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Department of Digital Systems

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# **PolicyCLOUD: Analytics as a Service facilitating efficient data-driven public policy management**

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# Background

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## □ Facts

- Increasing use of devices and networks leading to the generation of vast quantities of data
- Data linking is becoming the norm (e.g. linking new data sources with established data sources)
- Current approaches in policy making are not evidence-based
- Mature approaches to analyse and understand the “environment”

## □ Goal

- Creation of efficient and effective policies through data-driven policy management
- Decision support to authorities for policy modelling, implementation and simulation through identified populations, as well as for policy enforcement and adaptation



# Main challenges (1/5)

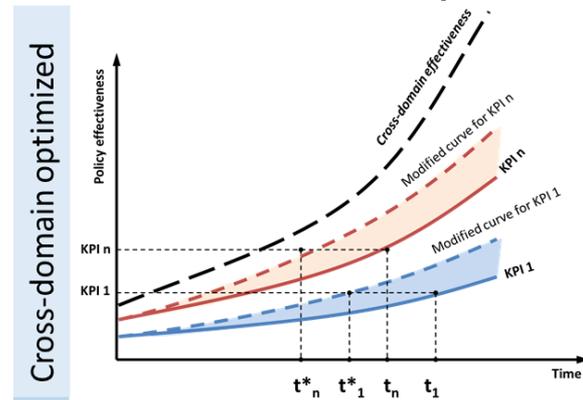
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- A data-driven approach for effective policies management
  - Across the complete data path, including data modelling, representation and interoperability, cleaning, heterogeneous datasets linking, analytics for knowledge extraction
  - Exploit the collective knowledge out of policy “collections” combined with the data from several sources (e.g. sensor readings, online platforms, etc.)



# Main challenges (2/5)

- Compilation, assessment and optimization of multi-domain policies
  - Holistic policy modelling, making and implementation in different sectors (e.g. environment, migration, goods and services, etc.), through the analysis and linking of KPIs of different policies that may be interdependent and inter-correlated (e.g. environment)
  - Analysis of (unexpected) patterns and policies relationships
    - Identification of effective KPIs to be re-used and non-effective ones (including the causes for not being effective) towards their improvement





# Main challenges (3/5)

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- Data management techniques across the complete data path
  - Meta-interpretation layer for the semantic and syntactic capturing of data properties and their representation
  - Data cleaning to ensure data quality and coherence including the adaptive selection of information sources based on evolving volatility levels (i.e. changing availability or engagement level of information sources)



# Main challenges (4/5)

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- Analytics as a service reusable on top of different datasets
  - Machine and deep learning techniques (e.g. classification, regression, clustering and frequent pattern mining) to infer new data and knowledge
    - Opinion mining, sentiment analysis, social dynamics and behavioral data analytics
  - Technologies that allow analytics tasks to be decoupled from specific datasets and thus be triggered as services and applies to various cases and datasets



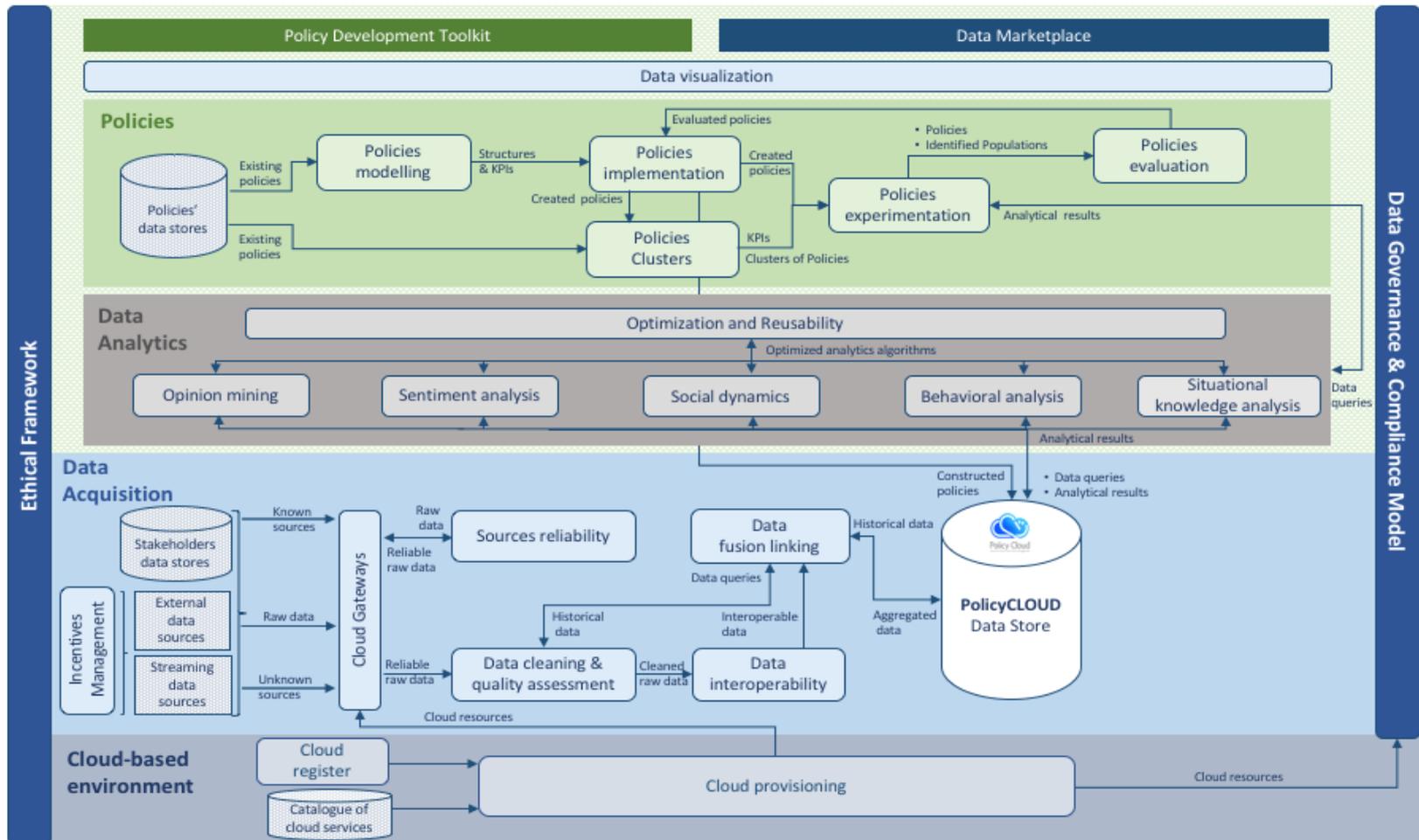
# Main challenges (5/5)

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- Unique endpoint to exploit analytics in different cases
  - Execution of different models / analytical tools on data (e.g. to identify trends, to mine opinion artefacts, to explore situational and context awareness information, to identify sensitives, etc.)
  - Modelled policies (through their KPIs) realized / implemented and monitored against these KPIs
  - Adaptive and incremental visualization enabling the policy lifecycle to be visualized in different ways, while the visualization can be modified on the fly and can enable the specification of the assets to be visualized (e.g. data sources or meta-processed information)



# Conceptual architecture





# Thank you for your attention!

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