



eGovPoliNet

The Policy Community

[www.policy-community.eu](http://www.policy-community.eu)

# Future Scenarios of ICT Solutions for Governance and Policy Modelling

**Dragana Majstorovic and Maria A. Wimmer**

University of Koblenz-Landau, Institute for IS research, Germany  
{majstorovic | wimmer}@uni-koblenz.de

ICEGOV 2014, Guimarães, Portugal

Coordination Actions funded in Framework Programme 7 of the EC  
Objective 5.6 ICT solutions for Governance and Policy Modelling





- ❖ Backgrounds for scenario development
- ❖ Method for scenario development
- ❖ Analysing future scenarios developed
- ❖ Deriving first technological trends and needs for future research

eGovPoliNet is (8/2011-2/2015) co-funded by the European Commission within Framework programme 7

Consortium with 17 partners from 14 countries around the globe

- ❖ Australia, Canada, New Zealand, Russian Federation, Ukraine, USA
- ❖ 11 EU MS: Belgium, 2 German, Greece, Italy, 2 Netherlands, Portugal Slovakia, 2 UK

# Backgrounds for scenario development

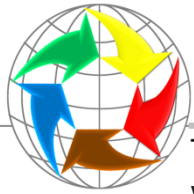


eGovPoliNet

The Policy Community  
[www.policy-community.eu](http://www.policy-community.eu)

Background | Method | Scenario analysis | First technology trends

- ❖ eGovPoliNet as a cross-disciplinary community building initiative
  - Aims to overcome existing shortcomings and drawbacks of mono-disciplinary works
  - Brings together experts from distinct disciplines
  - Discusses and compares existing understanding and approaches to ICT supported governance and policy modelling
  - Has developed visionary scenarios on which basis grand challenges of future research will be formulated
  
- ❖ This paper / contribution focuses on the scenario development



# Scenarios describing future visions

- ❖ Method of scenario development established in research for futures development since several decades
  - Particularly known are technology roadmapping exercises becoming popular around the 1970s
- ❖ Scenarios are about foresight and not about prediction
  - Sketching in an innovative and inspirational way along textual descriptions how particular aspects of interest could look like in a tentative future, not a progression of the situation to date
  - Including positive as well as negative considerations
  - Can be conflicting views, each scenario must be internally consistent
- ❖ Aiming to support the formulation of future policies

# eGovPoliNet's interest on futures scenarios

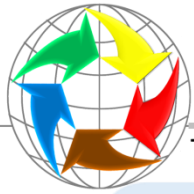


eGovPoliNet

The Policy Community  
[www.policy-community.eu](http://www.policy-community.eu)

Background | Method | Scenario analysis | First technology trends

- ❖ Investigating future interactions among governments and their constituency in the context of public governance and policy development therewith using innovative ICT and policy simulation solutions, and innovative models of governance and service provision
- ❖ Sketching plausible stories to demonstrate how ICT based governance and policy modelling might look like in the future
- ❖ Deriving insights in order to spot needs for future research
- ❖ Based on the approach used in the eGovRTD2020 project (Codagnone and Wimmer, 2007)

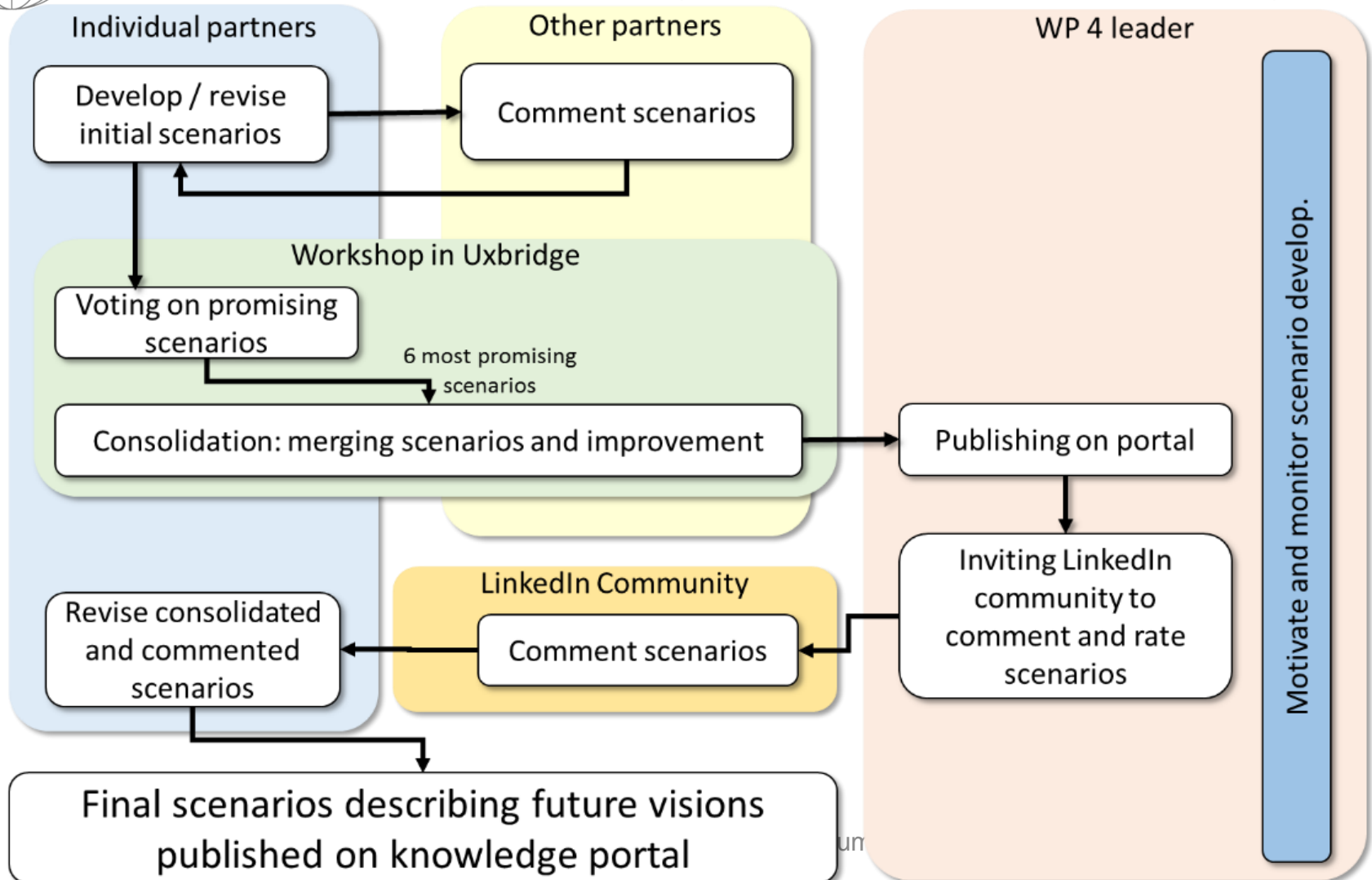


eGovPoliNet

The Policy Community

Background | Method | Scenario analysis | First technology trends

# eGovPoliNet's method of scenario development



# Six final scenarios derived from 19 initial



eGovPoliNet

The Policy Community  
[www.policy-community.eu](http://www.policy-community.eu)

Background | Method | Scenario analysis | First technology trends

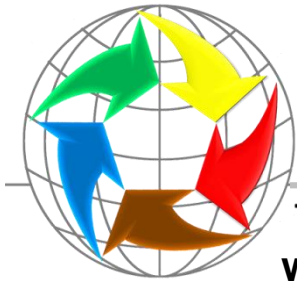
- ❖ Using air quality monitoring data to track and improve public health
- ❖ Policy decision making using intelligent simulations and exploiting open and big data sources
- ❖ Public / private innovation policy
- ❖ Optimising emergency response
- ❖ Using smart and mobile ICT for developing governance and policy
- ❖ Information warfare impact on developing governance and policy modelling



- ❖ Qualitative scenario analysis to identify key issues that direct to key developments in potential future public governance and policy modelling
- ❖ Clustering of issues along seven dimensions
  - Three core dimensions as defined in eGovRTD2020 (Janssen et al 2007)
    - ❖ The environment stable / disruptive
    - ❖ The attitude toward government trust / distrust
    - ❖ The scope of government activities all-inclusive / only core services
  - Further four dimensions as already used for scenario formulation
    - ❖ Social and contextual environment
    - ❖ Governments and their stakeholders
    - ❖ ICT standards and tools (and standards)
    - ❖ Benefits of ICT solution

All six eGovPoliNet scenarios are positive, i.e. assuming stable environment, trust in government and all-inclusive service provision of government





eGovPoliNet

The Policy Community  
[www.policy-community.eu](http://www.policy-community.eu)

---

Core dimensions with positive values: *stable* environment, *trust* in government and *all-inclusive* service provision of government

# EXEMPLIFYING SCENARIO ANALYSIS BY TWO EXAMPLES

# Scenario 1: Using air quality monitoring data to track and improve public health



eGovPoliNet

The Policy Community  
[www.policy-community.eu](http://www.policy-community.eu)

Background | Method | Scenario analysis | First technology trends

**Abstract:** The main goal of air quality monitoring is to measure the pollution of air, detect the current air conditions and identify problematic geographic areas prone to air pollution, enabling development of strategies to protect people and the environment from its dangerous consequences. The data obtained from measuring air quality can be used to forecast short-term changes and long-term trends in different geographic areas as well as to raise awareness of people and to push them toward alternative energy sources that do not produce air pollution. Nowadays, governments use a number of sensors placed on Earth as well as satellites to measure air pollution. However, the quality of the obtained data and its usability for improving public health can be enhanced in the future in many ways, which is the objective of this scenario.



# Scenario 1 – issues identified

Background | Method | Scenario analysis | First technology trends

## Key issues along further dimensions

Social and contextual environment	ICT standards and tools
Data from all relevant sources feed a central database	Policy consultations
Crowd sourcing is employed to collect data	Open government data analysis
Central database is freely accessible to citizens to connect and use the data	Visualisation tools
Data is integrated into the best estimates, aggregated and correlated at different levels, updated hourly and rated with respect to reliability of the sources	Big data analysis tools
Transparency is high	Simulation models
	Pollution standards
	Data protection protocols
	User-centric services
	Extensive provision of free cloud services for the population
	Services are embedded into various mobile and ubiquitous devices
Governments and their stakeholders	Benefits of the ICT solutions
Scientists and policy researchers	Support in scientific studies
Community health advocates	Forecast short-term health threats
Educational institutions	Predictions of climate changes
Regional and national governmental agencies	Policy analysis
Citizens	Urban and regional planning
	Health care services
	ICT support provides benefit to all stakeholders



eGovPoliNet

The Policy Community  
[www.policy-community.eu](http://www.policy-community.eu)

## Scenario 2: Policy decision making using intelligent simulations and exploiting open and big data

Background | Method | Scenario analysis | First technology trends

**Abstract:** Policy decision making currently relies intensely upon single approaches to policy simulations. In most of the cases, they are incapable of considering all relevant aspects of complex social interactions and situations (system dynamics) as well as all available data. This scenario describes how simulations and data can be used in the future to introduce transparent and successful policy decision making and how to actively engage citizens.

# Scenario 2 - issues identified

Background | Method | Scenario analysis | First technology trends

Key issues along further dimensions	
Social and contextual environment	ICT standards and tools
Combined social and formal simulations	Tools for overcoming information overload
Citizens develop their own simulations to participate in policy decisions	Tools for collecting opinions from social media
Opinions from social media integrated in simulation models	Big data analytics tools
Open government data feed simulation models	E-participation tools
Big data analytics	Comprehensive simulation platforms combining tools supporting distinct modelling paradigms
Participation platforms enable interaction and collaboration	Platforms for the exchange of data
Openness and transparency	Building blocks for quick simulation building
Governments and their stakeholders	Visualisation tools
Personalised interaction between government and citizens	Tools for the analysis of open government data
Evidence-driven communication between stakeholders	Tools for the analysis of unstructured data and subjective opinions (e.g. based on text mining)
NGOs	Tools for the integration of open government data in simulation models
Citizens	Benefits of the ICT solutions
Crowds and swarm intelligence	Transparent decision making process
Private companies	Stakeholders involved in policy decision making
Governmental institutions	Stakeholders better informed about policy options
	Building capacity of stakeholders to engage in policy making process
	Stakeholders have better understanding of policies
	Alternative choices of policy decision making become more reliable
	Complexity of system dynamics become manageable
	Combination of distinct simulation modelling paradigms add tremendous value to better understand complex social and policy processes



eGovPoliNet

The Policy Community  
[www.policy-community.eu](http://www.policy-community.eu)

---

Based on the scenario analysis ...

# **... IDENTIFYING TECHNOLOGICAL TRENDS AND NEEDS OF RESEARCH**

# First insights on technological trends and needs for future research



eGovPoliNet

The Policy Community  
[www.policy-community.eu](http://www.policy-community.eu)

Background | Method | Scenario analysis | First technology trends

- ❖ Simulation models as subsidiary decision tools as well as for trainings
  - Building blocks for quick modelling of simulations for non-experts
  - Simulation modelling platforms built on different modelling theories to catch the diversity of aspects
- ❖ Analysis and use of open government and big data and unstructured data conveying subjective opinions extracted e.g. from the social media
- ❖ Government knowledge-based systems, databases and platforms for the free exchange and usage of data
  - Information and knowledge management for overcoming information overload and extracting exact information needed
- ❖ Wearable technologies that capture and propagate different information
- ❖ Tools for responding to e-crimes, e-terrorism and information protection



eGovPoliNet

The Policy Community

<http://www.linkedin.com/groups?gid=4165795>



[www.policy-community.eu](http://www.policy-community.eu)

# Thank you for your attention!

{majstorovic | wimmer}@uni-koblenz.de



**UNU-IIST**

International Institute for  
Software Technology



Institute for  
European Studies  
Vrije Universiteit Brussel



**UNIVERSITÉ  
LAVAL**

Institut Technologies  
de l'information et Sociétés



Center for  
Technology in Government



Technische Universiteit Delft



CERT/IT



EA EUROPEAN ACADEMY  
OF TECHNOLOGY AND INNOVATION ASSESSMENT



UNIVERSITY OF  
TECHNOLOGY SYDNEY