



OpenGovIntelligence

Fostering Innovation and Creativity in Europe through Public
Administration Modernization towards Supplying and Exploiting
Linked Open Statistical Data

Deliverable 4.6

Pilots Evaluation Results– Third Round

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Abstract:	This report presents the evaluation results for the OGI project. It was updated taking into consideration the 2 nd evaluation report (D4.4) and 2 nd round of Pilots plan (D4.5). The evaluation has four areas: Co-creation, ICT Toolkit, Acceptance of ICT Toolkit and Outcomes.
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Executive Summary

OpenGovIntelligence (OGI) goes beyond traditional top down approaches and proposes the co-initiation, design, implementation and evaluation of innovative, data-driven public services. Building blocks for use of Linked Open Statistical Data (LOSD) are developed. Based on co-creation six pilot projects are developed which take different approaches and look at various aspects of Linked Open Statistical Data (LOSD). Each pilot exclusively addresses specific society's needs by exploitation of public sector statistical data.

The evaluation is focused on the four main areas of this project; the evaluation of the 1) Co-Creation Framework, 2) OGI ICT Toolkit evaluation by developers, 3) Acceptance of the pilots by end-users, and, 4) the outcomes of the pilots (public value creation). The first two areas were evaluated in the first and second year reports (D4.2 and D4.4) and in this report are only summarized.

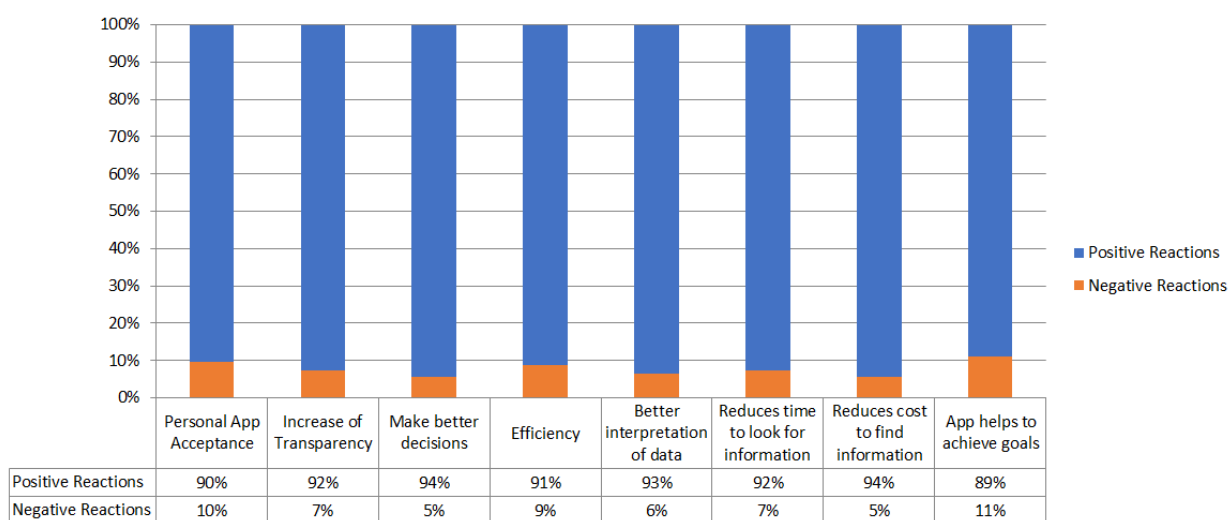
This report is focused on the evaluation of acceptance and outcomes, which could only be properly evaluated after they pilots have been used in practice by a sufficient user-base. In the final year of the project the final version of the pilots was delivered and the user-base was sufficient to arrive at sound outcomes. The OGI ICT Toolkit was evaluated using a mixed qualitative approach (described at section 3.3). The OGI ICT toolkit consists of building blocks. All pilots used the toolit, however, not all OGI buidling blocks were needed. Data quality was also evaluated, described at section sections 3.3.1.

Technical partners and pilots' leaders were interviewed and surveyed to collect information about fundamental requirements and parameters for an ICT Toolkit development. This shows the potential and limits of the LOSD OGI Toolkit.

The 6 pilots were evaluated by employing a user – questionnaire. Most users of 219 people surveyed found the pilots benefits include the creation of transparency, reduction the administrative burden by more efficient search of information and visualizing the results at a glance. We considered positive reactions strongly agree, agree and neutral answers. Negative reactions were disagree and strongly disagree. Below the descriptive statistics of Transparency, Decision-Making, Efficiency and Better Data Interpretation:

- **The overall acceptance of the pilots' apps was 90%;**
- **92% pointed out an increase of Transparency after accessing the Pilots' Apps;**
- **The Pilots' apps helped to 94% of surveyed people have better decision-making;**
- **93% of people answered there is a better interpretation of Data;**
- **For 92% of respondents, Pilots' app reduced the time spent searching information;**
- **94% of end-users identified a cost reduction when use OGI pilots' apps; and,**
- **There is an increase of efficiency to 91% of OGI Pilots' users.**

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Developing the ICT-toolkits more time than expected, as this is a new field in which there are hardly any examples. The development of the building block encountered the questions of which level of granularity would be fine as this requires a trade-off between the flexibility given to the developer and ease-of-use of manipulating data. User-friendliness and having right granularity is a trade-off and developers have different requirements in this regard.

Co-creation remains challenging in government. Co-creation is bottom-up, whereas government traditionally takes a more top-down approach by developing pilots and providing the services. Realizing co-creation is not only a technological problem, but rather a cultural problem.

The end-users regard the pilots as successful as shown in the figure below. The pilots show that data quality is a key aspect as garbage in is garbage out. Realizing high-data quality took often more time than expected, whereas the OGI ICT-toolkit enables to develop the pilots within a short time frame. They pilots help end-users to find information faster and in a more efficient way resulting in transparency and better decision-making quality.

1 Introduction

This document reports the evaluation results of OpenGovIntelligence (OGI) project. The OGI environment provides an ICT toolkit comprising easy-to-use and user-centric tools to facilitate realizing an Linked Open Statistical Data (LOSD) innovation ecosystem. Pilots were deployed to validate and prove the usability and effectiveness of OGI ICT toolkit to co-create and innovate ecosystems.

The first part of the evaluation is related to the co-creation development which was already covered in previous reports and will only be summarized here. The second part concerns the evaluation of the OGI Toolkit by developers. The third part is the acceptance of the OGI ICT Toolkit by end-users. The fourth part is the evaluation of the outcomes of pilots', which includes Transparency, Administrative Burden Reduction, and Costs Reduction.

1.1 Scope

The present document is the Deliverable 4.6 "D4.6 – Pilots Evaluation Results - Third Round" (henceforth referred to as D4.6) of the OGI project. The main objective of D4.6 is to describe the pilot's results in this third year of OGI project and elicit the lessons learned and conclusions from the evaluation results.

1.2 Audience

The audience for this deliverable is as follows:

- European Commission (EC);
- Audience interested on exploitation of Linked Open Statistical Data (LOSD) and Data Cubes for public service delivery
- Audience interested on public service delivery based on co-creation from external and internal stakeholders; and,
- OGI Project partners.

1.3 Structure

In the next chapter, we start by presenting the pilots' Evaluation Overview in accordance with Pilots' Implementation Plan in the report D4.5. The structure of this document is as follows:

- **Section 2** provides the Evaluation Overview;
- **Section 3** describes the Pilots Evaluation Methodology;
- **Section 4** presents the OGI Evaluation Results;
- **Section 5** has the Conclusion;
- **Section 6** includes the References; and,
- **Section 7** shows the annexes.

2 Evaluation Overview

The OGI toolkit is used by developers in 6 pilots projects. The pilots are deploying the OGI ICT Toolkit to implement an application that can be used by others. To develop the pilots, the OGI ICT Toolkit was used and tested and the co-creation framework is guiding the relationship between service providers and users. Each pilot made only use of the relevant OGI building blocks. The results of the evaluation provides insights for further improvement of the OGI toolkit and for improving the evaluation instruments.

OGI was evaluated by conducting six pilot projects, described in the report D1.1- Challenges and Needs (<https://www.slideshare.net/OpenGovIntelligence/deliverable-11-ogi-challenges-and-needs>). The projects use the OGI toolkit for co-creation, used LOSD to provide services and ultimately contribute to social impact.

1. **The Greek Ministry of Administrative Reconstruction (Greece)**
 - a. <http://wapps.islab.uom.gr/CubeVisualizer/vehicles/>;
2. **The Enterprise Lithuania (Lithuania)**
 - a. <http://vmogi03.deri.ie:8080/superset/dashboard/5/>
 - b. <http://vmogi03.deri.ie:8080/superset/dashboard/7/>
3. **The Tallinn Real Estate (Estonia)**
 - a. https://rnd-tut.shinyapps.io/Estonian_Pilot/
4. **Trafford Council *Worklessness* (England)**
 - a. <http://www.trafforddatalab.io/opengovintelligence/>
5. **The Flemish Environment Agency (Belgium)**
 - a. <https://www.milieuinfo.be/emissiepunten/>
6. **The Marine Institute (Ireland)**
 - a. http://vis.marine.ie/DashboardsTest/#/wave_spectral
 - b. http://vis.marine.ie/DashboardsTest/#/wave_zero
 - c. <http://vis.marine.ie/DashboardsTest/#/weather>

The OGI environment provides an ICT toolkit comprising easy-to-use and user centric tools to facilitate the processing and use of Linked Open Statistical Data (LOSD). The source code of OGI toolkit can be found at Github (<https://github.com/OpenGovIntelligence>)

The pilots were deployed to validate and prove the usability and effectiveness of OGI ICT toolkit to co-create and innovate ecosystems. The resulting apps should be used by a variety of users which in turn should result in long term effects (outcomes).

The WPs and evaluation are closely related to each other. Figure 1 summarizes the interdependencies and interconnections between the working packages (WP) of OGI project.

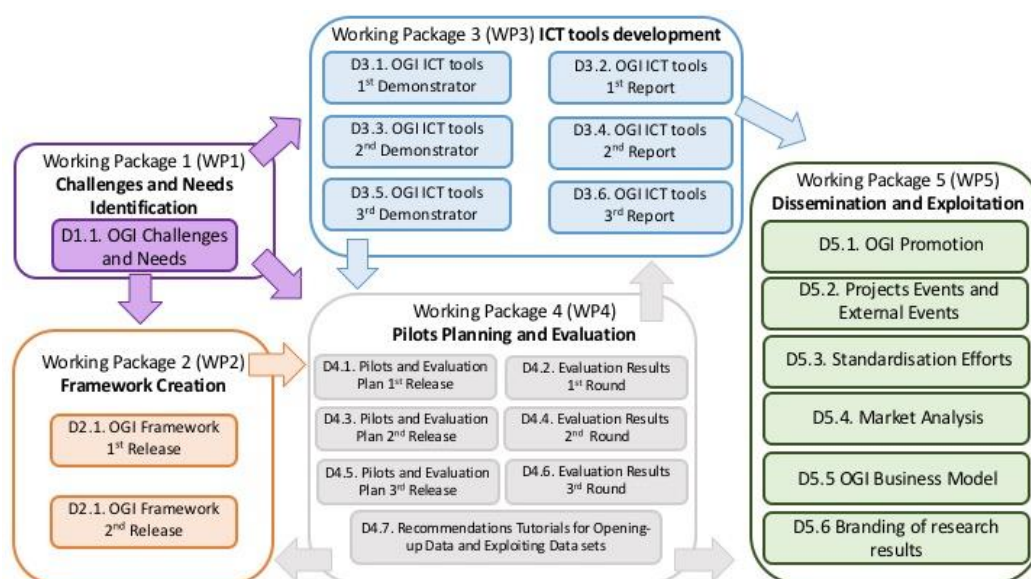


Figure 1- Interconnections and Interdependencies between OGI Working Packages and Deliverables

In an ecosystem, there are different stakeholders who view the pilots from their own perspectives. *Developers* might want to evaluate the pilots based on their ability to meet the end-user requirements using the OGI toolkit and building blocks. *End-users* want easy-to-use interfaces and pilots satisfying their needs. *Decision-makers* might look at how participation by users and other forms of co-creation result in impact of the applications on the number of users and return on investment. *Policy-makers* would be interested on societal impact generated by reducing administrative burden, the creation of transparency and its contribution to solving societal problems.. Our evaluation will take into account the multiple stakeholders' perspectives.

3 Evaluation Methodology

Based on the four stakeholder perspectives, four areas to be evaluated were derived In :

1. **The first area is the co-creation framework** (co-initiation, co-design, co-implement and co-evaluation). This is relevant for those decision-makers who want to innovate and ensure that there are high level of user participation.
2. **The second area is the OGI Toolkit** (ICT building blocks and cubes design). This is primarily relevant for *developers* who build applications.
3. **The third area is the acceptance of OGI Pilot Applications**. *End-users* should accept and use the OGI Toolkit deployed in the pilots.
4. **The fourth area is the outcomes** (estimative money savings, time reduction, efficiency perception of service delivery and transparency). The outcomes are of relevance for the *policy-makers*, but also for the society as a whole. At the end, the purpose is to create societal value.

These four areas are visualized in the Figure 2 together with co-creation. The second area about OGI solution platforms (in blue) contains the development of the building blocks contributing to the platforms and the use of the platforms, and its building block for developing the apps in the pilots. Both are closely connected to each other and therefore are integrated together.

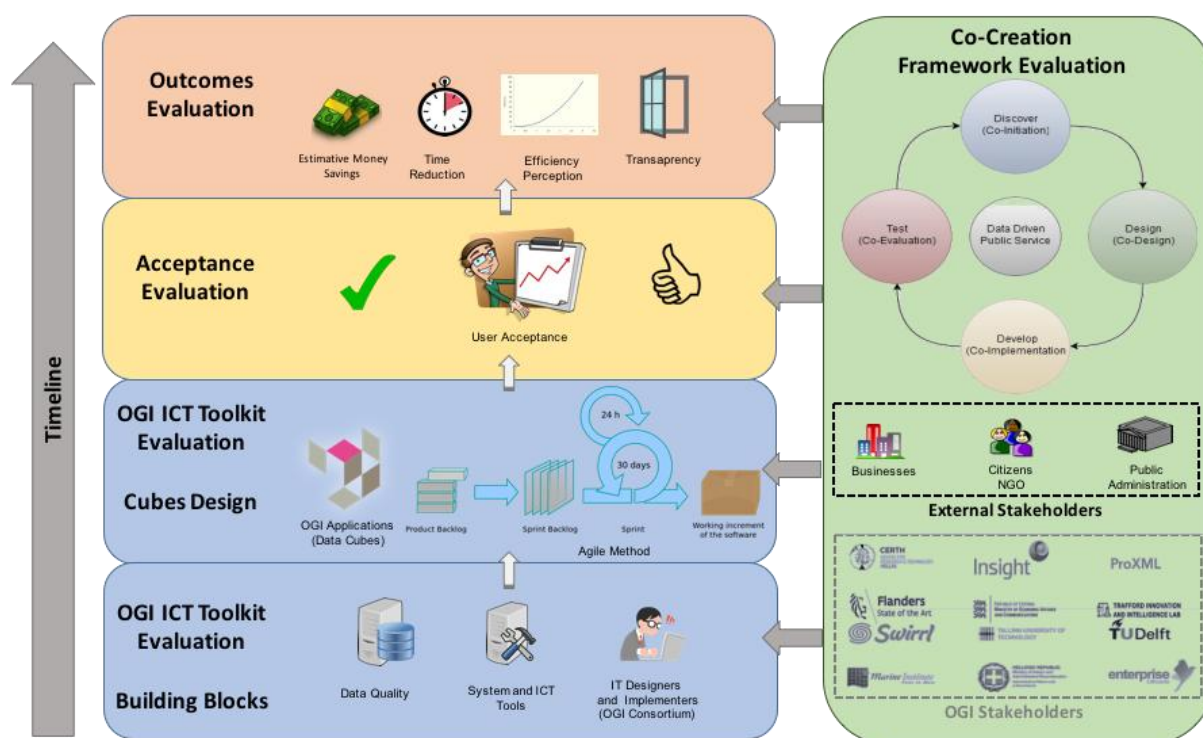


Figure 2 - Evaluation dimensions

The co-creation framework is described in detail in Deliverable D2.1, in the WP2 Framework Creation. The OGI toolkit is also described in detail in Deliverable D3.5, in the WP3 ICT Tools Development.

Beyond that, this report is linked to D1.1 OGI Challenges and Needs, as part of the WP1 Challenges and needs identification the D4.4 Pilots Evaluation results - Second round in the WP4- Pilots Planning and Evaluation. Those interconnections are visualized in Figure 1.

Pilots are organized in three main iterations. After each iteration the OGI toolkit will be more advanced and enable further development in the pilot. This agile way of working enables relatively short cycle-times and quick improvements. Furthermore, this enabled to evaluate the OGI Toolkit and building blocks and improve them each time.

1. The first (initial) iteration resulted in an early version of the evaluation of OGI services and tools. This feedback was used to further improve the OGI ICT Toolkit
2. The second iteration was used to develop a more advanced version. Again, this feedback was used to further improve the OGI toolkit; and,
3. The final iteration of pilots benefitted from the lessons learned in the first and second years of pilot iterations and resulted in a mature OGI toolkit.

Figure 3 illustrates the tasks involved in planning for and conducting a pilot and shows the high level process. Although the activities in this figure are presented in a waterfall manner, this is only for communication and planning purposes and the actual way of working was agile embracing co-creation and focussed on short iteration resulting in working software and meeting end-user requirements.

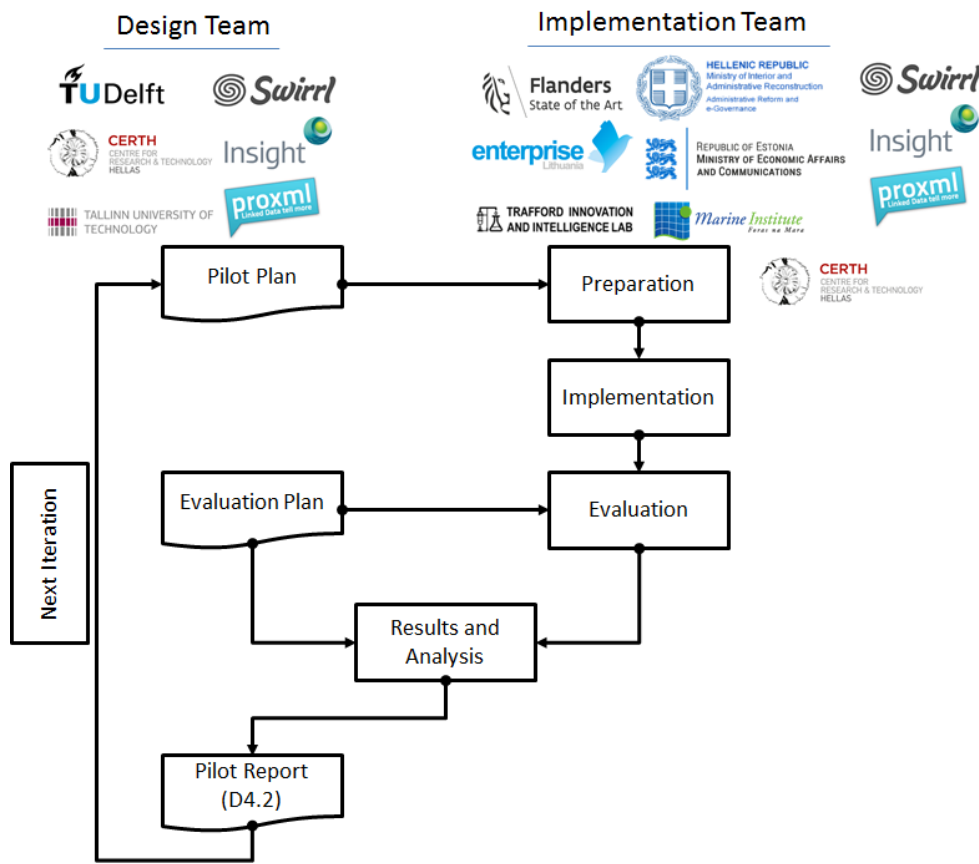


Figure 3 - High Level Processes of Pilot Plan

The pilot design team was responsible to create the pilot implementation and evaluation plans (Deliverables 4.1, 4.3 and 4.5) as well as pilot evaluation reports (Deliverables 4.2, 4.4 and 4.6). This team consists of the Research and Development (R&D) Partners in the OGI consortium.

The pilot implementation team was formed by the technical partners and, the people in charge of each of the six pilots. The Pilot implementation team is responsible to execute the pilot projects based on the plan created by pilot design team described on this report D4.5 and the previous version, D4.3 and D4.1.

The pilot implementation was divided in three main actions:

- 1) **Preparation:** the part that deals with collecting needed information from the pilots to fill the implementation template;
- 2) **Implementation:** the part that executes the implementation of the OGI toolkit and co-creation framework on the pilots by technical partners; and,
- 3) **Evaluation:** the part that measures the success of outputs and outcomes after implementation of OGI toolkit and co-creation framework.

D4.6 Pilots Evaluation Results – Third Round

The findings of the evaluation of the second step were analysed by the OGI Consortium. The result of this analysis was used to create the pilot plan for the next iterative cycle. These steps aimed to identify challenges and needs to improve the implementation and evaluation of OGI ICT Toolkit, and the OGI Co-Creation Framework in the OGI pilots.

The pilots' reports provided the processes of each pilot and evaluation on four evaluation dimensions for each pilot (described at Figure 4), and was the source for the pilot plan of next iteration, for example D4.4 (Evaluation results 2nd round) was the source for D4.5 (Pilot and Evaluation Plan 3rd release), influencing D4.6 (Evaluation results 3rd round – this report). Below, the Figure 4 describes the expected reports aforementioned.

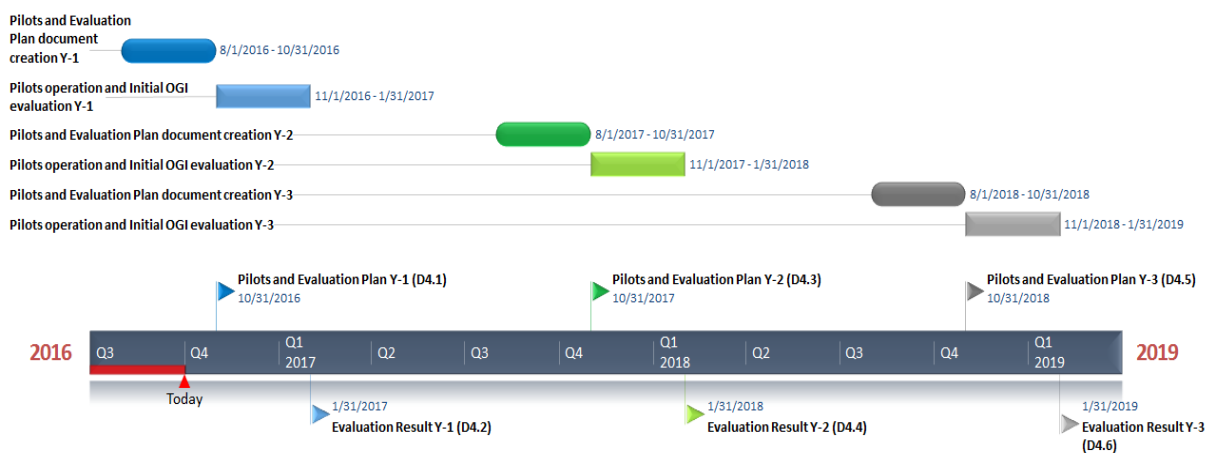


Figure 4 - Pilots' Timeline

3.1 Pilots' Co-Creation Evaluation Methods

Taking into consideration the types of co-creation and participant contribution an evaluation method was developed to collect data and to analyse the data and feedback of participants. This is explained at D2.1 OGI Framework from WP2 Framework Creation.

The objective of this section is to explain the methods to collect data and ICT tools used to evaluate the feedback from the identified types of co-creation and participant contributions during the three years of OGI project. Table 2 summarises the methods to collect data and ICT tools identified as useful to collect and analyse feedback from participant on the four different co-creation stages.

Table 1 - Co-Creation Framework Stages, Methods for Data Collection and Tools for Evaluation

<i>Co-Creation Step</i>	<i>Participant role</i>	<i>Source to collect data</i>	<i>Methods and Tools for evaluation</i>
Co-Initiation	Problem & needs identification	- Social Media	- R statistical analytics - TwitterR
	Idea generation for ways to solve problems (informed by data)	- User workshops - Public meetings - Social Media	- Weka - Other social media analytics
Co-Design	Input to service design	- User workshop - Continued participation - Focus groups - User Experience and User Interface testing	- Survey (Questionnaire and interviews)
Co-Implementation	Uploading user data	- Web and Phone Statistics (Number of access, download, etc.)	- Web Analytics - Survey (Questionnaire and Interviews)
	Suggesting changes to data sets	- Portal's Feedback channels	- R statistical analysis - TwitterR
	Data creation for a service	- Web and Phone Statistics (Number of access, download, etc.)	- Weka - Other social media analytics
Co-Evaluation	Providing feedback to service quality, usefulness, etc.	- Social Media - Portal's Feedback channels	- Web Analytics - Survey (Questionnaire and Interviews)
	Reporting data on service operation	- Web and Phone Statistics (Number of access, download, etc.)	- R statistical analysis - TwitterR - Weka - Other social media analytics

The selected sources and methods are described below in the next section 3.1.1.

3.1.1 Selected Co-Creation Tools and Methods Overview

3.1.1.1 User workshop for co-creation

A workshop is an activity that aims to introduce something (idea, skill, product, etc.) to potential interested people. Workshops range from short workshops (45 minutes or less) to one or more days. A critical aspect of user workshop feedback process is the inclusion of end-users in the creation of the new data driven public services.

The overall structure user workshop planned to be conducted on the pilots is described at Table 3:

Table 2 - User Workshop Protocol for Co-Creation

£	Stage	Number of questions
1	Introduction	This stage has the aim to describe the background to participants and clarify questions. A general objective is given to participants
2	Silent Ideation	In this stage participants brainstorm to produce ideas. They can take notes and be prepared to share the ideas with other people on the workshop.
3	Group Discussion	In this this stage there is a group discussion of all the participants, presenting the ideas that they had during the silent ideation. It is allowed to participants give commentaries or insert inputs from other participants ideas presentations (discussion).

The three stages can be repeated as many times as needed. This way is possible to all individuals to provide valuable inputs on the design and structure of the new public service. The user workshop can be used on all the four stage of Co-Creation framework.

The user workshops can produced outcomes like :

- List of issues (problems) with the new service;
- List of potential solutions and alternatives for improvement;
- Basic thoughts on the usability and functionality of the service;
- User stories;
- List of user personas of individuals who could use the service, and
- Any other information which may come out of the workshop organically.

After participating on the user workshop, a survey was conducted to identify the participants' feedback.

3.1.1.2 Survey Research

Whereas the workshops were focussed on deep-understanding and gaining feedback, surveys' were conducted to collect qualitative (interviews) and quantitative (questionnaires) data about the pilots performance.

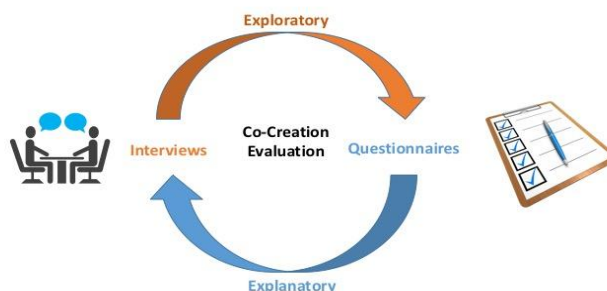


Figure 5 – Exploratory and Explanatory approaches at Co-Creation Evaluation Surveys

A survey is a systematic poll of questions made to some group, or individually, in order to collect answers about some problem, observation, etc. Glasow (2005) considers two types of data collection methods:

1. Written (questionnaire); and,
2. Verbal (interviews).

Both types will be conducted with different objectives and different periods of co-creation evaluation.

Based on the co-creation evaluation, survey research were used in all of the co-creation types. Interviews were used to examine the co-initiation and co-evaluation, while questionnaire will be used on the co-design and co-implementation.

The interviews used open-ended questions to seek understanding and interpretation in different situation. In the co-initiation stage, interviews were aimed at identifying problems and to generate ideas for problem solving. In the co-evaluation stage, interviews were aimed at understanding the questionnaire results as well as to seek in-depth information of the several issues found in the questionnaire. Normally, only specific group of stakeholders was involved, taking in consideration there is a low degree of statistical validity due its low number and less broader profile of participants. Also there is a higher chance of bias on the answers in comparison of questionnaires. Confidential information can be collected, need of resource, time, etc. are spent and less errors happens on this type of survey.

Questionnaires are using closed-ended questions to gather highly standardised data. It will be conducted so the target respondents can give more generic inputs of design and implementation on the co-creation of public policies processes. Normally questionnaires are given to several people to

reach substantial statistical validity of hypothesis, for example already observed on the qualitative approach of survey (interview).

Before conducting the survey (questionnaire or interview), Glasow (2005) suggests to create a model that identifies the expected relationships among the variables (independent and dependent). Variables are used to define the scope of study, however, cannot be explicitly controlled by the researcher. Then is possible to test the model against observations of the phenomena analysing the data collected on interview or questionnaire.

The survey design

In designing the survey research, Levy and Ellis (2006) suggests two steps 1) sampling strategy and the procedure to obtain the representativeness of the population, including ensure reliability and 2) validity. The nature of this evaluation process is in between exploratory and explanatory. Explorative to find issues and explanatory to explain the effects of the pilots on the user-satisfaction and outcomes. For this purpose a the mixed method, including qualitative and quantitative method was used. The sampling strategy should follows these methods. Population for this survey research will be all stakeholders in each pilot, or in general, units of observation will be the Public Administration's employees, citizens and companies' employees which use the OGI innovation ecosystem. Participants of this co-creation survey should represents these units of observation.

The sample techniques was different for each co-creation type. The co-initiation and co-design used the non-probability sampling, and the co-implementation and co-evaluation used the probability sampling. The non-probability sampling is used because in the two first types of co-creation, the respondents will be selected by the ones that actually use the OGI tools and framework to identify the problems and propose the improvement of the public services based on the LOSD from PAs, citizens and companies.

For co-implementation and co-evaluation, survey participants were selected randomly, in order to reach stronger analysis to justify the use of OGI innovation ecosystem. The challenges of this technique was to minimise sampling bias and achieve a good representativeness. To deal with these issues, each pilot partner need to really carefully acknowledge the stakeholders of the system, for example number of employee, the demography of users (citizens and businesses), structure of the companies, etc. The list of questions helped partners addressing this issue.

3.1.1.3 Overview of Pilots' Co-Creation Steps, Tools, Methods, and Results Description

Table 3 summarizes the selected co-creation tools and methods chosen by each of pilots to implement and evaluate the co-creation steps. Further, a brief description of results from each of tools and method.

Table 3 – Overview of Pilots' Selected Co-Creation Tools and Methods

<i>Pilot</i>	<i>Co-Creation Steps in Year 2</i>	<i>Co-Creation Methods and Tools for Evaluation</i>	<i>Brief Description of Results</i>
Pilot 1 The Greek Ministry of Administrative Reconstruction (Greece)	Co-Implementation	Continued participation from User workshop	Update in application design and data quality improvement.
	Co-Evaluation	End-User acceptance and outcomes survey	Statistical analysis of Pilot feedback from participants
Pilot 2 Enterprise Lithuania (Lithuania)	Co-Implementation	Online continued participation from User workshop	Update in application design, new data sets included and data quality improvement.
	Co-Evaluation	End-User acceptance and outcomes survey	Statistical analysis of Pilot feedback from participants
Pilot 3 Tallinn Real Estate (Estonia)	Co-Implementation	Hackathon event to exploit the code and data sets Online discussion via Github about code and data sets by Hackathon participants	List of ideas from Hackathon participants Github statistical analysis (views, forks, changes) and list of suggestions in code and data sets
	Co-Evaluation	End-User acceptance and outcomes survey	Statistical analysis of Pilot feedback from participants
Pilot 4 Trafford Council Worklessness (England)	Co-Implementation	User workshop	Update in application design and data quality improvement.
	Co-Evaluation	End-User acceptance and outcomes survey	Statistical analysis of Pilot feedback from participants
Pilot 5 The Flemish Environment Agency (Belgium)	Co-Implementation	User workshop	Update in application design and data quality improvement.
	Co-Evaluation	Didn't performed an evaluation because application is under review.	Didn't performed an evaluation because application is under review.
Pilot 6 Marine Institute (Ireland)	Co-Implementation	User workshop	Update in application design and data quality improvement.
	Co-Evaluation	Didn't performed an evaluation because application is under review.	Didn't performed an evaluation because application is under review.

3.2 Pilots' Acceptance and Outcomes Evaluation Methodology

3.2.1 Pilots' Acceptance Selected Methodology

A combination of theories were employed to create to evaluate the user perspective. The focus was on an evaluation of user acceptance and intention of use for OGI. The list of main theories is described in the report D4.3 and is listed below:

1. TAM 1 by Davis (1989);
2. TAM 2 by Venkatesh and Davis (2000);
3. TAM 3 by Venkatesh and Bala (2008);
4. UTAUT Framework by Venkatesh, Morris et al. (2003); and,
5. IS Success Framework by Delone and McLean (2003).

The presents variables and (general) measured items for the pilots evaluation. However, as each pilot has its own characteristics in term of objectives, target audiences, type of data, type of services, OGI building blocks uses, and visualization,. the questionnaire created for the evaluation was slightly different to each pilot. We used the same foundation, however, we added specific questions for the pilot. The questionnaires of each pilot are described in the Section 7.2.

Table 4 - User Acceptance Evaluation for OGI

Variable	Measured Items	Source
Job Relevance (JR)	OGI toolkit makes mine and my colleagues job tasks easier to be accomplished. In my job, usage of the system is important. In my job, usage of the system is relevant.	Venkatesh and Davis (2000)
Output Quality (OQ)	The quality of the output I get from the OGI toolkit is higher compare to previous system. I have no problem with the quality of the OGI toolkit's output.	Venkatesh and Davis (2000)
Result Demonstrability (RD)	I have no difficulty telling others about the results of using the OGI toolkit. I believe I could communicate to others the consequences of using the OGI toolkit. The results of using the OGI toolkit are apparent to me. I would have difficulty explaining why using the OGI toolkit may or may not be beneficial.	Venkatesh and Davis (2000)
Perceived Ease of Use (PEU)	My interaction with OGI toolkit is clear and understandable. OGI toolkit usage does not require a lot of skills. I find it easy to get the OGI toolkit to do what I want it to do. I find the OGI toolkit to be easy to use.	(Davis 1989)
Perceived Usefulness (PU)	Using OGI toolkit improves my performance in my job tasks. Using OGI toolkit enhances my effectiveness in my job tasks. Using OGI toolkit in my job increases my productivity. I find the OGI toolkit to be useful in my job.	(Davis 1989)
Intention to Use (IU)	If I have access, I would use OGI toolkit.	(Davis 1989)

3.2.1.1 Pilots' Outcomes Selected Methodology

The outcomes evaluation is divided into a contribution to transparency, Reduction of Administrative Burden and Costs. These will be discussed next.

3.2.1.2 Transparency

Transparency has been used as a magic concept by government and public managers (Ward 2014). The usage of transparency is sometimes used as a synonym for accountability (Bovens 2007), openness (Coglianese 2009), and even open government data (Frank and Oztoprak 2015) as example. There are no clear definitions that are generally accepted by scholars in this field. This project takes into consideration transparency as a concept of an unilateral process of disclosure of data, information, and actions that an organisation has been conducting to the public (Peixoto 2013).

Transparency is a phenomenon that can lead to accountability, but does not guarantee any concrete result of justice or mobilisation, just public exposure to scrutiny (Fox 2007). In addition to the discussion of what is and what is not transparency, there are only a few models trying to explain and evaluate transparency. Matheus and Janssen (2013) proposed an evaluation model for transparency initiatives considering transparency as a multidimensional object based on many factors influencing two main dimensions: interpretation and accessibility. Facilitating conditions were added considering background and profile of users influencing transparency.

The OGI project will test if factors and facilitating conditions influence transparency dimensions positively or negatively. These factors designed as propositions with suggest the direction the factors contribute to, however, there is no prove for this in the literature. Our evaluation of the pilots contribute to understanding these propositions. The transparency model used in OGI evaluation is described in detail in the section 3.6.1 of D4.3. The table below summarizes the attributes evaluated and described each proposition in detail. The figure thereafter shows the graphical view of Transparency Model of Matheus and Janssen (2013).

Table 5 - Adapted Transparency Model for OGI Evaluation

<i>Dimension</i>	<i>Factor</i>	<i>P. #</i>	<i>Proposition</i>
Interpretation	<i>ibid</i>	P1	easier interpretation of data results in higher transparency
	Examples of usage	P2	presence of examples of the website product, the higher has a positive influence on interpretation.
	Simple Language used	P3	simple language has significant positive influence on transparency
	Data Quality	P4	higher information quality has a significant influence on interpretation
	Updatedness of Information	P4a	higher updated information has a significant influence on data quality.
	Completeness	P4b	higher data completeness has a significant influence on data quality
	Accuracy	P4c	higher data accuracy has a significant influence on data quality
Accessibility	<i>ibid</i>	P5	higher accessibility has a significant positive influence on transparency
	Simple Language	P5a	simple language has significant positive influence on transparency
	Data Overload	P5b	data overload has a significant negative influence on accessibility
	Adhesion to Standards	P5c	adhesion to standards has a significant positive influence on accessibility
	Unified Technology	P5d	unified use of technology has positive influence on accessibility
Facilitating Conditions	Experience	6a	the influence of interpretation on transparency will be moderated by experience
		6b	the influence of accessibility on transparency will be moderated by experience
	Age	7a	the influence of interpretation on transparency will be moderated by age
	Level of Education	8a	the influence of interpretation on transparency will be moderated by the level of education
		8b	the influence of accessibility on transparency will be moderated by the level of education

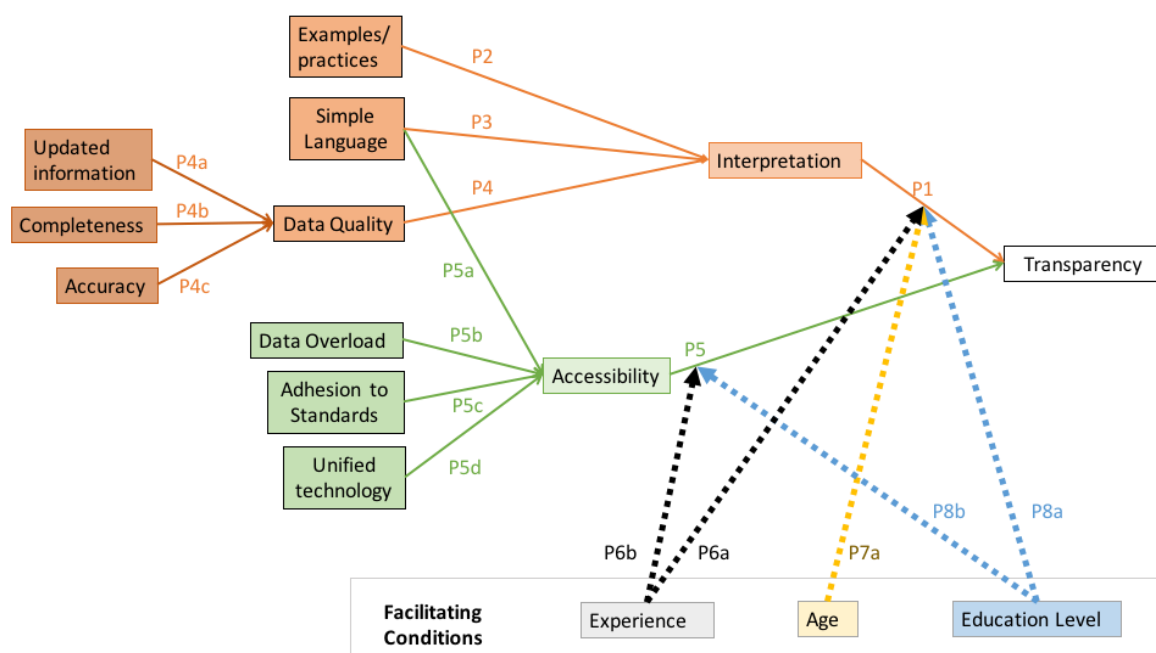


Figure 6 - Adapted Transparency Model for OGI Evaluation

Matheus and Janssen (2013)

3.2.1.3 Administrative Burden

Governments are facing issues to deliver more and better public services with less financial resources, time and people. Due these reasons, OGI evaluates how the OGI ICT toolkit can help to reduce the administrative burden. The evaluation methods are based on the Cost Benefit Assessment (CBA) approach, following the Study on eGovernment and the Reduction of Administrative Burden - SMART 2012/0061 (Gallo, Giove et al. 2014). The taxonomy of costs and benefits of Gallo et al. (2014) has been adapted.

The dimension considered for both Public Sector and Users Benefits, was divided in two categories e.g. direct and indirect benefits. The reason to focus only on Benefits is because the OGI consortium is interested in the benefits that OGI innovation ecosystem can provide. The figure below summarises the OGI focal point which is aimed at creating both advantages for the public sector and end-users.

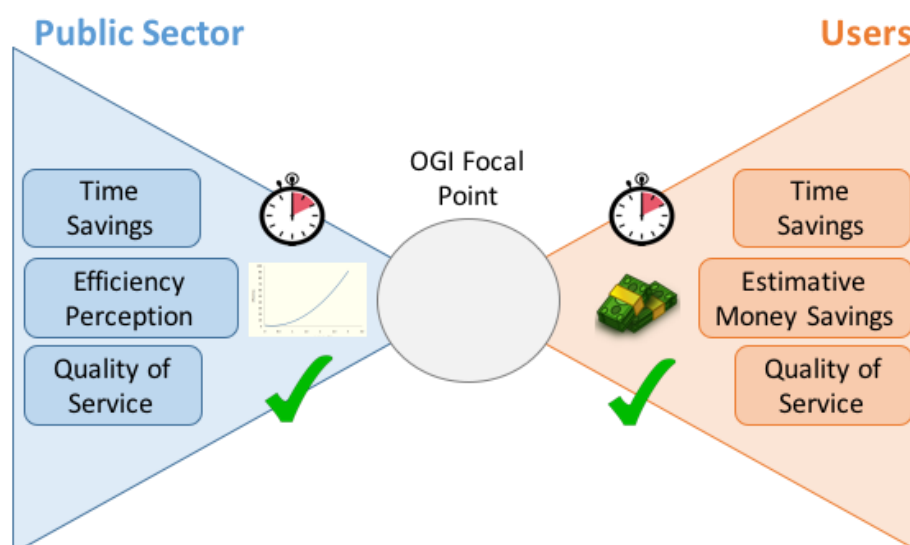


Figure 7- OGI Focal Point

Table 6 summarises the adapted taxonomy for Costs and Benefits of OGI innovation ecosystem for stakeholders.

Table 6 - Taxonomy for Benefits for OGI innovation ecosystem stakeholders

Dimension	Categories	Sub-Categories	Description
Benefits for Public Sector	Direct Benefits	Time Savings	Includes all monetizable benefits arising from improvements on public service delivery, including time savings before/after OGI innovative ecosystem implementation.
	Indirect Benefits	Efficiency perception	Encompass non monetizable benefits related to a better service delivery and the enhancement of the decision-making process.
		Quality of service	
Benefits to Users (citizens, businesses)	Direct Benefits	Time Saving	Includes all monetizable benefits arising from improvements on public service delivery, including time savings before/after OGI innovative ecosystem implementation.
	Indirect Benefits	Estimative Money Saving	Encompass non monetizable benefits related to a better service delivery and the enhancement of the decision-making process.
		Quality of service	

There was two ways to understand "benefits for Public Sector". First as organisation, and second as people involved on the processes. Taking in consideration the OGI innovation ecosystem, we decided to take approaches depending on pilots. Some pilots have clear boundary between Public

Sector (organisation and people – civil servants, policy makers, etc.) and users (citizens, businesses, etc.). However, other pilots didn't have a clear boundary between Public Sector and users, because the users are on the Public Sector (civil servants, policy makers, etc.).

The summary of data collection methods is presented at Table 6 and the planned questions of questionnaires and interviews are at section 7.2.

1. Time savings

Time savings can be determined in two types of scenarios. If the public service already existed, it is possible to measure how much time in days or hours a civil servant or citizen/business person performed the task or receive the public service delivery. The measure can be collected using the log observations of the service delivery, researcher observation of process (in person) or via survey (questionnaire and/or interview).

If the public service did not exist yet and a new service was created, measures comparing similar processes or collect data from users (civil servants, citizens, business person, etc.) from a perception or expectation perspective will be used. Next a Likert scale based on level of satisfaction with time spent on public service (1- very dissatisfied to 5-very satisfied) will be used to measure the perceived time savings.

2. Efficiency Perception

Efficiency perception considers the measuring of the perception of people who use public sector data in the OGI pilots. People might have experience to use open data and can compare this with the use of the data in the OGI pilot. This is a perception of the users and it does not mean quantifying the time savings like in the previous measure.. The objective of this measure is to identify if public sector users (civil servants, public managers, etc.) perceive if there is an improvement in efficiency. To measure the efficiency perception, a questionnaire will be conducted among pilot users. The questionnaire uses a Likert scale for measuring the level of agreement (1 strongly disagree to 5- strongly agree) with an increase in efficiency.

3. Estimative Money Savings

Money savings look like a hard measurement, but is often hard to quantify and has to rely on estimates. Taking this in consideration, the approach used a perception or expectation perspective for expenses saving by comparing the situations before and after implementation of OGI pilots. A questionnaire was used to collect data based on a Likert scale of agreement (1 strongly disagree to 5- strongly agree) and open question was used to ask users how much expenses were avoided.

4. Quality of Service

Quality of service considers two potential scenarios. If the public service already existed, it is possible to measure the level of quality using a Likert scale (1-poor to 5- excellent) of the current service and compare the outcomes with the ranking on the past service (1- much worse to 5- much better). If any issue was identified on this questionnaire, further interviews were conducted to further analyse the issue.

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If the public service doesn't exist and a new one was created, perception data about the quality of the new service was collected from the users (civil servants, citizens, business person, etc.) using a survey. A Likert scale was used measuring the level of satisfaction with quality of public service (1- very dissatisfied to 5-very satisfied).

3.2.1.4 Pilots' Acceptance and Outcomes Evaluation Questionnaire

In this section, we surveyed Pilots' end-users about their perceptions of using the OGI pilots Applications. The categories collected and evaluated are described in the Table 7:

Table 7 – Pilots' Outcomes Evaluation Questionnaire

<i>Outcomes Categories</i>	<i>Description</i>	<i>Number of questions</i>	<i>Source</i>
User Information	This section aims to introduce and explain the pilot application, describe the survey and identify general background information. For example, key questions if end-user is aware about Linked Open Data, the OGI Project and the specific pilot end-user is using.	2 questions	Created by authors
User Acceptance	This sections aims to identify if End-Users accepts the functionalities that pilot applications offer. For example, if the functionalities are in accordance with end-users needs, or, if the app does not crash.	13 questions and an open question in the final for general comments.	Adapted from Davis (1989); Venkatesh and Davis (2000); Venkatesh and Bala (2008); Venkatesh, Morris et al. (2003); and, Delone and McLean (2003)
Data Sets	This section aims to identify if End-Users accepts the available data sets in the pilot application has the desired or needed data quality standard.	5 questions and an open question in the final for general comments.	Adapted from Dodds (2016) and Matheus and Janssen (2013)
Results	This section aims to identify if End-Users accepts that pilot application can deliver expected results and outcomes. For example, if the pilot application can increase Transparency or can reduce the Administrative Burden and Costs.	10 questions and an open question in the final for general comments.	Adapted from Gallo, Giove et al. (2014)

For each pilot an end-user questionnaire was developed and distributed among users.

1. Pilot 1 – The Greek Ministry of Administrative Reconstruction (Greece)

- a. End-User Questionnaire (Section 7.2.1).

2. Pilot 2 – Enterprise Lithuania (Lithuania)

- a. End-User Questionnaire (Section 7.2.2)

3. Pilot 3 – Tallinn Real Estate (Estonia)

- a. End-User Questionnaire (Section 7.2.3)

4. Pilot 4 – Trafford Council *Worklessness* (England)

- a. End-User Questionnaire (Section 7.2.4)

5. Pilot 5 – The Flemish Environment Agency (Belgium)

- a. End-User Questionnaire (Section 7.2.5)

6. Pilot 6 – Marine Institute (Ireland)

- a. End-User Questionnaire (Section 7.2.6)

3.3 OGI ICT Toolkit Evaluation Methodology

To evaluate the implementation of OGI ICT Toolkit in the third Year we created the ICT Toolkit Questionnaire to measure the OGI Data Quality, OGI Architecture, System Quality of Application, and to externally evaluate the OGI ICT Toolkit.

The OGI ICT toolkit consists of building blocks that were developed for performing a certain functionality. Table 8 shows the evolution of the tools (building blocks) names and the merges of tools over the three years of projects and the accompanying deliverables (D3.1, D3.2, D3.3, D3.4, D3.5 and D3.6). Figure 8 summarizes the OGI data cycle and the tools for each step.

Table 8 - OGI Toolkit Releases and Tools per year

	1st Release (Based on D3.1 and D3.2)	2nd Release (Based on D3.3 and D3.4)	Full version (Expected D3.5 and D3.6)
A- Previous Project Results	1. Grafter	1. Grafter	1. Grafter
	-	2. Data Cube Builder	2. Data Cube Builder
B- OGI Toolkit	2. Data Cube OLAP Browser	3. Data Cube OLAP Browser	3. Cube Explorer
	3. Data Cube Explorer	4. Data Cube Explorer	
	4. Data Cube Visualizer	5. Data Cube Visualizer	
	1. JSON API for Data Cube	1. JSON API for Data Cube	1. CubiQL API
	2. Table2QB	2. Table2QB	2. Table2QB
	3. Data Cube Aggregator	3. Data Cube Aggregator	3. Cube Aggregator
	-	4. LOSD Machine Learning Component	4. LOSD Machine Learning Component
	-	5. SPARQL connector for Exploratory	5. SPARQL connector for Exploratory
	-	-	6. DataScience SPARQL plugin
	-	-	7. Data Cube RDF Validator
C- Pilot Specification Tools	-	1. Assisted Cube Schema Creator	1. Assisted Cube Schema Creator
	-	2. QB Multi-Dimensional Charting	2. QB Multi-Dimensional Charting
	-	3. RDF Data Cube Geo-Data Supported for Dashboard	3. RDF Data Cube Geo-Data Supported for Dashboard
	-	-	4. Data Cleansing Tools
	-	-	5. Data Collection Tools

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	-	-	6. Custom Mappings and Scripts
	-	-	7. ShinyR
	-	-	8. Superset + Druid

Table 8 - OGI Toolkit Releases and Tools per year

	1st Release (Based on D3.1 and D3.2)	2nd Release (Based on D3.3 and D3.4)	Full version (Expected D3.5 and D3.6)
A- Previous Project Results	1. Grafter	1. Grafter	1. Grafter
	-	2. Data Cube Builder	2. Data Cube Builder
B- OGI Toolkit	2. Data Cube OLAP Browser	3. Data Cube OLAP Browser	3. Cube Explorer
	3. Data Cube Explorer	4. Data Cube Explorer	
	4. Data Cube Visualizer	5. Data Cube Visualizer	
	1. JSON API for Data Cube	1. JSON API for Data Cube	1. CubiQL API
	2. Table2QB	2. Table2QB	2. Table2QB
	3. Data Cube Aggregator	3. Data Cube Aggregator	3. Cube Aggregator
	-	4. LOD Machine Learning Component	4. LOD Machine Learning Component
	-	5. SPARQL connector for Exploratory	5. SPARQL connector for Exploratory
	-	-	6. DataScience SPARQL plugin
	-	-	7. Data Cube RDF Validator
C- Pilot Specification Tools	-	1. Assisted Cube Schema Creator	1. Assisted Cube Schema Creator
	-	2. QB Multi-Dimensional Charting	2. QB Multi-Dimensional Charting
	-	3. RDF Data Cube Geo-Data Supported for Dashboard	3. RDF Data Cube Geo-Data Supported for Dashboard
	-	-	4. Data Cleansing Tools
	-	-	5. Data Collection Tools
	-	-	6. Custom Mappings and Scripts
	-	-	7. ShinyR
	-	-	8. Superset + Druid

Figure 8 shows how the various OGI Tools can be used in the LOSD work flow. The workflow start with the raw data that might need to be prepare and ends with the visualization.

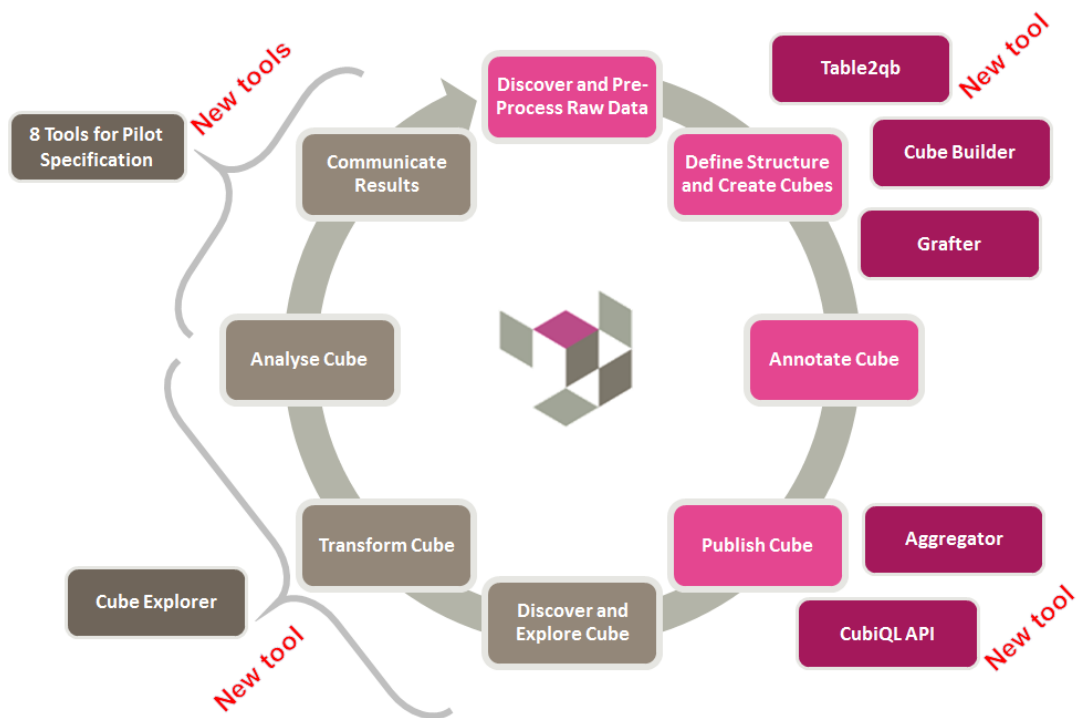


Figure 8- OGI Tools and Working Flow

Table 9 shows the list of tools, the links to the OGI Github code source (<https://github.com/OpenGovIntelligence>) and the pilots which are using these tools. Important to highlight is that the colours used are the same as in Table 8 to show the connection between them.

Table 9 - OGI Tools used in Pilots

Tools	Pilots					
	MAREG (Greece)	Lithuania Enterprise	Trafford (England)	The Flemish Government (Belgium)	Marine Institute (Ireland)	Ministry of Economics (Estonia)
Grafter (Private Tool) www.goo.gl/vaGzLc	X		X			X
Tarql – Cube Builder https://goo.gl/fQ9YQx		X		X	X	
Cube Explorer (NEW) www.goo.gl/WLC6zh		X			X	
Cube Browser www.goo.gl/b57zpX	X					X
Cube Visualizer www.goo.gl/hc9QGj	X					X
CubiQL API (NEW) www.goo.gl/tbZuPg	X	X	x		X	X
Table2QB (NEW) www.goo.gl/JgMKvx	X	X	X	X	X	X
Cube Aggregator www.goo.gl/urSj5V	X	X			X	X
LOSD Machine Learning Component (NEW) https://goo.gl/c2gkV9					X	
SPARQL connector for Exploratory (NEW) www.goo.gl/7AeYVF				X		
Validator (NEW) www.goo.gl/Kn6Bhh	X	X	X		X	X
Assisted Cube Schema Creator (NEW) https://goo.gl/BCLW2s		X			X	
QB Multi-Dimensional Charting		X				
RDF Data Cube Geo-Data Supported for Dashboard						
Data Cleansing Tools	X	X	X	X	X	X
Data Collection Tools	X	X	X	X	X	X
Custom Mappings and Scripts	X	X	X	X	X	X
ShinyR						X
SuperSet + Druid		X			X	

3.3.1 OGI Pilots' Data Quality Evaluation Methodology

To evaluate the implementation of OGI Data Quality in the third year we created a Data Quality Questionnaire. The Data Quality Questionnaire is inspired in the Open Data Institute blog post “Exploring Open Data Quality (<https://theodi.org/blog/exploring-open-data-quality>) by Leigh Dodds (Dodds, 2016). Table 10 describes the data quality attributes, their descriptions, the number of questions in the questionnaire and the source from where they were collected or inspired. The questionnaire with all the questions is presented in Table 21. The link to the online form is: <https://docs.google.com/forms/d/e/1FAIpQLSeCl3fIPZIGYEWWhhASTEnwF6GkMERIxZ8OWjkKpJCmqRLwoA/viewform>.

Table 10 – Pilots' Data Quality Questionnaire

<i>Data Quality Section</i>	<i>Description</i>	<i>Number of questions</i>	<i>Source</i>
Discoverability and Usability	This sections aims to identify the application characteristics that will influence in some attributes of data qualities below. For example, if the website or application has an option for downloading data. This influences the level of granularity.	7 questions	Created by authors.
Granularity	This section aims to identify the level of granularity. The desired level of granularity varies according to the problem being addressed. For example, if the data is in aggregated level (average sex instead of individual data) or timely option for download (per year average, per month, per week, per day).	3 questions	Frank and Walker (2016)
Intelligibility	This section aims to identify immediate intelligibility. This gives quality to the data in the sense of readability and increase immediate understand by users. For example, if there is a documentation giving context for humans understand the data and see how is possible to use it in human or machine ways.	1 question and open for commentary	
Trustworthiness	This section aims to identify data quality attributes that increase the trust in data. For example, if the source is trusted, if who is in charge of data is aware about how it was collected and created.	5 questions	
Linkable to other data (5 Stars LOD)	This section aims to identify data quality attributes to Linking the data to other opened datasets. For example, if the data is in CSV or RDF format.	4 questions	Bizer et al (2009)
15 Open Data Principles	This section aims to identify data quality attributes related with the 15 Open Data Principles such as timely, accessible and primary.	9 questions	OPENGOV DATA (2018)

3.3.2 Standard for Systems and Software Quality Requirements and Evaluation – ISO 25010 and ISO 25012

Evaluation of OGI ICT toolkits is divided in two categories. The first of building blocks and the second for evaluation of cubes design. The summary of data collection and methodology of evaluation is presented at Table 11.

Table 11 - Cube Design and Building blocks data collection and methodology methods of Evaluation

Category	Target groups	Data Collection Approach	Methodology of Evaluation
Product Quality	ICT Partners and IT Department of PAs	Questionnaire and Structured observation of application/website	ISO/IEC 25010
Quality in Use			
System's Data Quality			ISO/IEC 25012

Since the beginning, criteria for evaluation the OGI toolkit needs to be defined. Scientific literature review couldn't provide us an extensive list of standards and requirements organised and structured. On the other hand, ISO/IEC 25010:2011, the standard for Systems and Software Quality Requirements and Evaluation (ISO/IEC, 2010), presents a structured list of requirements for building blocks and systems, which we considered for cubes design.

ISO 25010 is adopted as the evaluation method for OGI ICT toolkit. ISO 25010 is organised in 8 parameters which are divided into 30 measurement variables presented at Table 12.

Table 12 - OGI Toolkit Requirements for Evaluation

No	Parameter	Description	Measured by	Description
1	Functionality	the degree to which the OGI solution platform provides functions that meet stated and implied needs when used under specified conditions	Functional completeness	the set of functions covers all the specified tasks and user objectives
			Functional correctness	the correct results with the needed degree of precision
			Functional appropriateness	the accomplishment of specified tasks and objectives
2	Performance	the degree to which the OGI solution platform performs relative to the amount of resources used under stated conditions	Time behaviour	the response and processing times and throughput rates of a product or system, when performing its functions, meet requirements.
			Resource Utilization	the amounts and types of resources used by a product or system, when performing its functions, meet requirements.
			Capacity	the maximum limits of a product or system parameter meet requirements.

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3	Compatibility	the degree to which the OGI solution platform can exchange information with other products, systems or components, and/or perform its required functions, while sharing the same hardware or software environment.	Coexistence	perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact on any other product.
			Interoperability	exchange information and use the information that has been exchanged.
4	Usability	the degree to which the OGI solution platform can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use	Appropriateness recognizability	users can recognize whether a product or system is appropriate for their needs.
			Learnability	can be used by specified users to achieve specified goals of learning to use the product or system with effectiveness, efficiency, freedom from risk and satisfaction in a specified context of use.
			Operability	has attributes that make it easy to operate and control.
			User error protection	protects users against making errors.
			User interface Aesthetics	user interface enables pleasing and satisfying interaction for the user.
			Accessability	can be used by people with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use.
5	Reliability	The degree to which the OGI solution platform performs specified functions under specified conditions for a specified period of time.	Maturity	meets needs for reliability under normal operation.
			Availability	operational and accessible when required for use.
			Fault tolerance	operates as intended despite the presence of hardware or software faults.
			Recoverability	recover the data directly affected and re-establish the desired state of the system.
6	Security	the degree to which the OGI solution platform protects information and data so that persons or other products or systems have the degree of data access appropriate to their types and levels of authorization	Confidentiality	ensures that data are accessible only to those authorized to have access
			Integrity	prevents unauthorized access to, or modification of, computer programs or data
			Non-repudiation	proven to have taken place, so that the events or actions cannot be repudiated later
			Accountability	actions of an entity can be traced uniquely to the entity
			Authenticity	identity of a subject or resource can

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				be proved to be the one claimed
7	Maintainability	the degree to which the OGI solution platform can be modified to improve it, correct it or adapt it to changes in environment, and in requirements	Modularity	composed of discrete components such that a change to one component has minimal impact on other components
			Reusability	an asset can be used in more than one system, or in building other assets
			Analysability	possible to assess the impact on a product or system of an intended change to one or more of its parts, or to diagnose a product for deficiencies or causes of failures, or to identify parts to be modified
			Modifiability	effectively and efficiently modified without introducing defects or degrading existing product quality
8	Portability	the degree to which the OGI solution platform can be transferred from one hardware, software or other operational or usage environment to another	Adaptability	can effectively and efficiently be adapted for different or evolving hardware, software or other operational or usage environments
			Installability	can be successfully installed and/or uninstalled in a specified environment
			Replaceability	can replace another specified software product for the same purpose in the same environment

Source: (ISO/IEC, 2010)

The quality in use relates to the impact or outcome of the product when used in particular context and consists of 5 parameters which are divided into 11 measurement variables as shown in Table 13.

Table 13 - Criteria for Evaluation of Quality in Use

No	Parameter	Description	Measured by	Description
1	Effectiveness	accuracy and completeness with which users achieve specified goals	-	-
2	Efficiency	resources expended in relation to the accuracy and completeness with which users achieve goals	-	-
3	Satisfaction	the degree to which the user needs are satisfied when using the OGI solution platform in a specific context of use	Usefulness	degree to which a user is satisfied with their perceived achievement of pragmatic goals, including the results of use and the consequences of use
			Trust	degree to which a user or other stakeholder has confidence that a product or system will behave as intended
			Pleasure	degree to which a user obtains pleasure from fulfilling their personal needs
			Comfort	degree to which the user is satisfied with physical comfort
4	Freedom from Risk	the degree to which the OGI solution platform mitigates the potential risk of the usage	Economic Risk Mitigation	the potential risk to financial status, efficient operation, commercial property, reputation or other resources in the intended contexts of use
			Health and Safety Risk Mitigation	the potential risk to people in the intended contexts of use
			Environmental Risk Mitigation	the potential risk to property or the environment in the intended contexts of use
5	Context coverage	the degree to which the OGI solution platform can be used with effectiveness, efficiency, freedom from risk and satisfaction in both specified contexts of use and in contexts beyond those initially explicitly identified	Context Completeness	can be used with effectiveness, efficiency, freedom from risk and satisfaction in all the specified contexts of use
			Flexibility	can be used with effectiveness, efficiency, freedom from risk and satisfaction in contexts beyond those initially specified in the requirements

Source: (ISO/IEC, 2010)

During the evaluation, each measurement variable was assessed from the user perspective, such as public administration offices, citizens and businesses. Their input was used to improve the OGI solution platform by the consortium and the revision was evaluated again during the next stage of pilot.

3.3.3 User Experience (UX) and User Interface (UI) testing

While user experience (UX) is a term that have been used on practice and scientific literature, but is hardly deep described or conceptualized in a uniform manner. After conducting 275 interviews on the UX area and deep literature review, Law, Roto et al. (2009) realised the reasons due an ill-description and ill-conceptualisation of UX:

1. First because broad range of fuzzy and dynamic concepts, including emotional, affective, experiential, hedonic, and aesthetic variables.
2. Second, because flexibility on analysis since single point to a holistic process.
3. Third due the fragmented and theoretical models involved on UX domain.

Hassenzahl and Tractinsky (2006) conceptualizes UX as *"a term associated with a wide variety of meanings ranging from traditional usability to beauty, hedonic, affective or experiential aspects of technology use"* (Forlizzi and Battarbee 2004). Garrett (2010) structures user experience as a project with five dimensions and two product layers (as functionality and as information), from the more abstract to the more concrete: strategy, scope, structure, skeleton and surface. This structured is presented at Figure 9.

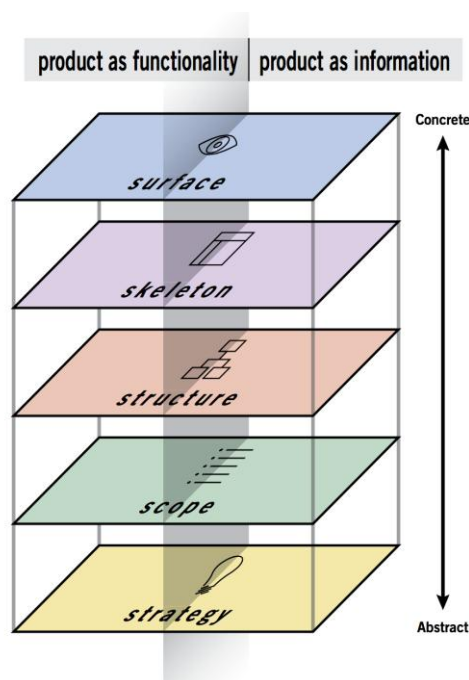


Figure 9 - UX Structure and layers of product and information

Source: Garret (2010)

To improve the usability of software and information systems, the paradigm of user-centred design, International Organization for Standardization (ISO) 13407, Human-centred design processes for interactive systems, is a standard that provides guidance for user-centred design (Jokela, livari et al. 2003).

The ISO 9241-210 replaced the ISO 13407, which aimed to provide guidance on achieving quality in use by incorporating user centred design activities throughout the life cycle of interactive computer-based systems. ISO 9241-210 standard describes 6 key principles that will ensure your design is user centred (Travis 2011):

1. The design is based upon an explicit understanding of users, tasks and environments.
2. Users are involved throughout design and development.
3. The design is driven and refined by user-centred evaluation.
4. The process is iterative.
5. The design addresses the whole user experience.
6. The design team includes multidisciplinary skills and perspectives.

ISO 9241-210 recommends the use of "ripple effect". It means to plan in advance all the possibilities of tools and scenarios of usage before implementing. After implementation, scenario, tools, activities, goals, etc., can change, and influence the result. If the plan is well conceptualised, the plan is likely to succeed. Figure 10 visualizes an example path taken due changes of plans made during the implementation.

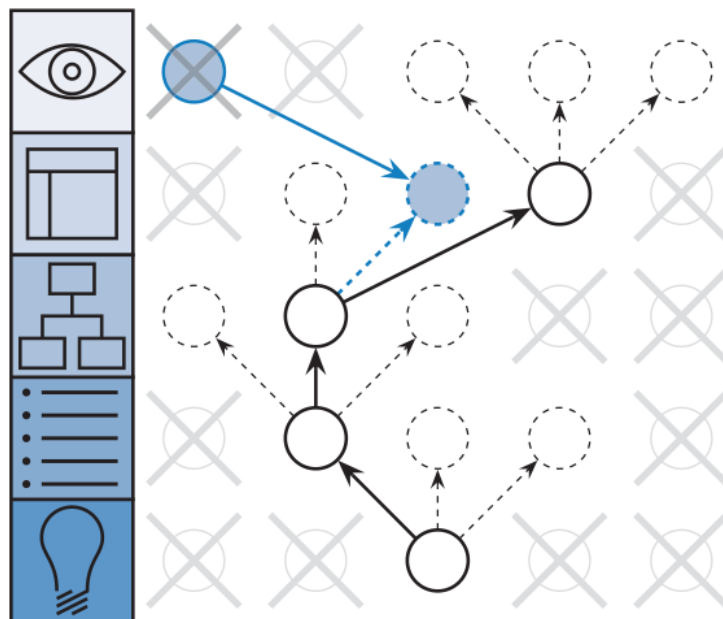


Figure 10 - The ripple effect

Source: Garret (2010)

Further to the explanations given on ISO 9241-210 (Travis 2011) and (13407 Travis 2011), on both standards, there is no clear guidelines of steps to implement UX. Filling in this void, Jokela et al (1999) proposed a guideline to fill this blank comparing both standards. The guideline consists of 6 steps:

1. Identify need for human-centred design;
2. Understand and specify the context of use;
3. Specify the user and organisational requirements;
4. Produce design solutions;
5. Evaluate design against requirements (loop to step 1 if not reach desired requirement); and,
6. System satisfies specified user and organisational requirements.

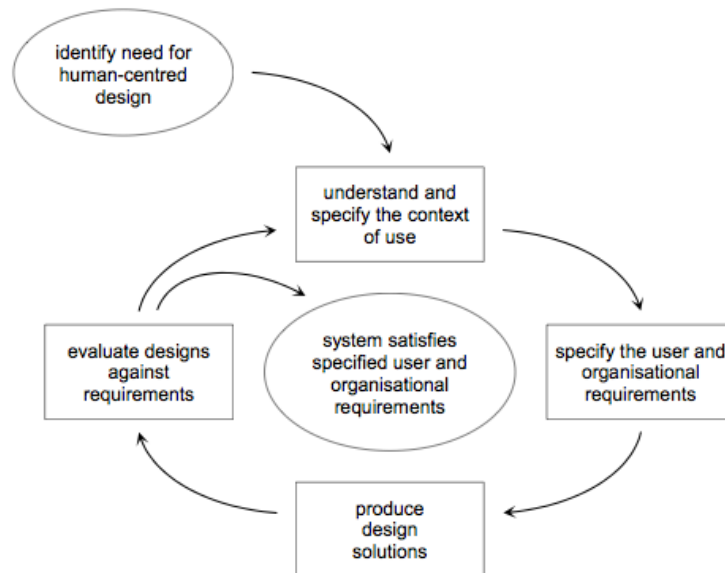


Figure 11 - UX implementation and evaluation steps

Source: Jokela et al. (2003)

Besides the steps to conduct implementation of UX, it was also identified by Jakola et al. (1999) that measures are not created to identify efficiency or any goal that should be reached. For this, we consider to use the ISO/IEC 25010:2011 (ISO/IEC 2010).

The ISO/IEC 25010:2011 has a parameter called "usability" in which 6 measures define if a system is usable. If consortium identify the need to improve this usability, the Albert and Tullis (2013) evaluation method can be used as auxiliary. We consider that User Interface (UI) is a complementary effect of UX and associated with look, feel and interactivity of system. It is already measured on the UX standards and ISO 25010:2011, in special on the evaluation quality of use.

4 OGI Evaluation Results

This section is divided in two main sections. The first section 4.1 shows the Pilot's Evaluation Results. The first section includes the evaluation of:

1. Pilots' Co-creation;
2. Pilots' acceptance of OGI App; and,
3. Pilots' outcomes
 - a. Transparency; and,
 - b. Administrative burden.

The second section **Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.** shows the OGI ICT Toolkit Evaluation Results. The second section includes the evaluation of:

1. OGI Data Quality;
2. OGI Architecture;
3. System Quality of Application; and,
4. External evaluation of OGI ICT Toolkit.

4.1 Pilots' Evaluation Results

This section presents evaluation results of the six pilots. The Figure 12 below summarizes the common flow of activities performed in pilots during implementation and evaluation.

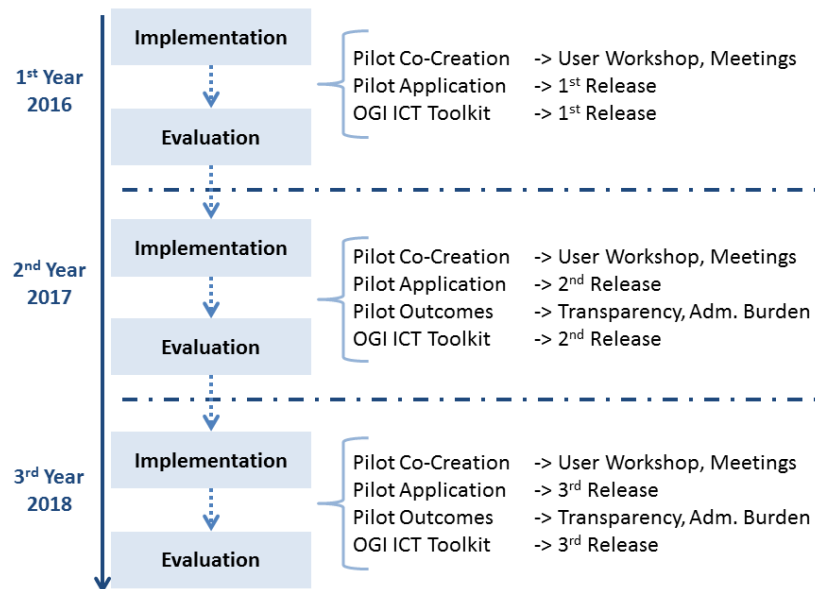


Figure 12 – Common flow of pilots activities

4.1.1 Pilot 1 – The Greek Ministry of Administrative Reconstruction (Greece)

4.1.1.1 Pilot Description and Expectation

The Greek pilot is coordinated by the Greek Ministry of Administrative Reconstruction (MAREG) and has as initial objective to improve the monitoring and management of Government Vehicles used by all Greek Public Agencies. The data that MAREG possesses for this monitoring and management originate from different sources have not been yet properly defined, structured and combined in order to be converted to meaningful information to facilitate internal decision-making and to increase transparency towards the public.

Taking into consideration the results of the first iteration, the updated target groups (A) and expected user scenarios (B) are presented below:

A- Target Groups:

1. Decision makers of MAREG
2. Public Agencies operating Government Vehicles

B- Expected User Scenarios:

1. As a user I want to be able to have an overview of all Government Vehicles operating in Greece based on descriptive statistical measures
2. As a user I want to have an overview of all Government Vehicles operating in each Public Agency
3. As a user I want to have an overview of Government Vehicles per Municipality
4. As a user I want to have an overview of Government Vehicles per Prefecture
5. As a user I want to have an overview of Government Vehicles per Region
6. As a user I want to search municipalities according to their population and have an overview of the Government Vehicles operating in them
7. As a user I want to search municipalities according to their altitude and have an overview of the Government Vehicles operating in them

For a detailed description of MAREG and Greek pilot, please check report D1.1 and D4.1.

4.1.1.1.1 Identified Pilot Problems in the First Year

MAREG invited pilot's stakeholders for this workshop with the objective to introduce them to the pilot's objective and extract from participants' useful inputs for Greek pilot and OGI ICT toolkit development. Important to highlight, all the workshops performed on this evaluation process were conducted using the Delbecq et al. (1975) methodology. Below, the list of Greek workshop objectives:

- Optimize monitoring and management of Government Vehicles
- Facilitate internal decision-making
- Minimize operational costs related to Government Vehicles
- Increase transparency on data related to Government Vehicles

From this, the following questions were purposed to participants.

Table 14 - Co-Creation User Workshop Questions

Question number	Question
1	Describe the main problems encountered in your interaction with the Ministry of Administrative Reconstruction regarding Government Vehicles?
2	What do you think are the causes of these problems?
3	What are the proposed solutions to these problems?
4	How do you think the current pilot could help towards these solutions by using linked open data?
5	What useful information would you like to be produced by combining the data sets available?
6	How will this information facilitate your daily work?
7	What services do you think could be available to the public?
8	What data could be openly available to the public?

The Greek pilot is mainly addressed to internal government users as it aims to facilitate internal decision-making. The use cases refer to user's need for accurate information on Government Vehicles. This section presents two examples of the need for such reporting:

- The Ministry of Administrative Report needs to reply to a parliamentary question about the number of Government Vehicles that operated by all Public Agencies. For this direct access to accurate data about the actual number of Government Vehicles, as well as statistical measures, such as their average cubic capacity, or their average fuel consumption per kilometre is needed.
- Public Agency X requests the permission to acquire a new four-wheel drive 2.000 cc car. User Y of the Department in charge of Government Vehicles needs to get a detailed overview of how many Government Vehicles operate in each Public Agency, as well as a summary of their technical specifications (e.g. average cubic capacity).

After 30 minutes of ideation, participants were invited to explain their perspectives, bringing ideas and solutions for the issues identified on the questions at Table 14.

Table 15 - Summary of Ideas and Solutions from participants

<i>Problems</i>	<i>Solutions</i>
Data Quality	Open API Solutions, Automatic dataset updates, Manual data cleansing
Data Integrity	Involve government agencies
Data is not open	Open API solutions, common license template
Data sets are not linked	Use OGI Tools to link datasets
Reports from data needed	Use visualization tools and link datasets to derive reports

The main data set which contains descriptive data about Government Vehicles consists of data that were collected regularly by means of a spreadsheet template that was sent to all Government Vehicles beneficiaries and were not extracted from an Information System. This spreadsheet template did not follow any standards, nor had any specific guidelines, which resulted in ad hoc data entry by users. This is the most serious problem recognised at the workshop and different solutions were suggested for it by participants.

The problem of data integrity was also connected to the method of data collection, as well as with the non-existence of an Information System available to end-users, who would also contribute in data updates. In the current situation, Government Vehicles data needs to be updated manually by users of the Ministry of Administrative Reconstruction. The OGI project will therefore serve as an opportunity to review available datasets.

The problems of data not opened and not linked to each other, as well as the lack of standardised reports that would facilitate internal decision-making are also connected with the absence of an Information System for Government Vehicles and shall be addressed by the OGI project.

The list of organisations in order in English is presented below:

1. Ministry of Administrative Reconstruction (MAREG) – OGI Research team;
2. Ministry of Administrative Reconstruction (MAREG) – Government Vehicles Department;
3. Ministry of Infrastructure, Transport and Networks;
4. Hellenic Police; and,
5. Ministry of Finance – Public Property Management Directorate.

4.1.1.1.2 Solutions for Pilot problems in Second Year

Some of the problems identified were solved in the second year and marked as “done”. If not yet solved, it was planned to be deployed in the third year and were considered as “in progress”.

Table 16 - Summary of Ideas and Solutions from participants

Problems	Solutions	Actions Taken	Status
Data Quality	Open API Solutions, Automatic dataset updates, Manual data cleansing	<p>Considering the main issue for data quality is the creation of proper ontology and metadata, the Greek pilot has 60% done.</p> <p>For example, not all the agencies agree in terms used to label the data. While part of agencies use abbreviation for names and other use the full name.</p>	<i>In Progress.</i>
Data Integrity	Involve government agencies	<p>In the first year of project, three data sets were found with similar data to describe the governmental vehicles and their status, performance, etc.</p> <p>In the second year, it was decided which would be the selected data set. After that, the data quality to find common sense of what are the useful data, metrics and ontology to be used. This issue is connected with the issue Data Quality.</p>	<i>Done.</i>
Data is not open	Open API solutions, common license template	Data sets were linked by technical partners and data cubes were created	<i>In Progress.</i>
Data sets are not linked	Use OGI Tools to link datasets	Data sets were linked by technical partners and data cubes were created.	<i>In Progress.</i>
Reports from data needed	Use visualization tools and link datasets to derive reports	<p>Pivot table on the top of the CubiQL API.</p> <p>There is no stable version for all pilots and is still being developed by technical partners.</p> <p>The visualization will be solved using the Pivot Table on the top of the CubiQL API.</p>	<i>In Progress.</i>

4.1.1.1.3 Solutions for Pilot problems in Third Year

Part of the problems identified were solved in the second year and marked as “done” or description of the last status achieved by the pilot.

Table 17 - Summary of Ideas and Solutions from participants

Problems	Solutions	Actions Taken	Status
Data Quality	Open API Solutions, Automatic dataset updates, Manual data cleansing	Considering the main issue for data quality is the creation of proper ontology and metadata, the Greek pilot has 100% done. A lot of time was spent on this task because the data cleansing was made manually	Done in the Third Year of Implementation
Data Integrity	Involve government agencies	In the first year of project, three data sets were found with similar data to describe the governmental vehicles and their status, performance, etc. In the second year, it was decided which would be the selected data set. After that, the data quality to find common sense of what are the useful data, metrics and ontology to be used. This issue is connected with the issue Data Quality.	Done in the Second Year of Implementation
Data is not open	Open API solutions, common license template	Data sets were linked by technical partners and data cubes were created	Done. Open via SPARQL endpoint
Data sets are not linked	Use OGI Tools to link datasets	Data sets were linked by technical partners and data cubes were created.	Done. Linked by default.
Reports from data needed	Use visualization tools and link datasets to derive reports	An application was created using the Cube Visualizer, producing data visualization. Check Figure 15.	Done.

4.1.1.2 Pilot Co-Creation Framework Evaluation

The Co-Creation in the Greek pilot is connected with the section 4.1.1.3 about Data Quality Evaluation. Taking into consideration the data quality situation of Greek pilot, technical partners and the person in charge of pilot decided to focus to increase the data quality before creating the application. This happened due existent data sets from different sources inside the government with divergent data about the same vehicles. These data sets must to be compared and the only data set that Greek pilot MAREG had was unstructured, resulting from *ad hoc* data entry and full of errors. The complete list of other issues identified in the Greek pilot were already describe above in the section 4.1.1.1. A blog post about Greek pilot was also created in the OGI Medium to summarise this scenario: <https://medium.com/opengovintelligence/opengovintelligence-showcase-the-greek-pilot-90639ae3fd3d>.

Further, the first step was to perform data cleansing and data comparison along with CERTH, which resulted in a total number of structured data records that amounted to 40% of the entire fleet. The next step demanded the validation of the existing data and data collection for the remaining 60% of the fleet. To encounter these problems, MAREG along with CERTH, elaborated a detailed plan for data validation with input from end-users. This included the development of a web app for data validation, where users will log in, view their Government Vehicles data and validate them, by editing, adding or deleting vehicles. This web app was created by CERTH using a free open source tool for the development of Linked Data Applications created by the Callimachus project (<http://callimachusproject.org/>), in honour of the Greek poet and scholar at the Library of Alexandria (<https://en.wikipedia.org/wiki/Callimachus>).


The next step demands the contribution of end-users, mostly employees of Decentralized Administrations in charge of Government Vehicles, who need to log in and provide feedback on the validity of the initial data imported in the app. The success of this step demands the imposition of the participation of all end-users by the top management in MAREG, preferably by the Minister herself. An existing risk that needs the attention of the Greek Pilot team is the recent change in the organization chart of MAREG, which brought by change in the duties of the new structure, as well as change of people now in charge of the management and supervision of Government Vehicles.

The following flowchart provides a description of the main steps of data validation, as part of the co-creation process:




Figure 13 – Greek Pilot Co-Creation Steps

The following screenshot shows the homepage of the data validation app:



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Υπουργείο Διοικητικής Ανασυγκρότησης

test



Προβολή

Ιστορικό τροποποιήσεων

Κατάλογος Φορέων

Πληκτρολογήστε και επιλέξτε τον Φορέα σας για να δείτε τα ανατεθειμένα οχήματα





Figure 14 – Greek Pilot Application Callimachus

4.1.1.3 Data Quality Evaluation

Table 18 – Data Quality Survey Results – Third Year

<i>Data Quality Attributes</i>	<i>Results Overview</i>
Discoverability and Usability	1- App has links to the original data sets; 2- App has searchable list of data sets used; 3- App allows users to download the data sets, including partial download of selected variables; 4- App does not have multiple format download option; 5- App allows to user preview and interact with the data.
Granularity	1- Not only aggregate level of data (e.g. average of cars), but individual unit data (raw data of cars' specifications)
Intelligibility	1- Supporting documentation exists, but has to be found separately
Trustworthiness	1- The data sets collected are known by developers, including how it was processed, with reliable information and double checked with external sources.
Linkable to other data (5 Stars LOD)	1- The data sets are available in different formats to different audiences, from XLS, to CSV and RDF; 2- The RDF is linked to other data to provide context.
15 Open Data Principles	1- Data is complete; 2- Data is primary; 3- There are still issues about timely availability; 4- Data is accessible to the widest range of users (XLS, CSV and RDF) 5- Data is non-discriminatory because is freely available; 6- Data has license-free (CLS, CSV, RDF); 7- Data is safe to open; 8- Data is not 100% designed with public input (decide format and parts of data sets to visualize and download).

Table 19 – Data Quality Improvement Progress

<i>Data Quality Attributes</i>	<i>Status</i>		
	<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>
Discoverability and Usability	App in development, with few functionalities.	App developed, almost complete and with more functionalities.	App is complete with all the demanded functionalities and datasets.
Granularity	Diverse Data sets with low quality and only raw or aggregate level.	Task-force for data quality unified and enriched data sets. Ontology for all variables.	Datasets have the demanded granularity.
Intelligibility	Low level of intelligibility, with no context. High level of data sensitivity.	High level of intelligibility and reduced level of data sensitivity with data context.	High level of intelligibility and reduced level of data sensitivity with data context.
Trustworthiness	Poor data quality due incomplete, not primary and not linked data sets. Data was not reliable.	Increase data quality due linking data and enriching with context from external sources.	Data quality can be trusted with context from external sources.
Linkable to other data (5 Stars LOD)	Not following all the 5 stars LOD principles.	Following all the 5 Stars LOD principles.	Following all the 5 stars LOD principles
15 Open Data Principles	Not following all the 15 Open Data Principles.	Following 7 of 8 principles that matches OGI needs.	Following 7 of 8 principles that matches OGI needs.

Table 20 – Data Quality Improvement Progress

<i>Data Quality Attributes</i>	<i>Summary of Benefits Achieved</i>	<i>Summary of Challenges Faced</i>
Discoverability and Usability	Greek pilot improve the discoverability and usability. Data quality was improved and visualizations were created on the top of the data cubes.	Combining data quality and end-users surveys, Greek pilot can increase the number of data sets in the cubes and include new asked functionalities.
Granularity	Despite of the 1 st year, the second year Greek applications brings both raw and aggregate data level of granularity.	This attribute is maxed out since both options are present (raw data and aggregate data).
Intelligibility	Data was linked, new ontology to normalise all data sets combined, metadata giving context and data cube enabling data visualization.	After linking the data, new ontology, metadata and data cubes, Greek pilot almost maxed out the attributes to bring intelligibility.
Trustworthiness	From data sets with poor quality in the first year, to a second year with high data quality and reliable content.	The Greek pilot improved the data quality achieving 100%.
Linkable to other data (5 Stars LOD)	The first year had data sets in spreadsheets (XLS and XLSX). The second year increase from 2 stars to 5 stars.	The Greek pilot maxed out the 5 stars (RDF) with an API endpoint to access the data using automate machine readable access.
15 Open Data Principles	The second year achieved 7 of 8 principles that should be followed in OGI pilot.	Pilot is not following the design with public input (users can select format and part of data to download).

4.1.1.3.1 Data Sets and Data Cubes

Below the list of data sets used on the Greek Pilot:

1. Data describing Government Vehicles
2. Data on the lifecycle of Government Vehicles
3. Data on the operation and maintenance of Government Vehicles
4. Statistical data on Greek Public Agencies and their personnel
5. Statistical data on Greek Municipalities, Prefectures and Regions (describing their population, their topography, their climate etc.)

A sample of data sets in both not linked (CSV file) and linked (RDF) are stored here: https://drive.google.com/open?id=0B0_fFuauiFo0M1V2REI2OG13QTQ.

Currently, the Greek data cubes with linked data have the follow dimensions for search and visualization:

1. Vehicles Data cube

- Area:** containing municipalities in both Greek and English characters (e.g. Athens, Thessaloniki);
- Fuel Type:** containing the eleven types of fuel (e.g. Diesel, Benzene);
- Vehicle Type:** containing the 15 types of vehicles (e.g. Bus, Car, Motorcycle)

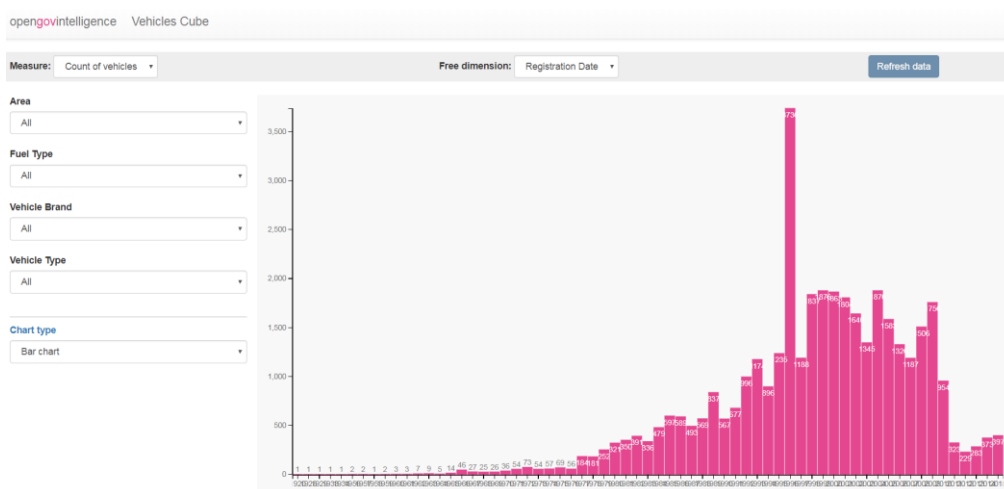
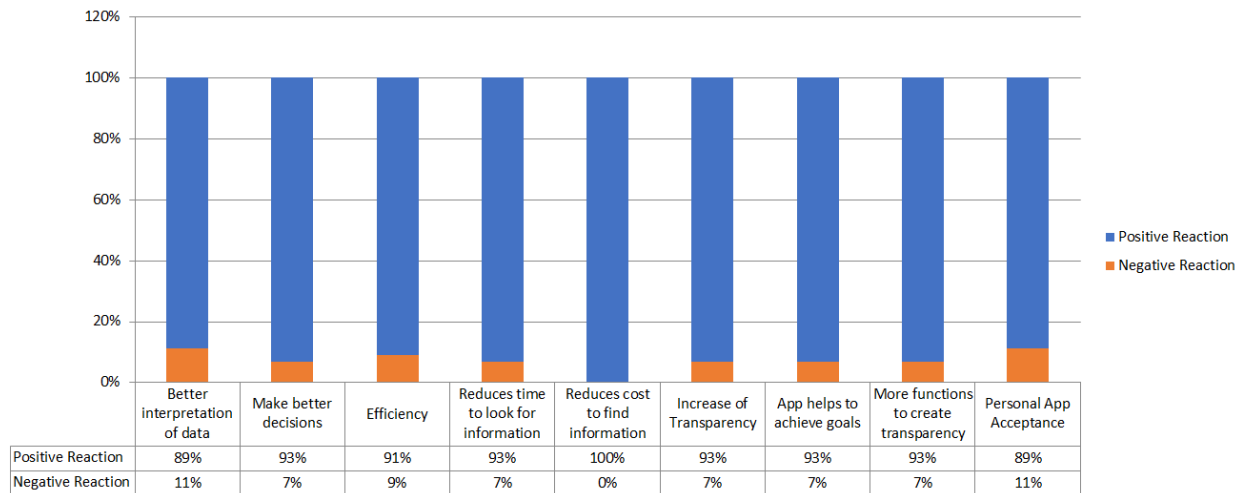


Figure 15 – Vehicles data Cubes Screenshot

4.1.1.4 Outcomes Evaluation

To evaluate the application from the perspective of end-users a questionnaire was distributed to the end-users. In total, 45 people were surveyed in Greek Pilot using the OGI acceptance questionnaire to evaluate the Greek Pilot Application (<http://wapps.islab.uom.gr/CubeVisualizer/vehicles/>).

The results from these interviews are displayed below.



4.1.1.5 Screenshots of The Greek Ministry of Administrative Reconstruction (MAREG) Application

The Figure 16 and the Figure 17 present the screenshots of OGI ICT toolkit using data sets from the Greek Pilot.

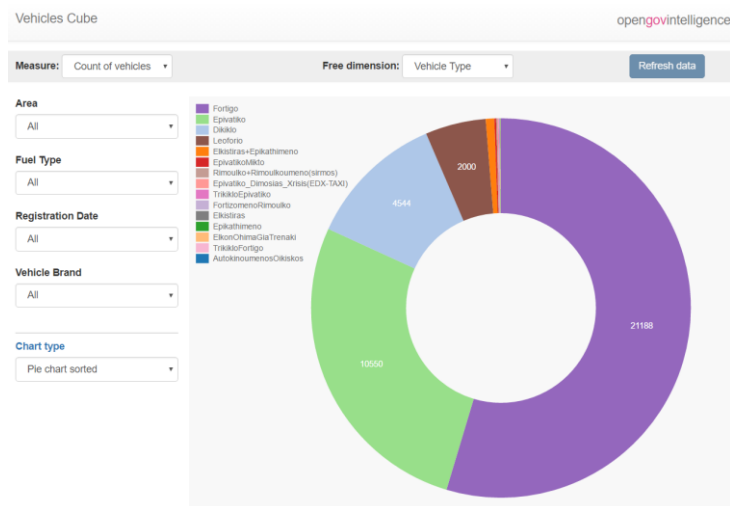


Figure 16 - Pie Sorted Graph Vehicle Type

D4.6 Pilots Evaluation Results – Third Round

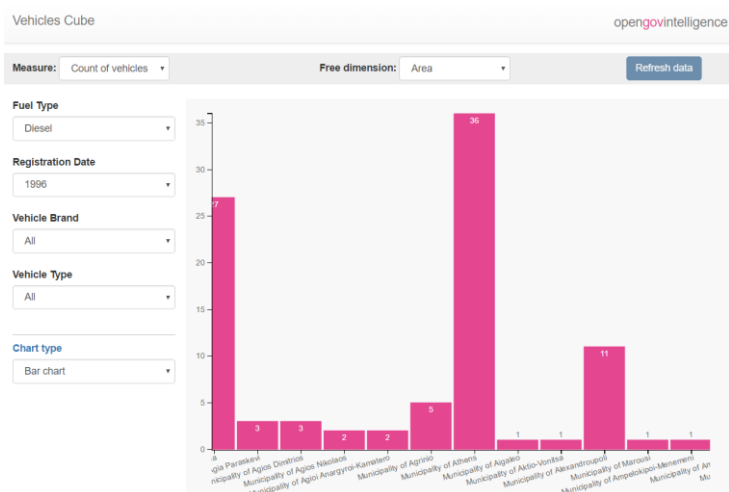


Figure 17 - Bar Graph Filtered by Area (Municipality)

5 Conclusions

The evaluation has four areas: Co-creation, ICT Toolkit, Acceptance of ICT Toolkit and Outcomes. In this report the evaluation methodology has been updated based on the insights gained from the first and second year.

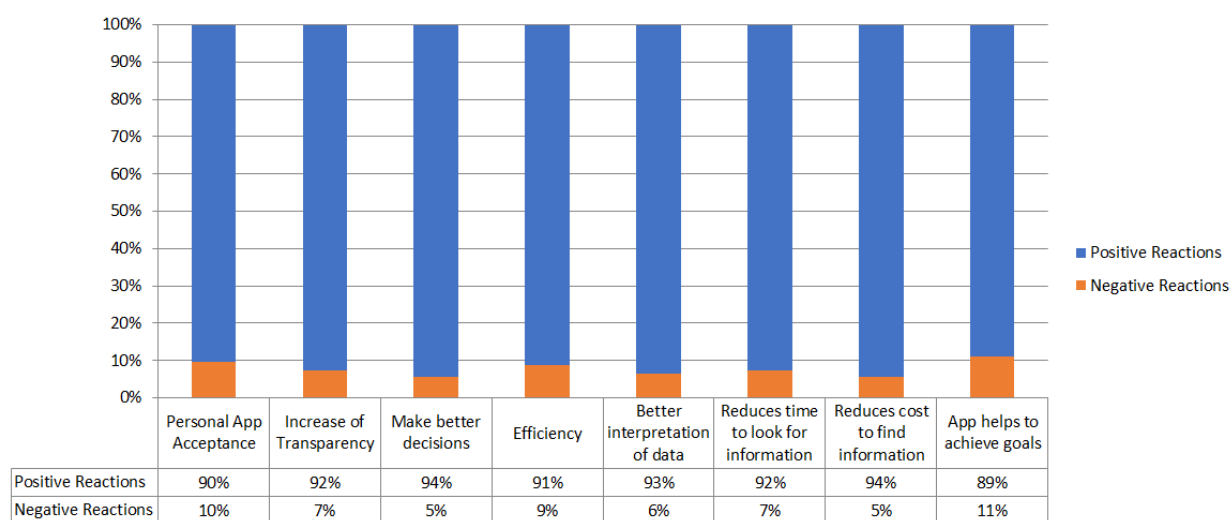
The *co-creation* was evaluated using the same framework used during first and second year, to compare the evolution and changes made on pilots influenced by the participation of pilot's stakeholders. The reason is that most of the co-creation aspects already took place in the first couple of years.

The *ICT toolkit* evaluation has been updated to include questions in the questionnaire to evaluate the new tools which developed after the evaluation in the second year. Finally, the part about data quality is new, given its importance.

The 6 pilots were evaluated by employing a user – questionnaire. Most users of 219 people surveyed found the pilots benefits include the creation of transparency, reduction the administrative burden by more efficient search of information and visualizing the results at a glance. We considered positive reactions strongly agree, agree and neutral answers. Negative reactions were disagree and strongly disagree. Below the descriptive statistics of Transparency, Decision-Making, Efficiency and Better Data Interpretation:

- **The overall acceptance of the pilots' apps was 90%;**
- **92% pointed out an increase of Transparency after accessing the Pilots' Apps;**
- **The Pilots' apps helped to 94% of surveyed people have better decision-making;**
- **93% of people answered there is a better interpretation of Data;**
- **For 92% of respondents, Pilots' app reduced the time spent searching information;**
- **94% of end-users identified a cost reduction when use OGI pilots' apps; and,**
- **There is an increase of efficiency to 91% of OGI Pilots' users.**

D4.6 Pilots Evaluation Results – Third Round



Developing the ICT-toolkits more time than expected, as this is a new field in which there are hardly any examples. The development of the building block encountered the questions of which level of granularity would be fine as this requires a trade-off between the flexibility given to the developer and ease-of-use of manipulating data. User-friendliness and having right granularity is a trade-off and developers have different requirements in this regard.

Co-creation remains challenging in government. Co-creation is bottom-up, whereas government traditionally takes a more top-down approach by developing pilots and providing the services. Realizing co-creation is not only a technological problem, but rather a cultural problem.

The end-users regard the pilots as successful as shown in the figure below. The pilots show that data quality is a key aspect as garbage in is garbage out. Realizing high-data quality took often more time than expected, whereas the OGI ICT-toolkit enables to develop the pilots within a short time frame. They pilots help end-users to find information faster and in a more efficient way resulting in transparency and better decision-making quality.

6 References

- Dodds, Leigh (2016). **Exploring Open Data Quality**. Open Data Institute Website (<https://theodi.org/blog/exploring-open-data-quality>). Published in: 26/10/2016. Accessed in: 26/01/2018.
- Barth, Michael (2012). **API Evaluation: An Overview of API Evaluation Techniques**. Michael Bart Blog A portfolio Blog about Software Development (<https://www.michaelbarth.net/>). Paper available at: <https://www.michaelbarth.net/files/publications/api-evaluation.pdf>. Published in 2012. Accessed in: 28/01/2018.
- OPENGOVDATA (2018). **Eight principles of open government data**. Available at: The annotated 8 Principles of Open Government Data Website (<https://opengovdata.org/>) from a meeting in 7th-8th December 2007. Accessed in: 26/01/2018.
- Bizer, C., Heath, T., & Berners-Lee, T. (2009). **Linked data-the story so far**. Semantic services, interoperability and web applications: emerging concepts, 205-227.
- Frank, M., & Walker, J. (2016). **User Centred Methods for Measuring the Value of Open Data**. The Journal of Community Informatics, 12(2).
- Brooke, J. (1996). **SUS-A quick and dirty usability scale**. Usability evaluation in industry, 189(194), 4-7.
- Bangor, A., Kortum, P. T., & Miller, J. T. (2008). **An empirical evaluation of the system usability scale**. Intl. Journal of Human-Computer Interaction, 24(6), 574-594.
- Joyce, E., & Kraut, R. E. (2006). **Predicting continued participation in newsgroups**. Journal of Computer-Mediated Communication, 11(3), 723-747.
- Glasow, P. A. (2005). **Fundamentals of survey research methodology**. Retrieved January, 18, 2013.
- Levy, Y. and T. J. Ellis (2006). **A systems approach to conduct an effective literature review in support of information systems research**. Informing Science: International Journal of an Emerging Transdiscipline 9(1): 181-212.
- Delbecq, Andre L., Andrew H. Van de Ven, and David H. Gustafson. **Group techniques for program planning: A guide to nominal group and Delphi processes**. Scott Foresman, 1975.
- 20510:2010, ISO/IEC. (2010). **Systems and Software Engineering—Systems and Software Product Quality Requirements and Evaluation (SQuaRE)—System and Software Quality Models**. Geneva, International Organization for Standardization.
- Davis, F. D. (1989). **Perceived usefulness, perceived ease of use, and user acceptance of information technology**. MIS quarterly: 319-340.
- Davis, F. D., R. P. Bagozzi and P. R. Warshaw (1989). **User acceptance of computer technology: a comparison of two theoretical models**. Management science 35(8): 982-1003.

- DeLone, W. H. and E. R. McLean (1992). **Information systems success: The quest for the dependent variable**. Information systems research 3(1): 60-95.
- Delone, W. H. and E. R. McLean (2003). **The DeLone and McLean model of information systems success: a ten-year update**. Journal of management information systems 19(4): 9-30.
- Venkatesh, V. and H. Bala (2008). **Technology acceptance model 3 and a research agenda on interventions**. Decision sciences 39(2): 273-315.
- Venkatesh, V. and F. D. Davis (2000). **A theoretical extension of the technology acceptance model: Four longitudinal field studies**. Management science 46(2): 186-204.
- Venkatesh, V., M. G. Morris, G. B. Davis and F. D. Davis (2003). **User acceptance of information technology: Toward a unified view**. MIS quarterly: 425-478.
- Ward, R. (2013). **The application of technology acceptance and diffusion of innovation models in healthcare informatics**. Health Policy and Technology 2(4): 222-228.
- Ward, S. J. (2014). **The magical concept of transparency**. Ethics for digital journalists: Emerging best practices: 45-58.
- Bovens, M. (2007). **Analysing and assessing accountability: a conceptual framework**. European law journal 13(4): 447-468.
- Coglianesi, C. (2009). **The transparency president? The Obama administration and open government**. Governance 22(4): 529-544.
- Frank, M. and A. A. Oztoprak (2015). **Concepts of Transparency: Open Data in UK Local Authorities**. Proceedings of the International Conference for E-Democracy and Open Government 2015 (CeDEM15).
- Peixoto, T. (2013). **The Uncertain Relationship between Open Data and Accountability: A Response to Yu and Robinson's 'The New Ambiguity of Open Government'**.
- Matheus, R. and M. Janssen (2013). **Transparency of civil society websites: towards a model for evaluation websites transparency**. Proceedings of the 7th International Conference on Theory and Practice of Electronic Governance, ACM.
- Matheus, R. and M. Janssen (2015). **Transparency Dimensions of Big and Open Linked Data**. Open and Big Data Management and Innovation. M. Janssen, M. Mäntymäki, J. Hidders et al., Springer International Publishing. 9373: 236-246.
- Matheus, R., M. M. Ribeiro and J. C. Vaz (2012). **New perspectives for electronic government in Brazil: The adoption of open government data in national and subnational governments of Brazil**. Proceedings of the 6th International Conference on Theory and Practice of Electronic Governance, ACM.
- Fox, J. (2007). **The uncertain relationship between transparency and accountability**. Development in Practice 17(4-5): 663-671.

Gallo, C., M. Giove, J. Millard, R. Kare and V. Thaarup (2014). **Study on eGovernment and the Reduction of Administrative Burden**. Luxembourg, Luxembourg. doi 10: 42896.

Law, E. L.-C., V. Roto, M. Hassenzahl, A. P. Vermeeren and J. Kort (2009). **Understanding, scoping and defining user experience: a survey approach**. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, ACM.

Hassenzahl, M. and N. Tractinsky (2006). **User experience-a research agenda**. Behaviour & information technology 25(2): 91-97.

Forlizzi, J. and K. Battarbee (2004). **Understanding experience in interactive systems**. Proceedings of the 5th conference on Designing interactive systems: processes, practices, methods, and techniques, ACM.

Garrett, J. J. (2010). **Elements of user experience, the: user-centered design for the web and beyond**, Pearson Education.

Jokela, T., N. Iivari, J. Matero and M. Karukka (2003). **The standard of user-centered design and the standard definition of usability: analyzing ISO 13407 against ISO 9241-11**. Proceedings of the Latin American conference on Human-computer interaction, ACM.

Travis, D. (2011). **ISO 13407 is dead. Long live ISO 9241-210**. London, UK: Userfocus Ltd., June 6.

Albert, W. and T. Tullis (2013). **Measuring the user experience: collecting, analyzing, and presenting usability metrics**, Newnes.

7 Annexes

7.1 Data Quality Questionnaire

Table 21 – Pilots' Data Quality Questionnaire

<i>Data Quality Section</i>	<i>#</i>	<i>Question</i>	<i>Answer</i>
A- Discoverability and Usability	1	There is a (pre-release) version of an application already:	() Yes () No If No, please skip to section B- Granularity.
	2	The application contains links to the data sources	() Yes () No
	3	The application contains a searchable list of data sources that are used	() Yes () No
	4	The application contains an option to download the data	() Yes () No
	5	The application contains an option to download the data in multiple formats	() Yes () No
	6	The application contains an option to download selected parts of the data	() Yes () No
	7	The application allows the user to preview and interact with the data	() Yes () No
B- Granularity	8	Your data includes only aggregated data (e.g. national averages)?	() Yes () No
	9	Your data includes individual unit level data, but without generic class data (data on a small, transactional level)	() Yes () No
	10	Your data includes generic class data (The data also includes information about different subsets within)	() Yes () No
C- Intelligibility	11	Is there existing supporting documentation for the data you used?	() Supporting documentation exists, but has to be found separately () Supporting documentation can be found at the same time as the data (e.g. right next to the link for the data) () Supporting documentation can be immediately accessed from within the data set, but it is not context sensitive () Supporting documentation can be immediately accessed from within the data set, and is context sensitive.
		If there was no supporting documentation, how did you deal with these datasets?	Open question.
D- Trustworthiness	12	I know how the data I used was collected	() Strongly Agree
	13	I know how the data I used was	() Agree

D4.6 Pilots Evaluation Results – Third Round

		processed	() Neutral
	14	The data I used was published by a trusted source	() Disagree
	15	The data I used is realistic	() Strongly Disagree
	16	The data I used is consistent with external sources	
E- Linkable to other data (5 Stars LOD)	17	The data I used was available in a structured format (e.g. xls)	() Strongly Agree
	18	The data I used was available in a non-proprietary open format (e.g. csv)	() Agree
	19	The data I used contained URLs to denote external things (e.g. RDF)	() Neutral
	20	The data I used linked to other data to provide context	() Disagree
F- 15 Open Data Principles	21	The data is complete (all data that is not subject to valid privacy, security or privilege reasons is opened)	() Strongly Disagree
	22	The data is primary (collected at the source, not in aggregate form)	
	23	The data is made available as quickly as necessary to preserve value for the end-users	
	24	The data is accessible (for the widest range of users; for the widest range of purposes)	() Strongly Agree
	25	The data is non-discriminatory (available to anyone, no registration needed)	() Agree
	26	The data is license-free (not subject to copyright concerns etc.)	() Neutral
	27	The data is permanent (made available at a stable location indefinitely)	() Disagree
	28	The data is safe to open (doesn't contain executable content)	() Strongly Disagree
	29	The data is designed with public input (the user decides how he can access the data)	

7.2 End-User Questionnaires

7.2.1 Pilot 1 – The Greek Ministry of Administrative Reconstruction (Greece) End-User Questionnaire

OGI Evaluation Questionnaire MAREG Pilot App End-users – 2018

This questionnaire is aimed to be filled by End-Users who have used the applications developed within the pilots of H2020 OpenGovIntelligence (OGI) project. When answering the questions, the application developed using the OGI Toolkit, named here as **MAREG Pilot App**, should be taken into account. The following topics will be asked:

- General background information;
- Data sets; and,
- Resulting Application (App developed using the OGI toolkit).

More Information about MARE Pilot APP (<http://wapps.islab.uom.gr/CubeVisualizer/vehicles/>)

A. General Background Information

1. **How familiar are you with open data applications?**

() Not at all familiar () Slightly () Somewhat () Moderately () Extremely familiar

2. **What is your role or position in terms of **Vehicles Cube App**?**

A: _____

B. Acceptance of the **Vehicles Cube App**

3. **The **Vehicles Cube App** provides all the functionalities I am interested in**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

4. **All functions in the **Vehicles Cube App** work properly**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

5. **The **Vehicles Cube App** recovers well from crashes**

() **The **Vehicles Cube App**** didn't crash

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

6. **The **Vehicles Cube App** helps me to achieve my goals**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

7. **My interaction with the **Vehicles Cube App** was satisfying**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

8. **The **Vehicles Cube App** is useful to me**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

9. **My interaction with the **Vehicles Cube App** is clear and understandable**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

10. **The Vehicles Cube App design is adequate**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
11. **I have sufficient skills to use the Vehicles Cube App**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
12. **The Vehicles Cube App does not require high level technical knowledge**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
13. **The Vehicles Cube App will be accepted by my peers**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
14. **Using the Vehicles Cube App can be hard for the average user**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
15. **The Vehicles Cube App is easy to use**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about acceptance?

C. Vehicles Cube App Data Sets

16. **The data in the Vehicles Cube App are accessible**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
17. **The data in the Vehicles Cube App is inadequate**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
18. **The data in the Vehicles Cube App are accurate**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
19. **A lot of time is needed to find the information I am looking for regarding vehicles**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
20. **I am able to find all the information I'm looking for when using the Vehicles Cube App**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about data sets?

D. Vehicles Cube App results

21. **The Vehicles Cube App has a clear visualization**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

22. **The Vehicles Cube App helps to do my job about government vehicles**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

23. **The Vehicles Cube App results in an increase of transparency of government vehicles**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

24. **The Vehicles Cube App is too complex to acquire knowledge into government vehicles**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

25. **The Vehicles Cube App helps me make better decisions about government vehicles**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

26. **The Vehicles Cube App helps my understanding of the government vehicles**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

27. **The Vehicles Cube App will increase efficiency of government vehicles management**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

28. **The Vehicles Cube App reduces time spent looking for information about government vehicles**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

29. **The Vehicles Cube App reduces the costs to search and decide about government vehicles**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

30. **More functions in the Vehicles Cube App are needed to create transparency of government vehicles**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about results?

Thank you for your time to answer the questions!

7.2.2 Pilot 2 – Enterprise Lithuania (Lithuania) End-User Questionnaire

OGI Evaluation Questionnaire Lithuania Enterprise App End-users – 2018

This questionnaire is aimed to be filled by End-Users who have used the applications developed within the pilots of H2020 OpenGovIntelligence (OGI) project. When answering the questions, the application developed using the OGI Toolkit, named here as **Lithuania Enterprise App (LE App)**, should be taken into account. The following topics will be asked:

- General background information;
- Data sets; and,
- Resulting Application (App developed using the OGI toolkit).

A text explaining more information about **Lithuania Enterprise App**
(<http://lithuania.opengovintelligence.eu/>).

A. General Background Information

1. **Please select your age:**

☐ Less than 21 ☐ 21 – 40 ☐ 41 – 60 ☐ Over 60 ☐ Don't want to share

2. **How familiar are you with open data applications?**

☐ Not at all familiar ☐ Slightly ☐ Somewhat ☐ Moderately ☐ Extremely familiar

3. **What is your role using **the LE App**?**

☐ Investors ☐ Citizens ☐ Civil servants ☐ Entrepreneurs

☐ Other _____

B. Acceptance of the **Lithuania Enterprise Pilot App**

4. ****The LE App** provides all the functionalities I am interested in**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

5. **All functions in **the LE App** work properly**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

6. ****The LE App** is stable**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

7. ****The LE App** helps me to achieve my goals**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

8. **My interaction with **the LE App** was satisfying**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

9. ****The LE App** is useful to me**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

10. **My interaction with the LE App is clear and understandable**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

11. **The LE App design is adequate**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

12. **I have sufficient skills to use the LE App**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

13. **The LE App does not require high level technical knowledge**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

14. **The LE App will be accepted by my peers**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

15. **Using the LE App can be hard for the average citizen**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

16. **The LE App is easy to use**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about acceptance?

C. Lithuania Enterprise App Data Sets

17. **The data in the LE App are accessible**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

18. **The data in the LE App is incomplete**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

19. **The data in the LE App are accurate**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

20. **A lot of time is needed to find the right data in the LE App**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

21. **I am able to find all the data I am looking for when using the LE App**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about data sets?

D.

E. **Lithuania Enterprise Pilot Apps RESULTS**

22. **The LE App has a clear visualization**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

23. **The LE App helps to create insights of Lithuanian business environment**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

24. **The LE App results in an increase of transparency of Lithuanian business environment**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

25. **The LE App is too complex to gain insight of Lithuanian business environment**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

26. **The LE App helps me to make better decisions**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

27. **The LE App helps my understanding of the subject matter**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

28. **The LE App will increase efficiency**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

29. **The LE App reduces time spent looking for information**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

30. **The LE App reduces the costs to search and decide**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

31. **More functions in the LE App are needed to create transparency of Lithuanian business environment**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about results?

Thank you for your time to answer the questions!

7.2.3 Pilot 3 – Tallinn Real Estate (Estonia) End-User Questionnaire

OGI Evaluation Questionnaire

Tallinn Real Estate App End-users – 2017

This questionnaire is aimed to be filled by End-Users who have used the applications developed within the pilots of H2020 OpenGovIntelligence (OGI) project. When answering the questions, the application developed using the OGI Toolkit, named here as **Tallinn Real Estate Pilot App**, should be taken into account. The following topics will be asked:

- General background information;
- Data sets; and,
- Resulting Application (App developed using the OGI toolkit).

More information about Tallinn Real Estate

(https://rnd-tut.shinyapps.io/Estonian_Pilot/)

A. General Background Information

- What is your gender?**
☐ Female ☐ Male ☐ Don't want to share
- Please select your age:**
☐ Less than 21 ☐ 21 – 40 ☐ 41 – 60 ☐ Over 60 ☐ Don't want to share
- How familiar are you with open data applications?**
☐ Not at all familiar ☐ Slightly ☐ Somewhat ☐ Moderately ☐ Extremely familiar
- What is your role using the Tallinn Real Estate App?**
☐ Students ☐ Foreign employees ☐ Tourists ☐ Real Estate Agents ☐ Other _____

B. Acceptance of the Tallinn Real Estate Pilot App

- The Tallinn Real Estate App provides all the functionalities I'm interested in**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
- All functions in the Tallinn Real Estate App work properly**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
- The Tallinn Real Estate App recovers well from crashes**
☐ The Tallinn Real Estate App didn't crash
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
- The Tallinn Real Estate App helps me to achieve my goals**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
- My interaction with the Tallinn Real Estate App user was satisfying**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
- The Tallinn Real Estate App is useful to me**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

11. **My interaction with the Tallinn Real Estate App is clear and understandable**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
12. **The Tallinn Real Estate App design is adequate**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
13. **I have sufficient skills to use the Tallinn Real Estate App**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
14. **The Tallinn Real Estate App does not require high level technical knowledge**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
15. **The Tallinn Real Estate App will be accepted by my peers**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
16. **Using the Tallinn Real Estate App can be hard for the average citizen**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
17. **The Tallinn Real Estate App is easy to use**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about acceptance?

C. Tallinn Real Estate Pilot App Data Sets

18. **The data in the Tallinn Real Estate App are accessible**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
19. **The data in the Tallinn Real Estate App is incomplete**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
20. **The data in the Tallinn Real Estate App are accurate**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
21. **A lot of time is needed to find the right data in the Tallinn Real Estate App**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
22. **I am able to find all the data I'm looking for when using the Tallinn Real Estate App**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about data sets?

D. Tallinn Real Estate Pilot App RESULTS

23. **The Tallinn Real Estate App has a clear visualization**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
24. **The Tallinn Real Estate App helps to create insights**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
25. **The Tallinn Real Estate App results in an increase of transparency**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
26. **The Tallinn Real Estate App is too complex to gain insight**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
27. **The Tallinn Real Estate App helps me to make better decisions**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
28. **The Tallinn Real Estate App helps my understanding of the subject matter**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
29. **The Tallinn Real Estate App will increase efficiency**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
30. **The Tallinn Real Estate App reduces time spent looking for information**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
31. **The Tallinn Real Estate App reduces the costs to search and decide**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree
32. **More functions in the Tallinn Real Estate App are needed to create transparency of Real Estate information in Tallinn**
 () Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about results?

Thank you for your time to answer the questions!

7.2.4 Pilot 4 – Trafford Council Worklessness (England) End-User Questionnaire

OGI Evaluation Questionnaire

Trafford Worklessness Pilot Apps End-users – 2018

This questionnaire is aimed at end-users who have used the applications developed by the pilots involved in the H2020 OpenGovIntelligence (OGI) project. When answering the questions, the applications developed using the OGI Toolkit, named here as the **Trafford Worklessness Pilot Apps**, should be taken into account. A separate usability survey will be used for the individual applications. The apps are designed to enable Jobcentre Plus Managers and Local Authority leads to identify areas of need and inform service delivery related to worklessness. The following topics will be asked:

- Your General background information;
- A Technical Evaluation of the Pilot developed using the OGI toolkit
- The Datasets available in the Pilot; and,
- Pilots Outcomes (e.g. transparency, administrative burden reduction, cost reduction).

Trafford Worklessness Pilot Apps - <http://www.trafforddatalab.io/opengovintelligence/>

A. General Background Information

1. Which organisation do you work for?

- () Department for Work and Pensions () Borough / City Council
 () Other: _____

2. Which Local Authority do you work within?

- () Bolton () Bury () Manchester () Oldham ()
 Rochdale
 () Salford () Stockport () Tameside () Trafford () Wigan
 () Other: _____

3. How long have you been working for your employer?

- () Less than 6 months () 6 to 12 months () 1 to 3 years () 3 to 6 years () 6 years or more

4. What is your employee status?

- () Managerial () Non-managerial

5. How comfortable do you feel using the Internet?

- () Very uncomfortable
 () Somewhat uncomfortable
 () Neither comfortable nor uncomfortable
 () Somewhat comfortable
 () Very comfortable

6. How familiar are you with open data?

- () Not at all familiar () Slightly () Somewhat () Moderately () Extremely familiar

7. How familiar are you with Linked Open Statistical Data (LOSD)?

() Not at all familiar () Slightly () Somewhat () Moderately () Extremely familiar

8. How familiar are you with downloading data from open data applications like [nomis](#) and [Stat-Xplore](#)?

() Not at all familiar () Slightly () Somewhat () Moderately () Extremely familiar

B. [Trafford Worklessness Pilot Apps](#) Datasets

9. The data in [the Trafford Worklessness Pilot Apps](#) are accessible

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

10. [The Trafford Worklessness Pilot Apps](#) contain all of the datasets that I require

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

11. The data in [the Trafford Worklessness Pilot Apps](#) are incomplete

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

12. The data in [the Trafford Worklessness Pilot Apps](#) are accurate

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

13. A lot of time is needed to find the right data in [the Trafford Worklessness Pilot Apps](#)

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

14. I am satisfied with the datasets quality provided by [the Trafford Worklessness Pilot Apps](#)

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about data sets?

C. [Acceptance of the Trafford Worklessness Pilot Apps](#)

15. [The Trafford Worklessness Pilot Apps](#) provide all the functionalities I am interested in

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

16. All functions in [the Trafford Worklessness Pilot Apps](#) work properly

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

17. I experienced a crash while using [the Trafford Worklessness Pilot Apps](#)

() [The Trafford Worklessness Pilot Apps](#) didn't crash

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

18. [The Trafford Worklessness Pilot Apps](#) help me in my work

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

19. My interaction with [the Trafford Worklessness Pilot Apps](#) is satisfying

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

20. [The Trafford Worklessness Pilot Apps](#) are useful to me

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

21. The Trafford Worklessness Pilot Apps are easy to use

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

22. The Trafford Worklessness Pilot Apps have an adequate design

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

23. I have sufficient skills to use the Trafford Worklessness Pilot Apps

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

24. The Trafford Worklessness Pilot Apps do not require high level technical knowledge

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

25. The Trafford Worklessness Pilot Apps are accepted by my peers

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

26. The Trafford Worklessness Pilot Apps are unnecessarily complex

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

27. I found the various functions in the Trafford Worklessness Pilot Apps are well integrated

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

28. I want to use the Trafford Worklessness Pilot Apps frequently

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about acceptance?

D. Trafford Worklessness Pilot Apps Outcomes Evaluation

29. The visualization provided by the Trafford Worklessness Pilot Apps makes better interpretation of data

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

30. The Trafford Worklessness Pilot Apps help me to make better decisions

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

31. The Trafford Worklessness Pilot Apps increase efficiency of my work

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

32. The Trafford Worklessness Pilot Apps reduce time spent looking for information

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

33. The Trafford Worklessness Pilot Apps reduce costs to find information

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

34. More functions in the [Trafford Worklessness Pilot Apps](#) are needed to create transparency to support decision-making

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

What functionality would you like to see added to the applications to add transparency?

Finally, do you want to explain your answers or comment on anything not covered about results?

Many thanks for taking the time to complete this questionnaire!

If you have any questions about the survey please email henry.partridge@trafford.gov.uk

7.2.5 Pilot 5 – The Flemish Environment Agency (Belgium) End-User Questionnaire

OGI Evaluation Questionnaire

Flemish Government App End-users – 2017

This questionnaire is aimed to be filled by End-Users who have used the applications developed within the pilots of H2020 OpenGovIntelligence (OGI) project. When answering the questions, the application developed using the OGI Toolkit, named here as **Flemish Government Pilot App**, should be taken into account. The following topics will be asked:

- General background information;
- Data sets; and,
- Resulting Application (App developed using the OGI toolkit).

B. General Background Information

1. **Please select your age:**

☐ Less than 21 ☐ 21 – 40 ☐ 41 – 60 ☐ Over 60 ☐ Don't want to share

2. **How familiar are you with open data applications?**

☐ Not at all familiar ☐ Slightly ☐ Somewhat ☐ Moderately ☐ Extremely familiar

D. Acceptance of the Flemish Government Pilot App

3. **The Flemish Government App provides all the functionalities I'm interested in**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

4. **All functions in the Flemish Government App work properly**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

5. **The Flemish Government App recovers well from crashes**

☐ The Flemish Government App didn't crash

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

6. **The Flemish Government App helps me to achieve my goals**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

7. **My interaction with the Flemish Government App was satisfying**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

8. **The Flemish Government App is useful to me**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

9. **My interaction with the Flemish Government App is clear and understandable**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

10. **The Flemish Government App design is adequate**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

11. **I have sufficient skills to use the Flemish Government App**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

12. **The Flemish Government App does not require high level technical knowledge**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

13. **The Flemish Government App will be accepted by my peers**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

14. **Using the Flemish Government App can be hard for the average citizen**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

15. **The Flemish Government App is easy to use**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about acceptance?

C. Flemish Government Pilot App Data Sets

16. **The data in the Flemish Government App are accessible**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

17. **The data in the Flemish Government App is incomplete**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

18. **The data in the Flemish Government App are accurate**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

19. **A lot of time is needed to find the right data in the Flemish Government App**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

20. **I am able to find all the data I'm looking for when using the Flemish Government App**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about data sets?

D. Marine Institute Pilot App results

21. **The Flemish Government App has a clear visualization**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
22. **The Flemish Government App helps to create insights about air pollution in Flanders**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
23. **The Flemish Government App results in an increase of transparency of air pollution in Flanders**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
24. **The Flemish Government App is too complex to gain insight**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
25. **The Flemish Government App helps me to make better decisions**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
26. **The Flemish Government App helps my understanding of the subject matter**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
27. **The Flemish Government App will increase efficiency**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
28. **The Flemish Government App reduces time spent looking for information**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
29. **The Flemish Government App reduces the costs to search and decide**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
30. **More functions in the Flemish Government App are needed to create transparency of air pollution in Flanders**
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about results?

Thank you for your time to answer the questions!

7.2.6 Pilot 6 – Marine Institute (Ireland) End-User Questionnaire

OGI Evaluation Questionnaire Marine Institute Pilot End-users – 2018

This questionnaire is aimed to be filled by End-Users who have used the Pilot applications developed within the H2020 OpenGovIntelligence (OGI) project. When answering the questions, the Pilot application developed using the OGI Toolkit, named here as **Marine Institute Pilot**, should be taken into account. The following topics will be asked:

- General background information;
- Data sets; and,
- Resulting Pilot (Pilot developed using the OGI toolkit).

A. General Background Information

1. What is your organisational role using the **Marine Institute Pilot**?

- ☐ Search and rescue professional ☐ Search and rescue volunteer
☐ Marine Energy Developer ☐ Marine Energy Consultant ☐ Planning Consultant
☐ Planner ☐ Private Citizen ☐ Public Servant ☐ Civil Servant
☐ Tourism Agent ☐ Tourism business owner ☐ Sailor ☐ Volunteer
☐ IT Professional Other: _____

2. For what purpose might you use the **Marine Institute Pilot** Dashboard?

- ☐ Recreational ☐ Work ☐ Both

3. How familiar are you with data dashboards?

- ☐ Not at all familiar ☐ Slightly ☐ Somewhat ☐ Moderately ☐ Extremely familiar

4. How familiar are you with marine data availability suitable to your needs?

- ☐ Not at all familiar ☐ Slightly ☐ Somewhat ☐ Moderately ☐ Extremely familiar

5. How familiar are you with Linked Open Statistical Data?

- ☐ Not at all familiar ☐ Slightly ☐ Somewhat ☐ Moderately ☐ Extremely familiar

B. Marine Institute Pilot Evaluation

6. The **Marine Institute Pilot** provides all the functionalities I require

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

7. All functions in the **Marine Institute Pilot** work properly

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

8. The **Marine Institute Pilot** system is stable

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

9. The **Marine Institute Pilot** supports my requirements

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

10. **My interaction with the [Marine Institute Pilot](#) was satisfying**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

11. **The [Marine Institute Pilot](#) is useful to me**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

12. **My interaction with the [Marine Institute Pilot](#) is clear and understandable**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

13. **The [Marine Institute Pilot](#) design is adequate**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

14. **I have sufficient skills to use the [Marine Institute Pilot](#)**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

15. **The [Marine Institute Pilot](#) does not require high level technical knowledge**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

16. **I will share the [The Marine Institute Pilot](#) with colleagues**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

17. **Using the [Marine Institute Pilot](#) can be hard for the average citizen**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

18. **The [Marine Institute Pilot](#) is easy to use**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Have you any comments and or recommendations regarding the evaluation of this pilot?

C. **[Marine Institute Pilot Data](#)**

19. **The data in the [Marine Institute Pilot](#) are accessible**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

20. **The data in the [Marine Institute Pilot](#) is complete**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

21. **The data in the [Marine Institute Pilot](#) are accurate**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

22. **The data in the [Marine Institute Pilot](#) are consistent**

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

23. **A lot of time is needed to find the right data in the [Marine Institute Pilot](#)**

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

24. I am able to find all the data I'm looking for when using [the Marine Institute Pilot](#)

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Are there any particular datasets you are aware of that would prove useful in the pilot evaluated?

E. [Marine Institute Pilot](#)

25. [The Marine Institute Pilot](#) has a clear visualisation

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

26. [The Marine Institute Pilot](#) helps to support emergency response operations

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

27. [The Marine Institute Pilot](#) helps to support marine renewable energy investment decisions

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

28. [The Marine Institute Pilot](#) helps to support planning a sailing event

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

29. [The Marine Institute Pilot](#) helps me to make better decisions

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

30. [The Marine Institute Pilot](#) helps my understanding of ocean conditions relevant to emergency response, marine energy and marine event planning

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

31. [The Marine Institute Pilot](#) will increase efficiency

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

32. [The Marine Institute Pilot](#) reduces time spent looking for information

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

33. [The Marine Institute Pilot](#) reduces the costs to search and decide

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

34. More functions in [the Marine Institute Pilot](#) are needed to create transparency to support marine decision-making

() Strongly Agree () Agree () Neutral () Disagree () Strongly Disagree

Do you want to explain your answers or comment on anything not covered about results?

Thank you for your time in completing this evaluation questionnaire.

7.3 OGI CubiQL API Developers' Questionnaire

OGI CubiQL API

Evaluation – Developer Questionnaire – Third Year 18/19

This questionnaire is aimed to be filled by Developers at various aspects of the applications developed within the toolkit provided by H2020 OpenGovIntelligence (OGI) project. When answering the questions the application developed using the [OGI CubiQL API](#) should be taken into account. The following topics will be asked:

- General background information; and, OGI API characteristics (Functionality, performance, etc.).

A. User Information

1. What is your field of education?

- ☐ Natural and Physical Science ☐ Social Science ☐ Information Technology
☐ Engineering and related ☐ Agriculture, environmental and related studies
☐ Health and related studies ☐ Other (Please specify): _____

2. What is the highest level of education that you have completed?

- ☐ Bachelor ☐ Master ☐ Ph.D. ☐ Don't have / Don't want to share

3 How many years have you been programming using APIs?

A: _____

4 Which pilot have you been working on?

- ☐ Belgium ☐ England ☐ Estonia ☐ Greece ☐ Ireland ☐ Lithuania

B. OGI CubiQL API Functionality

5 The [OGI CubiQL API](#) provides all required functionalities

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

6 It is easy to find all the needed functionalities in the [OGI CubiQL API](#)

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

7 All functions in the [OGI CubiQL API](#) work properly

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

8 All functions in the [OGI CubiQL API](#) provide correct results

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

9 All functions in the [OGI CubiQL API](#) help to access linked statistical data

- ☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about functionality?

C. OGI CubiQL API Performance**10 The OGI CubiQL API is responsive**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**11 The processing times of the OGI API are satisfactory**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**12 The OGI CubiQL API doesn't require too many computational resources to operate**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**13 The OGI CubiQL API performs required functions efficiently**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**Do you want to explain your answers or comment on anything not covered about performance?**

D. OGI CubiQL API Compatibility**14 The OGI CubiQL API has no problems working in a common environment with other products**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**15 The OGI CubiQL API can be used with your existing network**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**16 The OGI CubiQL API improved the interoperability of my application**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**Do you want to explain your answers or comment on anything not covered about compatibility?**

E. OGI CubiQL API Usability**17 The OGI CubiQL API is easy to learn**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**19 The OGI CubiQL API is easy to operate and control**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**20 The documentation of the OGI CubiQL API is easy to understand**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree**21 The OGI CubiQL API enables a satisfying interaction for the developer**☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

22 I have a good understanding of the [OGI CubiQL API](#)

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

23 The [OGI CubiQL API](#) has similar structure compared to the most common APIs

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

24 The structure is similar throughout the [OGI CubiQL API](#)

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about usability?

F. **[OGI CubiQL API Reliability](#)**

23 The [OGI CubiQL API](#) is reliable under normal operation

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

24 The [OGI CubiQL API](#) is accessible when required for use

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

25 The [OGI CubiQL API](#) can be restored quickly from a system failure

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Do you want to explain your answers or comment on anything not covered about reliability?

Thank you for your time to answer the questions!