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Multidisciplinary Framework for eGovPoliNet Knowledge Base (D 4.1)

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ABBREVIATIONS AND ACRONYMS

Abbreviation	Description
DANS	Data Archiving and Networked Services
DCMI	Dublin Core Metadata Initiative
EASY	Electronic Archiving System
EUROSIS	The European Multidisciplinary Society for Modelling and Simulation Technology
IJSCSSE	International Journal of Soft Computing Simulation & Software Engineering
NARCIS	National Academic Research and Collaborations Information System
NREPP	National Registry of Evidence- based Programs and Practices
RTD	Research and technology Development
VUIR	Victoria University Institutional Repository

1. INTRODUCTION

eGovPoliNet focuses on establishing a dialogue, building consensus and drawing up common political agendas to promote the RTD and use of ICTs in the strategic planning and decision-making processes and in parliamentary and government environments thereby contributing to better governance and policy modelling. An important instrument to achieve these objectives is to collect relevant cases, theories, methods and tools for ICT solutions in governance and policy modelling from different disciplines as well as from research and practice.

The overall objective of work package 4 is to support the exchange of experiences and lessons from current RTD in the field of ICT solutions for participation, governance and policy modelling, as well as consensus-building in the uptake of innovative e-governance services. To support the establishment of a community in the field, an important instrument is to build a knowledge base about relevant knowledge assets in the field.

In line with Bolte et al (1999), the eGovPoliNet Knowledge Base (KB) shall [1]:

- Facilitate its users (in particular governments) to help themselves rather than having to use more expensive human resources
- Provide its services worldwide around the clock
- Make information available for reuse for different purposes by the members of the eGovPoliNet
- Function as a repository of information about strategies, programs and projects in ICT for governance and policy modelling
- Provide its users with the collective expertise of a whole community of subject matter experts
- Increases the number of contacts that can be asked for help to solve problems that really require expert help

In order to achieve these goals, WP 4 “Knowledge Base” will conduct a state-of-play analysis and a comparative analysis, which will result in an overview of existing ICT solutions for Governance and Policy Modelling, as well as in best and good practices identification. eGovPoliNet will thereby focus on key assets accessible to its members and provided by the community. eGovPoliNet does not claim to provide an exhaustive list of strategies, programs or projects, since the project has limited resources available and will strongly depend on the contributions of its communities.

Along the collection of knowledge assets, work package 4 aims at identifying and responding to developing global research, practice and innovation challenges in the field of digital governance and policy modelling. Activities cover collection of knowledge assets, analysis and comparison of the international and multidisciplinary digital governance and policy modelling research and practice landscape. Insights and lessons will help to facilitate the development of RTD agendas and roadmaps to govern the direction and future evolution of the community. The work allows eGovPoliNet to put together the research and practice teams and thematic networks to respond to evolving challenges and therewith establishes a comprehensive knowledge base.

In the first year, main activities focused on defining a framework for the multidisciplinary knowledge base and for conducting comparative analysis of solutions in the field. Hence, the first part of this deliverable reports on existing theories and frameworks for multidisciplinary knowledge base (chapter 2). In Chapter 3, we introduce the multidisciplinary framework for the eGovPoliNet knowledge base. The framework consists of three core dimensions: a) structure of the knowledge base; b) process of collecting knowledge; and c) use of knowledge assets to generate added value. Each of these dimensions will be described. Finally, Chapter 4 concludes the report.

2. THEORIES AND FRAMEWORKS TO MULTIDISCIPLINARY KNOWLEDGE BASE

A multidisciplinary, comprehensive and systematic review of theories and practices regarding knowledge bases as well as past research in the field forms the ground for a rigorous development of the eGovPoliNet multidisciplinary knowledge base. To set this ground, a wide range of related work was studied. The main focus of the study was to investigate how to foster and conduct useful knowledge gathering, analysis, synthesis, and representation in a web-based knowledge base for ICT for governance and policy modelling.

2.1. THEORIES ON CREATING A KNOWLEDGE BASE

In the context of eGovPoliNet, the term ‘Knowledge Base’ is crucial and, hence, need to be clearly understood. In general, the term ‘Knowledge Base’ describes a particular kind of database for knowledge management. To support knowledge management, a Knowledge Base (KB) is providing functionalities for the computerised collection, organisation, and retrieval of knowledge, which relates to a specific problem and/or solution. In eGovPoliNet the KB aims at facilitating the knowledge management concerning ICT solutions for governance and policy modelling. Therefore, eGovPoliNet is establishing a web-based repository covering the state-of-the-art in the field of ICT for governance and policy modelling thereby incorporating a store (i.e. database) of expert knowledge with combinations and linkages designed to facilitate its retrieval in response to specific queries of its users. Further, it helps to transfer expertise from one domain of knowledge to another by classifying and categorising the existing ICT solutions for governance and policy modelling gathered and conducting a comparative analysis among them.

The theories investigated for developing the eGovPoliNet are presented in this section thereby focusing on the following main aspects:

- What are the crucial elements of a knowledge base in general?
- What approaches exist to create a global multidisciplinary knowledge base?
- Who should be the main user categories of the multidisciplinary knowledge base?

2.1.1. Crucial elements of KBs

The most crucial elements when building up a new knowledge base refer to the logical sequencing of tasks associated with information management [1]:

- 1) identification of content,
- 2) collection of information,
- 3) dissemination to users, and
- 4) maintenance.

In this regard it is important to define what information is to be acquired (i.e. supporting users in providing relevant information on their ICT solutions) and how to present this information (i.e. visualising the information gathered by a group of users in a way that meets the demands of users who are searching for solutions that help them solving their own problems thereby working out relevant inter-dependencies among different components of the knowledge base).

The former refers to what kind of data should be collected. The information collected is the evidence available to answer on the one hand stakeholder queries and on the other hand the evaluation questions to be answered through the comparative analysis. Poor evidence is information which is not relevant to the questions asked by stakeholders or by comparative analysis. Good evidence is information that uses reliable methods to address significant questions. There are different types of knowledge use:

- Knowledge generation for conceptual use (cf. [2], [11]) implies “*changes in knowledge, understanding or attitudes*” [13]
- knowledge generation for instrumental use “*is the concrete application of knowledge and describes changes in behaviour or practice. Knowledge can be translated into a usable form (...) and is used in making a specific decision*” [13].
- knowledge generation for persuasive use or strategic or symbolic use “*refers to research being used as a political or persuasive tool. It relates to the use of knowledge to attain specific power or profit (i.e., knowledge as ammunition)*” [13].

Information presentation refers to how to make gathered knowledge explicit and how to query the gathered knowledge.

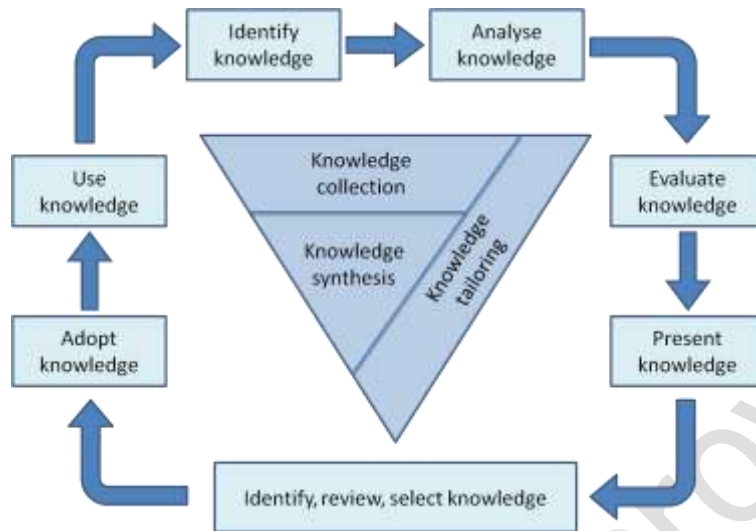


Figure 1 Sequence of managing information in a Knowledge Base (adopted from [12])

2.1.2. Creation of a global multidisciplinary KB using the concept of virtual communities

The creation of a global multidisciplinary KB requires the establishment of meeting points for knowledge acquisition and exchange accessible by people worldwide having different disciplinary backgrounds. In particular the “global” aspect of the KB can be addressed by using the Internet (also called the World Wide Web) and the opportunities offered by it for connecting people worldwide. In this context, the concept of virtual communities has been investigated. According to Heimbürger et al “*virtual communities rely primarily on ICT to connect their members to work together, and to share knowledge and practices. The importance of virtual collaborative work is increasing not only because of its economical and environmental benefits, but also due to its flexibility for establishing dynamically new cross-organizational and cross-cultural innovative teams. Virtual collaborative spaces should support their joint activities. In order to design and realize such spaces, an understanding of the tasks to be carried out by the virtual community is necessary, as well as an understanding of the related processes, contexts, and knowledge*” [5]. One of the most pervasive types of virtual community includes social networking services, which encourage people to form a community [3]. These services may consist of various online communities (such as LinkedIn) that allow for instant information exchange, engaging in activities from home, forming specialized relationships and giving a feeling of membership and belonging. The technical details on the eGovPoliNet knowledge base are presented in the interim report of D 2.1, while the details on community building for the eGovPoliNet knowledge base are outlined in D3.1.

2.1.3. Definition of the main users of the KB using the Triple Helix model

Over the last decades, Research and Technology Development (RTD) have become important to economic and societal development in particular in regard of technology transfer from academia to industry and government. In this regard, the Triple Helix model has been developed. It explains the convergence and crossover of academia-industry-government relations [4] thereby showing that, although firms having the leading role in innovation [3][6], the role of universities is currently underestimated. The main argument for the leading role of industry is that academic research findings are not directly applicable (i.e. academic knowledge transfer mechanisms are inefficient). However, Etzkowitz and Leydesdorff [4] state that universities “*can play an enhanced role in innovation in increasingly knowledge-based societies*”. To create synergies and wins-wins, collaborations are promoted between industry and academia together to link basic research with practical utilization. Governments are interested in the results of RTD as innovations shown their positive impacts on country’s economy and society’s quality of life. Since industry focuses mainly on RTD that is commercially applicable, some basic research is underfunded, although it may be of interest for economy and society. Hence, governments do not rely on the private sector alone to fund RTD. The interplay of these three key players in

RTD with particular regard to knowledge transfer is, thus, crucial success factor to enhance and advance innovation. So, the common objective should be to 8 modelling an innovative environment promoting and facilitating the knowledge transfer among these three stakeholder groups [4]. Thus, the Tripel Helix model grounds the identification of target groups for the knowledge base. Besides, its attempt to innovative seems particularly apposite for the development of a multidisciplinary research and practice community-based knowledge base in the field of ICT for Governance and Policy 8 Modelling – the range of disciplines (cf. [14]), the need to engage stakeholders from academia, industry and government, the geographical separation, the different markets and socio-economic situations. This network approach is likely to be efficacious in fostering the RTD innovations as aimed at by eGovPoliNet.

The targeted audiences provide important clues about information needs:

- Academia (i.e. researchers, scientific communities) will usually be interested in how the policy issue/concern has been formed, who funded the project and how to categorize e.g. available models or parts of it.
- Industry (i.e. practitioners, consultancies, IT provider) will usually be interested in how to select best practices and what are the needed resources to use the approach (i.e. tool or technology).
- Government (i.e. policy operators, decision makers, policy makers, civil servants) will usually be interested in what impact has been achieved already / is expected to be achieved.

2.2. KNOWLEDGE BASE FRAMEWORKS AND PRACTICE EXAMPLES

In this section, several reference models of knowledge base frameworks and practical examples are introduced. Table 1 provides an overview of reference models and examples. Several of them are described in more detail in subsequent subsections. We conclude with a summary of concepts that can be adopted from the different reference models investigated (see Table 2).

Table 1 Overview of examples of knowledge bases and reference models

Acronym, Name, URL	Short description
NARCIS (National Academic Research and Collaborations Information System) narcis.nl	NARCIS gives access to scientific information consisting of (open access) publications from all the Dutch universities, the Netherlands Royal Academy of Sciences (KNAW), the Netherlands Organisation for Scientific Research (NWO), and a number of research institutes, the datasets of the institute Data Archiving and Networked Services (DANS), as well as descriptions of research projects, institutes and researchers. It grounds on EUROSIS and Dublin Core (see further entries in this table)
EUROSIS (The European Multi-disciplinary Society for Modelling & Simulation Technology) eurosism.org	EUROSIS is a non-profit society that is an auto-financing entity funded by membership dues. The aim of EUROSIS is to be the primary mover and initiator for and of European simulation and modelling projects, which bridge the gap between academic and industry based simulation and modelling research in Europe. This, by using the power of communication, dissemination of information and member-sourcing. EUROSIS aims at stimulating simulation and modelling projects in various fields in Europe and beyond. It is an extension of Dublin Core.
ePractice epractice.eu	The portal created by the European Commission offers a service for the professional community of e-government, e-inclusion and e-health practitioners. It is an interactive initiative that empowers its users to discuss and influence open government, policy-making and the way in which public administrations operate and deliver services. It involves practitioners from all over Europe and combines online activities with frequent offline exchanges such as workshops, face-to-face meetings and public presentations. With a large knowledge base of real-life case studies submitted by ePractice members from across Europe, it serves as a point of reference for all users. It is based on the inherently participative nature of web services.
VUIR (Victoria University Institutional Repository)	This site is powered by Eprints 3, free software developed by the University of Southampton. It provides a repository of academic publications.

eprints.vu.edu.au	
DCMI (Dublin Core Metadata Initiative) dublincore.org	DCMI is a useful source for relying on standardised definitions of terms for knowledge assets. The standard is relevant for eGovPoliNet in terms of how the knowledge assets should be described.
R4eGov Interoperability knowledge base	R4eGov conducted a state-of-the-art analysis in the area of interoperability thereby analysing existing concepts and solutions and assessing their efficiency to match the peculiarities of the public sector. It built up a web application as a knowledge repository to store and to provide interoperability assets to stakeholders in a structured manner. The concept provides a relevant reference model for eGovPoliNet's knowledge base.
DEMO-net knowledge assets for different stakeholders demo-net.org	DEMO-net developed a portal on e-participation knowledge assets for different stakeholders, which provides a useful example for eGovPoliNet's knowledge base. Its knowledge assets are: Projects, Research papers & reports, eParticipation areas, Technologies, Tools, Standards, Methods, Glossary, Conferences and workshops, eParticipation journals, Links to other resources. The attributes of each knowledge asset provide valuable grounds for the eGovPoliNet knowledge assets, too. Likewise, the linking concept among the assets is interesting to provide a good knowledge network of assets.
IU (Indiana University) Knowledge Base kb.indiana.edu	The KB was created in the late 1980s as a consultant tool in the Computing Support Center on the Bloomington campus of Indiana University. The IU Knowledge Base is a tool used to share information about computing and information technology as used by students, faculty, and staff at IU. It contains documents in question/answer format (i.e., content was directly related to user questions), with an average length of two screens. There are cross references among documents within the KB (about four per document) and more links to resources outside the KB. Access is provided using a search engine.
NREPP (National Registry of Evidence-based Programs and Practices) nrepp.samhsa.gov	The NREPP is a searchable online registry of mental health and substance abuse interventions that have been reviewed and rated by independent reviewers. The purpose of this registry is to assist the public in identifying approaches to preventing and treating mental and/or substance use disorders that have been scientifically tested and that can be readily disseminated to the field.
CVCE (Centre Virtuel de la Connaissance sur l'Europe)	The CVCD is an interdisciplinary research and documentation centre dedicated to the European integration process. It provides a valuable example for the eGovPoliNet knowledge base

2.2.1. The IU Knowledge Base for sharing information about computing and information technology

Bolte et al [1] summarised the experiences made with setting up the IU Knowledge Base to facilitate KB developers. In their paper, Bolte et al explained that the success of the IU Knowledge Base grounds on the fact that on the one hand it was a grassroots effort (i.e. people responsible for creating it were the immediate beneficiaries and, thus, content was directly related to user questions) and on the other hand the community of the KB was used to share information. From this experience, they derived a set of suggestions for KB developers to be successful. These suggestions are structured along the sequential order of tasks to be fulfilled namely identification of content, collection of information, dissemination to users, and maintenance.

Collecting content: In order to fill the KB with content, Bolte et al [2] recommends approaching those end users first who are already sharing information and who can benefit directly from the KB, since these people know what end users want to know and how to explain it. Then, involve "*Subject Matter Experts*". This group of end users is "*constantly fending off interruptions while they try to apply their knowledge to tasks that require their unique expertise*" [2]. After that, communication channels are to be identified that can be monitored such as change management minutes or distribution lists in order to receive feedback from the end users of the KB. Considering that most of the information will be provided by experts outside the team that is managing the KB, Web logs for the KB site are to be watched in order to see what end users are looking for. Otherwise, technical

experts in the field could be hired to research and write the documents from scratch. The latter approach is not recommended as it limits the breadth of coverage and the number of documents available. The former approach contains more chances of success as everyone can contribute to the process according to their specific expertise. For instance, the *“Subject Matter Experts are not expected to produce a finished document, or even a draft. They are only expected to make the KB team aware of the need for documentation and provide the basic accurate content. Skilled writers produce the document, which is then reviewed by a content expert”* [2]. To approach information providers it is recommended to *“use both formal and informal lines of communication”* [2]. For information collection to be successful, Bolte et al [1] explain the importance that information providers perceive the benefit of contributing. Hence, the KB developers should develop the understanding that the KB is a service for the information provider as well as for the customer. However, it is also crucial to ensure as little additional effort as possible for information providers (i.e. by e.g. providing templates to assist information provision or providing multiple submission channels such as web forms, distribution lists, face-to-face meetings). Besides, the time factor plays a crucial role not only in accessing information but also in contributing with information. In addition, priority information should be made available at once. Therefore, the KB developer should learn about the way its end users currently work to integrate the tool for collecting information into their normal workflow. Furthermore, information providers should be informed about what is happening with the information they will submit / have submitted.

Making content available: The IU Knowledge Base is a web-based application as the Internet is seen as the key vehicle for making the content of the KB available. In general it is important to use dynamic media that are able to continuously updating the content of the KB. In this regard static media such as CDs are not appropriate as information customers would access incorrect/old information. Besides, the IU Knowledge Base includes a text search and menu interface, as well as an online distributed learning application, called Oncourse. The inclusion of links to KB documents within e-mail and printed documents is a way to deliver content right at the point it is needed. Besides, a well-elaborated search engine supports stakeholders in finding relevant information that meet their information needs. In order to make the information more accessible, clarity, accuracy, consistent formatting, and predictability of all contributions are established as underlying principles using an extensive Style Guide to ensure readability.

To sum up, the following recommendations are derived for the establishment of a Knowledge Base based on experiences from IU Knowledge Base:

- *Starting small:* It is recommended to start with a manageable size (of e.g. functionalities, contributors, recipients, etc.) to iron out the problems that would be unmanageable in a larger initiative
- *Sharing:* First, approach people who are used to share information as they understand the core principle any KB is built on namely sharing.
- *Added value:* Provide services to simplify their work.
- *Integration:* Pay attention to current work practices, and try to integrate the new procedures into what is already familiar.
- *Positive experiences:* Make sure the people who do the work experience the benefit immediately.
- *Support:* Be ready to offer support at the right time.
- *Leadership:* Multiple grassroots KBs can develop. Integrating across units takes leadership and a clear directive.

2.2.2. NREPP Descriptive Information Guidelines for programmes

The National Registry of Evidence- based Programs and Practices (NREPP)¹ is a searchable online registry of mental health and substance abuse interventions that have been reviewed and rated by independent reviewers. NREPP helps improving access to information on tested interventions and thereby reduce the lag time between the creation of scientific knowledge and its practical application in the field.

NREPP publishes a report that is an intervention summary for every intervention it reviews. Each intervention summary includes general information about the intervention, a description of the research outcomes reviewed, quality of research and readiness for dissemination ratings, a list of studies and materials reviewed, and contact information to obtain more information about implementation or research.

With it, NREPP can be a first step to promoting informed decision making as the information provided (i.e. the intervention summaries) may help to determine whether a particular intervention may meet the needs of a

¹ <http://nrepp.samhsa.gov/AboutNREPP.aspx>

specific stakeholder who wants to establish a similar intervention. Besides, it may direct conversations with intervention developers and others listed contacts thereby receiving advice before making any decisions regarding selection or implementation of an intervention. In addition, a list of potential questions to ask developers is available to facilitate these conversations.

NREPP rates the quality of the research supporting intervention outcomes and the quality and availability of training and implementation materials. However, it should be noted that NREPP ratings do not reflect an intervention's effectiveness.

2.2.3. R4eGov Interoperability Knowledge base

The R4eGov project conducted a state-of-the-art analysis in the area of interoperability thereby analysing existing concepts and solutions and assessing their efficiency to match the peculiarities of the public sector [9]. This broad investigation is based on a methodical framework, which has been developed by Wimmer et al [13] in earlier work. The methodology categorizes interoperability in terms of the levels of interoperability, the phases of application throughout public service processes, and the layers of application in terms of government systems (local, national and international level) [9]. Based on this framework, interoperability has been investigated along case studies, as well as along discussions provided in scientific articles and documentations of relevant projects available on the Internet [9]. The critical state-of-the-art analysis is mostly driven top-down thereby investigating current solutions on frameworks for interoperability at international and national level, recent and currently running EC-funded RTD projects addressing interoperability in one or another way, as well as concrete national solutions relevant for R4eGov [9]. The top-down analysis is counterbalanced by input gathered from the use-case interoperability analysis and through workshops with key stakeholders through offline interaction.

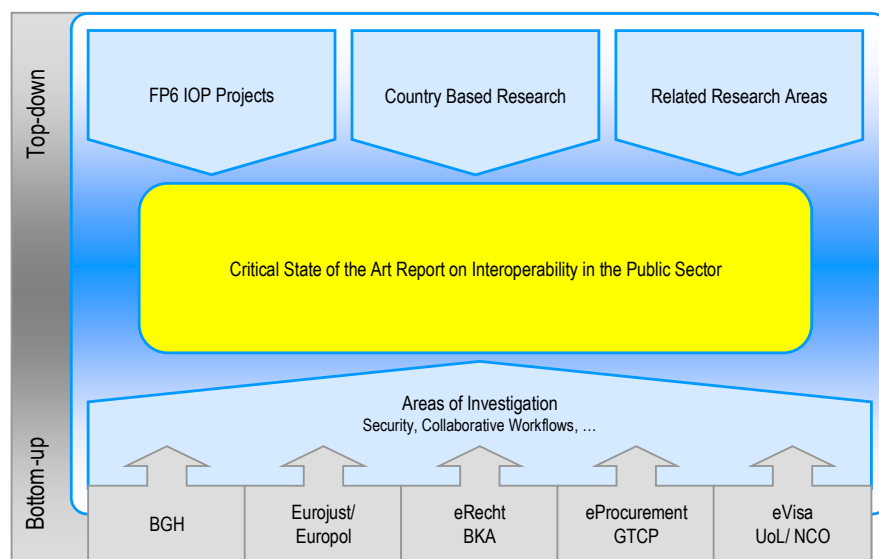


Figure 2 R4eGov's scope of investigating the state-of-the-art [9]

The overall methodology was based on the holistic framework introduced above, which was applied to the following sources of information [9]:

- Literature research in the domains of e-government and semantic web for e-government;
- Web search on interoperability frameworks investigating
- International and national frameworks and initiatives to depict the scope of interoperability
- National implementations of standards and IOP solutions reported in national portals;
- Scanning EC-funded RTD projects on interoperability and their (interim) results;

In order to support the management and overview of interoperability developments, a web application was implemented to help structure, classify and relate specifications, agreements and definitions that contribute to interoperability in the large (cf. Figure 3). Main aim of this demonstrator is to visualize standards, specifications and definitions of interoperability in terms of the R4eGov interoperability framework's dimensions [9].

Depending on a user's role, it is possible just to search for existing documents, to insert new documents or even to modify the framework's structure [9].

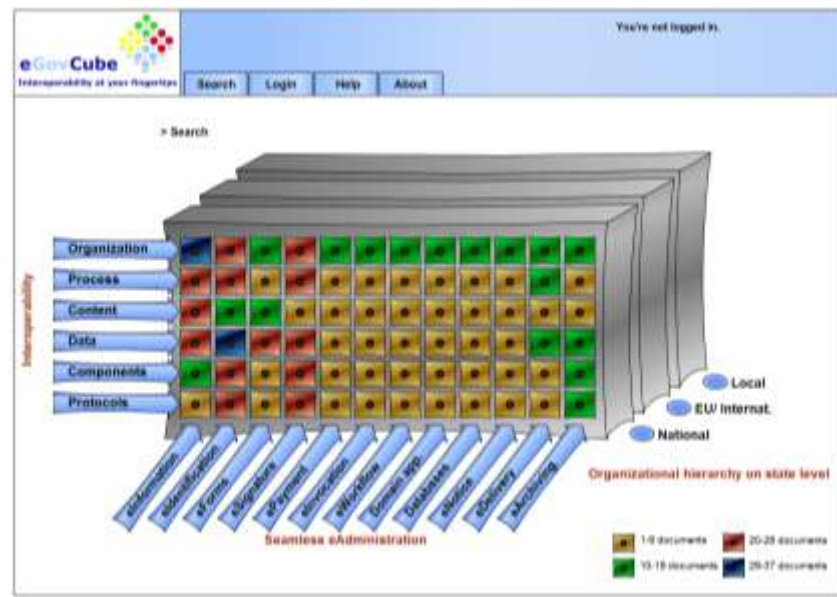


Figure 3 R4eGov Demonstrator – Example: Search Overview National [9]

2.2.4. DEMO_net concept for an online survey to study eParticipation in Government Innovation Programmes and Strategies

In the DEMO_net project, a framework for sustainable engaging and integrating eParticipation practitioners has been developed. This framework describes the establishment of an eParticipation Community of Practice (ePCoP) via the formation of four Specific Interest Groups (SIGs) [1]:

- Industry
- Elected representatives
- Government executives
- Third sector actors (such as NGOs, NPOs, and citizens community groups)

The SIGs and the umbrella ePCoP framework formulate regular communication channels with practitioners with the aim of facilitating sustainable networking among research and practice in the field of eParticipation [10]. The underlying rationale therefore is that eParticipation research is (like e-government) application oriented and, hence, needs a stronger dialogue among research and practice than other, more basic research-oriented disciplines might need (cf. [14]).

Besides, the DEMO_net project investigated the current status of eParticipation innovation in the European context. Therefore, it gathered information on European, national, regional and local level Government innovation programs via an online survey. The online survey aimed to identify relevant Government Innovation Programs and Strategies with Participation and eParticipation either as a central focus or with the themes incorporated amongst others. The DEMO_net survey analysed the degree of integration of eParticipation in ICT and e-government research and implementation programmes and strategies and resulted in a collection of existing practice and identification of policy gaps across Europe [8].

Figure 4 gives an overview of the DEMO_net concept to distinguish strategies and programmes, which grounds the standardized strategy and programme data collection template of the eGovPoliNet knowledge base.

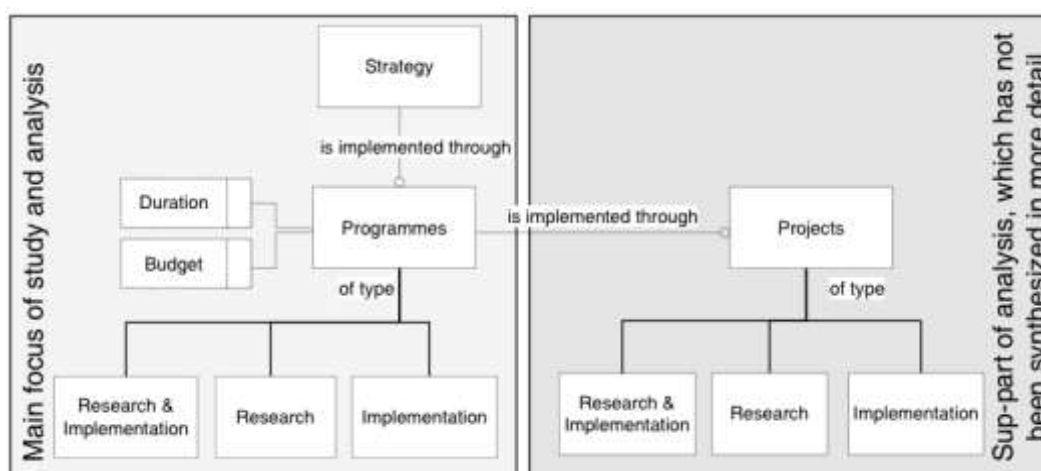


Figure 4 DEMO_net concept to distinguish strategies and programs [8]

Figure 4 grounds the DEMO_net online survey that was designed to identify eParticipation programmes and strategies, as well as research and implementation programmes at European, national, and regional/local levels of government. DEMO_net allowed its registered users to either insert a new entry or to edit an existing one. With it, DEMO_net allows for correcting and/or completing the respective data entries.

The DEMO_net online survey encompasses the following four categories of information [8]:

- It gathered general data about a strategy or program
- It compiled indications of the general areas and activities the program or strategy was covering and focusing on. Besides, respondents could add missing choices by inserting it in the text box “others”.
- It collected a more detailed classification along specific eParticipation dimensions
- It accumulated specific aspects of an innovation policy the program or strategy covers

2.2.5. Elements to be adopted for eGovPoliNet from existing reference models and examples

In Table 2, we sum up the elements of the concepts from existing reference models and examples that can be adopted for the eGovPoliNet knowledge base.

Table 2 Reference models and their different functionalities to be considered for the implementation of the eGovPoliNet knowledge base

Elements for	Knowledge Base Reference Models			
	NARCIS	EUROSIS	ePractice	DEMO-net
Community building	-	Conferences Exhibition	Events Workshops	Events Conferences Workshops
Constituency building and knowledge base	-	Conferences Exhibition Forum ²	Events Workshops	Glossary Technologies Tools Standards Methods Events Conferences Workshops Forum

² EUROSIS Forum that is only for members; LinkedIn group open to everyone

Publications	Open access to publications	Publishes conference papers in: EUROSIS conference proceedings ³ ; Journal papers; Publishes conference proceedings for 3rd parties on demand; Links to key books in simulation; Links to on-line publications	Library Factsheets	Research papers and reports E-Participation journals Links to other sources
Membership Categories for Networking	Researcher Research institutes	Individual Members; Institutional Membership; Corporate Membership; Student Membership	Different communities Professionals related to e-government, e-inclusion and e-health	Researchers corner Practitioners corner eParticipation Community of Practice (ePCoP) corner
Projects	Project descriptions of current and completed research projects ⁴	Network of Excellence Integrated Projects Scientific database	Collection of case descriptions	Research project descriptions Practitioner projects description
Special functions	Scientific news items ⁵	Courses Sponsors Software Corporate Newsletter Blog	News TV Blog	News

³ Depending on the nature of the conference, selected papers of the event are published in journals such as: a) Eurosia International Journal of Soft Computing Simulation and Software Engineering (IJSCE); b) The World Review of Science, Technology and Sustainable Development (WRSTD); c) Advances in Wireless & Mobile Communications.; d) International Journal of Computer Aided Engineering and Technology, e) International Journal of Oil, Gas and Coal Technology; f) Central European Journal of Engineering; and g) International Journal of Computer Aided Engineering and Technology. (see <http://www.eurosia.org/cms/?q=taxonomy/term/4>)

⁴ e.g. per research discipline, programme, research school, organisation, researcher and index term

⁵ taken from various sources e.g. Intermediary magazine, Science Guide and several universities with the option of clicking through to the full articles. The news content is refreshed every hour.

3. MULTIDISCIPLINARY FRAMEWORK FOR EGOVPOLINET KNOWLEDGE BASE

A key part of the activities in work package 4 will be the state of play analysis reflecting ICT solutions for governance and policy modelling in Europe and globally over the next two years. The analysis will provide an overview about existing practice examples of ICT solutions for governance and policy modelling, completed and running projects on ICT solutions for governance and policy modelling, as well as currently running research programs and policies. The knowledge base has to be built along the objectives of the analysis and comparison so to support effective work over the next two years.

The multidisciplinary framework for eGovPoliNet's knowledge base therefore has three crucial dimensions of consideration (see Figure 5):

- How to structure the knowledge assets in the knowledge base
- How to collect the knowledge assets in an effective manner (process)
- How to use the knowledge assets to generate added value (perform comparative analyses, use knowledge assets widely, provide lessons learnt, develop recommendations and extract grand challenges, etc.)

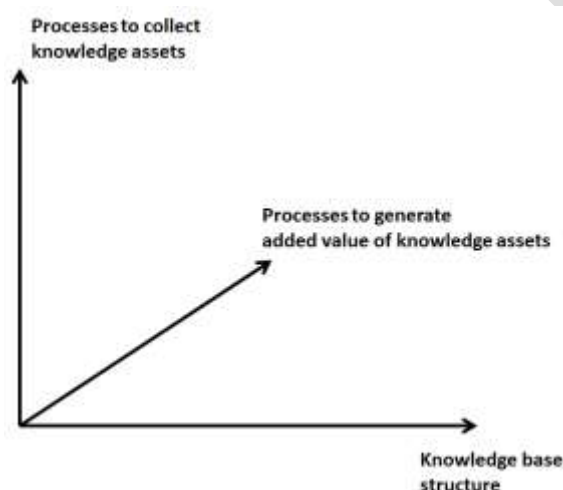


Figure 5: Three dimensions of the multidisciplinary framework for eGovPoliNet's knowledge base

In the subsequent sections, each of the three dimensions is introduced.

3.1. MULTIDISCIPLINARY FRAMEWORK FOR KNOWLEDGE STRUCTURING

The concept for the knowledge base is described in subsequent models using UML class diagrams. The first diagram describes an abstract model of knowledge assets in eGovPoliNet (see Figure 6). The abstract model contains all relevant assets that have to be dealt with in order to collect content for the knowledge base. By analysing the multitude of information, it was possible to identify the entities and the relations among them.

The main concepts in this model are

- Actor: main concept which performs projects/cases and thereby creates and uses knowledge assets (methods, tools, theories, application cases with lessons learnt, etc.). Moreover the actor edits media files that describe projects/cases and knowledge assets (publications, audio- and video files etc.).
- Discipline: Actors and knowledge assets may come from particular discipline. To understand the fragmentation of the domain and to effectively work as interdisciplinary community, the indications of discipline are therefore important.

- Project/Case: knowledge assets are usually developed in projects or cases. This institutional environment is an important source of information for the knowledge base when it comes to the comparative analysis and to the assessment of potential knowledge transfers.
- FundingProgramme: A Project/Case is usually initiated and/or funded in the context of a particular funding programme, which is in turn enacted usually in the context of strategies and policies of the funding body.
- Policy/Strategy: A strategy or policy is a documentation of commitments and political will to advance developments in certain areas. Such documents guide the implementation and focus of activities. While the link from programmes goes to FundingProgrammes, the strategic objectives to be implemented through projects are actually rooted in strategic documents.
- KnowledgeAsset: this concept is an abstract class of particular knowledge assets such as theories, methods, models, etc.
- MediaFile: this concept is an abstract class of any type of media file such as publications, audio- and video files, presentations, etc. Usually, such MediaFiles are generated in the context of Projects/Cases.
- Publication: The main type of MediaFile is the publication because it provides an explicit representation of many KnowledgeAssets and will be an important source for the comparative analysis in eGovPoliNet.
- Glossary: The glossary describes abstract entities of the knowledge base in a simple and understandable way. It therewith becomes an important source of consultation and reference for any stakeholder. Since it plays a particular role for creating understanding, the concept has been introduced as a separate element in the abstract model.

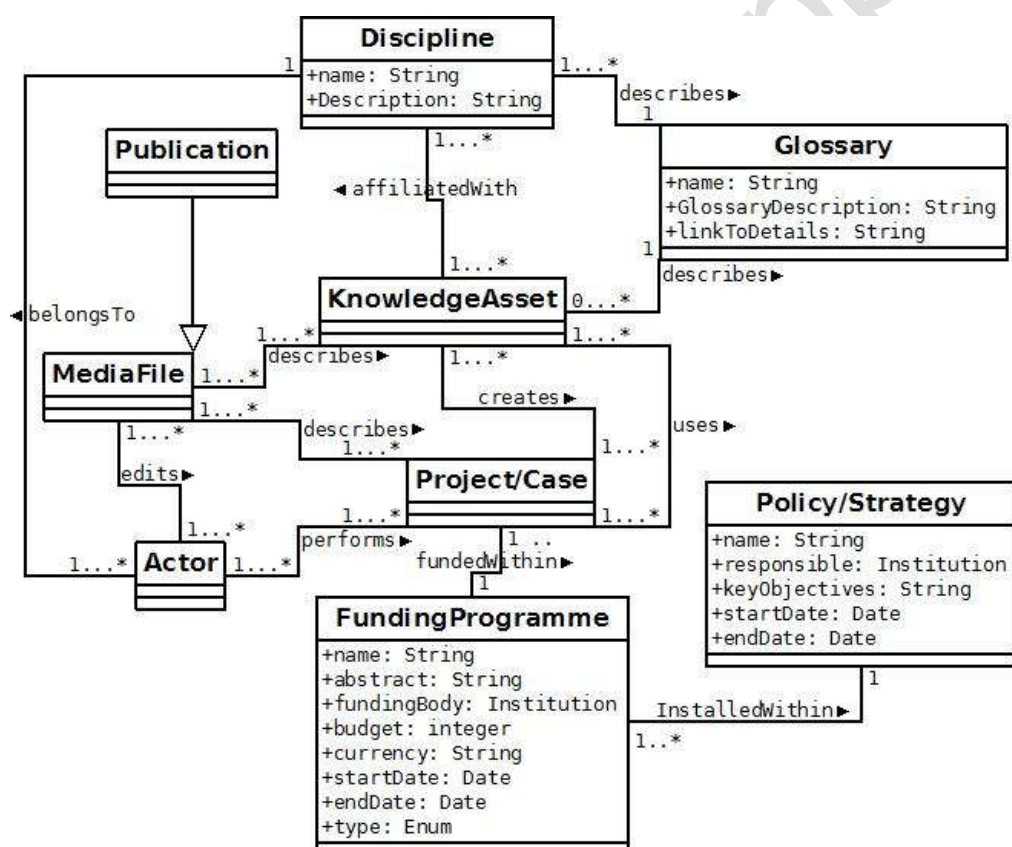


Figure 6: Abstract model of the knowledge base

The type: Enum in FundingProgramme and Project/Case can have the values of “Research”, “Research & Implementation” or “Implementation”. This way it is possible to search for particular types of projects or programmes in the knowledge base.

The subsequent figures provide detailed insights into the concepts of the abstract model (except for Glossary, FundingProgramme and Policy/Strategy, which are classes that need no further decomposition). Figure 7 details the actor class. Actors can be distinguished among individual or institution. While Institutions can collaborate with each other or are member of Consortia (mostly in projects and cases and relevant to eGovPoliNet to analyse collaboration), Individuals are usually affiliated with one or more Institutions. Every Actor has an Address and CommunicationMeans, which are important information for the knowledge base and for the community to reach each other and to get in contact. They can also be engaged in networks and consortia. This information provides indications of wider activities and outreach of an actor. As eGovPoliNet aims at overcoming fragmentation of disciplinary research and practice, an Individual is usually affiliated a disciplinary background.

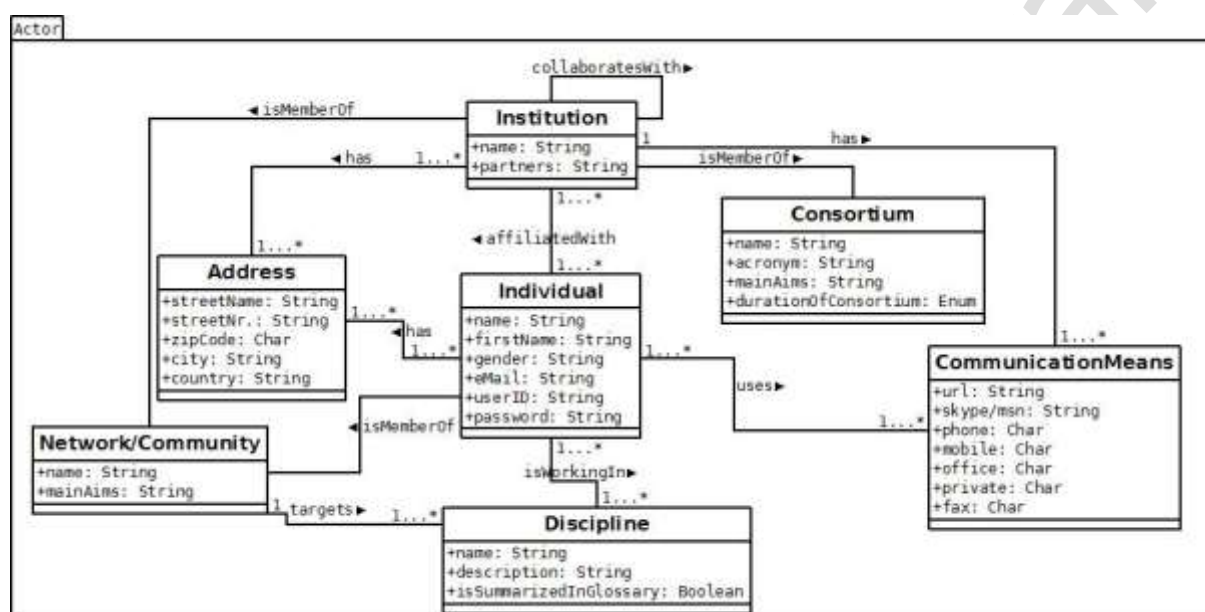


Figure 7: Detailed model of Actor

Figure 8 describes the detailed model of the class Project/Case. As the model shows, Project/Case is usually performed within the context of a policy or strategy and funded in the scope of a particular funding programme. Projects may organise events, which can have an agenda and results documented. A project or case can be described by MediaFiles (e.g. videos, ppt presentations, etc.). Several KnowledgeAssets are produced and can be used during the performance of projects/cases. The KnowledgeAssets as crucial and tangible results of Projects/Cases are detailed in Figure 9.

In the eGovPoliNet knowledge base, KnowledgeAssets can be:

- Theories developed within the Project/Case or applied therein,
- Methods developed within the Project/Case or applied therein,
- Tools developed and implemented or in the Project/Case,
- Technologies developed within the Project/Case or used therein
- Studies that compare knowledge assets or projects and cases or other aspects of interest in the domain of ICT solutions for governance and policy modeling. eGovPoliNet distinguishes
 - o Comparative analyses performed within the eGovPoliNet activities
 - o Other empirical studies relevant to the field

The concept of KnowledgeAssets is of particular interest to stakeholders and within the project, as it maps out the body of knowledge relevant in the field and providing the ground of sources for comparative analyses in the project.

As shown in Figure 6, a KnowledgeAsset is described in one or more MediaFiles. The MediaFile class is therefore a generalisation of different electronic documentation types, as e.g. Presentation, Publication, WebPage, DiscussionThread, NewsEntry, BlogEntry, Software, Video or Audio (see Figure 10).

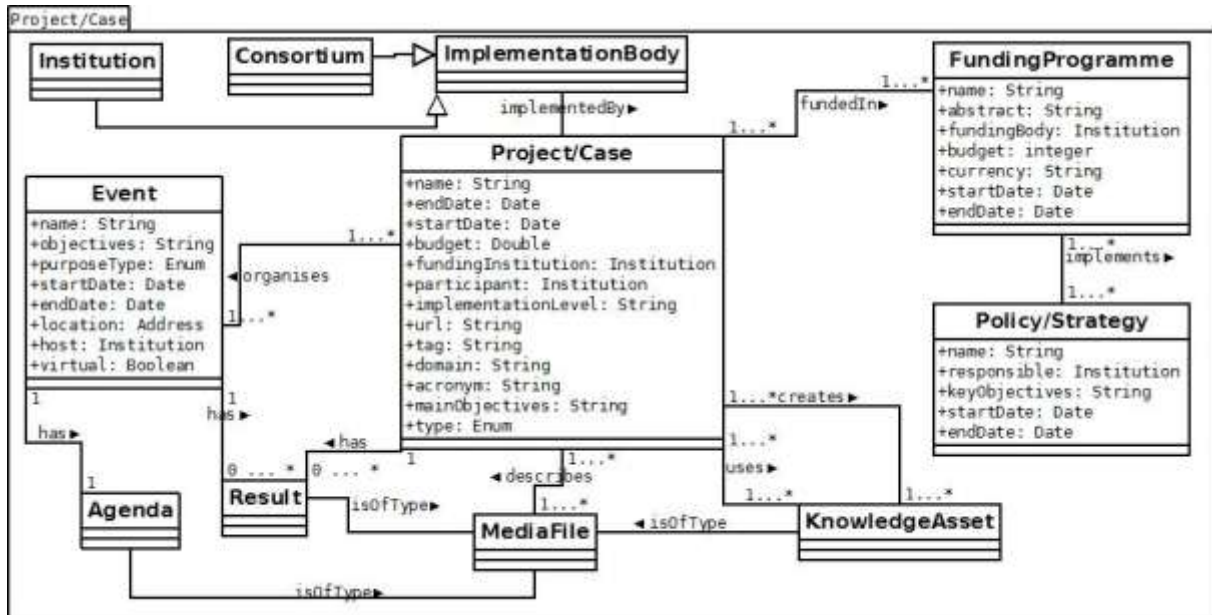


Figure 8: Detailing the Project/Case abstract class

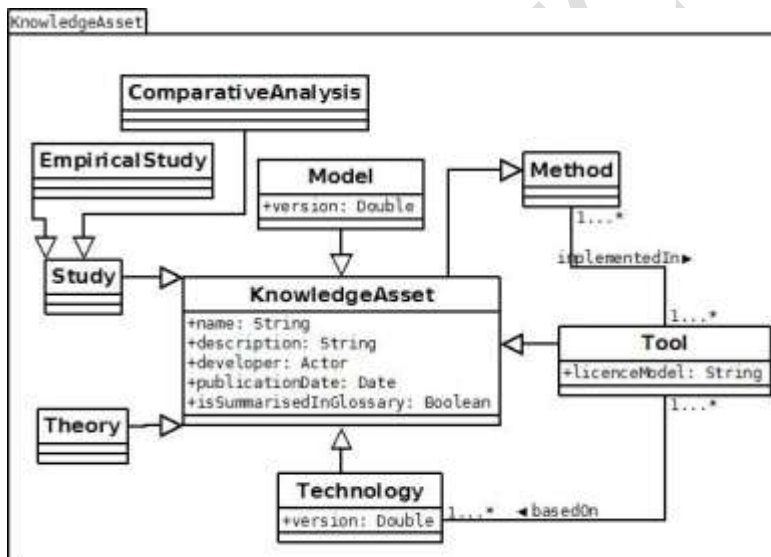


Figure 9: Detailing the KnowledgeAsset class of the abstract model

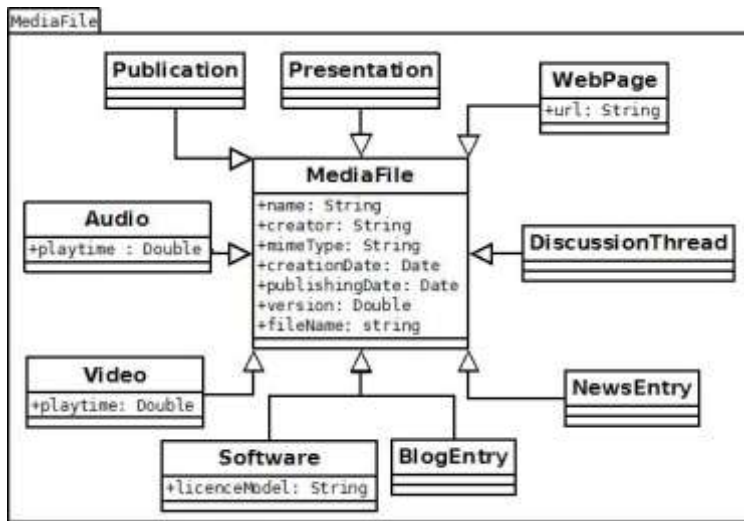


Figure 10: MediaFile class detailing the types collected in this generalisation class

Publication is a type of MediaFile of particular interest for the knowledge base. Since publications describe knowledge assets such as e.g. theories, methods or models, the concept of Publication is further as shown in Figure 11. The following types of publication are distinguished: Book, which is further detailed into Proceedings, Monography or CollectiveVolume; Article; Journal; TechnicalReport (e.g. deliverables of projects available as knowledge assets); Other. A Publication is published by a PublishingBody, which is a type of actor, hence the generalisation PublishingBody of Institution and Consortium (cf. detailed model in Figure 7).

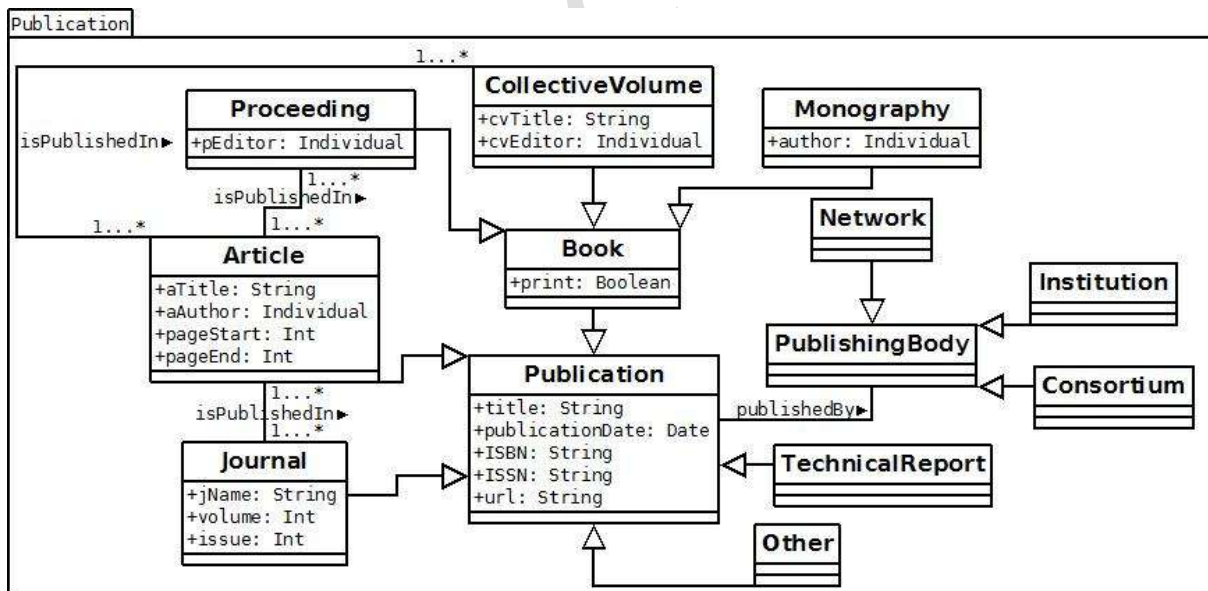


Figure 11: The concept of Publication for the knowledge base

3.2. MULTIDISCIPLINARY FRAMEWORK FOR KNOWLEDGE COLLECTION

In accordance with the technical annex (DoW), eGovPoliNet will scan existing literature and documents, and other online sources available in order to identify knowledge assets as follows:

- current research and practice examples of ICT solutions for participation, governance and policy modelling of the different countries and sources of funds concerning diverse issues and serving multiple purposes
- main relevant (running and finalized) RTD projects running around the world
- Collect information about the main currently running research programs and policies all around the world that address ICT solutions for governance and policy modeling

In eGovPoliNet, knowledge collection is also planned through a community effort, i.e. the members of a wider community will be asked to contribute their knowledge assets to the community portal. The engagement of representatives of digital governance and policy modelling projects in the exchange of experiences and of solutions will be supported through community building activities as aimed at in WP 3 (see plans detailed in D 3.1). The added value for these stakeholders to contribute to the knowledge collection via eGovPoliNet's knowledge base is:

- Achieving visibility of the solutions and concepts developed by these stakeholders
- Gaining feedback from other stakeholders about the concepts and solutions
- Diffusing the solutions and concepts to wider application fields
- Finding potential partners for amendments and evolution of existing solutions
- Participating in a community of experts with similar interests and therewith in a worldwide network of exchange

The multidisciplinary framework foresees the following process to collect knowledge assets:

- Initialise the KB (year 1):
 - o eGovPoliNet partners provide entries to the KB
 - o A core team of WP 4 reviews and assesses the quality of the entries to ensure the knowledge base fulfills a reasonable quality of content
 - o All content items reviewed and accepted by the review team are published in the knowledge base
- Enlarge the KB (years 2-3):
 - o eGovPoliNet partners provide entries to the KB
 - o The wider community provides content to the KB, i.e. different stakeholders are engaged
 - o eGovPoliNet partners provide entries to the KB
 - o A core team of WP 4 reviews and assesses the quality of the entries to ensure the knowledge base fulfills a reasonable quality of content
 - o All content items reviewed and accepted by the review team are published in the knowledge base

The initialisation of the KB with knowledge assets will be crucial for the wider community to motivate them to insert new entries to the KB by demonstrating already added value when these stakeholders will be engaged.

Precondition for the collection of knowledge assets is the availability of a knowledge portal. Hence, dependability from work package 2 is high.

When talking of stakeholders in the eGovPoliNet community, we embark on the Triple Helix Model of and identify the following groups that will be involved to collect in the eGovPoliNet knowledge base activities:

- Academia (i.e. researcher)
- Industry (i.e. policy and public governance consultancy firms, ICT provider for policy development and public governance, etc.)
- Government (i.e. public servants, policy makers, etc.)
- NGOs and activist groups in the field

Particular usage scenarios for the knowledge base interaction are introduced in D 2.1 – Annex III. To avoid redundancy of documentation, presentation of the usage scenarios is therefore omitted here.

3.3. MULTIDISCIPLINARY FRAMEWORK FOR THE USE OF THE KNOWLEDGE BASE

Creating added value through the establishment of a knowledge base is a crucial performance aspect. As already mentioned in the previous section, the contribution of knowledge assets to the knowledge base may result in visibility and wider outreach of solutions. The third dimension of the eGovPoliNet multidisciplinary framework for the knowledge base goes beyond dissemination and visibility purposes. On the basis of the collection of knowledge assets, eGovPoliNet will perform comparative analyses of projects, cases, methods and theories. Thereby, a mapping of current and emergent RTD through proper presentation and filtering of assets in the knowledge base will be provided. Powerful search and filter mechanisms will help stakeholders of different groups to find valuable input for knowledge exchange and transfer.

In a first activity of comparative analysis, eGovPoliNet members have e.g. investigated currently running FP 7 projects⁶. The report outlines 15 FP 7 projects on ICT for governance and policy modelling along the following assets:

- Acronym and name, logo and URL of project
- Main objectives of project
- (expected) outcomes in terms of
 - a) theories contributing to better understanding of key thematic aspects and phenomena to be addressed,
 - b) methods used and/or developed to support the call objectives,
 - c) tools used and/or developed to support the call objectives,
 - d) technologies used and/or developed to support the call objectives,
 - e) concepts and frameworks used and/or developed to support the call objectives,
 - f) principles of open government and good governance addressed / how do the findings and outcomes of the project contribute to these principles,
 - g) field applications / cases / piloting areas, and
 - h) who are the target users of the solution(s) and how is active citizenship and stakeholder engagement addressed in the project
- Call objectives the project addresses

The comparative analysis of the projects was performed along the following aspects:

- Objectives regarding “ICT for governance and policy modelling” stressed in calls 4 and 7 of FP 7, area Information and Communication Technologies (see Table 3 for the comparison template)
- Impacts expected in respect to particular objectives (see Table 4 for the comparison template)
- Instruments used and/or developed by the projects (see Table 5 for the comparison template)

The report by Millard and Wimmer provides a good starting point for further comparative analyses. For each analysis, particular objectives have to be outlined, along which the templates in Table 3, Table 4 and Table 5 need to be adapted.

Another comparative analysis was performed by UBRUN in the frame of work package 1. The results of the comparative analysis are documented in D 1.1, Annex A: EU Funding of ICT for Governance and Policy Modelling.

The inputs of these two studies are good starting points for the knowledge portal. Further comparative analyses will follow in the subsequent years of eGovPoliNet performance. They will be coordinated within work package 4 as part of task 4.3.

⁶ The results will be published as an EC report, as part of the work was funded by different contracts. The

Table 3: Comparing projects along the objectives of calls 4 and 7 of FP 7 on ICT for governance and policy modelling

Objectives			Project 1	Project 2
Governance	(new) governance models	Empower stakeholder groups		
		Mass collaboration platforms		
		Collaborative solving of complex societal problems		
	Tools to support governance models	Tools for stakeholders and government for data & knowledge (creation (cross-borders), multi-lingual, multi-culture sharing, learning, tracking)		
		Tools to support transparency, tracking of inputs to policy modelling		
		Tools for security, identity, access to ensure privacy, delineation of constituency domains		
Policy modelling, visualisation and simulation	1) Opinion	Mining, mapping, simulation, aggregation, visualisation		
	2) simulation/ modelling of policy options / new policy options	Instruments (methods, tools, theories) for impact on groups, options, behaviour (micro-level)		
		Tools for overall societal simulations of outcomes (macro-level)		
	3) tools and models for public services as complex systems	Social networking		
		Collaborative society		
		Youth		
	4) tools for exploiting public sector data and knowledge	Translation		
		Modelling		
		Mining		
		Gaming		
	5) modelling complex systems	Dynamics		
		Large scale data analysis		
		Cloud		
	6) identifying emerging societal trends	Input from 1 and 4 (2009)		
		Using 5 from 2009 as instrument		
	7) merging (1) opinions and (4) data & knowledge and using (5) instruments	advanced simulation and visualisation techniques and tools		
	8) stakeholders	policy institutes, public administrations,		
	9) application fields involving public consultations	examples of fields of application, where public consultation of citizens has been perceived as valuable		

Table 4: Impacts expected in respect to particular objectives

Empowering & engaging stakeholders in policy making	Generally addressing topic
	Increasing trust
	All stakeholders
More efficient collection of feedback for governance	Public sector governance
	Using data & knowledge
	Using stake-holder input
Strengthening competitive position of European industry	Instruments as cooperation platforms
	Instruments for optimisation, visualisation and simulation

Table 5: Instruments used and/or developed by the projects

Theories explaining phenomena		Project 1	Project 2	Project ...
Methods addressing procedural aspects and guidelines				
Models	Meta models			
	Domain models			
ICT	HW, SW, solutions			
	technologies and languages			
	Tools			
	Devices/channels			

A more general template for knowledge asset description and comparative analysis of research and implementation projects and practices is presented in Table 6. A similar template is provided in Table 7 for programs and policies. These templates describe and analyse projects and cases or programs and policies along particular interests of stakeholder groups “scientific community”, “practitioner community” or “policy operators”.

Table 6: Research and Implementation Projects and practices

Scientific Community	Practitioner Community	Policy Operators
Who funded the project	Project general description & objectives	Why was the project funded?
Consider template presented in: "A framework for assessing eParticipation Projects and Tools" by E. Tambouris et al. Proceedings of the 40th HICSS 2007	Abstract or summary, period, amount spent, results, lessons learnt	summary, date, results, costs, lessons learnt
Descriptive part of the application	stage of implementation	proof of successful models
purpose, methodology, time it took, team size	project/practice owners contact base in English? (or in which other language)	DG INFSO smart tenders

reason of failure/success	lessons learnt	project stages (e.g. conception, implementation, motivation) and input into policy making cycle
part of a policy programme? Which one?	contact person	strategic goals the project aims to address (policy/strategy context)
	Is there a model we can easily use?	descriptive part of the application

Table 7: Research and Implementation Programs and Policies

Scientific Community	Practitioner Community	Policy Operators
Model composition - aggregation of simulation models within and across paradigms	AUB-NL, EGEM-NL, OCTU/UFNG-NL	policy start-end date, legislative process, succeeded by xxx policy, governments affected
Modelling Data Ontology to facilitate data exchange between modelling tools	World Summit on the Information Society (WSIS)	policy making process
Validation model correctness	Overview of simulation models that can easily be adapted to other (comparable) cases	need to do case study of ways that policy processes are carried out and whether they are processes that are more likely to lead to success
Re-use of model parts	Local government policies in supporting community groups	policies for anticipating responses to disasters
Question: What was or is the policy question or problem?		
Question: How did they form the policy issue/concern?	Questions to select best practices (expert systems)	Question: How did they form the policy issue/concern?
eligible activities	Which projects ...	policy domain (e.g. transportation, health, education)
Categorisation of available models (parts) => conceptually organised toolbox of models on different levels of description	General question to policy formulation: What are the needed roles to facilitate interdisciplinary decision making?	policy classification
Model description in SysML	What impact has been achieved already / is expected to be achieved?	framework describing how different policies affect behavioural drivers of target group
funding amount, period, summary, website		examples of failing policies due to a lack of understanding complex behaviour
Question: How many projects? Which run under this program (e.g. Providing cross-links)		governance model
MATLMING NEED (expert system)		level of government
Impact expected or already achieved impact		governance through network
		How many project (which ones?) run under the initiative?
		Impact expected or already achieved impact

Finally, the knowledge base will also serve as basis for reflections to establish and disseminate recommendations and guidelines for running and upcoming initiatives in the field with the aims of improving current and future practices in the field across borders. This includes the analysis of environment and emerging changes in governance and socio-political demands influenced by policy, economic, social, technological, environmental and legal factors, which contribute to a better understanding of the field and its settings. The two analyses mentioned before also cover the extraction of recommendations from the comparative analyses performed.

To sum up, assets relevant for comparative analysis of projects and cases will address amongst others:

- Impact achieved by the project / case
- Innovativeness (state-of-the-art, incremental innovation vs. radical innovation, sustaining innovation vs. disruptive innovation, bottom-up-driven innovation vs. top-down-driven innovation)
- Adaptability (specification vs. generalization)
- Resources needed (financial, personnel, time)
- Complexity
- Multidisciplinary (how many disciplines are involved)
- Lessons and recommendations from the project / case
- Diffusion of the solution in terms of number of transfers of solution into the same environments as well as into different environments.

4. CONCLUDING REMARKS

When building a KB, not all pieces of knowledge to be acquired and presented are clear and available from the beginning. This fact results in some challenges for the KB design. Even if the developers of the KB understand the domain very well, it is hard to depict how all the knowledge should be expressed usefully. Besides, at the beginning not much knowledge is presented, there will be many missing pieces that should be added as time goes on. Hence, this report documents the way forward for the establishment of the eGovPoliNet knowledge base as an incremental activity, with an overall concept and framework that is agile and flexible to respond to changing requirements.

The establishment of the knowledge base is strongly related to other activities in the project. Work package 2 provides the technical environment for the knowledge collection. The design of the knowledge base must therefore be carefully coordinated. Due to the request of the project officer to collaborate with Crossover to define one joint knowledge base, the multidisciplinary framework will be activated along the second year of eGovPoliNet, in collaboration with WP 2. It can already be stated now, that the Crossover knowledge base does not yet cover the extensive information to be collected of projects, cases, tools, methods, technologies and theories as we foresee it in eGovPoliNet. The rationale for a more comprehensive description of knowledge assets is grounded in the objective of eGovPoliNet to perform comparative analyses and to create added value beyond the visibility and reference point of overviews of knowledge assets.

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