Data Driven Policy Cluster

Co-creating digital tools for better governance

Disruptive technologies accelerating data-driven policymaking in the public sector

Data Driven Policy Cluster @EGI2022, a post event report with demonstrations and recommendations on prediction tools for data-driven policymaking

November 2022

Disruptive technologies accelerating data-driven policymaking in the public sector

The convergence of Cloud, Big Data and AI has already resulted in major transformation across Government services, yet the process of policy making itself is often left behind. Digital technologies have changed the world. Today people expect faster, seamless, on-demand services from their providers, and the Government is no exception. For effective urban operations which make life easier for residents, workers and visitors, Public Sector decision making needs to become more agile, breaking down data silos to combine day-to-day tactical decisions with longer term policies and strategies. Disruptive technologies such as Digital Twins, Artificial Intelligence (AI) and High Performance Computing (HPC) unlock new opportunities for sustainable decision making through visualisations, simulations and predictions that enhance transparency, increase public support and involvement, and optimise resources.

To support this transformation, Policy Cloud, Decido, AI4PublicPolicy, DUET and Intelcomp pan-European projects and initiatives dedicated to using cloud for data-driven policy, have joined forces in the **Data Driven Policy Cluster.** Together they explore major challenges, trends and opportunities to improve public sector decision making that will deliver healthier, happier places to live and work.

During the **EGI 2022 workshop** the cluster demonstrated technologies developed to advance decision making in the public sector. The cluster engaged around 30 EGI2022 attendees in discussion on the state of the art of these technologies and their adoptability.

Data Driven Policy Cluster: piloting the use of the European cloud infrastructure for public administrations

The EGI2022 session aimed to raise awareness on the cluster of projects and disruptive technologies they develop for the public sector. In addition, the session will foster collaboration between the EGI researchers and the public authorities in the decision making with the use of research data and advanced tools for the benefit of society.

The Data Driven Policy Cluster showcases the joint network of:

AI for Public Policy (AI4PP) project is a joint effort of policy makers and Cloud/AI experts to unveil AI's potential for automated,transparent and citizen-centric development of public policies. The project will deliver,validate and promote the AI4PublicPolicy Platform,offering innovative policy management on unique AI technologies. The AI4PublicPolicy Virtualized Policy Management Environment(VPME) integrated with EOSC facilitates access to the Cloud and HPC resources required to enable the project's AI tools and to a wider use of the project's developments.

The eviDEnce and Cloud for more InformeD and effective pOlicies (DECIDO) project aims to boost the use of EOSC by Public Authorities enabling innovation in the policy-making sector allowing cross-support and cross-collaboration,using secure compute and data intensive services. Decido involves citizens and local communities through co-creation activities for better targeted policies.

The Digital Urban European Twins (DUET) project (**www.digitalurbantwins.com**) is a EU initiative which leverages the advanced capabilities of cloud, sensor data and analytics in Digital Twins,to develop more democratic and effective public sector decision-making.DUET Digital Twins provide virtual city replicas which simplifies the understanding of complex interrelation between traffic, air quality, noise and other urban factors. Powerful analytics predict the impacts of potential change to make better evidence-based operational decisions and long-term policy choices.

Develops a Competitive Intelligence Cloud/HPC Platform for AI-based Science, Technology and Innovation Policy-Making. Multi-disciplinary teams will co-develop analytics services, Natural Language Processing pipelines and AI workflows,exploiting EOSC open data and resources, HPC environments and federated operations at the EU, national and regional level. Ensuring a cooperative environment,different actors visualize, interact and analyze information. Through co-creation, IntelComp will adopt a living labs approach, engaging public policy makers, academia, industry, SMEs, local actors and citizens to explore, experiment with and evaluate STI policies. IntelComp is targeting domains aligned with the European Agenda and the Horizon Europe Missions:AI, Climate Change and Health.

Exploits the potential of digitisation, big data and cloud to improve the modelling, creation and implementation of policies. Delivering a unique, integrated environment of datasets, data management, and analytic tools it addresses the full lifecycle of policy management in four thematic-areas (radicalisation, food-value chain, city environment, city services),leveraging the data management capabilities of the EOSC Initiative. The Project empowers the Citizens to contribute to data and policies related to their everyday-life. The onboarding of these solutions in the EOSC Portal offers a great opportunity to reach a wide audience.

All presentations are now availale on Zenodo: **zenodo.org/record/7143219**

Demonstrating the use of the European cloud infrastructure for public administrations

AI4PublicPolicy Policy Explainability and Interpretation Tool is one of the main modules of the Virtualized Policy Management Environment (VPME) platform which will be hosted on EOSC cloud. The tool under development was presented during the EGI 2022 Conference and its task is to produce end to end analytics pipelines which can analyse the policies datasets and produce meaningful insights.

This was realised by developing and applying AI and Explainable models on the policy dimensions and social problems in order to produce interpretations and solutions for the policies. The architecture of the AI pipeline comprises three main components, the data analysis component will realise a first data exploration and the data visualisation to gain insights from the dataset, then the data engineering part will follow, and especially the data cleansing, the data normalising and finally the data splitting.

After this procedure our data are ready to be fed to our model which contains three phases, the model selection , the model training and validation and last but not least our model's performance evaluation in the test data. The policy explainability and interpretation tool is in the process of being fully automated with MLOps techniques and will be ready to be automatically triggered with the least possible input from the user.

Demonstrating the use of the European cloud infrastructure for public administrations

Decido

DECIDO Portal supports the **policy makers** along with citizens, organisations, businesses, public authorities to create/improve **better policies**, exploiting the **power of data**. All these actors will use **DECIDO Digital Services** to be facilitated in the **co-creation activities**, in each phase of the **Policy Life Cycle**.

DECIDO Portal facilitates the policy creation actors in all the activities to be carried out to build a new policy, based on evidence facts: understanding what the problem is through online or in person discussions on specific documents, collecting data from different data sources and analysing/visualising them, understanding the opinion of the crowd by administering surveys and monitor the impact of the new policy.

DECIDO Portal integrates different technologies, in particular exploits the EOSC services and storage/power capacity (e.g. EGI Check-in, EGI Data Hub, EGI Jupyter Notebook, OpenAIRE Amnesia, OpenAIRE Zenodo).

Demonstrating the use of the European cloud infrastructure for public administrations

DUET

The presented DUET City Twin Platform (**https://citytwin.eu**) first allows any user to easily browse relevant case studies for which the platform was used. Each case study (e.g. **https://citytwin.eu/pilsen-new-development-in-nepomucka-street**) starts with a description of the challenge, outlines the approach taken, and formulates an expected outcome.

Additional information is usually added about how to progress to the desired outcome technically (by the detailed How to use, Used data, and Used models sections, which demonstrate videos and illustrative screenshots can accompany).

Lastly, each case study description contains a direct link to the live project in the platform **https://platform.citytwin.eu/app/map**.

The presentation shown during the workshop is also available as youtube video

Demonstrating the use of the European cloud infrastructure for public administrations

The **Interactive Model Trainer (IMT)** is a tool currently under development for the EU-funded project Intelcomp whose main aim is the assistance of domain experts on the training and curation of topic models for different specific domains and data sources, as means of extracting the main themes, these data sources deal with. The IMT currently consists of two main tools, namely a domain selection tool and a topic modelling toolbox.

The domain classifier solves the problem of identifying the documents (papers, projects, patents) that belong to a particular field of interest. Currently, it supports three different approaches for the documents' identification, namely keywords, topics, and zero-shot classifier-based. The output provided by these methods can then be improved by a domain expert in the area using a relevance feedback tool.

Regarding the topic modeling toolbox, it supports the training of topic models following an expert-in-the-loop approach. The software package currently includes several state-of-the-art topic modeling solutions, together with a novel implementation of hierarchical topic models that allow for the exploration of certain subject areas with application-specific levels of detail. Additionally, it includes a set of topic preprocessing, evaluation, annotation, visualization, and curation tools aimed at the usage of domain experts.

Demonstrating the use of the European cloud infrastructure for public administrations

Policy Cloud
Cloud for Data-Driven Policy Management

Politika is an agent-based tool implementing the Social Dynamics component of the PolicyCLOUD environment. It is a web-based, social simulation system that is also integrated with the rest of the PolicyCLOUD platform as an external tool.

It allows the policy maker to simulate the effects of various policy alternatives during policy design and evaluate each alternative based on a set of criteria defined by the user. The demo showcased its application in an agri-food pilot use case of the PolicyCLOUD project in which the policy maker sought to estimate promising price points and advertising intensity efforts that could improve the popularity of a wine brand against a competitor in a specific market.

The demo showcased the use of Politika as a stand-alone environment and also as an external tool to the PolicyCLOUD platform.

Recommendations & Adaptability of the Policy Prediction Tools

After the demos, the speakers discussed about the most demanding challenges they encountered in developing the presented tools. In addition to the recommendation to invest in training at all levels to have informed stakeholders, here are a few recommendations that we can draw from the interaction with the audience:

1. Work on integrating the tools to provide the users with a seamless access to the services
2. Foster digital skills for a generation of digitally-informed policy makers
3. Improve the cooperation among the stakeholders to reach more successful results
4. Plan for sustainability and the availability of the tools after the end of the EC funding
5. Ensure that data is not only available but also reusable

The cluster will continue to raise awareness with a joint voice, check our activities, policy briefs and joint publications here:
policycloud.eu/data-driven-policy-cluster

Data Driven Policy Cluster

Co-creating digital tools for better governance

Join the community!

AI4PublicPolicy ai4publicpolicy.eu

Decido decido-project.eu

DUET digitalurbantwins.com

intelcomp intelcomp.eu

Policy Cloud policycloud.eu

Contact us at **info@policycloud.eu**

These projects have received funding from the European Union's Horizon 2020 Research and Innovation program. Under the following grant agreement numbers:
Policy Cloud No.870675, DUET No.870697, AI4PublicPolicy No.101004480, Intelcomp No.101004870, Decido No.101004605.