ODINE

H2020-ICT-2014-1

Project Number: 644683

D4.1 DaaS platform and experimentation facilities

Coordinator: Sergio García Gómez (TID)

Quality reviewer: Luis Daniel Ibañez (SOTON)

Deliverable nature:	Other (O)
Dissemination level: (Confidentiality)	Public (PU)
Contractual delivery date:	31/07/2015
Actual delivery date:	31/07/2015
Keywords:	Software tools, platform

Document Information

IST Project Number	644683	**Acronym**	ODINE
Full Title	Open Data Incubator for Europe		
Project URL	http://opendataincubator.eu		
Document URL			
EU Project Officer	Francesco Barbato		

Deliverable	D4.1 DaaS platform and experimentation facilities
Work Package	WP4 Data and computing infrastructure

Table of Contents

1. Introduction

This document describes the technical resources and services that ODINE consortium provides to SMEs and entrepreneurs accelerated by the project. In a nutshell, ODINE will provide cloud resources for experimentation, tools recommendations, open data directories and coaching and technical support for those that request it.

As for the cloud services, section 2 explains how ODINE accelerated SMEs can access and use FIWARE Lab resources for development and experimentation. Section 3 elaborates on the tools that are being recommended or suggested by the ODINE partners. Finally, Section 4 brings a number of openly available open data resources and catalogues that can be helpful for developers.

2. Infrastructure description and usage

FIWARE Lab

The cloud resources provided through the ODINE consortium are based on FIWARE Lab. SMEs will be able to setup the basic virtual infrastructure needed to run applications that make use of the APIs provided by FIWARE Generic Enablers [1] or any other piece of software.

In a nutshell, FIWARE Lab is a cloud hosting environment built on top of the Open Stack [2] platform which, in combination with FIWARE Cloud Generic Enablers provides the following major features:

- Infrastructure as a Service, as Virtual Machines deployable and manageable through a web portal and accessible through SSH and other services. A set of VM images with preinstalled open source operating systems (e.g. Ubuntu, CentOS) and software components (e.g. FIWARE GEs and ODINEs supported tools) are provided for easy deployment.
- Security aspects, as integrated authentication based on OAuth 2.0., Security SSH certificates to access VMs and security groups to manage firewall rules to control access to VMs.
- Object Storage service.
- Networking capabilities, and IP access to resources.
- Software deployment tools (known as blueprints), to configure and one-click-deployment of software architecture designs (bundles of tools) in various layers.
- Global (shared) instances of tools that can be used for tools testing and prototyping. A global instance of the CKAN open data portal is also provided, can be used for accessing existing data sources and publishing new output open data.

There are online webinars where the main concepts and tutorials are provided [3]. ODINE's Accelerated SMEs and entrepreneurs will be entitled to get a Community Account in FIWARE Lab. There is a procedure [4] to register and apply for this type of account, being important to specify "ODINE" as accelerator during the application. The following resources will be granted initially for 9 months, and it can be extended under justification.

Resource	Default	Maximum (the need must be justified)

---

[1] http://forge.fiware.org/plugins/mediawiki/wiki/fiware/index.php/Overall_FI-WARE_Vision#FIWARE_Generic_Enabler_Open_Specifications.2C_Compliant_Platform_Products.2C_Instances

[2] https://www.openstack.org/

[3] http://help.lab.fiware.org/

[4] http://forge.fiware.org/plugins/mediawiki/wiki/fiware/index.php/FIWARE_Lab:_Upgrade_to_Community_Account

VM Instances	2	5
VCPUs	2	10
Hard Disk	40 GB	100 GB
Memory	4096 MB	10240 MB
Public IP	1	1

Other environments

At the time this deliverable is written, special deals are being negotiated with important commercial cloud services providers to offer special conditions and resources for ODINE's accelerated SMEs and entrepreneurs. The results of these agreements will be opportunely explained in ODINE's web portal and social media channels, and will lead to revision of this document.

Notwithstanding that, SMEs can rely on any existing commercial cloud offering, taking advantage of the free tier that it is often provided by these: Amazon Web Services, Rackspace, IBM, Joyent, etc. E.g., Amazon EC2 offers 750 hours/month of a t2.micro instance of Linux[5] for one year.

3. Tools for open data

This section describes the tools that are provided, supported or suggested for developers and entrepreneurs for handling open data at the different stages of the typical lifecycle, from publications to reutilization in various ways. First, tools provided through the FIWARE Lab infrastructure with automatic deployment mechanisms are described, detailing multiple aspects, and particularly the level of support provided by ODINE consortium.

Additionally, there are many third party tools that can be useful for developers, but as ODINE partners are not involved in their development, support cannot be provided.

Supported tools

This section describes the tools supported by the ODINE consortium. There are different technologies that can be applied in different contexts and phases of the data lifecycle. There are three types of tools: first, those related to semantic / linked open data technologies; second, those which are part of the data handling capabilities of the FIWARE platform; finally, some other open data related tools supported by the consortium.

The support will be provided by the consortium through a Slack channel at ODINE-dev.slack.com. For specific tools where the support is provided by third parties, developers will be properly pointed to the right channel, ensuring that they get fast track support.

Linked Open Data tools

Tool Name	*SPARQLMap*
Classification	*Technical*
URL	*http://aksw.org/Projects/SparqlMap.html*
Short description	*It is a SPARQL-to-SQL rewriter. It allows the execution of SPARQL queries on a relational database and does not require dumping the data first. The translation is a lightweight process with low requirements on processing power. The mapping of the relational database is expressed using R2RML.*
License	*Code available, but no license is specified by the developer.*

---

[5] http://aws.amazon.com/es/free/

Category	Transformation
Type of Data	Semantic (RDF-Linked Data)
Supporting partner	IAIS
Level of support	Best Effort (contact to partner)
Installation How-To	https://code.google.com/p/sparqlmap/wiki/Installation
Video Tutorials	N/A
Resources For Developers	https://code.google.com/p/sparqlmap/

Tool Name	LinDA Viz
Classification	Technical
URL	https://github.com/linda-tools
Short description	Visualization tool for CSV and RDF data developed for non-expert users and SMEs
License	MIT
Category	Visualization
Type of Data	Semantic (RDF-Linked Data)
Supporting partner	IAIS
Level of support	Direct support from the team
Installation How-To	https://github.com/LinDA-tools/Visualization
Video Tutorials	N/A
Resources For Developers	https://github.com/LinDA-tools/Visualization

Tool Name	LinDA RDF2Any
Classification	Technical
URL	https://github.com/linda-tools
Short description	Conversion tool from RDF format to tabular formats and RDB
License	MIT
Category	Transformation
Type of Data	Semantic (RDF-Linked Data)
Supporting partner	IAIS
Level of support	Direct support from the team
Installation How-To	https://github.com/LinDA-tools/RDF2Any
Video Tutorials	N/A
Resources For Developers	https://github.com/LinDA-tools/RDF2Any

Tool Name	LinDA QueryBuilder
Classification	Technical
URL	https://github.com/linda-tools
Short description	Tool for exploration and consumption of Linked Data datasets in RDF
License	MIT
Category	Exploration
Type of Data	Semantic (RDF-Linked Data)

Supporting partner	*IAIS*
Level of support	*Direct support from the team*
Installation How-To	*https://github.com/LinDA-tools/QueryBuilder*
Video Tutorials	*N/A*
Resources For Developers	*https://github.com/LinDA-tools/QueryBuilder*

Tool Name	*LinDA Transformations (any2RDF)*
Classification	*Technical*
URL	*https://github.com/linda-tools*
Short description	*Converters from CSV and other tabular formats to RDF*
License	*MIT*
Category	*Transformation*
Type of Data	*Semantic (RDF-Linked Data)*
Supporting partner	*IAIS*
Level of support	*Direct support from the team*
Installation How-To	*https://github.com/LinDA-tools/transformation*
Video Tutorials	*N/A*
Resources For Developers	*https://github.com/LinDA-tools/transformation*

Tool Name	*Silk*
Classification	*Technical*
URL	*http://wifo5-03.informatik.uni-mannheim.de/bizer/silk/*
Short description	*The Silk framework is a tool for discovering relationships between data items within different Linked Data sources. Data publishers can use Silk to set RDF links from their data sources to other data sources on the Web.*
License	*Apache*
Category	*Linking*
Type of Data	*Semantic (RDF-Linked Data)*
Supporting partner	*IAIS*
Level of support	*Best Effort (contact to partner)*
Installation How-To	*https://www.assembla.com/spaces/silk/wiki*
Video Tutorials	*https://www.youtube.com/watch?v=Xhir0cWAF3I*
Resources For Developers	*https://www.assembla.com/spaces/silk/wiki*

Tool Name	*Limes*
Classification	*Technical*
URL	*http://aksw.org/Projects/LIMES.html*
Short description	*LIMES is a link discovery framework for the Web of Data. It implements time-efficient approaches for large-scale link discovery based on the characteristics of metric spaces. It is easily configurable via a web interface. It can also be downloaded as standalone tool for carrying out link discovery locally.*
License	*N/A*
Category	*Linking*

Type of Data	Semantic (RDF-Linked Data)
Supporting partner	IAIS
Level of support	Best Effort (contact to partner)
Installation How-To	http://saim.aksw.org/
Video Tutorials	http://saim.aksw.org/
Resources For Developers	N/A

Tool Name	OntoWiki
Classification	Technical
URL	http://ontowiki.net/
Short description	is a tool providing support for agile, distributed knowledge engineering scenarios. OntoWiki facilitates the visual presentation of a knowledge base as an information map, with different views on instance data. It enables intuitive authoring of semantic content. It fosters social collaboration aspects by keeping track of changes, allowing to comment and discuss every single part of a knowledge base.
License	GNU GPL v2
Category	Authoring
Type of Data	Semantic (RDF-Linked Data)
Supporting partner	IAIS
Level of support	Best Effort (contact to partner)
Installation How-To	N/A
Video Tutorials	N/A
Resources For Developers	N/A

Tool Name	SemMap
Classification	Technical
URL	http://wiki.aksw.org/Projects/SemMap
Short description	Spatial visualization widget for OntoWiki
License	N/A
Category	Transformation
Type of Data	Semantic (RDF-Linked Data)
Supporting partner	IAIS
Level of support	Best Effort (contact to partner)
Installation How-To	N/A
Video Tutorials	N/A
Resources For Developers	N/A

Tool Name	CubeViz
Classification	Technical
URL	http://aksw.org/Projects/CubeViz.html
Short description	CubeViz is a faceted browser for statistical data utilizing the RDF Data Cube vocabulary, which is the state-of-the-art in representing statistical data in RDF. This vocabulary is compatible with SDMX and increasingly being

	adopted. Based on the vocabulary and the encoded Data Cube, CubeViz generates a faceted browsing widget that can be used to filter interactively observations to be visualized in charts. Based on the selected structure, CubeViz offers beneficiary chart types with customizable options.
License	*GNU GPL v2*
Category	*Visualization*
Type of Data	*Semantic (RDF-Linked Data)*
Supporting partner	*IAIS*
Level of support	*Best Effort (contact to partner)*
Installation How-To	*N/A*
Video Tutorials	*N/A*
Resources For Developers	*N/A*

Tool Name	*LOD2 Stack of tools*
Classification	*Technical*
URL	*http://stack.lod2.eu/blog/*
Short description	*Comprises a number of tools for managing the life-cycle of Linked Data. The life-cycle is comprised of the following phases:* *Extraction of RDF from text, XML and SQL; Querying and Exploration using SPARQL; Authoring of Linked Data using a Semantic Wiki; Semi-automatic link discovery between Linked Data sources; Knowledge-base Enrichment and Repair*
License	*Collection of open-source components, each with its individual license.*
Category	*Set of tools for Linked Data*
Type of Data	*Semantic (RDF-Linked Data)*
Supporting partner	*IAIS*
Level of support	*Best Effort (contact to partner)*
Installation How-To	*N/A*
Video Tutorials	*N/A*
Resources For Developers	*N/A*

FIWARE Platform

Tool Name	*CKAN*
Classification	*Technical*
URL	*http://ckan.org/*
Short description	*CKAN is a powerful data management system that makes data accessible – by providing tools to streamline publishing, sharing, finding and using data. CKAN is aimed at data publishers (national and regional governments, companies and organizations) wanting to make their data open and available.*
License	*GNU GPL v3.0.*
Category	*Cataloging*
Type of Data	*Metadata / Any format or API*
Supporting partner	*OKF*

Level of support	*Direct support from the team*
Installation How-To	*http://docs.ckan.org/en/latest/*
Video Tutorials	*https://vimeo.com/78249419*
Resources For Developers	*http://docs.ckan.org/en/latest/*

Tool Name	*Orion Context Broker*
Classification	*Technical*
URL	*http://catalogue.fiware.org/enablers/publishsubscribe-context-broker-orion-context-broker*
Short description	*The Orion Context Broker is an implementation of the Publish/Subscribe Context Broker GE, providing the NGSI9 and NGSI10 interfaces. Using these interfaces, clients can do several operations: Register context producer applications, e.g. a temperature sensor within a room; Update context information, e.g. send updates of temperature; Being notified when changes on context information take place (e.g. the temperature has changed) or with a given frequency (e.g. get the temperature each minute) Query context information. The Orion Context Broker stores context information updated from applications, so queries are resolved based on that information*
License	*GNU GPL v3.0.*
Category	*Publication and data API*
Type of Data	*NGSI / JSON*
Supporting partner	*TID*
Level of support	*Direct support from the team*
Installation How-To	*http://catalogue.fiware.org/enablers/publishsubscribe-context-broker-orion-context-broker/documentation*
Video Tutorials	*https://edu.fiware.org/course/view.php?id=44*
Resources For Developers	*http://catalogue.fiware.org/enablers/publishsubscribe-context-broker-orion-context-broker/documentation*

Tool Name	*Kurento*
Classification	*Technical*
URL	*http://www.kurento.org/*
Short description	*Kurento provides an open platform for video processing and streaming based on standards. This platform has several APIs and components which provide solutions to the requirements of multimedia content application developers. Analysed media can be a source of open data (e.g. through NGSI).*
License	*LGPL 2.1*
Category	*Media management*
Type of Data	*WebRTC*
Supporting partner	*TID*
Level of support	*Best Effort (contact to partner). Very responsive community*
Installation How-To	*https://www.kurento.org/docs/current/*
Video Tutorials	*https://edu.fiware.org/course/view.php?id=62*
Resources For Developers	*https://www.kurento.org/docs/current/*

Tool Name	Proton CEP
Classification	Technical
URL	http://catalogue.fiware.org/enablers/complex-event-processing-cep-proactive-technology-online
Short description	The CEP GE analyses event data in real-time, generates immediate insight and enables instant response to changing conditions. While standard reactive applications are based on reactions to single events, the CEP GE reacts to situations rather than to single events. A situation is a condition that is based on a series of events that have occurred within a dynamic time window called processing context. Situations include composite events (e.g., sequence), counting operators on events (e.g., aggregation) and absence operators. The Proactive Technology Online is an implementation of the FIWARE CEP (Complex Event Processing) GE. The Proactive Technology Online is a scalable integrated platform to support the development, deployment, and maintenance of event-driven applications. The Proactive Technology Online authoring tool allows the definition of CEP applications using a web user interface. The Proactive Technology Online engine is a runtime tool that receives information on the occurrence of events from event producers, detects situations, and reports the detected situations to external consumers.
License	Apache v2
Category	Analysis
Type of Data	JSON
Supporting partner	TID
Level of support	Best Effort (contact to partner)
Installation How-To	https://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/CEP_GE_-_IBM_Proactive_Technology_Online_Installation_and_Administration_Guide
Video Tutorials	https://edu.fiware.org/course/view.php?id=58
Resources For Developers	https://forge.fi-ware.org/plugins/mediawiki/wiki/fiware/index.php/CEP_GE_-_IBM_Proactive_Technology_Online_User_and_Programmer_Guide

Tool Name	Cosmos Big Data
Classification	Technical
URL	http://catalogue.fiware.org/enablers/bigdata-analysis-cosmos/terms-and-conditions
Short description	Cosmos is an implementation of the Big Data GE, allowing the deployment of private computing clusters based on Hadoop ecosystem. Current version of Cosmos allows users to: I/O operations regarding Infinity, a persistent storage cluster based on HDFS. Creation, usage and deletion of private computing clusters based on MapReduce and SQL-like querying systems such as Hive or Pig. Manage the platform, in many aspects such as services, users, clusters, etc, from the Cosmos API or the Cosmos CLI There is also a component called Cygnus in charge of receiving context data from Orion (Context Broker GE implementation) and storing it in HDFS.
License	Apache v2
Category	Analysis
Type of Data	Any
Supporting partner	TID
Level of support	Direct support from the team

Installation How-To	*http://forge.fi-ware.org/plugins/mediawiki/wiki/fiware/index.php/BigData_Analysis_-_Installation_and_Administration_Guide*
Video Tutorials	*https://edu.fiware.org/course/view.php?id=69*
Resources For Developers	*http://forge.fi-ware.org/plugins/mediawiki/wiki/fiware/index.php/BigData_Analysis_-_User_and_Programmer_Guide*

Tool Name	*Spago BI*
Classification	*Technical*
URL	*http://www.spagobi.org/*
Short description	*A complete, innovative and flexible suite allowing you to get instant insights on any data from any source, and build effective strategies according to your business objectives. Providing traditional analytical solutions (e.g. reports, charts), as well as innovative ones for emerging requirements (e.g. location intelligence, mobile, big data, what-if, social listening). Beyond historical analysis, towards predictive analytics. Based on open standards and APIs, it can be easily integrated into existing project environments and products. This encourages the creation of multiple business models, such as SaaS, embedded BI and analytics, Cloud BI, ISVs, OEMs, VARs.*
License	*Mozilla Public Licence v. 2.0*
Category	*Analysis and Visualization*
Type of Data	*CSV / NGSI / etc.*
Supporting partner	*TID*
Level of support	*Best Effort (contact to partner)*
Installation How-To	*http://forge.ow2.org/project/showfiles.php?group_id=204*
Video Tutorials	*http://www.spagobi.org/homepage/services/videos-and-webinars/*
Resources For Developers	*http://forge.ow2.org/project/showfiles.php?group_id=204*

Tool Name	*Wirecloud*
Classification	*Technical*
URL	*http://catalogue.fiware.org/enablers/application-mashup-wirecloud*
Short description	*Wirecloud builds on cutting-edge end-user development, RIA and semantic technologies to offer a next-generation end-user centred web application mashup platform aimed at leveraging the long tail of the Internet of Services. Wirecloud builds on cutting-edge end-user (software) development, RIA and semantic technologies to offer a next-generation end-user centred web application mashup platform aimed at allowing end users without programming skills to easily create web applications and dashboards/cockpits (e.g. to visualize their data of interest or to control their domotized home or environment). Web application mashups integrate heterogeneous data, application logic, and UI components (widgets) sourced from the Web to create new coherent and value-adding composite applications. They are targeted at leveraging the "long tail" of the Web of Services (a.k.a. the Programmable Web) by exploiting rapid development, DIY, and shareability. They typically serve a specific situational (i.e. immediate, short-lived, customized) need, frequently with high potential for reuse. Is this "situational" character which precludes them to be offered as 'off-the-shelf' functionality by solution providers, and therefore creates the need for a tool like Wirecloud*
License	*AGPLv3*
Category	*Visualization*

Type of Data	*Any*
Supporting partner	*TID*
Level of support	*Best Effort (contact to partner). Very responsive community*
Installation How-To	*http://forge.fiware.org/plugins/mediawiki/wiki/fiware/index.php/Application_Mashup_-_Wirecloud_-_Installation_and_Administration_Guide*
Video Tutorials	*http://www.youtube.com/watch?v=yzQgstBAUeo#t=1*
Resources For Developers	*https://forge.fiware.org/plugins/mediawiki/wiki/fiware/index.php/Application_Mashup_-_Wirecloud_-_User_and_Programmer_Guide*

Other tools

Tool Name	*CSVLint*
Classification	*Technical*
URL	*http://csvlint.io/*
Short description	*CSVLint helps you to check that your CSV file is readable. And you can use it to check whether it contains the columns and types of values that it should.*
License	*N/A*
Category	*Data quality*
Type of Data	*CSV*
Supporting partner	*ODI*
Level of support	*Best Effort (contact to partner)*
Installation How-To	*N/A*
Video Tutorials	*N/A*
Resources For Developers	*N/A*

Tool Name	*Open Data Certificate*
Classification	*General*
URL	*https://certificates.theodi.org/*
Short description	*Certify your open data* *Show that it's easy to find, use and share*
License	*N/A*
Category	*N/A*
Type of Data	*N/A*
Supporting partner	*ODI*
Level of support	*Best Effort (contact to partner)*
Installation How-To	*N/A*
Video Tutorials	*N/A*
Resources For Developers	*N/A*

Tool Name	*Open Refine*
Classification	*Technical*
URL	*http://openrefine.org/*

Short description	*OpenRefine (formerly Google Refine) is a powerful tool for working with messy data: cleaning it; transforming it from one format into another; extending it with web services; and linking it to databases like Freebase.*
License	*BSD*
Category	*Quality*
Type of Data	*Tabular*
Supporting partner	*IAIS*
Level of support	*Best Effort (contact to partner)*
Installation How-To	*N/A*
Video Tutorials	*N/A*
Resources For Developers	*N/A*

Other recommended tools

The following online catalogue of open source open data related tools is maintained by ODI, and will be contributed by ODINE: https://github.com/theodi/open-data-tech-review/wiki

The following tools have been highlighted due to the experience of ODINE technical team on development and support of Open Data based solutions.

Tool Name	*CSV2RDF*
Classification	*Technical*
URL	*http://data-gov.tw.rpi.edu/ws/csv2rdf.html*
Short description	*csv2rdf is a simple tool for generating RDF output from CSV/TSV files. The conversion is done by a template file that shows how the RDF output will look for one row.*

Tool Name	*Piwik*
Classification	*Technical*
URL	*http://piwik.org/*
Short description	*Piwik is the leading open-source analytics platform*

Tool Name	*datawrapper*
Classification	*General*
URL	*http://datawrapper.de*
Short description	*Datawrapper is an open source tool helping everyone to create simple, correct and embeddable charts in minutes.*

Tool Name	*Poplus Components*
Classification	*Technical*
URL	*http://poplus.org/components/current/*
Short description	*Poplus Components are independent pieces of software developed to solve a range of common problems encountered when building civic and democratic websites. These common problems include tasks like:* *- Making and maintaining up-to-date data on politicians* *- Working out what district, city or region a particular problem or politician relates to*

Tool Name	*Cuttlefish*
Classification	*Technical*
URL	*https://github.com/mlandauer/cuttlefish/*
Short description	*A lovely, easy-to-set-up transactional email server. Sending email can be painful. Do your emails get delivered? Are you considered a spammer? What about all those bounces? Let's make sending email fun again!*

Tool Name	*Represent Boundaries*
Classification	*Technical*
URL	*https://github.com/opennorth/represent-boundaries/*
Short description	*A web API to geographic areas, like electoral districts. Easily find the areas that cover your users' locations to display location-based information, like profiles of electoral candidates.*

Tool Name	*SayIt*
Classification	*Technical*
URL	*https://github.com/mysociety/sayit*
Short description	*A web service which makes it easy to store and retrieve written transcripts and written statements made by politicians and other public figures.*

Tool Name	*MapIt*
Classification	*Technical*
URL	*https://github.com/mysociety/mapit*
Short description	*A web service which makes it easy to find out which administrative area (i.e county, city, region) covers a particular point. Mature and stable.*

Tool Name	*WriteIt*
Classification	*Technical*
URL	*https://github.com/ciudadanointeligente/write-it*
Short description	*Public person messaging tool. Avoid the hassle of mail servers, creating special gmail accounts for your website. If you want your user to send messages you're in the right place. Just write it, we deliver it...*

Tool Name	*PopIt*
Classification	*Technical*
URL	*https://github.com/mysociety/popit*
Short description	*A tool to make it easy to make and maintain lists of politicians and their basic biographical information as structured data, without requiring technical skills.*

Tool Name	*BillIt*
Classification	*Technical*
URL	*https://github.com/ciudadanointeligente/bill-it*
Short description	*Flexible Document storage tool. Bills, contracts, papers it doesn't matter Billit will keep them tidy, labeled, accesible, findable. Conceived as a bill tracker, born as a document manager.*

4. Open Data Repositories

ODINE does not provide a unified catalogue of datasets, but it provides a commented list of open data portals and resources that might be explored by developers to identify the best data sources for them to use in their projects.

Additionally, ODINE members, as experts on the Open Data ecosystem will help and support entrepreneurs to identify the best open data resources for their application, to identify what open data is what is not, and to engage with third party administrations and organizations to open new datasets on demand.

The following open data cataloguing resources are highlighted:

- **Open Data Monitor**[6] brings a comprehensive catalogue of harvested open datasets from different organizations all over the world, harmonized in a way that they can be discovered and compared. It offers a catalogue of over 200 open data portals for exploration.
- **PublicData.eu** is a Pan European data portal, providing access to open, freely reusable datasets from local, regional and national public bodies across Europe. It is maintained by OKF (UK) under LOD2 project.
- **FIWARE Lab data portal**[7], a CKAN instance that publishes or harvests open data resources from the Smart Cities that are experimenting with FIWARE technologies. In particular, the open data that is released as a result of the Open and Agile Smart Cities (OASC) initiative is published in this portal (see subsection below), including NGSI in-time data from cities (e.g. public transport or IoT).
- **awesome-public-datasets**[8] is an extensive list of high-quality heterogeneous datasets in public domains that can be used by developers.

Open and Agile Smart Cities

ODINE will help entrepreneurs that request it to get in touch and request to open data that is currently closed. For instance, it will be possible to request open data to municipalities under the Open and Agile Smart Cities initiative[9].

The vision of the Open & Agile Smart Cities initiative is to create an open smart city market based on the needs of cities and communities. Cities need interoperability and standards to boost competitiveness by avoiding vendor lock-in, comparability to benchmark performance, and easy sharing of best practices. They also need solutions that can be implemented with respect for local practices and job creation.

The specific mechanisms proposed are pragmatic and simple, intended to be powerful enough to support the exchange that is needed, yet simple, so that they do not create a considerable overhead in terms of resources, and based on free licenses, so that they do not tie city development to a specific vendor or technology. This will be done by advocating cities to adopt four simple mechanisms as de facto standards. The first mechanism is a driven-by-implementation attitude. The other three mechanisms are technical (an API, a set of data models, and an open data platform):

- *Approach*: The adoption of a driven-by-implementation approach is the cornerstone of the OASC initiative. As opposed to design-by-committee approaches, the goal is that communities and developers can (1) co-create their services based on basic but commonly-defined APIs and data models, (2) influence the definition of new models by implementing and experimenting, and (3) help "curate" and evolve adopted APIs and data models based on results of implementation and actual usage.
- *API*: Within the OASC initiative, the FIWARE NGSI API is adopted as a first open license standard API targeted to provide the basic artefact for portability and interoperability of smart city solutions. This API provides a lightweight and simple yet powerful means to gather, publish, query and subscribe-to in-time context information describing what is going on in a city. This information can

---

[6] http://www.opendatamonitor.eu/
[7] https://data.lab.fiware.org/
[8] https://github.com/caesar0301/awesome-public-datasets
[9] http://connectedsmartcities.eu/open-and-agile-smart-cities/

be updated or accessed by the systems within a city dealing with the management of city services or from third party applications when the information is publicly exposed. Integration with those systems and third-party applications is low cost and is not intrusive in their respective architectures.

- *Data model*: The FIWARE NGSI API is agnostic to data models, therefore full portability and interoperability is achieved through the definition of standard city data models. Following the driven-by-implementation approach of the OASC, a first set of data models are adopted based on results of the CitySDK project

- *Platform*: Last but not least, the OASC initiative goes for the adoption of an open, flexible and easily distributable open data/API publication platform which any organisation can set up at a low cost if it is not already being used. Specifically, CKAN will serve as the base standard platform for publication of static file datasets or NGSI API query resources.

There are currently 31 cities from 7 countries in Europe and Brazil who have officially joined the Open & Agile Smart Cities initiative 1st Wave. The 2nd Wave is now open, with more than 25 new cities from 10 countries lined up. The deadline for expressing interest to join is August 31, 2015 (signing deadline is August 31).

5. Conclusions

This deliverable summarizes the various types of technical resources that ODINE consortium will deliver to SMEs and entrepreneurs accelerated by the project, from computing resources to open data catalogues, including software and support/coaching. This activity will be now complemented with a series of blog posts where the different technical teams will elaborate on the usage of certain tools and datasets to build services and solutions, as a way to inspire entrepreneurs to reify their ideas and bring their business plans into reality.

Additionally, the experience so far demonstrates that many developers will build their own software or will rely on other third party tools (in many cases general purpose tools). For them, and in order to cover the broader spectrum of needs, new agreements are being negotiated by the consortium with commercial cloud providers.