?
2. Identify emerging markets that present opportunities

For this scenario, the following parameters will be used:

1) Relevant **KPIs** (as specified in D6.11 [3]):

- **SAR-KPI8**: Total number occurrences. New concepts related to wine sector, that are trends in the source data
- **SAR-KPI9**: relative Total n° occurrences %.

In this case, the analysis can be complemented, in addition to the sections and impact on social networks, with the study of specialized websites, trendsetters and all the information available on the wine market.

2) **Analytical tools**:

- Data Visualisation-
 - Type: tag concepts, tables with more relevant concepts

3) **Additional parameters to be specified**:

- “idate”, period of time to be evaluated.
- “region”, the geographic area of interest.

Once the policy maker has reviewed and submitted the Policy Model, he/she will be redirected to the PDT to evaluate the submitted Policy Model.

3.4.4 Policy Development Toolkit

For this scenario, the policy maker will need to select the Policy Model defined previously and specify the relevant KPI for its evaluation and the terms and concepts to be monitored.

In the properties of the KPI, the policy maker needs to specify the data source, Twitter, so the toolkit will perform the analysis and it will show the visualization results the concepts for one specific time

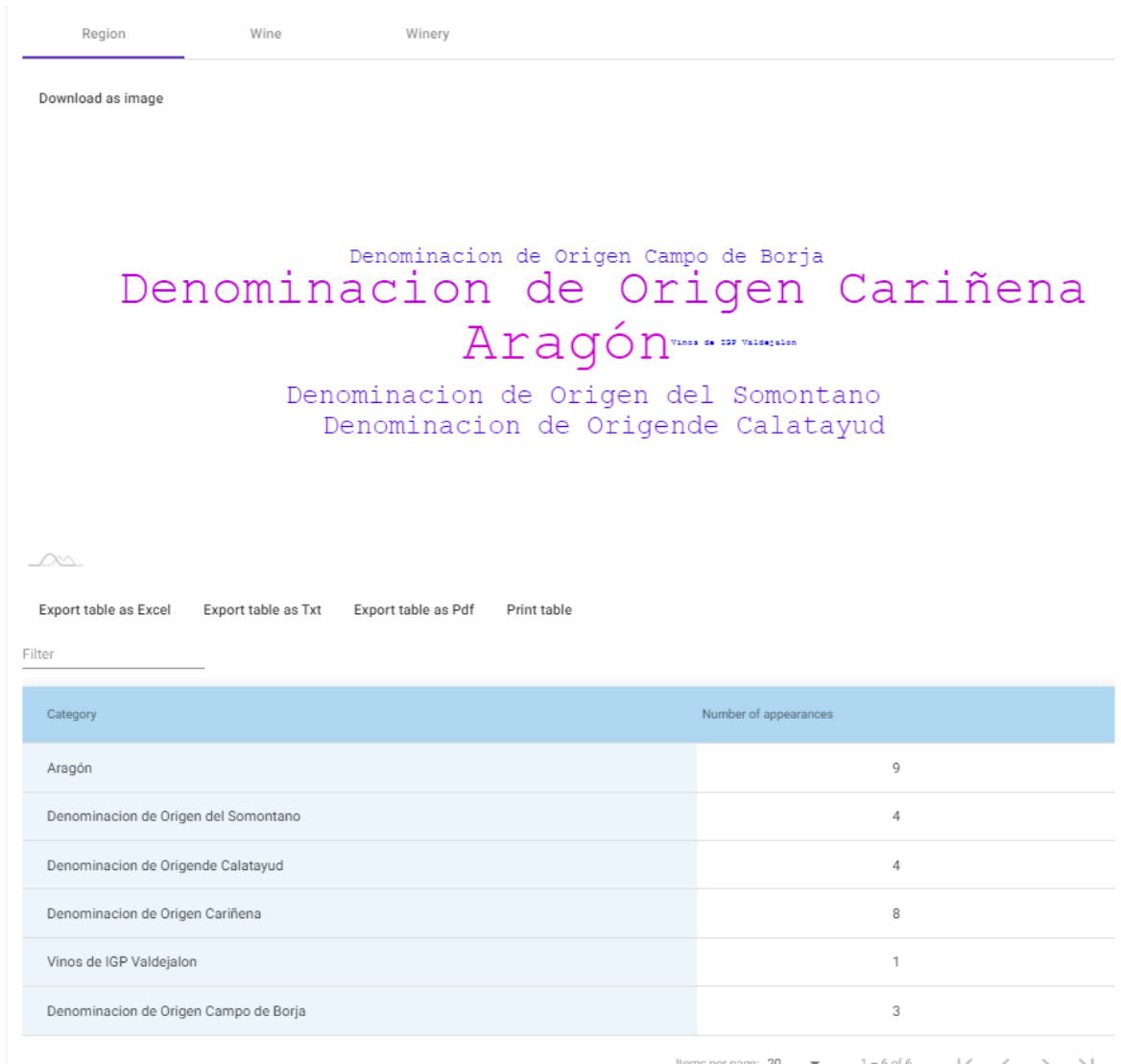


FIGURE 10 - VISUALIZATIONS FOR TREND PRODUCT ANALYSIS

4 SOFIA - Use case 3

The aim of this use case (**UC3 - Facilitating urban policy making and monitoring through crowdsourcing data analysis**) is to support Sofia Municipality's policy making in important areas of citizen's everyday life. Sofia municipality is constantly working to improve the urban environment and meet the challenges that the city facing. Evidence-based policy making is crucial for addressing urban challenges in a cost-efficient way. The PolicyCLOUD project will support Sofia municipality to address this challenge by adapting the design of its policies, considering analytics' results that combine information of sectors, related to: road infrastructure; environment and air quality, waste collection and waste disposal; transport and parking, cleanliness of public spaces, violation of public order; and other topics of importance to citizens.

The data, crowdsourced directly from citizens through their signals on non-urgent deviations in the urban environment and reported to Sofia's Call Center (CallSofia) either via the 24/7 telephone line, or the Call Sofia mobile app or via the desktop version of Call Sofia, allows policy-makers to get a detailed, up-to date information and snapshot of the types and geographical distribution of the urban challenges that the citizens are encountering every day, and to identify certain tendencies. In the same time, Call Sofia allows citizens to get directly and easily in contact with the Municipality, to signal issues, and to follow the process of their signals and the resolving of the issues on behalf of the City.

During the second project workshop in 2021, we demonstrated to stakeholders the integrated analysis and visualizations of scenario A, demonstrated how to model for policy.

During the third workshop for Sofia, the predictive analysis (scenarios B) was also demonstrated. This analysis has great added value in the work of policy makers. We also showed the data marketplace, explained what its added value is and how it could be useful for different organizations.

Given that the analytics to be deployed in Scenario C were quite similar that those in Scenario A, this scenario was given low priority, and finally it was not possible to be deployed and integrated into PolicyCLOUD on time.

4.1 Scenario A. Visualisation

4.1.1 Overview

Sofia's first scenario is focused on the detailed and diverse visualisation of the data received with regards to the 6 abovementioned sectors.

4.1.2 Description of Scenario

Sofia Municipality is able to carry out a detailed analysis of the territorial distribution of the signals by categories / types, areas, districts, major transport roads, etc. The results of the analysis will allow the municipal and district administrations to identify the problems in the road infrastructure and adjacent urban environment and to adopt or modify adequate policy making decisions, including on budget planning and effective use of budget and public resources. It will also help Sofia Municipality to better control and monitor, as well as can serve as early warning to prevent issues.

The PolicyCLOUD visualisation technologies will enable policy makers to identify tendencies.

4.1.3 Policy Modelling

For this scenario the following parameters can be defined:

KPIs:

- # of incidents
- # of incidents per year
- # of incidents per geographical location
- # of incidents per category per location
- % per type of incident
- % per month
- % per year
- change in frequency over the years

Analytical tools:

- Data Visualization:
 - **Type: Heatmap**, that illustrates:
 - the occurrence of incidents or issues, leading to citizen signals in a given area,
 - geographical distribution
 - areas with repeating incidents over given time
 - **Type: Pie Chart**, that illustrates major categories of incidents
 - **Type: Line Chart**, that illustrates frequency of issues per area over time, etc.
 - **Type: Radar Chart**, that illustrates the number of incidents in road infrastructure per month and per type
 - **Type: Horizontal Bar Chart**, that illustrates the number of incidents in road infrastructure per district

Configurable parameters related to the selected KPIs

- Dependant on choice - users should see either an annual percentage increase/decrease
- Combined analysis including cross analysis of several criteria should be possible – e.g., per type and district and year
- Increase / decrease per type/ year/ district/ month
- Geographical spread per district/ per geo location
- share of incidents per type / per month / per year

4.1.4 Policy Development Toolkit

For this scenario, the policy maker will need to select the Policy Model defined previously and specify the relevant KPI for its evaluation and the terms and concepts to be monitored.

In the properties of the KPI, the policy maker needs to specify the data source, so the toolkit will perform the analysis and it will show the visualization results as it is shown in the following picture.

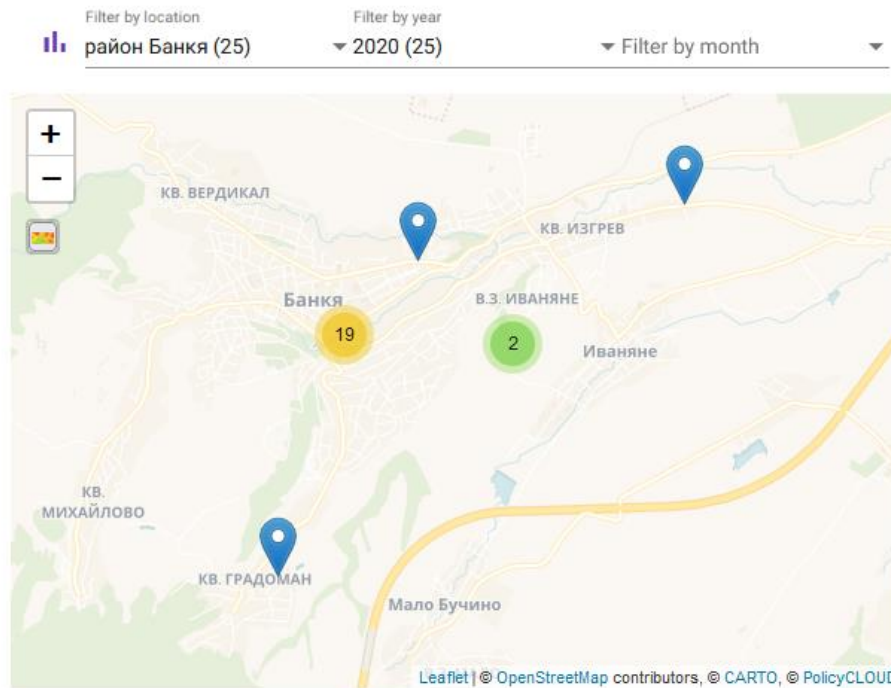


FIGURE 11 - HEATMAP FOR ROAD INFRASTRUCTURE INCIDENTS/ISSUES REPORTED

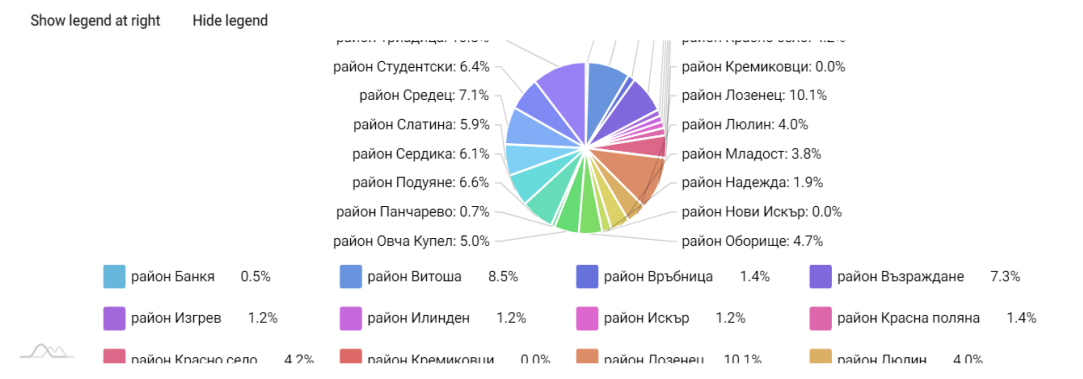


FIGURE 12 - PIE CHART FOR ROAD INFRASTRUCTURE INCIDENTS/ISSUES REPORTED

Name: distribution of observations across multiples categories
Description: number of incidents in Road Infrastructure per monthYear(x-axes) and per type_description(in colours)
Range: 2020-01-01 00:00:00.000 - 2020-12-31 23:59:59.000

Show as lines Add total line Show legend at right Hide legend

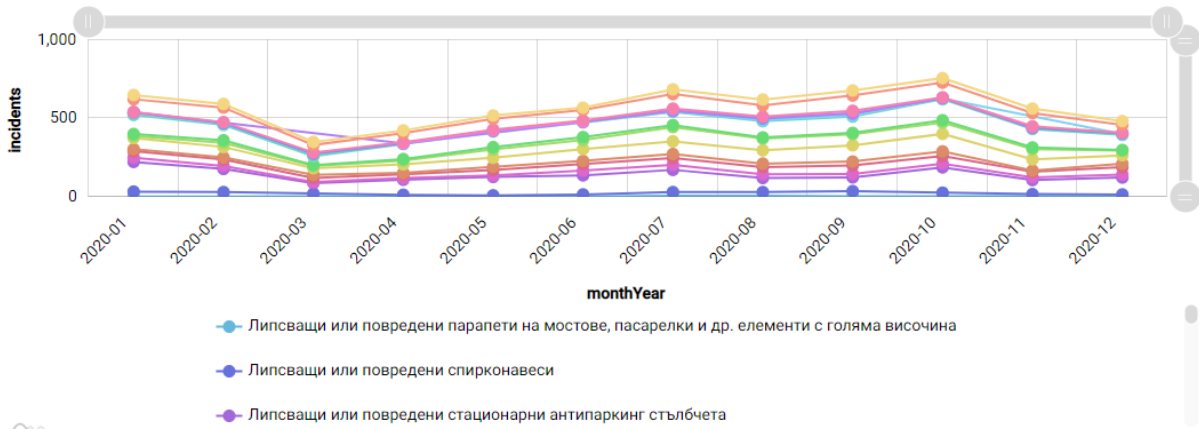


FIGURE 13 - LINE CHART FOR ROAD INFRASTRUCTURE INCIDENTS/ISSUES REPORTED

Name: distribution of observations across multiples categories
Description: number of incidents in Road Infrastructure per monthYear(x-axes) and per type_description(in colours)
Range: 2020-01-01 00:00:00.000 - 2020-12-31 23:59:59.000

Add total line Show legend at right Hide legend



FIGURE 14 - RADAR CHART FOR ROAD INFRASTRUCTURE INCIDENTS/ISSUES REPORTED

Name: frequency distribution of one variable
Description: number of incidents in Road Infrastructure per district(x-axis)
Range: 2020-01-01 00:00:00.000 - 2020-12-31 23:59:59.000

Show legend at right Hide legend

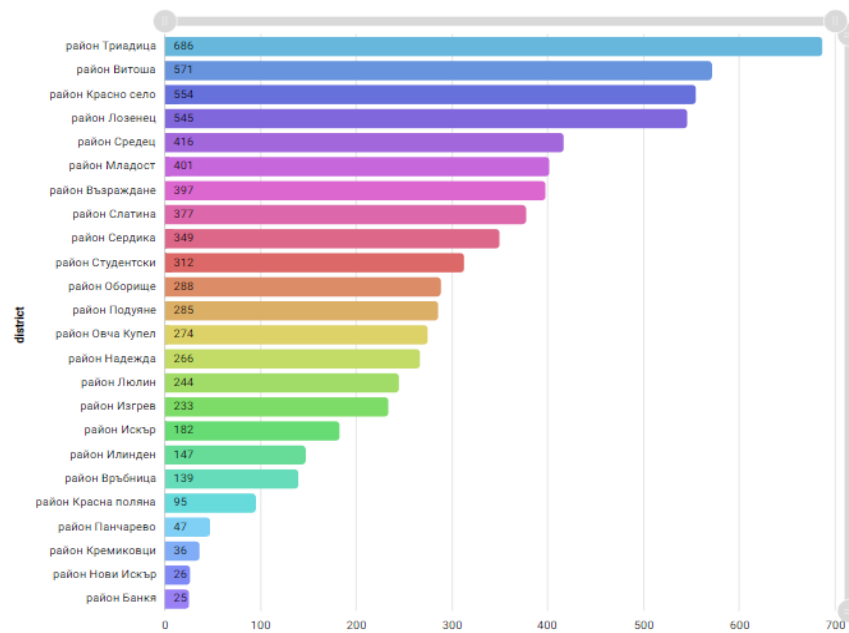


FIGURE 15 - HORIZONTAL BAR CHART FOR ROAD INFRASTRUCTURE INCIDENTS/ISSUES REPORTED

4.2 Scenario B. Forecasting analysis

4.2.1 Overview

Sofia's second scenario provide a predictive analysis identifying trends and forecasts in the above domains to facilitate for better control and monitoring.

4.2.2 Description of Scenario

The predictive analytics tool processes the uploaded data and creates an algorithm that informs what we can expect in a future period of time. Here the analysis is based on the data/alerts submitted so far from previous years or months. Predictive analysis shows us what we can expect in terms of the intensity of incoming signals on the particular topic.

4.2.3 Policy Modelling Editor

For this scenario the following parameters can be defined:

KPIs:

- # of incidents
- # of incidents per year

- # of incidents per geographical location
- # of incidents per category per location
- % per type of incident
- % per month
- % per year
- change in frequency over the years

Analytical tools:

- Prophet forecasting:
 - hourly, daily, or weekly observations with at least a few months (preferably a year) of history
 - strong multiple “human-scale” seasonalities: day of week and time of year
 - important holidays that occur at irregular intervals that are known in advance (e.g., the Super Bowl)
 - a reasonable number of missing observations or large outliers
 - historical trend changes, for instance due to product launches or logging changes
 - trends that are non-linear growth curves, where a trend hits a natural limit or saturates
- Predicting sarima: autoregression model, we forecast the variable of interest using a linear combination of past values of the variable (autoregression indicates that it is a regression of the variable against itself)
 - **Type: analytic analysis**:
 - here we used time series with trend
 - geographical distribution

Configurable parameters related to the selected KPIs

- Dependant on choice - users should see either an annual percentage increase/decrease
- Combined analysis including cross analysis of several criteria should be possible – e.g., per type and district and year
- Increase / decrease per type/ year/ district/ month
- Geographical spread per district/ per geo location
- share of incidents per type / per month / per year

4.2.4 Policy Development Toolkit

For this scenario, the policy maker will need to select the policy model defined earlier and specify the corresponding KPI to produce the predictive analysis.

In the KPI properties, the policy maker needs to specify the data source (in this particular use case we are using data from the first use case, namely Road Infrastructure) so that the toolkit will perform the analysis and display the visualization results as shown in the following image.

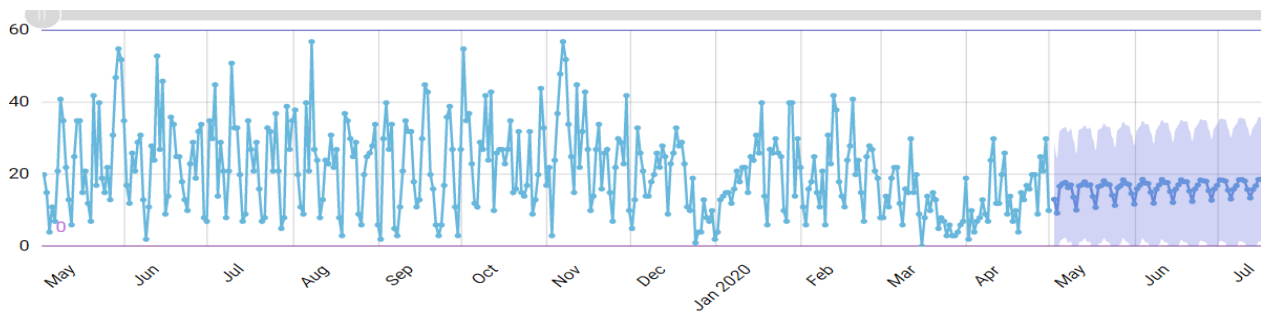


FIGURE 16 - VISUALIZATION OF THE RESULT OF A PREDICTIVE ANALYSIS

4.3 Scenario C. Environment and air quality cross-analysis

4.3.1 Overview

Sofia's third scenario (optional) will focus on the topic of environment and air quality and the cross-analysis between the data received from CallSofia and the data from the air quality sensors in the city. As this scenario had low priority for its implementation it was not possible to deploy and integrate the corresponding components during the project life.

4.3.2 Description of Scenario

In addition to the data analysis, visualization and predictive analytical functions mentioned above, this scenario will allow for the cross-analysis of the datasets received via Sofia's Call Sofia and the additional data provided by Sofia's air quality measurement stations. This will support and facilitate data-based municipal decisions in the field of environment and air quality - one of the key areas of urban development locally and globally, and will allow for:

- Optimized effort distribution within the Municipal teams
- More efficient measures to prevent pollution in specific areas
- Development of new solutions for tackling the challenges in the sector

5 Methodology

5.1 Co-Creation and Experimentation

5.1.1 Co-creation methods and techniques

Co-creation is defined as the participation of users in the process of developing a product or a service. The core principle of the co-creation is engaging people to create valuable experiences together. A central element of the transition to co-creation is the ability to effectively develop and manage two-way communication. An example within the context of smart cities projects, Spagnoli et al. (2019) [4] views co-creation as *"an active flow of information and ideas among five sectors of society: government, academia, business, non-profits and citizens, which allows for participation, engagement, and empowerment, developing policy, creating programs, improving services and tackling systemic change with each dimension of society represented from the beginning"*.

In the literature, there are different methods and techniques related to co-creation which can be used in different phases of the design process: discover opportunities, generate concepts and ideas, and methods for design. Examples of methods include workshops, prototyping, surveys, testing, evaluation and validation. A multitude of techniques are used, e.g., personas, scenarios, mock-ups, interviews, focus groups, questionnaires, observations and more. A categorization of primary, secondary and tertiary users¹ can provide valuable guidance on how to compose different groups of users for activities (see Figure 17). It can also be used as help to interpret and understand conflicting opinions between different users.

¹ In PolicyCLOUD, there are the following three categories of users:

Primary users: policy makers and operators working for a public organisation at any level (local, regional, national, international).

Secondary users: technicians (data analysts, software developers, legal experts, etc.) and third-party providers (enterprises: start-ups, SMEs, companies; RTOs)

Tertiary users: organisations and entities that can support in the creation and implementation process of the policies (NGOs, schools, religious communities, community-based organisations, etc.)

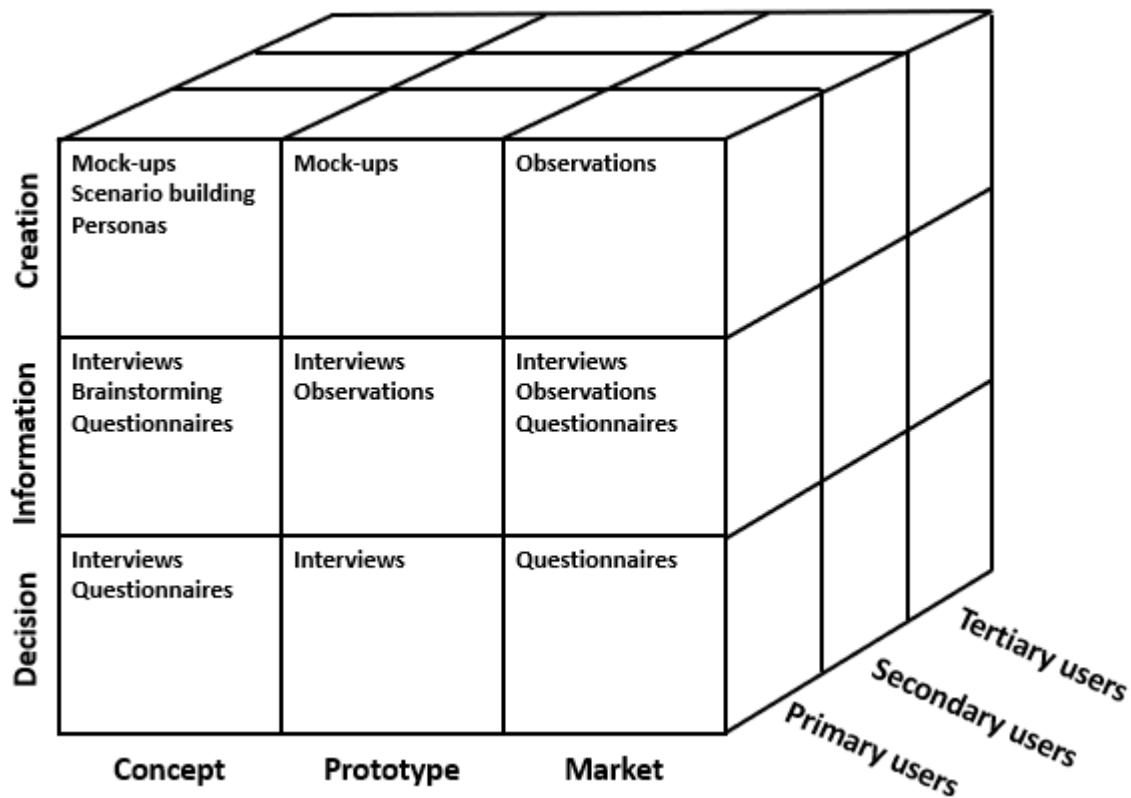


FIGURE 17 - MODIFIED CUSTOMER INTEGRATION CUBE WITH SUGGESTED TECHNIQUES FOR USER CONTRIBUTION

Some of these methods are described below:

Discover opportunities

The aim is to gain insight into the different basic needs that different stakeholders have of the service. It is important to start by determining the target user group for the “discover needs” phase. Here the aim should be to find established groups due to the difficulty of finding time and place for the interview.

- Contextual Design:** This method is described as a collection of principles and techniques, founded on the perspective that systems development should have its starting point in the future users work but with the purpose to enrich it through the new possibilities the technology can offer. It consists of a combination of interviews and observations where the purpose is to gain as rich picture of the actual work situation as possible with their roles, areas of responsibilities, problems related to the work and the existing tools and so forth.
- Why-Why-Why:** To sustain a broad perspective throughout the investigation it is important to question and exceed the apprehension about the defined “problem” that already exists in the design situation. One way to do this is to ask a number of “why” questions and by that means build a chain of relations backwards from the original formulation.
- Dialog café:** This has the purpose to create a common dialog, to exchange experiences and knowledge, to highlight the common knowledge and to enrich the fellowship. This process is carried out in small conversation groups around round tables exploring a question or a specific

theme. At certain points in time, the participants change groups. This method is suitable when sharing experiences or discussing a question with the aim to increase the individual knowledge sought. In addition, it is suitable when similarities and differences in opinion needs to be highlighted or when different perspectives on an issue are desired.

In PolicyCLOUD, we have adopted the contextual design particularly for the first co-creation sessions that were organised during the first year of the project. The main goal was to validate the preliminary set of scenarios and mock-ups that were developed following the requirement elicitation and engineering process.

Generate concepts and ideas

Different stakeholders can be involved in generating ideas for new solutions using workshops, brainstorming and idea competitions. The generated ideas and further developed solutions can be concretized in various ways so that it is easier for end users and other stakeholders to understand them in a similar way and evaluate their suitability.

- **Workshops:** Workshops can be used for different purposes where stakeholders' input is required. The purpose of these groups is to gather different kinds of groups around a joint subject or matter or to find a subject to gather around and work more with. Workshops can be implemented, e.g., using rotation table or open space techniques presented below. Workshops can also be arranged online, e.g., via web conferencing tools, where the participants are guided to answer certain topics. The result should be concrete action plans that are implemented in their own context. The original idea of a workshop is to bring together people from various backgrounds who all share an interest in a common issue or a problem. The aim is to increase people's participation in solving collective problems by giving them an opportunity to influence future decisions of an issue whose development might otherwise be defined solely by traditional decision makers such as policy makers, civil servants or experts.
- **Brainstorming:** This can be used for generating a lot of new ideas in a short time. Brainstorming is a method for generating ideas to solve a design problem in a systematic way. It is a creative activity where people produce as many ideas as possible for later analysis, and under the direction of a facilitator. The tone of the session is open to the inscription and tolerant. Brainstorming serves to promote a culture of building on the ideas of others generated from multiples perspectives and levels of expertise. Using brainstorming and collages provides the participants to translate their experiences. The strength of brainstorming is the potential participants have in drawing associations between their ideas in their environment, thereby broadening the solution space. The participants are told to lose their inhibitions and that no ideas will be judged so that people are free to shout out any ideas at all without feeling uncomfortable. People should build on the ideas called out by other participants.
- **Experience Prototyping:** This is research through design and learning through practice, a methodology for designing with context in mind. Experience prototyping is valuable when designing a service that adapts to the situation the participants are in. Experience Prototyping is less a set of techniques than it is an attitude, allowing the designer to think of the design problem in terms of designing an integrated experience, rather than one or more specific artifacts.

Therefore, an Experience Prototype is any kind of representation, in any medium, that is designed to understand, explore or communicate what it might be like to engage with the product, space or system being designed.

In PolicyCLOUD, we have organised workshops and brainstorming sessions for the evaluation of the developed tools and services. The main goal is to test and validate the implemented E2E scenarios in the different pilots.

5.1.2 Chosen methodology for co-creation

Design Thinking (DT) is a term coined and popularized by David Kelley [5]. Briefly, it brings forward and systematizes the mindset and ecosystem in which designers think and develop their ideas. DT deploys the typical design setting for iteratively prototyping ideas. In a workshop setting that is inspired by the DT process, ideation and experimentation aims at generating as many ideas as possible in a short time, making a selection of ideas that are further developed and tested through quick prototyping. In a workshop setting, this may be simulated by forming groups and swapping ideas between them. Groups may rotate between ideas as an attempt to liberate the participants from their first favourite ideas, making the process more open-ended. At the end of the workshop, all groups present their outcomes and the generated ideas are discussed in each table. The workshop ends by sharing insights of different tables with the rest of the participants and reflecting on the results from all tables.

Pilot partners have chosen the DT methodology to help them to reach the goal of co-creation and that would be a good fit for the intended audience. DT is co-creative and iterative by nature. It is about changing and improving, now and in the future. It is key to understand the starting point of innovation (current situation), the preferred situation (vision) and the way to get there. This is needed to make a change and start with smaller steps that lead towards the end goal. DT puts people and their context at the centre. Experiences are influenced by the social, physical and cultural context. Insight in the daily context of those involved enables the creation of solutions that meet people's needs and wishes. The process is iterative. Small interventions make things tangible and enable reasoning towards the unknown. Stakeholders are actively involved in the different steps through co-creation. Design tools are applied to visualize insights and create common ground.

DT is about approaching things differently with a strong user orientation and fast iterations with multidisciplinary teams to solve complex problems. It is equally applicable to (re)designing products, services, processes, business models, and ecosystems. It inspires radical innovation as a matter of course, and ignites capabilities beyond mere potential.

In Lombardy and Aragon region, many stakeholders and policy makers are already familiar with the concept of DT, so the choice to use DT as their method was quite obvious. Instead of starting at the beginning, more time could be spent in exploring the possibilities of policies and finding concrete applications.

5.1.3 Setting the agendas

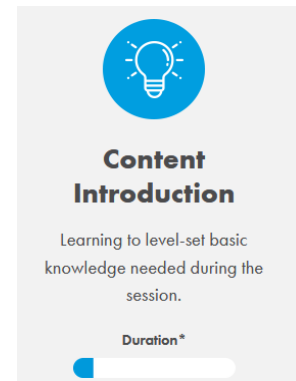
In order to facilitate the organisation of the co-creation sessions in the four pilots, MAG as leader of Task 6.3, proposed the following step-by-step approach to be used as a guideline for setting up the agendas of the workshops. This of course is only the starting point of discussion; the pilot partners have set the specific agendas based on their needs, ambition and status of implementation of the different scenarios.

Step 1: Introduction

- Brief presentation of the PolicyCLOUD project
- Introduction to the specific purpose of the co-creation session and supporting tools to be used

Goal: define what is expected from the participants during the session and explain the co-creation process

Duration: 10-15 min

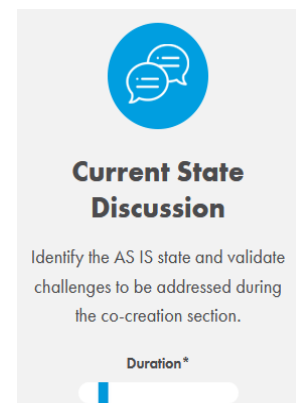


Step 2: Preliminary discussion

- Presentation of the E2E scenario(s)
- Establish a common understanding of the context and work practices

Goal: Establish a common understanding of the context and work practices; identify the existing practices to be followed by policy makers and discuss potential challenges (if applicable)

Duration: 5-10 min (per scenario)

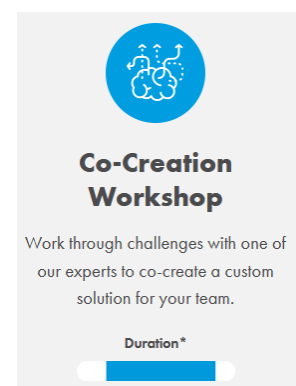


Step 3: Co-creation session

- Scenarios' development: focus on the implementation of the scenarios in the platform and how it should be used by the relevant stakeholders

Goal: showcase the implemented scenario(s) and conduct co-design sessions for further improvements/fine-tuning of the services

Duration: 45-60 min

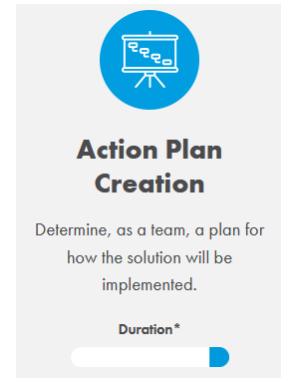


Step 4: Action Plans

- Next steps:
 - Improvements/enhancements of existing scenarios
 - Additional scenarios to be implemented

Goal: define with the policy makers the next action points to be carried out and their expected involvement.

Duration: 10-15 min



Step 5: Reporting

- Common templates (see Annex 1)
- Dissemination through the project website and social media channels



5.1.4 Planning

Below it is presented the initial plan for the project's co-creation workshops:

- **Co-creation 1:** M9-10 (September-October 2020)
- **Co-creation 2:** M21-22 (September-October 2021)
- **Co-creation 3:** M27-28 (March-April 2022)
- **Co-creation 4:** M33-34 (September-October 2022)

For some pilot cases the programmed dates were not fully respected, both for technical problems and health issues regarding a participant. However, the general structure reported below was maintained along the duration of the project.

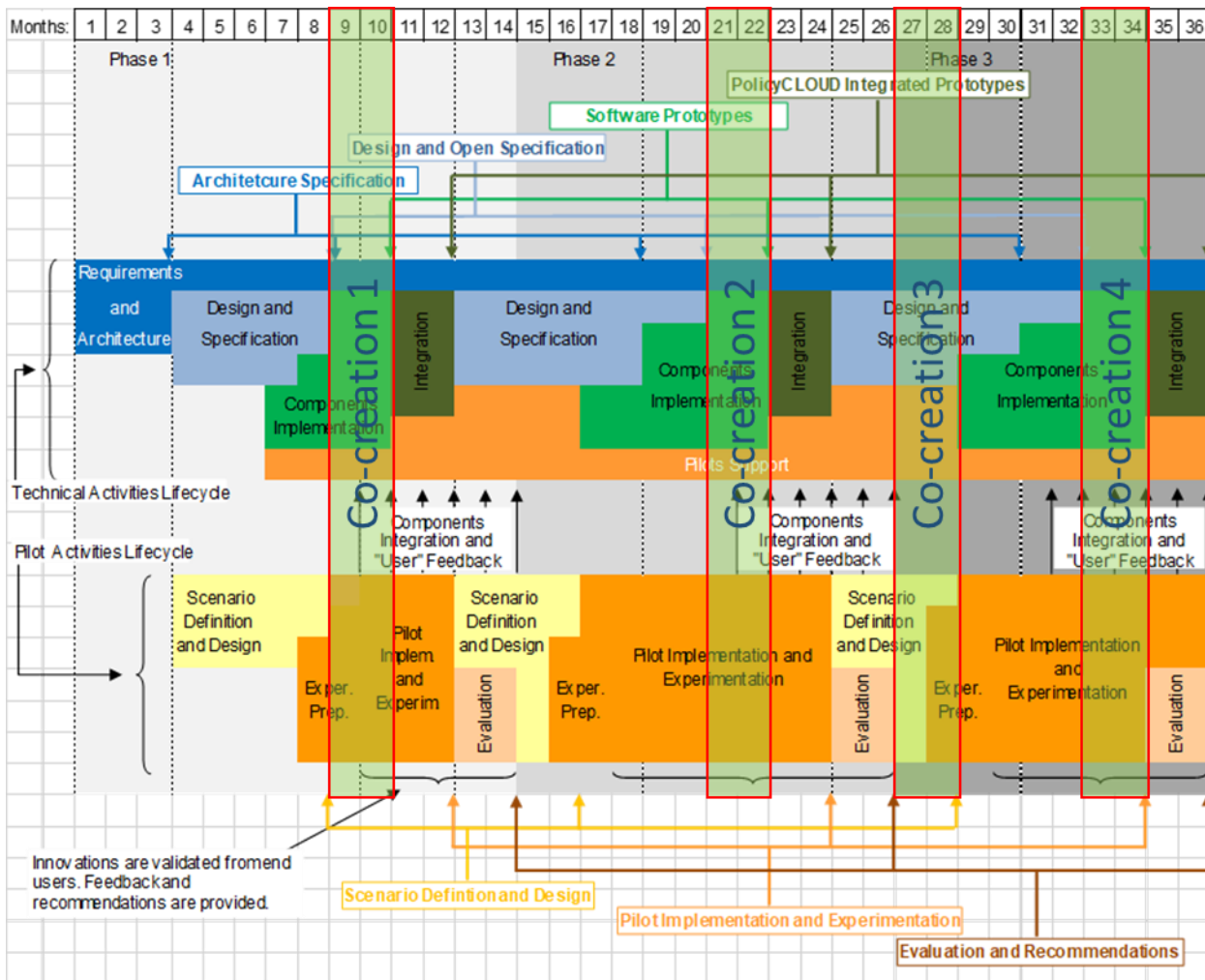


FIGURE 18 - CO-CREATION SESSIONS PLANNING

5.2 Co-Creation Workshops

5.2.1 Maggioli – Use Case 1

5.2.1.1 THIRD CO-CREATION WORKSHOP

Organisation

The third co-creation workshop of Maggioli was held on 15th September 2022 at an event called “Giornate della Polizia Locale”, the biggest Local Police fair in Italy, held in Riccione. During the event we presented the PolicyCLOUD platform, the scenarios implemented until the workshop and the current status of the system.

The participants - representatives from the DG Digital Transformation and Innovative Systems and DG security - received formal invitations 3 weeks prior to the event. The project offered train transportation

and one night accommodation in Riccione, where the workshop was held. Also, we offered a one-day ticket for the fair to the participants. The event was also promoted through the project website and social media channels in order to extend the invitation to other relevant stakeholders.

Most of the participants have already participated in the previous two co-creation workshops, and it was important to show them the progress to date and what the project has implemented.

Agenda

Time	Description	Presenter
17:00 – 17:05	Welcome from the host	Daniele Crespi
17:05 – 17:15	PolicyCloud at glance <ul style="list-style-type: none"> Brief project introduction 	Samuele Baroni
17:15 – 17:45	Presentation of the use case + demo session <ul style="list-style-type: none"> Tools and functionalities implemented How to use the new tools introduced 	Samuele Baroni
17:45 – 18:15	Open discussion <ul style="list-style-type: none"> Andrea Sion – Lombardy Region, DG Digital Transformation and Innovative Systems Oscar Sovani – Lombardy Region, DG Digital Transformation and Innovative Systems <p>(local police representatives)</p>	Daniele Crespi
18:15 – 18:25	Follow-up questionnaire <ul style="list-style-type: none"> Feedback and recommendations Evaluation (technical, business,..) 	Samuele Baroni
18:25 – 18:30	Wrap up and meeting closure	Daniele Crespi

TABLE 1 AGENDA FOR MAGGIOLI THIRD WORKSHOP

Participants

List of Participants		
Organisation	Department	No. of participants
Gruppo Maggioli	Innovative Systems Development and eGovernment	1
	Gruppo Maggioli, R&D Department	2

Lombardy region	DG Digital Transformation and Informative Systems	2
	DG security	4
Municipality of Pavia	Local police unit	1
Municipality of Desio	Local police unit	1
Municipality of Trezzano	Local police unit	1
Municipality of Cantù	Local police unit	1
Municipality of Belgiojoso	Local police unit	1

TABLE 2 PARTICIPANTS AT MAGGIOLI THIRD WORKSHOP

Short summary

During the workshop, we presented scenario A, Radicalization Incidents. Many of the participants, presents at the previous workshops, had already see this tool and visualizations. This time, we were able to provide them with a dynamic environment, taking data directly from the ingested datasets. Also, two weeks before the event we gave access to the platform to the participants of the workshop, in order to let them test the system with the help of the User Manual, translated in Italian.

The participants appreciated the system and visualizations, even if they reported a difficulty in the usage of the platform for non-technical personnel. They brought interesting opinions on the way of proceeding and of structuring the remaining scenarios, not yet ready for testing. The interest was especially focused on the social media analysis scenarios (Scenarios C and D). In the end, questionnaires were distributed in order to collect written feedback, impressions and suggestions for improvement.

5.2.1.2 FINAL CO-CREATION WORKSHOP

Organisation

The fourth co-creation workshop of Maggioli was held on 25th November 2022 at Palazzo di Regione Lombardia (the regional government headquarter) in Milan. During the event, the PolicyCLOUD project, the different scenarios developed in collaboration with Lombardy region, and the current status of their implementation, including the available visualisations were presented.

The participants - representatives from the DG Digital Transformation and Innovative Systems and DG security - received formal invitations 3 weeks prior to the event. The event was also promoted through the project website and social media channels in order to extend the invitation to other relevant stakeholders. The workshop was initially planned for the 17th of November 2022, but due to some technical issue on the platform it was postponed to the 25th November 2022. As a consequence, some personnel of the Local Police stations that usually participated in the PolicyCLOUD workshops was not

present, due to a difficulty to move the date with short notice. We choose to move the event to the 25th November 2022 according to Regione Lombardia availability in the near future, since moving it to December would mean not being able to report appropriately on this event before the end of the project.

The participants have already participated in the previous three co-creation workshops, and it was important to show them the progress to date and what the project has implemented.

Agenda

Time	Description	Presenter
11:00 – 11:05	Welcome from the host	Daniele Crespi
11:05 – 11:15	PolicyCloud at glance <ul style="list-style-type: none"> Brief project introduction 	Samuele Baroni
11:15 – 11:45	Presentation of the use case + demo session <ul style="list-style-type: none"> Tools and functionalities implemented How to use the new tools introduced 	Samuele Baroni
11:45 – 12:15	Open discussion <ul style="list-style-type: none"> Andrea Sion – Lombardy Region, DG Digital Transformation and Innovative Systems Oscar Sovani – Lombardy Region, DG Digital Transformation and Innovative Systems <p>(local police representatives)</p>	Daniele Crespi
12:15 – 12:25	Follow-up questionnaire <ul style="list-style-type: none"> Feedback and recommendations Evaluation (technical, business, ...) 	Samuele Baroni
12:25 – 12:30	Wrap up and meeting closure	Daniele Crespi

TABLE 3 AGENDA FOR MAGGIOLI FOURTH WORKSHOP

Participants

List of Participants		
Organisation	Department	No. of participants
Gruppo Maggioli	Innovative Systems Development and eGovernment	1
	Gruppo Maggioli, R&D Department	2

Lombardy region	DG Digital Transformation and Informative Systems	2
	DG security	5
Municipality of Corbetta	Local police unit	1
Municipality of Martinengo	Local police unit	1

TABLE 4 PARTICIPANTS AT MAGGIOLI FOURTH WORKSHOP

Short summary

During the workshop, we presented scenarios B, C and D. Many of the attendees appreciated the clear way in which data are visualized in different scenarios, as long as the filtering capacity and the fact that the system can be easily support additional datasets. Scenario B resulted interesting to the DG Security representatives since it showcases a new social dynamics algorithm, created by the consortium and validated for this scenario by two different professors from Università Bocconi. Scenarios C and D received some positive feedback since social media are a hot topic at the moment, and many people are radicalized on this platform for religious, political and also “minor” forms of radicalization as the “No Vax” movement. On the other hand, the use of synthetic data for our demonstration raised some doubts from the participants.

In conclusion of the project and in particular during the open discussion we received positive feedback from the Regione Lombardia representatives. Many of the participants could clearly see the benefits of the platform and how it can be integrated with existing systems, including the one provided by Maggioli. Regarding the potential future usage of the platform, there were already many questions about the continuation of the usage after the project end in particular for those entities that are already customers of Maggioli.

5.2.2 Sarga – Use Case 2

5.2.2.1 THIRD CO-CREATION WORKSHOP

Agenda

Time	Description	Presenter
10:00 – 10:05	Welcome for the host	
10:05 – 10:25	Results of the second Policycloud workshop	Javier Sancho (Sarga)
10:25 – 11:25	Presentation of the improvements made in the different scenarios	ITAINNOVA

11:30 – 12:00	Progress of the project: Challenges and difficulties found out	SARGA-ITA-Government of Aragón
12:00 – 13:30	Debate on improvements of the different PolicyCLOUD scenarios. Questions and answers	SARGA-ITA-Government of Aragón
14:00	Lunch	

TABLE 5 AGENDA FOR SARGA THIRD WORKSHOP

Participants

A total of 43 participants joined the final workshop, all of them from the public sector, policy makers and digital services technicians from Aragon

Participants from Public sector		
Organisation	Department	No. of participants
Aragon Government	Digital services	38

TABLE 6 PARTICIPANTS AT SARGA THIRD WORKSHOP

Short summary

The third co-creation workshop was carried out the 24th June 2022 at the Caixa Forum space for the Department of Digital Technologies of the Government of Aragon. This department is part of the Innovation Unit of the Government of Aragon. Several people from this department had already participated in previous co-creation meetings, and the director of the department, José María Subero, has followed with interest the results of the project from the beginning.



FIGURE 19 - SARGA THIRD WORKSHOP

During the first session, the project was described for those who had not participated in previous meetings, describing the project objectives and expected results, especially what was expected from this co-creation meeting. Javier Sancho (Sarga) explained very clearly the process followed by this type of European projects, and the timescales involved.

During this session only questions were asked about the objectives of the project and the types of funding that these projects have.

Presentation of the improvements made in the different scenarios

At this point, ITAINNOVA (Vega Rodrigálvarez and Rafael del Hoyo), explained the protocol for using PME and PDT and how they were used through different videos.

Finally, the process of generating a Politika example was explained, with the different parameters and the charts were explained.

As the price monitoring part was not working, a predefined Price Monitoring job was taken and the plots were shown and explained.

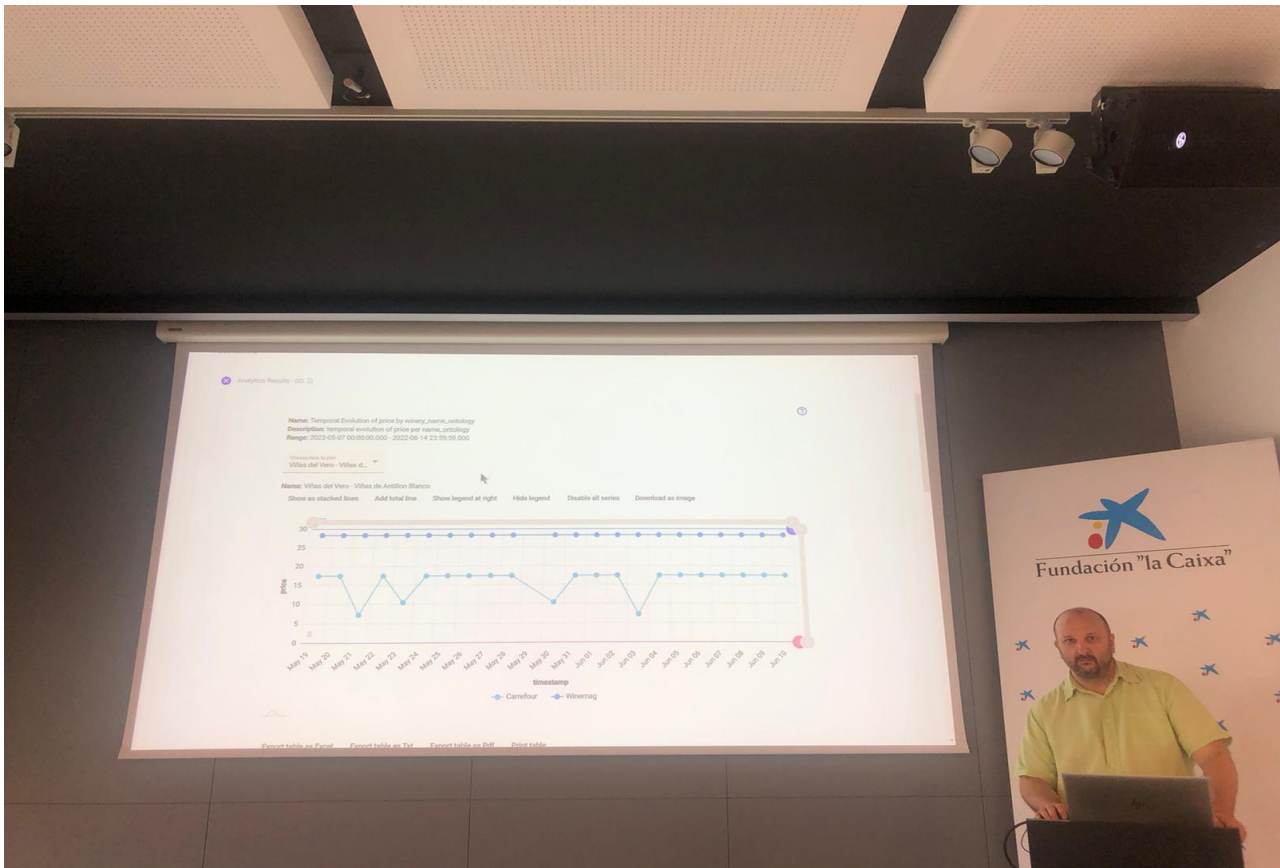


FIGURE 20 - SARGA THIRD WORKSHOP #2

In this phase many doubts were solved, about how the PME and PDT worked. Most of the participants found it not very intuitive. However, they found the concept behind it very interesting. The approach of generating indicators and then evaluating them with graphs seems very interesting to them.

The configuration parameters were not so clear to them, and especially not usable for them, in particular the generation of a JSON.

They showed a lot of interest in the monitoring system, but they see it more suitable for the Denominations of Origin than for their department. Although they showed a lot of interest in POLITIKA, the tool.



FIGURE 21 - SARGA THIRD WORKSHOP #3

The project schedule described the challenges encountered and the inherent difficulties of this type of European project due to its size. The rest of the project and the time remaining were analyzed.

5.2.2.2 FINAL CO-CREATION WORKSHOP

Agenda

Time	Description	Presenter
10:00 – 10:05	Welcome from the host	
10:05– 10:25	Results of the previous workshops	Javier Sancho (Sarga)
10:205– 11:25	Presentation of the improvements made in the different scenarios presented in the previous workshops	ITAINNOVA
11:30 – 12:00	Presentation of the trend analysis and price evolution scenarios	SARGA-ITA-Government of Aragón
12:00 – 13:30	Debate on improvements of the different PolicyCLOUD scenarios. Questions and answers	SARGA-ITA-Government of Aragón
14:00	Lunch	

TABLE 7 AGENDA FOR SARGA FOURTH WORKSHOP

Participants

A total of 38 participants joined the final workshop, all of them from the public sector, policy makers and digital services technicians from Aragon

Participants from Public sector		
Organisation	Department	No. of participants
Aragon Government	Digital services	38

TABLE 8 PARTICIPANTS AT SARGA FOURTH WORKSHOP



FIGURE 22 - SARGA FINAL WORKSHOP

Short summary

The final workshop on the Aragon Use Case was held on 25th November 2022 at the Caixa Forum space. As on previous occasions we have the presence of the Department of Digital Technologies of the Government of Aragon, a department that had participated in the previous workshops and which is responsible for the implementation of digital services in the Government of Aragon. It was attended by both the head of the Digital Services Service, José María Subero, and Antonio Calvo, head of information security for the department, policy makers, who participated in the presentation of the use case of Aragón in Larissa during the Major cities of Europe meeting on last the 3rd and 4th of November 2022.



FIGURE 23 - SARGA FINAL WORKSHOP #2

As the vast majority of the guests had participated in the previous workshops, a brief presentation was made in which both the scenarios shown and a reminder of the content of the reviews of the previous workshops were shown.

During the presentation of the improvements made in the different scenarios presented in the previous workshops, a review was made of the improvements made in the previously presented scenarios. All of them were reviewed, with special emphasis on the improvements made following the review and the feedback received from our end users in the price workshops.

The improvements were seen especially in the parts that in the previous reviews had an impact: usability and visualization. The prototype character and the future possibilities of development have been highlighted.

5.2.3 Sofia – Use Case 3

5.2.3.1 THIRD CO-CREATION WORKSHOP

Organisation

The third co-creation workshop of Sofia Municipality was held on 26th October, 2022. During the event, we presented the PolicyCLOUD project, the use cases of Sofia Municipality, we demonstrated the use of the platform, focusing on the types of analytics and visualizations available for Sofia's use cases, and showed stakeholders the data marketplace. We have explained how and what is the advantage of using this tool, as well as the ways in which it has helped our business.

The participants - representatives of various Municipal structures - received invitations and a brief overview of the project 3 weeks before the event. Some of the participants have already participated in the first and the second co-creation workshop, and it was important to remind them of the key aspects of the project and to show them the progress to date.

By sending the materials (short overview) in advance, we ensured that the participants could be better prepared for the workshop in advance.

Agenda

Time	Description	Presenter
10:00 – 10:05	Welcome from the host	Dobrinka Blagova, Metodiyka Tarlyovska, Martin Atanasov
10:05 – 10:15	Introduction <ul style="list-style-type: none"> Brief introductory words Introduction of the Sofia's team We remained in a few words the essence of the project, the set goals and the participating partners 	Metodiyka Tarlyovska
10:15 – 10:45	Overview presentation and showcasing demo <ul style="list-style-type: none"> PolicyCLOUD at a glance: goals, consortium, value-added services, pilot use cases, importance of co-creation, and more Pilot use of Sofia: we demonstrated how to use the platform itself. We have shown in real time how a policy model can be created, how it is saved on the platform and what possibilities there are for visualizing the results We demonstrated the latest tool developed for Sofia's use cases - predictive analytics 	Metodiyka Tarlyovska Petya Nikolova

	<ul style="list-style-type: none"> We explained and demonstrated in real time what the data market is. We explained how the data market can be used, what is currently uploaded there, how it can be useful, we explained the added value of using it in policy making 	
10:45 – 11:35	<p>Q&A session</p> <p>Moderated discussion with participants about the PolicyCLOUD platform - their first impressions, questions, recommendations, etc.</p> <p>Basis for discussion:</p> <ul style="list-style-type: none"> The demonstration of the predictive analysis and the future use of the platform after the end of the project, how it will be paid and what the technical support will be, how suggestions can be made to improve the functionalities The co-creation workshop questionnaire provided by the Consortium partners. We provided an opportunity for the participants to fill in their answers to the questions. 	Metodiyka Tarlyovska, Petya Nikolova
11:35 – 11:45	Summary	Metodiyka Tarlyovska,

TABLE 9 AGENDA FOR SOFIA THIRD WORKSHOP

Participants

List of Participants		
Organisation	Department	No. of participants
Sofia Municipality	IT Department	12
	Call Centre Department	1
	"European policies, programs and tourism" Directorate	1
	Secretary	1
OKYS		1

TABLE 10 PARTICIPANTS AT SOFIA THIRD WORKSHOP

Short summary

Participants recognized the added value of the project, especially in terms of opportunities related to:

- exchange of various international good practices
- development of concrete policies based on data, analysis of trends, predictions of policy effects
- overall implementation of more effective policies in the long term with the support of the instrument

According to stakeholders, the overall appearance of the tools is very pleasing; they liked the variety of graphics available and the colors used. The general opinion is that the tool allows for relatively easy use, especially by people who have some degree of previous experience working with digital platforms.

Participants were quite pleasantly surprised by the ability to make predictive analytics that will facilitate the activity of more optimized planning of activities for a specific area for a given period of time. Using this approach, a more optimized planning of the budget for the following year can be made or a good monitoring of the performed activities and achieved results can be ensured. Stakeholders agreed that the platform would be able to bring added value and assist policy makers in developing more effective and efficient policies, thereby facilitating the improvement of the overall quality of life of citizens.

Some questions arose from the fact that there is a lack of clarity about how the platform will be used after the project is completed, how the system will be maintained and how the data will be processed and uploaded to the platform in a workable form. The issue was raised with the possibilities of communication with the team that will support the technical platform in order to share with them ideas for improving and updating the functionalities. The participants also asked some questions regarding the specific functionalities that will be very useful for the platform (e.g., analysis of data from different sources to be able to compare measured values and prepare more detailed analyzes provided by different stakeholders, not only from the Metropolitan Municipality). They shared the opinion that such an analysis of data from various sources will be one of the most sought-after analyzes that will attract a large number of users.

On 26th October 2022, the third use case workshop for Sofia was organized in order to complete and implement a new data analysis - predictive analysis in the platform. This analysis was the highlight of our third workshop, which we were expecting so that we could show something new and different to our stakeholders. During our previous workshops, we introduced the analysis capabilities of the PolicyCLOUD tools and the graphs that present the results on the platform. There was no added value for the project, or for us as a team, to show something that had already been presented and commented on in detail. When we analyzed the remaining time until the end of the project and the remaining necessary improvements, it became clear that the functionalities described above will be the final ones implemented for the use cases of Sofia, and therefore we decided to organize the workshop towards the end of the project to familiarize ourselves with the novelties in the platform, which are related to our activity as a municipality. We wanted to show a finished and working product that is ready to use and gives visible results.

Due to the remaining time until the end of the project, there is no opportunity to develop new tools for analysis and data processing for the goals and needs of Sofia: there will be no cross-analysis. Therefore, there is no added value to organize an additional event, we have presented to the interested parties the final product that we will have for Sofia.

6 Conclusion

This deliverable describes the selected E2E scenarios that have been experimented during year three of the project (January 2022 – December 2022) with their final specifications. The successful completion of this task proved that the PolicyCLOUD platform is robust and can be configured to support different scenarios produced by the end users in different domains.


This document elaborates on the configuration of the various analytical tools and KPIs that are required for each scenario in order to produce the desired results. Finally it depicts the last iteration of co-creation workshops held in the project, with their respective agendas and summaries.

References

- [1] PolicyCLOUD. D6.4 Use Case Implementation and Experimentation. Ben Williams. 2020.
- [2] PolicyCLOUD. D6.12 Use Case Implementation and Experimentation. Armend Duzha. 2021.
- [3] PolicyCLOUD. D6.11 Use Case Scenarios Definition Design. Javier Sancho. 2021
- [4] Spagnoli, F., van der Graaf, S., & Brynskov, M. (2019). The Paradigm Shift of Living Labs in Service Co-creation for Smart Cities: SynchroniCity Validation. *Organizing for Digital Innovation* (pp. 135-147). Springer, Cham.
- [5] Kelley T., Kelley, D. (2013) *Creative Confidence: Unleashing the Creative Potential Within Us All*. Currency.

Annex I – Templates

Workshop agenda template



Policy Cloud
Cloud for Data-Driven Policy Management

**CLOUD FOR DATA-DRIVEN POLICY
MANAGEMENT**


Project Number: 870675 Start Date of Project: 01/01/2020 Duration: 36 months

**AGENDA OF CO-CREATION WORKSHOP #2
(DATE), (TIME)**

NOTE TO EDITORS

Please remove this section when starting the deliverable.

The template contains several guidelines to provide the editors with hints about the different sections. Please remove these guidelines before sending the agenda.



PolicyCloud has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 870675. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the European Commission.



1 Agenda

Meeting Objective(s) and Expected Results:


- Describe here briefly which is the general purpose of the 2nd co-creation workshop.
- Describe here the expected results from the meeting/teleconference.
- Indicate who called the meeting.


Enter your text here.

Time	Description	Presenter
10:00 - 10:05	Welcome for the host	
10:05 - 10:xx	[Provide information about the topic to be discussed. Break down the text into several subtopics when necessary.] e.g. PolicyCloud at glance	[Add the Organization Name responsible for reporting about the item or the topic]
10:xx - 10:xx	[Provide information about the topic to be discussed. Break down the text into several subtopics when necessary.] e.g. Presentation of the use case	[Add the Organization Name responsible for reporting about the item or the topic]
10:xx - 10:xx	[Provide information about the topic to be discussed. Break down the text into several subtopics when necessary.] e.g. Scenarios implementation	[Add the Organization Name responsible for reporting about the item or the topic]
10:xx - 10:xx	[Provide information about the topic to be discussed. Break down the text into several subtopics when necessary.] e.g. Demo session	[Add the Organization Name responsible for reporting about the item or the topic]

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Workshop report template

 Policy Cloud
Cloud for Data-Driven Policy Management



Policy Cloud

Cloud for Data-Driven Policy Management

CLOUD FOR DATA-DRIVEN POLICY MANAGEMENT

Project Number: 870675

Start Date of Project: 01/01/2020

Duration: 36 months

UC#N Co-creation Workshop #2

Report

Date: dd/mm/yyyy

Submitted by: name surname (partner short name)

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1 Meeting information

Meeting information	
Date	dd/mm/yyyy
Location	
Host / Organising partner	
Facilitator	
Note keeper	
No. of invited persons	NN
No. of participants	NN

2 Agenda

Time	Description	Presenter
10:00 – 10:05	Welcome for the host	
10:05 – 10:xx	[Provide information about the topic to be discussed. Break down the text into several subtopics when necessary.] e.g. PolicyCloud at glance	[Add the Organization Name responsible for reporting about the item or the topic]
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10:xx – 10:xx	[Provide information about the topic to be discussed. Break down the text into several subtopics when necessary.] e.g. Demo session	[Add the Organization Name responsible for reporting about the item or the topic]

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4 Proceedings / Notes

Summary for technical partners

1. Requirement evaluation

2. System performance

3. System usability

4. Business processes

5. Other relevant information / comments

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