



OpenGovIntelligence

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

Deliverable 3.3

OpenGovIntelligence ICT tools – second release

Leading partner:	NUIG
Participating partners:	CERTH, TUT, ProXML, SWIRRL, NUIG, MI, TRAFFORD
Version-Status:	1.0
Dissemination level:	PU

Deliverable factsheet

Project Number:	693849
Project Acronym:	OpenGovIntelligence
Project Title:	Fostering Innovation and Creativity in Europe through Public Administration Modernization towards Supplying and Exploiting Linked Open Statistical Data

Deliverable title:	OpenGovIntelligence ICT tools – second release
Deliverable number:	D3.3
Official submission date:	31 October 2017
Actual submission date:	31 October 2017

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Abstract:

This deliverable list the prototypes of software components delivered as a result of the second development stage of OpenGovIntelligence project.

Effort of Participating Partners

	<i>Name</i>	<i>Short Name</i>	<i>Role</i>	<i>Person Months</i>
1.	Centre for Research & Technology - Hellas	CERTH	Participant	7.5
2.	Delft University of Technology	TU Delft	Indirect	0
3.	National University of Ireland, Galway	NUIG	Leader	19.35
4.	Tallinn University of Technology	TUT	Participant	0.8
5.	ProXML bvba	ProXML	Participant	0.29
6.	Swirrl IT Limited	SWIRRL	Participant	7.6
7.	Trafford council	TRAF	Indirect	0.2
8.	Flemish Government	VLO	Indirect	0
9.	Ministry of Interior and Administrative Reconstruction	MAREG	Indirect	0
10.	Ministry of Economic Affairs and Communication	MKM	Indirect	0
11.	Marine Institute	MI	Indirect	0.25
12.	Public Institution Enterprise Lithuania	EL	Indirect	0.1

Revision History

<i>Version</i>	<i>Date</i>	<i>Revised by</i>	<i>Reason</i>
0.1	18-Sep-2017	A. Stasiewicz (NUIG)	First Draft
0.2	09-Oct-2017	A. Stasiewicz (NUIG)	Tools list update
0.3	18-Oct-2017	A. Stasiewicz (NUIG)	Tools list update
0.4	20-Oct-2017	A. Stasiewicz (NUIG)	General updates
0.5	26-Oct-2017	A. Stasiewicz (NUIG)	General updates
0.6	31-Oct-2017	A. Stasiewicz (NUIG)	Addressing internal review comments
1.0	31-Oct-2017	CERTH	Submission to EC

Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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List of Abbreviations

The following table presents the acronyms used in the deliverable in alphabetical order.

<i>Abbreviation</i>	<i>Description</i>
API	Application Programming Interface
CMS	Content Management System
ICT	Information and Communication Technologies
LOSD	Linked Open Statistical Data
OLAP	OnLine Analytical Processing
RDF	Resource Description Framework
UI	User Interface
URI	Uniform Resource Identifier
WP	Work Package

Executive Summary

This document lists and provides access to the components delivered as the Second Software Prototype of the OpenGovIntelligence ICT tools. Specification details and information about usage are documented in Deliverable D3.4 – “Report on OpenGovIntelligence ICT tools – second release” (referred to as D3.4). Listed components reflect the status of work of OpenGovIntelligence project in Month 21.

Based on the primary purposes, the tools are be grouped in three categories:

- (a) the creation of Linked Open Statistical Data (LOSD) from various sources,
- (b) the expansion of LOSD with datasets from existing sources,
- (c) the exploitation of LOSD for the co-production of public services.

The second (final) version of the OpenGovIntelligence innovation framework for public service co-creation driven by the exploitation of Linked Open Statistical Data is documented in deliverable D2.2 – “OpenGovIntelligence Framework” (referred to as D2.2)

OpenGovIntelligence ICT tools is a suite of both open source and commercial tools.

1 List of Software Components

Below we list the tools, which were delivered during the first and the second development stage as well as links by which they can be accessed. In general, tools developed during the project lifecycle can be accessed at the GitHub repository available at: <http://github.com/OpenGovIntelligence> .

While the development of the majority of the tools were initialised during the OpenGovIntelligence project, some of them were using outputs of the DaPaaS¹ and OpenCube² projects as the technical starting point. Details are presented in Table 1. OGI ICT Tools technical starting point and visualised in Figure 1. LOSD Tool Ecosystem and discussed further in D3.4.

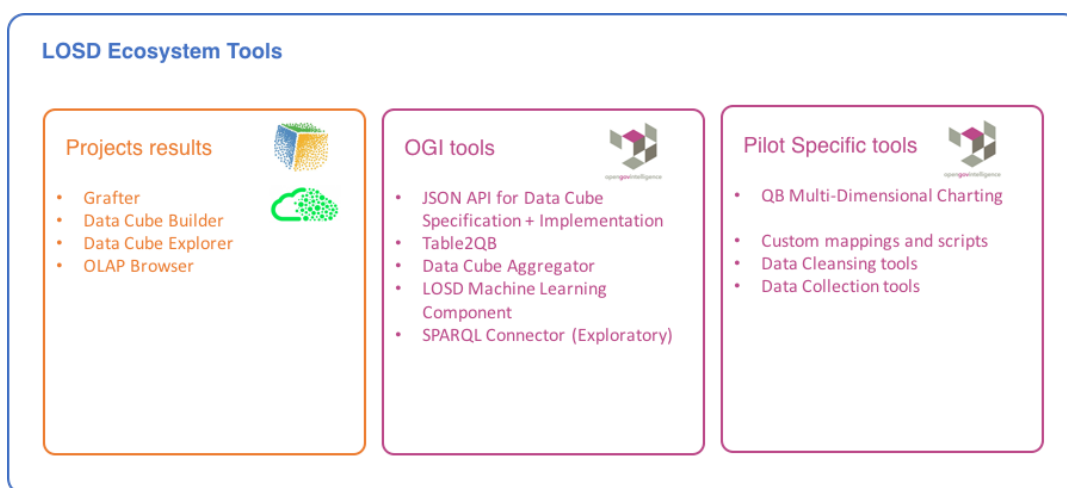


Figure 1. LOSD Tool Ecosystem

Table 1. OGI ICT Tools technical starting point

No.	Name	Started in Year 2	Foundation
1	JSON API For Data Cube Specification	No	OpenGovIntelligence
2	JSON API For Data Cube Implementation	No	OpenGovIntelligence
3	Table2QB And Grafter	No	DaPaaS
4	Assisted Cube Schema Creator	Yes	OpenGovIntelligence
5	Data Cube Builder	No	OpenGovIntelligence
6	Data Cube Explorer	No	OpenCube

¹ <https://project.dapaas.eu>

² <http://opencube-project.eu>

7	Data Cube Aggregator	No	OpenCube
8	LOSD Machine Learning Component	Yes	OpenGovIntelligence
9	OLAP Browser	No	OpenCube
10	QB Multi-Dimensional Charting	Yes	OpenGovIntelligence
11	RDF Data Cube Geo-Data Supported Dashboard	Yes	OpenGovIntelligence
12	SPARQL Connector for Exploratory	Yes	OpenGovIntelligence

1.1 JSON API for Data Cube specification

The JSON-QB API aims to (i) facilitate the development of Linked Open Statistical Data (LOSD) tools through a style of interaction familiar to web developers and (ii) offer a uniform way to access LOSD. The API can be installed on top of a RDF repository and offer basic and advanced operations on RDF Data cubes assuming that:

- i) they are stored using the RDF Data Cube Vocabulary,
- ii) they follow a specific application profile (common practices) and
- iii) are accessible through a SPARQL endpoint.

The returned results are in JSON format. In the second year the implementation adopted the GraphQL query language for APIs. This approach enables the flexible expression of data queries giving to the API clients the power to ask for exactly what they need and thus enabling the development of powerful tools. Moreover, in the second year new functionality has been developed that enables the advanced searching of data cubes that match the user requirements.

Available at: <https://github.com/Swirrl/graphql-qb>

1.2 JSON API for Data Cube implementation

This component is the implementation of the JSON QB specification provided by OpenGovIntelligence project. It aims to provide an easy to use API for web developers that use statistical data stored in the form of RDF Data cubes. The API implementation can be installed on top of any RDF repository and offer basic and advanced operations on RDF Data cubes.

Available at: <https://github.com/Swirrl/graphql-qb>

1.3 Table2qb and Grafter

The Table2qb tool, implemented with Grafter, takes data in a specific tabular structure, either as a CSV or Excel file, and converts it into an RDF Data Cube: representing the data as a series of observations with dimensions, attributes and measures, and generating the associated Data Structure Definition.

Availability

Grafter can be obtained from <https://github.com/Swirrl/grafter>

Table2qb can be obtained from <https://github.com/OpenGovIntelligence/table2qb>

1.4 Assisted Cube Schema Creator

Assisted Cube Schema Creator is a tool created in order to simplify the mapping process. It is built on top of spreadsheet concept, Open Refine and Data Cube vocabulary. Based on user inputs it generates RDF data structure definition used by e.g. Data Cube Builder.

Available at: <https://github.com/OpenGovIntelligence/qb-assisted-schema-creator>

1.5 Data Cube Builder

Data Cube Builder is a tool for transforming non-RDF data sources to RDF Data Cube. It is built on top of TARQL³. Data Cube Builder can be used through multiple interfaces such as desktop UI, command line, web user interface and as a web service.

Available at: <https://github.com/OpenGovIntelligence/data-cube-builder>

1.6 Data Cube Explorer

Data Cube Explorer is a web-based tool that catalogues and presents details of available data cubes to the users, it also enables user to preview cube data using pivot table, cube browser and other visualisation widgets.

Available at: <https://github.com/OpenGovIntelligence/data-cube-explorer>

³ <http://tarql.github.io>

1.7 Data Cube Aggregator

The Data Cube Aggregator aggregates data across dimensions of a cube. The aggregate functions supported are the AVG, SUM, MIN, MAX and COUNT. The second year implementation aims in computing aggregations from raw RDF data. Thus, taking as input the raw RDF data it creates a cube that contains the corresponding aggregated observations.

Available at: <https://github.com/OpenGovIntelligence/json-qb-api-implementation>

(currently integrated with JSON-QB API)

1.8 LOSD Machine Learning component

The Machine Learning Component enables the automatic extraction of numerous features from LOSD based on the needs of the users and the predictive scenario that is implemented. It also enables the performance of dimension reduction based on relevant algorithms such as Forward Subset, Backward Subset, and Lasso in a user friendly approach. The implementation of the Machine Learning Component is based on the JSON-QB API and R server.

Available at: <https://github.com/OpenGovIntelligence/qb-machine-learning-component>

1.9 OLAP Browser

The OLAP Browser enables the exploration of RDF data cubes by presenting each time a two-dimensional slice of the cube as a table.

Available at: <https://github.com/OpenGovIntelligence/qb-olap-browser>

1.10 QB Multi-Dimensional Charting

QB Multi-Dimensional Charting component is a multi dimensional charting dashboard written in JavaScript on top of a dc.js⁴ library. It leverages d3 engine to render data driven charts in SVG format.

The main objective of this tool is to provide an easy, yet powerful JavaScript dashboard which can be utilized to perform data visualization for cube data and analysis in the browser as well as on mobile devices.

Available at: <https://github.com/OpenGovIntelligence/qb-multi-dimensional-charting>

⁴ <https://dc-js.github.io/dc.js>

1.11 RDF Data Cube geo-data supported Dashboard

This dashboard is designed and implemented in order to support visualisation of geo annotated data sets. Currently it is used to support the Lithuanian pilot use case requirements.

Available at: <https://github.com/OpenGovIntelligence/qb-geo-ui>

1.12 SPARQL connector for Exploratory⁵

SPARQL connector for Exploratory allows to connect the Exploratory Data Science tool to a SPARQL endpoint. This component is provided as R code together with JSON configuration file. It has become part of a largely deployed product. Details about the Exploratory extensions are available at: <https://docs.exploratory.io/import/extensions.html>

Available at: https://github.com/OpenGovIntelligence/exploratory_sparql_plugin

⁵ <https://exploratory.io>

2 Conclusion

This deliverable lists the components delivered in the second phase of OpenGovIntelligence project (Month 21). The detailed descriptions of the components (developed and to be developed) are provided in the Deliverable D3.4 – “Report on OpenGovIntelligence ICT tools – second release”.

This deliverable will be updated together with the ongoing development of the OpenGovIntelligence tools. The final release of the developed components will be documented in deliverable D3.5 “OpenGovIntelligence ICT tools” planned at October 2018.