



PROJECT INTERIM REPORT

Grant Agreement No.:	318159
Project Acronym:	GEOKNOW
Project Title:	Making the Web an Exploratory Place for Geospatial Knowledge
Funding Scheme:	Collaborative Project (CP) – Specific Targeted Research Project (STReP)
Periodic Report:	3 rd Interim Report
Period Covered:	from M25 to M30 (1 st December 2014 – 31 st May 2015)
Project Co-ordinator Name:	Dr Jens Lehmann
Project Co-ordinator Organization:	Institute for Applied Informatics E.V.
Phone:	+49 341 97 32260
Fax:	+49 341 97 32329
E-mail:	lehmann@infai.org
Project Website Address:	http://geoknow.eu
Date of Preparation:	23.07.2015
Version:	1.0

Table of Contents

1. Work Progress and Achievements during the Period.....	4
1.1. Overview of the Progress of the Work	4
1.2. Description of Work Progress for each Work Package	6
2. Deliverables and Milestones Tables	31
2.1. Overview of Adherence to Plan of Deliverables.....	31
2.2. Overview of Adherence to Plan of Milestones	32
3. Internal and External Project Cooperation	33
3.1. Internal Meetings.....	33
3.2. Conference Calls.....	33
3.3. Conferences.....	34
3.4. Presentations	36
3.5. Workshops	36
4. Foreground and Dissemination Activities during this Period	37
4.1 List of Publications	37
5. Explanation of the Use of the Resources.....	38
5.1 Overview of Actual Allocated Resources	38

List of Tables

Table 1 - Work Progress Description of Work Package WP1.....	7
Table 2 - Work Progress Description of Work Package WP2.....	10
Table 3 - Work Progress Description of Work Package WP3.....	13
Table 4 - Work Progress Description of Work Package WP4.....	17
Table 5 - Work Progress Description of Work Package WP5.....	20
Table 6 - Work Progress Description of Work Package WP6.....	22
Table 7 - Work Progress Description of Work Package WP7.....	25
Table 8 - Work Progress Description of Work Package WP8.....	30
Table 9 - Deliverable Table.....	32
Table 10 - Milestone Table	32
Table 11 - Internal Meetings.....	33
Table 12 - Conference Calls	34
Table 13 - Conferences	35
Table 14 - Presentations	36
Table 15 – Workshops.....	36
Table 16 – Actual Efforts per Activity Type per Beneficiary for the Full Period.....	40
Table 17 – Actual Efforts per Activity Type per Beneficiary for the Current Period.....	43

1. Work Progress and Achievements during the Period

1.1. Overview of the Progress of the Work

This document serves to report the work performed between months 25 and 30 (M25-M30, December 1, 2014 – May 30, 2015) of the GeoKnow project. The following deliverables were due in this period:

- M26: D4.1.2 Final release spatial-semantic exploration component
- M28: D3.3.2 Context sensitive spatial knowledge aggregation
- M28: D5.2.2 Second prototype of Supply Chain Geo Data Management infrastructure
- M28: D7.2.3 Second exploitation report
- M30: D2.5.1 Distributed Geospatial Querying
- M30: D3.1.3 Evaluation of spatial interlinking
- M30: D4.2.2 Spatial curation interface
- M30: D4.3.2 Public-private Co-Evolution
- M30: D5.3.1 Release of the supply chain dashboard
- M30: D8.2.3 Intermediate project report

Regarding deviations from the description of work, there are delays with respect to deliverables D2.5.1, D4.2.2 and D5.3.1, which have, however, not resulted in an overall delay of the project. Upcoming deliverables (D3.2.3, D3.5.2, D7.1.5, D7.3.2, D4.6.2, D6.3.3, D3.4.2 and D4.4.2) due until M34 are already in progress.

Generally, the project work in the first half of the 3rd project year has mainly focussed on two directions: 1. On the one hand, the maturity of the tools has improved. In some cases, refined versions of components or reports developed in GeoKnow have been delivered (D4.2.1, D5.2.2, D7.2.3). This has led to an increased usability and popularity of the tool set developed in GeoKnow. Consequently, the Linked Data Stack as underlying repository contains more packages and has itself matured. 2. On the other hand, those tools are now applied to a larger extend in the use cases. Both BROX and Unister have integrated tools from GeoKnow in their workflows and apply them to their internal as well as public data. Naturally, the feedback through those processes positively affects scalability and flexibility of the developed tools.

Members of the GeoKnow consortium met on several occasions to discuss progress and to coordinate concurrent development efforts. Overall the project is progressing very well. The above delays are mostly due to a focus on producing high quality work and are not on critical paths of the project. The consortium has continuous communication within plenary meetings, bilateral meetings and regular phone conferences. A plenary meeting took place in conjunction with the first review meeting in Luxembourg in January, 2015 and another one was already held in Leipzig in June/July, 2015.

Dissemination activities are also progressing very well. General dissemination material such as leaflets, stickers and posters is being continuously distributed by the project partners. The results of the projects have been presented at top conferences such as the European Semantic Web conferences. Moreover, we are preparing a new demo to be presented at the

Semantics, European Data Forum and the final review meeting which highlights some GeoKnow results, in particular related to supply chain management.

The total work effort was 126.73 person-months for this reporting period (7.24PM for project management and 119.49 for RTD work). Slightly more resources were used than the linear average (94.4 PM planned) mainly due to the fact that the use of resources does not follow a linear average allocation for most partners and most WPs and less resources have been spent in these cases between M1 and M24.

1.2. Description of Work Progress for each Work Package

Work Package No.	WP 1	Plan-Start:	M01	Plan-End:	M36
Lead Participant	Ontos	Actual-Start:	M01	Actual-End:	M36
Work Package Title	Requirements, Design, Benchmarking, Component Integration				
Activity Type	Research Activities (RTD)				
Participant Involved	Ontos, InfAI, Athena, Unister, OpenLink, Brox				
Work Package Summary of Progress Towards Objectives					
<p>This work package has now two remaining tasks, and no deliverables were planned for this period. The Performance Benchmarking and Evaluation task continued to work on improving the GeoBench which will be reported in the final deliverable. The Component Integration and GeoKnow Generator task continued to track the tools development for their distribution in the Linked Data Stack. This distribution platform has also been maintained and documented, as well as the website for disseminating the new releases.</p>					

Task No.	Task 1.1	Plan-Start:	M01	Plan-End:	M04
Lead Participant	Unister	Actual-Start:	M02	Actual-End:	M04
Task Title	Common Requirements Specification				
Activity Type	Research Activities (RTD)				
Participant Involved	Unister, InfAI, BROX, Ontos				
Progress of Work					
Completed.					

Task No.	Task 1.2	Plan-Start:	M01	Plan-End:	M18
Lead Participant	Athena	Actual-Start:	M01	Actual-End:	M18
Task Title	GeoKnow Architecture & System Design				
Activity Type	Research Activities (RTD)				
Participant involved	Athena, InfAI, Ontos, Unister				
Progress of Work					
Completed.					

Task No.	Task 1.3	Plan-Start:	M01	Plan-End:	M36
Lead Participant	OpenLink	Actual-Start:	M01	Actual-End:	M36
Task Title	Performance Benchmarking and Evaluation				
Activity Type	Research Activities (RTD)				
Participant Involved	OpenLink, Athena				
Progress of Work					
<p>Improvements in D1.3.3 were made for the review meeting, including the integration of the SNB feature from the LDBC benchmark. Improvement work continued in the GeoBench program made in preparation of the final deliverable. Additional PM's were needed in this task to perform</p>					

the necessary improvement required for the benchmark results of the deliverable.

Task No.	Task 1.4	Plan-Start:	M06	Plan-End:	M36
Lead Participant	Ontos	Actual-Start:	M06	Actual-End:	M36
Task Title	Component Integration and GeoKnow Generator				
Activity Type	Research Activities (RTD)				
Participant Involved	Ontos, all partners				
Progress of Work					
<p>New releases of the tools have been uploaded and distributed in the Linked Data Stack repositories: Facete2, Mappify, Limes service, Deer service, including the creation and testing of new Virtuoso 7.2 "custom" (LOD2 Stack) packages for Ubuntu 14.04. An automatic testing of all the tools for Ubuntu 14.04 is currently under design; this update will allow us to provide rapid feedback of the components to developers. The documentation about the repository maintenance is also part of the current work and will be added in the final deliverable. Moreover, we have worked on improving the documentation for users and developers of the Linked Data Stack website.</p> <p>The GeoKnow Generator Workbench has been refactored in order to provide better REST APIs concerning the management of components and graphs. The integration of the public co-evolution services developed in task 4.3 was done in the Workbench. A wiki for the Workbench is in progress https://github.com/GeoKnow/GeoKnowGeneratorUI/wiki, and will be available for the final release of the Generator due in month 36.</p>					

Table 1 - Work Progress Description of Work Package WP1

Work package No.	WP 2	Plan-Start:	M01	Plan-End:	M35
Lead Participant	OpenLink	Actual-Start:	M01	Actual-End:	M35
Work Package Title	Semantics-Based Geospatial Information Management				
Activity Type	Research Activities (RTD)				
Participant Involved	OpenLink, Athena, InfAI, BROX				
Work Package Summary of Progress Towards Objectives					
<p>The implementation of adaptive schema and characteristic set support continued in Virtuoso to provide the necessary performance improvements required for distributed GeoSpatial capabilities. Graph analytics support has been added to Virtuoso enabling the derivation of insight from the structure of connections between data. The D2.5.1 due in M30 is delayed by one month due to additional improvements required in the SQL adaptive schema (characteristic sets) support in the Virtuoso engine to achieve the performance improvements believed possible in SPARQL Geospatial querying, making the results of more value to the project.</p>					

Task No.	Task 2.1	Plan-Start:	M01	Plan-End:	M05
Lead Participant	Athena	Actual-Start:	M01	Actual-End:	M05
Task Title	State of the Art in Geospatial and Semantic Data Management				
Activity Type	Research Activities (RTD)				
Participant Involved	Athena				
Progress of Work					
Completed.					

Task No.	Task 2.2	Plan-Start:	M02	Plan-End:	M20
Lead Participant	Athena	Actual-Start:	M02	Actual-End:	M20
Task Title	Integration with External Geospatial Databases				
Activity Type	Research Activities (RTD)				
Participant Involved	Athena, InfAI				
Progress of Work					
Completed.					

Task No.	Task 2.3	Plan-Start:	M06	Plan-End:	M24
Lead Participant	OpenLink	Actual-Start:	M06	Actual-End:	M24
Task Title	Geospatial Query Optimization				
Activity Type	Research Activities (RTD)				
Participant Involved	OpenLink, Athena				
Progress of Work					
Completed.					

Task No.	Task 2.4	Plan-Start:	M09	Plan-End:	M31
Lead Participant	OpenLink	Actual-Start:	M09	Actual-End:	M31
Task Title	Geospatial Clustering				
Activity Type	Research Activities (RTD)				
Participant Involved	OpenLink				
Progress of Work					
T2.4 ended actually with the submission of D2.4.1 in M24 and the output of this deliverable drove T2.5 as indicated in the DoW. The remaining work in this task performed has hence been reported in T2.5 as it was propelled by the output of D2.4.1.					

Task No.	Task 2.5	Plan-Start:	M13	Plan-End:	M36
Lead Participant	OpenLink	Actual-Start:	M13	Actual-End:	M36
Task Title	Distributed Geospatial Capabilities				
Activity Type	Research Activities (RTD)				
Participant involved	OpenLink				
Progress of Work					
Structured RDF					
<p>The implementation of adaptive schema and characteristic set support continued in Virtuoso to provide the necessary performance improvements required for distributed GeoSpatial capabilities. RDF is most often used because of its schema flexibility and its use of globally unique identifiers. These make RDF a self-describing format that is flexible and queryable, thus well-suited for dealing with heterogeneity and data exchange. Real data benefits from flexibility, but nearly always exhibits high regularity. Whatever real-world event generates the data, e.g. commercial transaction, scientific measurement, social interaction, the same aspects of the event will be captured. Most of the data being exchanged and integrated by means of RDF originates in relational systems with a well-defined schema. By exploiting structure in physical data storage, the added cost of flexibility may be greatly reduced. The overheads of RDF are largely eliminated and the fact of Virtuoso being a highly optimized relational column store makes it possible to outperform many relational systems while enjoying the flexibility of RDF.</p>					
Graph analytics					
<p>Graph analytics support has been added to Virtuoso enabling the derivation of insight from the structure of connections between data. This is generally done by specialized software that is separate from the DBMS managing the data. The specialized software implements a variety of canned algorithms, e.g. Page rank, centrality, community detection, analysis of traffic volume between points in the dataset etc. The applications can range from social networks to E-science. These operations usually cannot be expressed as database queries. In Virtuoso, the SQL procedure language is extended with distributed data and control structures for building graph algorithms. A set of algorithms is provided as samples and these can be customized to suit various application needs with no more effort than that of customizing a reporting query. There is no ETL stage between the database and the graph analytics and graph operations may exploit arbitrary queries as part of the algorithms. Parallelization and scale-out are handled transparently by the DBMS.</p>					
<p>The D2.5.1 due in M30 is delayed by a month due to additional improvements required in the SQL Adaptive schema (characteristic sets) support in the Virtuoso engine to achieve the performance improvements believed possible in SPARQL Geospatial querying, making the results of more value to the project.</p>					

Task No.	Task 2.6	Plan-Start:	M13	Plan-End:	M20
Lead Participant	OpenLink	Actual-Start:	M13	Actual-End:	M20
Task Title	Geospatial Problem Solving				
Activity Type	Research Activities (RTD)				
Participant Involved	OpenLink, BROX				
Progress of Work					
Completed.					

Task No.	Task 2.7	Plan-Start:	M07	Plan-End:	M18
Lead Participant	Athena	Actual-Start:	M07	Actual-End:	M18
Task Title	Exposing INSPIRE Data as Linked Data				
Activity Type	Research Activities (RTD)				
Participant involved	Athena				
Progress of Work					
Completed.					

Table 2 - Work Progress Description of Work Package WP2

Work Package No.	WP 3	Plan-Start:	M02	Plan-End:	M34
Lead Participant	Athena	Actual-Start:	M02	Actual-End:	M34
Work Package Title	Spatial Knowledge Aggregation, Fusing & Quality Assessment				
Activity Type	Research Activities (RTD)				
Participant Involved	Athena, InfAI, Unister, OpenLink				
Work Package Summary of Progress Towards Objectives					
<p>The work in this period involved developing and extending technologies covering all tasks of the Work Package, i.e.: interlinking and fusion; spatial knowledge aggregation; metrics for geographic information and spatial quality assessment. With respect to fusion of geospatial RDF data, we extended FAGI-gis so that it takes into account spatial relations for fusion, such as neighbourhoods of close spatial entities, pairs of spatial entities that are interlinked in similar ways, etc. Furthermore, we added learning mechanisms for automatically recommending fusion actions and OSM annotation classes for pairs of linked geospatial entities. To this end, we integrated OSMRec into FAGI tool. Moreover, we implemented OSMRec as a JOSM plugin, allowing the real time recommendation of OSM categories for newly created spatial entities in JOSM. Support for personalized category recommendations based on a user's editing history and/or a geographic area is also supported now. With respect to spatial quality assessment, quality metrics for ontologies (such as average surface area, average number of points) have been implemented on top of the CROCUS framework. Likewise, we prototypically implemented and tested further metrics on a Unister dataset, including metrics for detecting outliers for hierarchical relationships. The developed metrics have been tested on several datasets, including GeoLinkedData, LinkedGeoData, NUTS and Unister data. The next steps, w.r.t. fusion, include efficiency improvements and testing of FAGI on several use case scenarios.</p>					

Task No.	Task 3.1	Plan-Start:	M02	Plan-End:	M30
Lead Participant	InfAI	Actual-Start:	M02	Actual-End:	M30
Task Title	Spatial Knowledge Mapping				
Activity Type	Research Activities (RTD)				
Participant Involved	InfAI, OpenLink				
Progress of Work					
<p>In Task3.1, we carried out a dedicated evaluation of the technologies and frameworks developed over the course of the project. In particular, we evaluated ORCHID on datasets of different sizes and granularity. We used LinkedGeoData as a provider of large numbers of polygons and large numbers of instances. In addition, we used DBpedia as it provides a large number of resources but in a low resolution. High resolution with a small number of resources was also considered through the use of the Nuts dataset. Partner data used included the geo-spatial data from Unister. Within our experiments, we used a large number of industry-like settings (e.g., up to 6 million geo-spatial entities) to measure both the runtime achieved by the approach and the quality of the links it returned. Similar evaluation work was carried out by combining ORCHID with nine other polygon distance measure as well as evaluating the distances on their own. Another area of interest was the use of caching to make the execution of very large specifications on standard hardware possible. Load balancing for ORCHID was also evaluated.</p>					

Task No.	Task 3.2	Plan-Start:	M05	Plan-End:	M31
Lead Participant	Athena	Actual-Start:	M05	Actual-End:	M31
Task Title	Spatial Knowledge Fusing				
Activity Type	Research Activities (RTD)				

Participant Involved	Athena
Progress of Work	
<p>In Task 3.2, we extended FAGI-gis so that it takes into account spatial relations for fusion, such as neighbourhoods of close spatial entities, pairs of spatial entities that are interlinked in similar ways, etc. To this end, we incorporated nearest neighbour and clustering algorithms with FAGI. Furthermore, we added a learning mechanism that learns the latent relations between linked spatial entities and their properties (w.r.t. fusion actions) and is able to automatically recommend proper fusion actions for pairs of linked entities. Likewise, we integrated OSMRec into FAGI-gis, allowing the latter to recommend automatically OSM categories (classes) for annotation of the fused spatial entities, using the learning and recommendation mechanisms of OSMRec. Apart from the aforementioned major improvements in FAGI, we also improved and extended existing functionality, including: the map-based (and now map-centric) user interface, the fusion actions on m-to-n properties and on chain properties. The next steps of FAGI development will focus on further improving the efficiency of the tool and on enhancing/aligning the implemented functionality according to end users requirements (e.g. specific fusion use cases from Unister's commercial setting). The FAGI-gis tool was accepted and presented as a demo paper at ESWC'15.</p>	

Task No.	Task 3.3	Plan-Start:	M09	Plan-End:	M28
Lead Participant	Athena	Actual-Start:	M09	Actual-End:	M28
Task Title	Quality Aware Spatial Knowledge Aggregation				
Activity Type	Research Activities (RTD)				
Participant Involved	Athena, InfAI				
Progress of Work					
<p>In Task 3.3, we implemented OSMRec, (initially developed as a command-line utility for recommending OSM categories for newly inserted spatial entities in OSM) as a plugin for the JOSM tool for editing OpenStreetMap. In addition, we added personalization functionality that takes into account the OSM editing history of the specific user in order to recommend annotation categories for new entities. OSMRec also allows the users to train and combine several recommendation models, based on (a) a specific geographic area, (b) a user's editing history and (c) a user's editing history on a specific geographic area. Finally, OSMRec's functionality was incorporated into FAGI, allowing the automatic recommendation of OSM categories for fused spatial entities.</p> <p>Work by Openlink in this task included a peer review of D3.3.2 "Context-Sensitive Spatial Knowledge Aggregation" performed by Hugh Williams.</p>					

Task No.	Task 3.4	Plan-Start:	M13	Plan-End:	M34
Lead Participant	InfAI	Actual-Start:	M13	Actual-End:	M34
Task Title	Metrics for Volunteered Geographic Information				
Activity Type	Research Activities (RTD)				
Participant Involved	InfAI				
Progress of Work					
<p>In Task 3.4, we combined the spatial quality metrics developed in Task 3.5 with the different spatial distances developed in Task 3.4 to compute the quality of volunteered geographic information. Here, the idea is to assume the existence of a reference dataset. We can now measure the distribution of instances within geospatial areas by using the quality metrics previously developed in Task 3.5. Moreover, by measuring the distance between representations of the same world resource, we can compute the difference in accuracy and position across the different datasets.</p>					

Task No.	Task 3.5	Plan-Start:	M12	Plan-End:	M32
Lead Participant	InfAI	Actual-Start:	M12	Actual-End:	M32
Task Title	Spatial Knowledge Quality Assessment				
Activity Type	Research Activities (RTD)				
Participant Involved	InfAI, Unister				
Progress of Work					
<p>Unister has implemented geospatial quality metrics for ontologies on top of the CROCUS framework. These metrics include average surface area per class, average number of points and polygons per class. The results are represented by using the RDF Data Cube vocabulary and can be visualized with CubeViz. We have tested the metrics on different datasets including GeoLinkedData, LinkedGeoData, and NUTS. Moreover, we have prototypically implemented and tested further metrics on a Unister dataset, including metrics for detecting outliers for hierarchical relationships. This further helps evaluating the framework. Examples include the number of materialized "located-in" relationships per class, the number of self-related properties (statements with the same subject and object) and missing materialized statements for geospatial relationships. These metrics depend on certain restrictions so they cannot immediately be applied to other datasets.</p>					

Table 3 - Work Progress Description of Work Package WP3

Work Package No.	WP 4	Plan-Start:	M02	Plan-End:	M36
Lead Participant	InfAI	Actual-Start:	M02	Actual-End:	M36
Work Package Title	Spatial-Semantic Exploration, Visualization, Analysis & Authoring				
Activity Type	Research Activities (RTD)				
Participant Involved	InfAI, Unister, Ontos, Brox				
Work Package Summary of Progress Towards Objectives					
<p>The following work was carried out in this period: For concluding T4.1 on the "spatial semantic visualization and exploration component", two applications were delivered: The first one, called "Facete2", is a faceted browser for spatial data and was extended with the RDF editing system developed in D4.2.1. The second one, named "Mappify", is a wizard for customizing the style of map views on spatial data and supports exporting projects as code skeletons.</p> <p>In T4.2, work on the RDF edit system "REX" (D4.2.1) was finished. Current ongoing work in D4.2.2 is the development of a spatial curation interface. Thereby our focus is on the creation of components (server API and user interface) for geocoding large amounts of RDF data with powerful configuration capabilities.</p> <p>In T4.3, the concepts for the co-evolution component, specified in D4.3.1, were revised and enhanced, such as by the introduction of heuristics for conflict resolution. Further, an implementation of these concepts was made which is now being integrated into the GeoKnow Generator and Facete2.</p> <p>With regard to T4.4 spatial social networking, work continued on investigating which sources for potentially useful information on supply chain topics exist and what APIs / filter capabilities they offer. Concretely, processing articles referenced in tweets seems to be the most promising approach. For the mobile spatial browser of T4.5, besides considering different routing solutions for the final version, several minor improvements were made to the application's feature set and code base. Finally, for T4.5, the ESTA-LD tool, which facilitates exploration and analysis of spatio-temporal statistical Linked Data, was improved with support for filtering data along time dimensions using a slider. Furthermore, enrichment of datasets was carried out. Expected delays concern T4.2 (6 weeks) and T4.3 (less than a month).</p>					

Task No.	Task 4.1	Plan-Start:	M02	Plan-End:	M26
Lead Participant	InfAI	Actual-Start:	M02	Actual-End:	M26
Task Title	Spatial-Semantic Visualization and Exploration				
Activity Type	Research Activities (RTD)				
Participant Involved	InfAI				
Progress of Work					
<p>The goal of this task in this period was the development of the final version of the spatial visualization and exploration component. For this purpose we delivered two Web applications: the faceted browser "Facete2" and the spatial view customization wizard "Mappify".</p> <p>With regard to Facete2, we performed several enhancements, such as implementing internationalization support for labels in the user interface as well as in data sets. The most significant work performed, however, was the addition of RDF editing support via the integration of the RDF Edit Extensions (REX) of D4.2.1 (see T4.2 for a summary of this work). The major challenge that had to be addressed was how to make all of Facete2's components edit aware, such that persisting changes to a backend store would be properly reflected by refreshing the user interface. As a solution we developed a system which we refer to as "Data Driven Dependency Injection" (DDDI): This system enables one to define a target attribute's value as the result of the application of a given function whose arguments depend on a set of source attributes. The target's value is recomputed only when the state (i.e. the data) of any of its dependencies change. By exploiting that Facete2's user interface components already refreshed themselves when the references to their underlying services (e.g. a SPARQL endpoint) changed,</p>					

with DDDI it is now easy to link the life-span of internal service objects to e.g. a counter that is increased after each edit.

Mappify is a tool aimed at easily creating custom views over spatial Linked Data: A user can select data from SPARQL endpoints, customize a map view by choosing different base layers and defining styles for markers and polygons, and eventually generate a code skeleton from their settings. The code skeleton can be used for embedding it into one's own web site or for kick starting a stand-alone project.

Task No.	Task 4.2	Plan-Start:	M07	Plan-End:	M30
Lead Participant	InfAI	Actual-Start:	M07	Actual-End:	M30
Task Title	Adaptive Spatial-Semantic Authoring and Curation				
Activity Type	Research Activities (RTD)				
Participant Involved	InfAI				

Progress of Work

The goal of this task is to develop a spatial curation interface that allows editing small and large numbers of resources. We see Facete2 as a platform to build these features upon. In order to handle large amounts of data, a server-side solution is needed where (possibly long-running) tasks can be submitted and their progress queried. Our approach is to develop both user interface as well as server-side components for these two categories of tasks:

- Tasks that can be accomplished directly with (a set of) SPARQL update queries, such as renaming resources and normalizing values (e.g. trimming white spaces). For this type of tasks we will provide predefined input forms for parameterizing these actions.
- Geocoding large amounts of data. This part forms the core of this deliverable, and we will deliver system which accomplishes that based on the following input:
 - A source SPARQL endpoint containing the data to geocode
 - A target SPARQL endpoint where to write the result to (may be the same as the source one)
 - A specification of the set of resources which to geocode, such as museums, pubs or cities.
 - A function for obtaining address strings for each resource to geocode. This requires specifying which of a resource's attributes need to be requested.
 - The geocoder service, such as the ones offered by OpenStreetMap and Google.
 - The RDF vocabulary to use for representing spatial information, such as WGS84 or GeoSPARQL
 - The property path where to place the spatial information, relative to the set of geocoded resources. In cases where these paths are not already present in the data, rules for generating necessary resources along that path can be specified.

Once the geocoding task is complete, the system will allow the user to review the geocoding results and fix potentially wrongly coded results by choosing from alternative suggestions. We expect a delay of 6 weeks due to difficulties encountered in representing the workflow information and making it possibly to properly process it in both the JavaScript client and the Java server.

Task No.	Task 4.3	Plan-Start:	M15	Plan-End:	M34
Lead Participant	Unister	Actual-Start:	M15	Actual-End:	M34
Task Title	Public-Private Spatial Data Co-Evolution				
Activity Type	Research Activities (RTD)				
Participant Involved	Unister				
Progress of Work					
<p>In T4.3, Unister has implemented the Co-Evolution Services component and specified their integration into the GeoKnow Generator. The component builds upon the concept and interfaces developed for D4.3.1 and enables managing, applying and synchronising changes on the Virtuoso store used by the GeoKnow Generator. The concept has been extended with regards to heuristics for conflict resolution when applying changes to updated datasets. The functionality is currently integrated into the Generator web application, including extensions to the Facete component for managing the change requests. The deliverable D4.3.2 (due M30) is delayed slightly due to the incomplete Generator integration.</p>					

Task No.	Task 4.4	Plan-Start:	M13	Plan-End:	M34
Lead Participant	Ontos	Actual-Start:	M13	Actual-End:	M34
Task Title	Spatial Social Networking				
Activity Type	Research Activities (RTD)				
Participant Involved	Ontos, Brox				
Progress of Work					
<p>In this task we have investigated the benefits for the use cases on the integration of an Open Social APIs into the Generator workflow. The goal is to improve the Supply Chain use case and integrate useful information from the social networks. Thus, the current ongoing development is to extend the news extractor component (https://github.com/GeoKnow/scd-news) so that we are able to extract news content shared specifically in Twitter. As for the data workflow relevant for the use case, the articles extracted from Twitter are to be analysed as presented in the deliverable D5.2.2 "Second Prototype of Supply Chain Geo Data Management Infrastructure". Another deliverable is planned for this task in M34.</p>					

Task No.	Task 4.5	Plan-Start:	M11	Plan-End:	M36
Lead Participant	IMP	Actual-Start:	M11	Actual-End:	M36
Task Title	Mobile Spatial-Semantic Visualization, Exploration and Authoring				
Activity Type	Research Activities (RTD)				
Participant Involved	IMP, InfAI				
Progress of Work					
<p>The work in the reporting period focused on, among other efforts, bug-fixing, fine-tuning, as well as extending the mobile semantic geospatial browser's capabilities and improving the overall user experience by providing point-to-point routing support. Different routing solutions were considered, including Leaflet.Routing, Leaflet Routing Machine, MapQuest Routing, and Route360°. Moreover, work on a more powerful source manager that will support custom views per resource was initiated. The existing code was also made more flexible to ease the upcoming integration with the mobile supply chain consolidated spatial view application presently developed in T5.6. Finally, the development of a separate authoring component as well as the development of components building on top of existing WP4 efforts were investigated with respect to resource (i.e. time and effort) costs. Effort in this task was presented at the 5th ICIST</p>					

conference (Kopaonik, Serbia, March 8-11) and at the 59th International Fair of Technique and Technical Achievements (Belgrade, Serbia, May 11-15).

Task No.	Task 4.6	Plan-Start:	M11	Plan-End:	M33
Lead Participant	IMP	Actual-Start:	M11	Actual-End:	M33
Task Title	GeoKnow Prototype for Exploratory Spatiotemporal Analysis				
Activity Type	Research Activities (RTD)				
Participant Involved	IMP				
Progress of Work					
<p>The goal of this task is to enable exploration and analysis of spatio-temporal statistical linked data. To this end, the tool (ESTA-LD) needs to support a wide array of space and time dimensions. In order to maximize the coverage, it was decided to support GeoNames URIs and XSD time types for the spatial and temporal dimensions respectively. Furthermore, support for GeoNames URIs will bring an additional benefit since it will enable to acquire polygons needed for visualization on the map by querying LinkedGeoData, thereby enabling visualization of any dataset that provides statistics on a country level, such as Eurostats datasets that show how different EU countries compare in various categories. Furthermore, in order to detect spatial and temporal dimensions, the tool searches and detects standard concepts and dimensions defined in the RDF version of the SDMX content-oriented guidelines (COG) that provide a set of common statistical concepts and code lists which are meant to be reused across different datasets. Moreover, initial support for the time dimension was implemented. That is, the time dimension is visualized on a “slider” component where a user can select any time window by moving the “start” and “end” delimiters and moving the entire window through time. In the next steps, we will finalize the support for different spatial and temporal dimensions and fully link all visualizations so that selections in one visualization are reflected in the other, e.g. when a user selects a different time frame in the temporal visualization, spatial visualization will be updated to take into account only observations from the selected period.</p> <p>Effort in this task was presented at the 5th ICIST conference (Kopaonik, Serbia, March 8-11) and at the 59th International Fair of Technique and Technical Achievements (Belgrade, Serbia, May 11-15).</p>					

Table 4 - Work Progress Description of Work Package WP4

Work Package No.	WP 5	Plan-Start:	M03	Plan-End:	M36
Lead Participant	Brox	Actual-Start:	M03	Actual-End:	M36
Work Package Title	Spatial Linked Data in the Supply Chain				
Activity Type	Research Activities (RTD)				
Participant Involved	Brox, InfAI, Athena, OpenLink, Ontos				
Work Package Summary of Progress Towards Objectives					
<ul style="list-style-type: none"> • The second prototype of the Supply Chain Management Infrastructure has been delivered in D5.2.2. • The release of the Supply Chain Dashboard is currently finalized and will be delivered in D5.3.1. • The simulation environment has been deployed and presented at the Automobillogistik-Forum Leipzig 2015. • Work on the mobile version of the dashboard is in progress and will be delivered in D5.6.1. 					

Task No.	Task 5.1	Plan-Start:	M03	Plan-End:	M22
Lead Participant	Brox	Actual-Start:	M03	Actual-End:	M22
Task Title	Connecting RFID Data to the Web of Data				
Activity Type	Research Activities (RTD)				
Participant Involved	Brox, InfAI				
Progress of Work					
Completed.					

Task No.	Task 5.2	Plan-Start:	M05	Plan-End:	M36
Lead Participant	Brox	Actual-Start:	M05	Actual-End:	M36
Task Title	Supply Chain Geo Data Management Infrastructure				
Activity Type	Research Activities (RTD)				
Participant Involved	Brox, OpenLink				
Progress of Work					
<p>The second prototype of the Supply Chain Management Infrastructure has been delivered in D5.2.2 in M29. The following extensions have been made to the first prototype:</p> <ul style="list-style-type: none"> • The configuration of suppliers and the structured parts list that is used to build an end product by the OEM are read from RDF files upon application start. An RDF vocabulary was defined for that purpose. • Integration of the Prototype with the Xybermotive commercial Web-EDI system. Xybermotive can be used as a data source for supply chain data, while the GeoKnow Supply Chain Prototype enables the supply chain manager to visualize incoming data, i.e, in order to identify shortages in supply. • On-the-fly calculation of metrics, for example weather influences and news aggregation. 					

Task No.	Task 5.3	Plan-Start:	M13	Plan-End:	M31
Lead Participant	InfAI	Actual-Start:	M13	Actual-End:	M31
Task Title	Consolidated Spatial View of the whole Supply Chain				
Activity Type	Research Activities (RTD)				
Participant Involved	InfAI, Brox				
Progress of Work					
Work in progress on delivering the release of the Supply Chain Dashboard based on the initial version of the Dashboard that has been delivered in D5.2.2. The Supply Chain Dashboard is a web application that allows the user to search, browse and to explore supply chain data.					

Task No.	Task 5.4	Plan-Start:	M15	Plan-End:	M34
Lead Participant	Brox	Actual-Start:	M15	Actual-End:	M34
Task Title	GeoKnow Background Knowledge for the Supply Chain				
Activity Type	Research Activities (RTD)				
Participant Involved	Brox, Athena				
Progress of Work					
In addition to the integration of structured background knowledge as already delivered in M24, the integration of unstructured sources has been made possible. D5.2.2 demonstrated a corresponding use case by implementing a news extractor.					

Task No.	Task 5.5	Plan-Start:	M07	Plan-End:	M36
Lead Participant	Brox	Actual-Start:	M07	Actual-End:	M36
Task Title	Evaluation and Testing				
Activity Type	Research Activities (RTD)				
Participant Involved	Brox				
Progress of Work					
Ongoing work on the simulation environment, which provides a supply chain simulator that simulates the interaction among a number of suppliers. The simulator can generate a large number of messages and supports in this way the testing of both live view in the dashboard (as implemented in T5.3) and supply chain analytics by the supplier scorecards (as implemented in T5.4). The simulation environment has been deployed on a server for the purpose of evaluation in a customer environment. The deployment and maintenance strategies have been specified. The deployed infrastructure in the WP5 use case setting has been presented at the Automobillogistik-Forum Leipzig 2015. Feedback from commercial users has been collected and will be integrated for the evaluation and test report in D5.5.1.					

Task No.	Task 5.6	Plan-Start:	M25	Plan-End:	M36
Lead Participant	IMP	Actual-Start:	M25	Actual-End:	M36
Task Title	Mobile Supply Chain consolidated spatial view				
Activity Type	Research Activities (RTD)				
Participant Involved	IMP, Brox				
Progress of Work					
<p>Having in mind that supply chains are typically too complex to visualize using a map on a mobile device, it was decided that a mobile version of the dashboard should be able to visualize the supply chain in a tree-like view where a user would be able to see relationships between suppliers as well as their status and then choose a specific supplier in order to inspect it in detail. To this end, two views were implemented so far: (a) tree view, and (b) supplier view. Supplier view represents a central view, it takes the whole screen and shows all relevant information, such as coordinates, address, sub-suppliers, and metrics. Tree view is implemented as a sliding drawer which is opened by sliding it from the right, and it shows the overview and structure of the supply chain, as well as statuses of all suppliers, and highlights the supplier that is currently shown in the supplier view.</p> <p>Like GEM, the application is implemented in Apache Cordova which will ease maintenance and enable reusability. The only potential issue with this approach was the fact that mobile supply chain dashboard needs to access more native functionalities than GEM, such as periodic execution in the background and access to the notification system. However, these functionalities are supported by third party plugins that were evaluated, after which it was concluded that all requirements are met. In the next steps, the application will be extended in order to acquire and visualize dynamic information such as metrics, where for each metric, a user will be able to set thresholds that will trigger alerts indicating that a supplier is under-performing. Furthermore, we will implement a map view which will visualize a single supplier, and incorporate any future progress in other tasks.</p>					

Table 5 - Work Progress Description of Work Package WP5

Work Package No.	WP 6	Plan-Start:	M03	Plan-End:	M36
Lead Participant	Unister	Actual-Start:	M03	Actual-End:	M36
Work Package Title	GeoKnow for E-Commerce				
Activity Type	Research Activities (RTD)				
Participant Involved	Unister, InfAI, Athena, OpenLink, Ontos				
Work Package Summary of Progress Towards Objectives					
<p>The first prototype of a motive-based search was completed in time at the end of the previous reporting period. In this reporting period, we focused on background work towards the final prototype due in M33. No deliverables were due in WP6 in this reporting period.</p>					

Task No.	Task 6.1	Plan-Start:	M02	Plan-End:	M12
Lead Participant	Unister	Actual-Start:	M02	Actual-End:	M12
Task Title	Customer Data Selection, Retrieval and Preparation				
Activity Type	Research Activities (RTD)				
Participant involved	Unister, InfAI				
Progress of Work					
Completed.					

Task No.	Task 6.2	Plan-Start:	M03	Plan-End:	M15
Lead Participant	Unister	Actual-Start:	M03	Actual-End:	M15
Task Title	Design Integration Methods and Develop Prototype to Utilize RTD Results				
Activity Type	Research Activities (RTD)				
Participant Involved	Unister, Athena				
Progress of Work					
Completed.					

Task No.	Task 6.3	Plan-Start:	M13	Plan-End:	M36
Lead Participant	Unister	Actual-Start:	M13	Actual-End:	M36
Task Title	Motive and Topic-Based Search Infrastructure and UI Interfaces				
Activity Type	Research Activities (RTD)				
Participant Involved	Unister, OpenLink				
Progress of Work					
<p>In T6.3, we developed approaches for computing geospatial regions for motives, first using classification-based using features of regions and contained entities. The corresponding publication was accepted at Know@LOD workshop at the ESWC2015 conference. A more general approach only using entities and their locations is about to be completed and a related publication will be submitted to the Semantics2015 conference. Furthermore, we created plugins using the Virtuoso index extension API, with the goal of making separate requests to various store backends redundant to achieve performance boost and reducing complexity for the motive-</p>					

based search architecture. A plugin integrating memcache technology has been completed and benchmarked with very good performance results. A second plugin for ElasticSearch full-text technology is in progress. Development of the final prototype of the motive-based search infrastructure has been started.

Work by Openlink included the development of a procedure to calculate a polygon for an area which can be reached in a certain amount of time given a sort of road network and a starting position. An RDF_GRAPH_DIFF function was investigated and searched for in any of the Virtuoso archives. As it did not, an alternative method was provided for doing it as in the DBpedia Live services whose diffs datasets determine differences in polygon for an area which can be reached in a certain amount of time, given a sort of road network and a starting position.

Task No.	Task 6.4	Plan-Start:	M13	Plan-End:	M36
Lead Participant	Unister	Actual-Start:	M13	Actual-End:	M36
Task Title	Evaluation and Testing of the Search Prototype				
Activity Type	Research Activities (RTD)				
Participant Involved	Unister, Ontos				
Progress of Work					
Following the user study for the first motive-based search prototype conducted in M24, evaluation and testing of the search prototype was limited to performance tests of the background components developed in this reporting period. Benchmarks on the Memcache Virtuoso plugin were completed with substantial improvements compared to the federated approach. Benchmarking computed regions and the ElasticSearch Virtuoso plugin is work in progress. Additionally, we evaluated functionality of GeoKnow components such as LIMES, TripleGeo, Sparqlify and Virtuoso with regards to geospatial data processing for computing metrics and preprocessing data for search. Evaluation of a function for computing places that are reachable on a road network in available time is pending as the function is still in development.					

Table 6 - Work Progress Description of Work Package WP6

Work Package No.	WP 7	Plan-Start:	M01	Plan-End:	M36
Lead Participant	Ontos	Actual-Start:	M01	Actual-End:	M36
Work Package Title	Dissemination, Community Building, Exploitation & Standards				
Activity Type	Research Activities (RTD)				
Participant Involved	Ontos, Athena, InfAI, Unister, Brox, OpenLink				
Work Package Summary of Progress Towards Objectives					
<p>Continuously ongoing activities included publishing results in conferences and journals following publishing directives, providing access to the developed tools within the Linked Data Stack repositories, disseminating results through the organization of workshops and community building. A final report about exploitation activities was submitted in this period, however upcoming activities concerning exploitation, will be included in the D7.1.7 Final Report, in addition to orchestration with other projects. Another deliverable will be submitted about standardisation activities in the next months and will be followed by the GeoKnow Showcase as well as by further dissemination activities and the Final Report that are due by the end of the project.</p>					

Task No.	Task 7.1	Plan-Start:	M02	Plan-End:	M36
Lead Participant	Ontos	Actual-Start:	M01	Actual-End:	M36
Task Title	Dissemination, Community Building and Cross-Fertilization				
Activity Type	Research Activities (RTD)				
Participant Involved	Ontos, all partners				
Progress of Work					
<p>During this period the consortium had around 10 publications, 5 paper presentations in different conferences, including an article presenting the GeoKnow Generator Workbench and Use Cases, presented at http://2015.wasabi-ws.org/programme/. Moreover, the project was promoted at a couple of events. The social network activities remained the same, making tweets and writing blog posts for the GeoKnow blog and the W3C group.</p>					

Task No.	Task 7.2	Plan-Start:	M09	Plan-End:	M36
Lead Participant	Unister	Actual-Start:	M09	Actual-End:	M36
Task Title	Exploitation				
Activity Type	Research Activities (RTD)				
Participant Involved	Unister, all partners				
Progress of Work					
<p>Recent exploitation achievements are reported in more detail in the second exploitation report, which was submitted with a slight delay in M29. As in the previous reporting periods, all consortium partners continued to be committed to the exploitation of the results of the GeoKnow project. In addition to the two commercial use cases in WP5 and WP6 and the two new business cases reported on in the first exploitation report (M20), work on one more business use case has started. In order to increase exploitation opportunities, significant effort has been made regarding the maturity, publicity, release management and benchmarking of the OpenSource software tools developed and maintained within the GeoKnow project. By taking over responsibility of the Linked Data Stack, which is a well-established collection of software tools developed in a related EU-funded project, impact of the included GeoKnow tools is ensured beyond the project's runtime.</p>					

Task No.	Task 7.3	Plan-Start:	M05	Plan-End:	M32
Lead Participant	InfAI	Actual-Start:	M05	Actual-End:	M32
Task Title	Standardisation				
Activity Type	Research Activities (RTD)				
Participant Involved	InfAI, OpenLink, Ontos				
Progress of Work					
<p>Many of the performed activities related to standardization are continuations of the ones listed in the prior report. As several of GeoKnow's tools are maturing, so is their standards compliance, such as Sparqlify's R2RML, and Virtuoso's GeoSPARQL support. With regard to standardization activities at the intersection of GIS and Linked Data, the Spatial Data on the Web Working Group was recently formed. This is a joint effort of the OGC and W3C with the goal to devise standards and best practices for many of the challenges one encounters with spatial data to the Web. This effort can be seen as a continuation of the discussions initiated with the Linked Geospatial Data (LGD) workshop in early 2014, to which GeoKnow contributed and continues to do so. Maintenance of the Linked Data Stack will continue in several partner projects, such as Big Data Europe (InfAI), Sake (Ontos, InfAI), LiDaKrA (BROX). Conversely, first third-party contributions to the stack were made by the Mico project. An effort that benefits from the experiences and outcomes of GeoKnow is SHARE-PSI, a network for exchange of experience and ideas around implementing open data policies in the public sector. There, PUPIN is involved in defining the SHARE-PSI best practices that will be taken into consideration when writing the localized guidelines in SHARE-PSI partner countries. OpenLink as a member of the W3C Data Shapes Working Group additionally takes part in regular meetings to devise strategies and directions of the group.</p>					

Task No.	Task 7.4	Plan-Start:	M01	Plan-End:	M26
Lead Participant	Athena	Actual-Start:	M01	Actual-End:	M26
Task Title	Orchestration with Other Projects				
Activity Type	Research Activities (RTD)				
Participant Involved	Athena				
Progress of Work					
<p>Orchestration with other projects for this period has been pursued in the context of preparation activities for the European Data Forum 2015, in which GeoKnow members are holding prominent organizational responsibilities. Following the successful LinkedDataEurope workshop at EDF 2014, we are coordinating our efforts with several FP7/H2020 projects (e.g. Optique, SmartOpenData) in order to repeat the workshop at EDF 2015. We continued and intensified our collaboration with the PublicaMundi project towards integrating GeoKnow technologies for the provision of INSPIRE Annex I data as linked data. This collaboration has been further enlarged and led to the successful implementation of a workshop in the INSPIRE-GWF 2015 ("INSPIRE & Linked data: Bridging the gap"). Finally, we are currently involved in the working group for the development of DCAT-AP (GeoDCAT sub-group). Openlink's collaboration with the LDBC project continues with features of the LDBC SNB benchmark being incorporated into the GeoBench program. Openlink also facilitated correspondence between Unister and the tourism use case in WP6 with the Fusepool P3 project which is curating datasets for the tourism as one of its main use cases.</p>					

Task No.	Task 7.5	Plan-Start:	M01	Plan-End:	M36
Lead Participant	Ontos	Actual-Start:	M01	Actual-End:	M36
Task Title	Publishing Directives				
Activity Type	Research Activities (RTD)				
Participant Involved	Ontos, all partners				
Progress of Work					
The activities in this task remain constant, which include persistent communication about guidelines to follow in the publication activities.					

Table 7 - Work Progress Description of Work Package WP7

Work Package No.	WP 8	Plan-Start:	M01	Plan-End:	M36
Lead Participant	InfAI	Actual-Start:	M01	Actual-End:	M36
Work Package Title	Project Management				
Activity Type	Management				
Participant Involved	InfAI, all partners				
Work Package Summary of Progress Towards Objectives					
<p>In the current reporting period the GeoKnow project management revolved largely around the coordination of relevant project reporting tasks related to the Y2 EC review and its accompanying cost claims. Other obligations included the submission of deliverables and the organization of regular conference calls. Furthermore, project- and funding-related questions were answered for consortium members and, if necessary, clarified with the EC. Most of these activities relied on the use of the GeoKnow MediaWiki and the project's subversion repository which supported, for instance, the documentation of resources and work progress for the entire consortium and eased the creation and sharing of documents. The general GeoKnow mailing list was frequently used for internal communication. In addition, the project's management mailing list as well as skype calls were alternatively used allowing a swifter and more direct communication with the GeoKnow members responsible for management issues at the respective partner's or within the given WP.</p>					

Task No.	Task 8.1	Plan-Start:	M01	Plan-End:	M36
Lead Participant	InfAI	Actual-Start:	M01	Actual-End:	M36
Task Title	Management of the Consortium				
Activity Type	Management				
Participant Involved	InfAI				
Progress of Work					
<p>The Management Board executes the role of the ultimate decision-making body of the GeoKnow consortium. Based on the Consortium Agreement, its mission is to define the project strategy, to assess progress and to propose corrections if needed. It is composed of one representative of each party, which includes the following members: Dr. Jens Lehmann (InfAI), Giorgos Giannopoulos (Athena), Hugh Williams (OpenLink), Daniel Hladky (Ontos), Dr. Andreas Booth (Unister), Hans-Christian Brockmann (Brox), Prof. Dr. Sanja Vranes (IMP). No major activity is to be reported for the current reporting period with regard to the work of the Management Board of the GeoKnow consortium.</p> <p>Besides, the W3C GeoSemWeb group launched in December 2012 serves as a public forum for discussion on the geospatial Semantic Web and outreach activities beyond the project (see also http://www.w3.org/community/geosemweb/) as well as for dissemination of project results. Currently, the group consists of 71 participants who are interested in geospatial semantic data. The input of the group also feeds into the http://www.w3.org/2015/spatial effort, which targets large scale standardisation efforts for geospatial data on the web.</p>					

Task No.	Task 8.2	Plan-Start:	M01	Plan-End:	M36
Lead Participant	InfAI	Actual-Start:	M01	Actual-End:	M36
Task Title	Communication with the EC				
Activity Type	Management				
Participant Involved	InfAI				
Progress of Work					
<p>This task involved the timely communication of needs and results of the project between consortium partners and the EU. One major focus in the reporting period was on the preparation, completion and submission of the periodic report and the yearly cost statement for the consortium. There was regular and swift email contact, occasionally also using skype between the project partners, to keep each other up-to-date and to inform the EC about delays on time, clarify particular reporting requirements and address feedback as requested by the EC. Another focus was on monitoring the completion and submission of deliverables due in the reporting period and informing the PO on shifts and delays, if necessary. Other project- and funding-related correspondence included the organization of a review and plenary meeting in Luxembourg in January 2015.</p>					

Task No.	Task 8.3	Plan-Start:	M01	Plan-End:	M36
Lead Participant	InfAI	Actual-Start:	M01	Actual-End:	M36
Task Title	Financial Management				
Activity Type	Management				
Participant Involved	InfAI				
Progress of Work					
<p>Management activities in this field focused on the Y2 cost reporting including the preparation, collection and review of partners' Forms C and cost explanations. Guidance on cost reporting and on how to use NEF was given via email and Skype. The information entered by each partner was checked by the coordinator; as well reviewing each partner's cost explanations for consistency. Revisions as requested by the EC were monitored by the CO and addressed without delay. If applicable, Forms C were corrected accordingly. Likewise, InfAI's means of controlling have been regularly updated to ensure the proper administration and allocation of funds within the consortium.</p>					

Task No.	Task 8.4	Plan-Start:	M01	Plan-End:	M36
Lead Participant	InfAI	Actual-Start:	M01	Actual-End:	M36
Task Title	Internal Communication				
Activity Type	Management				
Participant Involved	InfAI, all partners				
Progress of Work					
<p>During this reporting period the GeoKnow collaboration tool suit again supported the organization and management of the project very well and made the communication among the partners most efficient. It comprises a mailing list, a GeoKnow Event Calendar, a MediaWiki as well as a subversion repository.</p> <p>Email List</p> <p>The mailing list (GeoKnow@lists.informatik.uni-leipzig.de) with currently 41 subscribers was frequently used for internal communication focusing on the following topics:</p> <ul style="list-style-type: none"> • exchanging on issues regarding research and development in the GeoKnow project 					

(e.g. coordinating collaborative work on deliverables; preparation of the Y2 review and accompanying plenary meeting in January 2015, planning of the Y3 mid-year plenary meeting in Leipzig, planning of contribution to EDF2015 as well as announcements of, for instance, W3C/OGC WG Launch and other GeoKnow-relevant events or calls for papers)

- coordinating joint efforts of dissemination and exploitation in the GeoKnow project (e.g. distributing dissemination material, submission of a book chapter to the IOS Semantic Web book and publication of the GeoKnow handbook by the GeoKnow consortium)
- organizing project management issues of the GeoKnow consortium (e.g. submission of the Y2 periodic report and due deliverables between M25-M30, preparation and submission of the Y2 cost statements, etc.).

Several other communication channels were used continuously (e.g., Twitter with 286 followers, Facebook with 129 Likes, Google+ and LinkedIn with 37 and 89 members respectively, the project website and weblog: [http:// http://geoknow.eu](http://http://geoknow.eu), the GeoKnow W3C Community and Business Group, and slideshare). For instance, foreground such as deliverables, publications and presentations were made available at <http://geoknow.eu/Results.html>. The GeoKnow weblog served again as a platform for exchange and public dissemination. During the current reporting period 6 blogposts were published on various topics including:

- project results (e.g. software tools such as OSMRec, Geospatial-semantic Exploration on the Move, Generator Workbench v1.1.0 and its 2nd year releases,),
- events (e.g. Belgrade Fair and launch of Open Geospatial Consortium (OGC) and the W3C working group for spatial data)

Online Collaboration Platforms

In order to easily share and collaboratively edit information about work packages, tasks, deliverables, calls, meetings and management issues, the GeoKnow consortium has been using a MediaWiki as collaboration platform. The MediaWiki was made available at <http://wiki.geoknow.eu>. The internal wiki has largely been used for the organization of individual WPs, the execution of specific tasks within the WPs and the documentation of reviews and submissions of deliverables. Minutes of meetings and audio conferences held between the GeoKnow members were collected and shared in the wiki in addition to including and updating guidelines on report writing, cost reporting, submission of deliverables and on the use and implementation of timesheets. Updates are also regularly made in the wiki w.r.t the consortium's combined dissemination and exploitation efforts, documenting each partner's event participation (e.g. their talks and presentations, workshops attended and/or organized, cooperations sought and initiated, etc.)

The GeoKnow subversion repository was used actively for creating and sharing documents including mostly GeoKnow-relevant publications, deliverables and reports. The project reporting for Y2 and the current period was managed through SVN, helping to collect progress statements on WP and task level, to specify the spending of resources and the submission of deliverables as well as to detail collaboration and standardization activities. Partners were informed on time on what to submit for these reports. Corresponding templates were prepared by the coordinator and the information entered by each partner was checked for accuracy and consistency. The submission of the second periodic report as well as the revisions required for its final acceptance were also managed by the coordinator.

The project calendar provided by Google allowed the coordination of the partners' dissemination and exploitation activities as well as the organisation of internal conference calls. It was regularly updated with detailed information about events in which the GeoKnow consortium was involved during the reporting period.

Conference Calls

A general telephone conference in which at least one representative of each partner was required to participate was organized every month. Partners participated in an active and reliable manner. Discussions were focusing on the following:

- to document the progress within each work package with a particular focus on due deliverables (e.g. discussion about delays and problems that occurred, on status of demos, on project-based software releases and use case improvements)
- to report on recent and coming events attended by GeoKnow members (e.g. EDF2015, ICIST session on Open Data and Geographical Information System applications, cooperation with the BigDataEurope project)

<ul style="list-style-type: none"> • discuss dissemination efforts (e.g. GeoKnow book chapter and handbook, publication of blogposts) • to discuss relevant management issues (e.g. Y2 periodic report and cost claims, organization of review and plenary meeting) <p>Telephone and skype conferences were also scheduled on a regular basis for almost all of the work packages. A list of these calls is given section 3.2. In this reporting period six monthly telcos and eight specific WP- or task-related telcos were organized by the consortium members.</p> <p>Meetings</p> <p>The second review meeting was held in Luxembourg between January 14th and 15th, 2014 and was followed by a one-day plenary meeting of the consortium on January 16th, 2015. Review preparations were steered by the coordinator, managing organisational issues as well as collecting presentations beforehand via SVN for peer review. Following a successful review meeting, the latter event gave the opportunity:</p> <ul style="list-style-type: none"> • to summarize the project's achievements and lessons learnt in year two • to discuss the structure and organization of upcoming project work per partner and WP in year three and especially define strategies to achieve technical developments and meet expectations (as identified within the review) with use cases • to outline relevant dissemination and management issues for the final year <p>Partners also met in different subgroups to plan and discuss specific work and collaboration efforts with respect to their WPs and tasks. The agenda looked as follows:</p> <ul style="list-style-type: none"> • 09:30 - 10:00 Welcome, Summary Day 1, Planning Day 2 - some tasks may need to be discussed in the whole consortium • 10:00 - 11:00: Parallel Break-Out-Session 1: WP1 + WP3 • 11:00 - 12:00: Parallel Break-Out-Session 2: WP2 + WP4 • 12:00 - 13:00 Lunch Break • 13:00 - 14:00: Parallel Break-Out-Session 3: WP5 + WP6 • 14:00 - 14:30: (Dissemination and Exploitation) Future Activities and Brainstorming • 14:30 - 15:00 Coffee Break • 15:00 - 15:30 Special Session: GeoKnow Generator / Linked Data Stack • 15:30 - 16:00 Special Session: Exploiting research (WP1-WP4) in Use Cases • [ad hoc sessions on problems discovered in WPs] • 16:00 - 16:30: Planning, Next Steps, Next Meeting, QA <p>The agenda and minutes as well as other material such as presentations were collected in the MediaWiki and SVN. The next project meeting will take place in Leipzig between June 30th and July 1st, 2015 and is organized by Unister.</p>

Task No.	Task 8.5	Plan-Start:	M01	Plan-End:	M36
Lead Participant	InfAI	Actual-Start:	M01	Actual-End:	M36
Task Title	Monitoring of Resource Expenditure				
Activity Type	Management				
Participant Involved	InfAI				
Progress of Work					
Throughout the current reporting period, the distribution of PMs was documented and reviewed at InfAI for the entire consortium. The PM allocation per WP and partner generally appeared in line with the description of work. Each partner was asked to specifically justify any over/underspending of resources; none of the deviations from the planned resources has, however, resulted in an overall delay of the project or otherwise jeopardized the project's objectives. Finally, timesheets were regularly updated and collected at InfAI. The partners were provided with a timesheet template, which was made available through SVN.					

Task No.	Task 8.6	Plan-Start:	M01	Plan-End:	M36
Lead Participant	InfAI	Actual-Start:	M01	Actual-End:	M36
Task Title	Quality Assurance of Deliverables				
Activity Type	Management				
Participant Involved	InfAI, all partners				
Progress of Work					
<p>In order to ensure the quality of deliverables, a clearly structured review process had been established by the consortium and was again closely documented in the MediaWiki. Review activities were coordinated via the internal wiki, SVN and the mailing list. Each deliverable was peer-reviewed by one or two consortium members who were chosen from an organization other than the ones responsible for the deliverable and was given a final revision for style by the coordinator. The WP leader of the respective deliverable was responsible for its final approval. The submission of deliverables was monitored through SVN and the project website. Guidelines on how to prepare, write and submit deliverables have been published in the GeoKnow Wiki. The status of overdue deliverables was persistently checked and regular notifications were sent via email. Their owners were required to provide an update of the deliverable's progress and explanation on its delay. The PO was informed accordingly. An overview of deliverables due in this reporting period was also provided in the internal wiki to manage better their creation, finalization and submission.</p>					

Table 8 - Work Progress Description of Work Package WP8

2. Deliverables and Milestones Tables

2.1. Overview of Adherence to Plan of Deliverables

Del. No.	Deliverable Name	WP No.	Lead Beneficiary	Nature	Dissemination Level	Delivery date from Annex I	Status	Actual / Forecast delivery date	Comments
D4.1.2	Final Release Spatial-Semantic Exploration Component	4	InfAI	P	PU	26	Submitted	30.04.2015 (M29)	
D3.3.2	Context-Sensitive Spatial Knowledge Aggregation	3	Athena, InfAI	P	PU	28	Submitted	24.03.2015 (M28)	
D5.2.2	Second Prototype of Supply Chain Geo Data Management Infrastructure	5	Brox	P	PU	28	Submitted	30.04.2015 (M29)	
D7.2.3	Second Exploitation Report	7	Unister	R	PU	28	Submitted	17.04.2015 (M29)	
D2.5.1	Distributed Geospatial Querying	2	OpenLink	P	PU	30	Not yet submitted	31.05.2015 (M30)	Delayed by three months
D3.1.3	Evaluation of Spatial Interlinking	3	InfAI	R	PU	30	Submitted	27.05.2015 (M30)	
D4.2.2	Spatial Curation Interface	4	InfAI	P	PU	30	Not yet submitted	31.05.2015 (M30)	Delayed by three months
D4.3.2	Public-Private Co-Evolution	4	Unister	P	PU	30	Submitted	15.06.2015 (M31)	
D5.3.1	Release of the Supply Chain Dashboard	5	Brox	R	PU	30	Submitted	05.08.2015 (M33)	

Del. No.	Deliverable Name	WP No.	Lead Beneficiary	Nature	Dissemination Level	Delivery date from Annex I	Status	Actual / Forecast delivery date	Comments
D8.2.3	Intermediate Project Report	8	InfAI	R	PU	30	Submitted	06.08.2015 (M33)	

Table 9 - Deliverable Table

2.2. Overview of Adherence to Plan of Milestones

No milestones to report on in the current reporting period.

Milestone No.	Milestone Name	WP No.	Lead Beneficiary	Delivery Date from Annex I	Status	Actual / Forecast Achievement Date	Comments
xx	xx	xx	xx	xx	xx	xx	

Table 10 - Milestone Table

3. Internal and External Project Cooperation

3.1. Internal Meetings

Start Date	End Date	Description	Participants	Location
Jan. 14, 2015	Jan. 16, 2015	Y2 Review and Plenary meeting	InfAI (Jens Lehmann, Axel Ngonga, Claus Stadler), Athena (Giorgos Giannopoulos), OpenLink (Mirko Spasic & Orri Erling), Ontos (Alejandra García-Rojas, Daniel Hladky), Unister (Andreas Both, Matthias Wauer), Brox (Robert Isele), IMP (Valentina Janev, Uros Milosevic)	Luxemburg, Luxemburg
Feb. 24, 2015	Feb. 24, 2015	Meeting with the Geodetic Institute of Slovenia (GI) team - 10 attendees	Valentina Janev (IMP)	Ljubljana, Slovenia

Table 11 - Internal Meetings

3.2. Conference Calls

Date	Description	Participants	Location
Dec. 3, 2014	GeoKnow General TelCo	InfAI (Claus Stadler, Nadine Jänicke), ATH (Giorgos Giannopoulos), Ontos (Alejandra Garcia-Rojas), Brox (Robert Isele), OpenLink (Hugh Williams, Orri Erling), IMP (Uroš Milosevic), Unister (Matthias Wauer)	Skype
Jan. 5, 2015	GeoKnow-Generator	Ontos (Alejandra Garcia-Rojas), InfAI (Jens Lehmann), IMP (Uroš Milošević, Vuk Mijović), ATH (Giorgos Giannopoulos), Brox (Robert Isele), Unister (Matthias Wauer)	Skype
Jan. 7, 2015	GeoKnow General TelCo	ATH (Giorgos Giannopoulos), Unister (Matthias Wauer), IMP (Valentina Janev, Vuk Mijović, Uros Milosevic), Ontos (Daniel Hladky, Alejandra Garcia Rojas), InfAI (Nadine Jänicke, Jens Lehmann, Claus Stadler), Brox (Robert Isele), OpenLink (Hugh Williams, Orri Erling)	Skype
Jan. 28, 2015	GeoKnow-Generator TelCo	Ontos (Alejandra Garcia-Rojas), Unister (Matthias Wauer), Brox (Robert Isele, René Pietzsch), InfAI (Jens Lehmann, Claus Stadler), IMP (Uros Milošević, Vuk Mijović, Valentina Janev), OpenLink (Hugh Williams), Athena (Giorgos Giannopoulos)	Skype

Feb. 4, 2015	GeoKnow General TelCo	Ontos (Alejandra Garcia Rojas M), InfAI (Jens Lehmann, Claus Stadler, Nadine Jänicke), Unister (Matthias Wauer), OpenLink (Hugh Williams, Orri Erling, Mirko Spasic), IMP (Vuk Mijović, Uroš Milošević, Valentina Janev), Brox (Robert Isele), Athena (Giorgos Giannopoulos)	Skype
Feb. 25, 2015	GeoKnow-Generator TelCo	Ontos (Alejandra Garcia Rojas M), IMP (Uroš Milošević, Vuk Mijović), InfAI (Claus Stadler), Unister (Matthias Wauer), Athena (Giorgos Giannopoulos), Brox (Robert Isele)	Skype
Mar. 4, 2015	GeoKnow General TelCo	InfAI (Jens Lehmann, Claus Stadler, Nadine Jänicke), Ontos (Alejandra Garcia-Rojas, Daniel Hladky), Athena (Giorgos Giannopoulos), Unister (Matthias Wauer), Brox (Robert Isele), IMP (Vuk Mijović, Uroš Milošević, Valentina Janev), OGL (Hugh Williams, Orri Erling)	Skype
Mar. 25, 2015	GeoKnow-Generator TelCo	Ontos (Alejandra Garcia-Rojas, Jonas Schulz), IMP (Vuk Mijović, Uroš Milošević), Unister (Matthias Wauer), InfAI (Jens Lehmann, Claus Stadler), Brox (René Pietzsch)	Skype
Apr. 1, 2015	GeoKnow General TelCo	InfAI (Claus Stadler, Nadine Jänicke), Athena (Giorgos Giannopoulos), Unister (Matthias Wauer), Brox (René Pietzsch), Ontos (Alejandra Garcia-Rojas, Daniel Hladky), IMP (Valentina Janev, Uroš Milošević, Vuk Mijović)	Skype
Apr. 22, 2015	GeoKnow-Generator TelCo	Ontos (Alejandra Garcia-Rojas, Jonas Schulz), IMP (Uroš Milošević, Vuk Mijović, Valentina Janev), Unister (Matthias Wauer), Athena (Giorgos Giannopoulos), InfAI (Jens Lehmann, Claus Stadler)	Skype
May 6, 2015	GeoKnow General TelCo	Athena (Giorgos Giannopoulos), Brox (René Pietzsch, Robert Isele), Ontos (Alejandra Garcia-Rojas, Jonas Schulz), OGL (Hugh Williams), Unister (Matthias Wauer), InfAI (Nadine Jänicke, Jens Lehmann, Claus Stadler), IMP (Vuk Mijović, Uroš Milošević)	Skype
May 13, 2015	GeoKnow-Generator TelCo	Ontos (Alejandra Garcia-Rojas), InfAI (Jens Lehmann, Claus Stadler), Unister (Matthias Wauer); IMP (Vuk Mijović, Uroš Milošević, Valentina Janev), Brox (Rene Pietzsch), Athena (Giorgos Giannopoulos)	Skype

Table 12 - Conference Calls

3.3. Conferences

Start Date	End Date	Description	Participants	Location
Dec. 11, 2015	Dec. 12, 2015	8th Greek HellasGIs Conference - Kostas Patroumpas presented Greek Geospatial Linked Data in	Kostas Patroumpas (Athena)	Athens, Greece

		geodata.gov.gr/sparql, based on the work done in Task 2.7		
March 9, 2015	March 9, 2015	<p>ICIST'15, special session on Open Data and Geographical Information System Applications</p> <ul style="list-style-type: none"> - Keynote by Orri Erling (OpenLink) on <i>The Changing Shape of Data</i> - Mitko presented <i>Design of Geospatial Benchmarking System and Performance Evaluation of Virtuoso and PostGIS</i> - Vuk, Valentina and Dejan presented <i>ESTA-LD: Enabling Spatio-Temporal Analysis of Linked Statistical Data</i> - Uroš and Claus presented <i>Mobile Semantic Geospatial Visualization and Exploration</i> - about 40 attendees 	Mitko Spasić, Orri Erling (OpenLink), Vuk Mijović, Valentina Janev, Dejan Paunović, Uroš Milošević (IMP), Jens Lehmann, Claus Stadler (InfAI)	Kopaonik, Serbia
May 20, 2015	May 22, 2015	<p>WWW2015</p> <ul style="list-style-type: none"> - Axel presented <i>GERBIL - General Entity Annotator Benchmarking Framework</i> - about 1.000 attendees 	Axel Ngonga Ngomo (InfAI), Christiane Lemke (Unister)	Florence, Italy
May 21, 2015	May 22, 2015	<p>W2GIS 2015</p> <ul style="list-style-type: none"> - Kostas Patroumpas presented paper <i>Spatial Selectivity Estimation for Web Searching</i> 	Kostas Patroumpas (Athena)	Grenoble, France
May 31, 2015	May 31, 2015	<p>WaSABi 2015</p> <ul style="list-style-type: none"> - Andreas presented paper <i>GeoKnow Generator Workbench: An Integration Platform for Geospatial Data</i> - about 50 attendees 	Andreas Both (Unister)	Portoroz, Slovenia
May 31, 2015	June 4, 2015	<p>ESWC 2015</p> <ul style="list-style-type: none"> - Giorgos Giannopoulos, Nick Vitsas (Athena) presented demo paper <i>FAGI-gis: A tool for fusing geospatial RDF data</i> - about 300 attendees 	Giorgos Giannopoulos, Nick Vitsas (Athena)	Portoroz, Slovenia

Table 13 - Conferences

3.4. Presentations

Start Date	End Date	Description	Participants	Location
Mar. 19, 2015	Mar. 20, 2015	Sixth Technical User Community Meeting of LDDB (Linked Data Benchmark Council) <ul style="list-style-type: none"> - Andreas presented <i>E-Commerce and Graph-driven Applications: Experiences and Optimizations while moving to Linked Data</i>, including results obtained in the scope of the GeoKnow project - About 35 attendees 	Andreas Booth (Unister), Hugh Williams (OpenLink)	Barcelona, Spain
May 11, 2015	May 14, 2015	International Science and Technology Fair <ul style="list-style-type: none"> - Uroš and Vuk presented /demonstrated project results of the GeoKnow project - About 100 attendees 	Uroš Milosević and Vuk Mijović (IMP)	Belgrade, Serbia
May 25, 2015	May 29, 2015	INSPIRE & Linked Data: Bridging the Gap - Geospatial World Forum <ul style="list-style-type: none"> - Kostas Patroumpas presented on bridging the gap between Linked Data and INSPIRE, based on the work done in Task 2.7 	Kostas Patroumpas (Athena)	Lisbon, Portugal

Table 14 - Presentations

3.5. Workshops

Start Date	End Date	Description	Participants	Location
Mar. 27, 2015	Mar. 27, 2015	LWDM 2015 <ul style="list-style-type: none"> - Kostas presented <i>TripleGeo-CSW: A Middleware for Exposing Geospatial Catalogue Services on the Semantic Web</i> 	Kostas Patroumpas (Athena)	Brussels, Belgium
May 31, 2015	June 4, 2015	ESWC 2015 <ul style="list-style-type: none"> - Know@LOD 2015 workshop organized by Jens at the ESWC2015 - about 50 attendees 	Jens Lehmann (InfAI)	Portoroz, Slovenia

Table 15 – Workshops

4. Foreground and Dissemination Activities during this Period

4.1 List of Publications

1. Athanasiou, S., Georgomanolis, N., Patroumpas, K., Alexakis, M. & Stratiotis, T. (2015). TripleGeo-CSW: A Middleware for Exposing Geospatial Catalogue Services on the Semantic Web. In P. M. Fischer, G. Alonso, M. Arenas & F. Geerts (eds.), EDBT/ICDT Workshops (pp. 229-236), CEUR-WS.org.
2. Garcia-Rojas, A., Hladky, D., Wauer, M., Both, A., Isele, R., Stadler, C. & Lehmann, J. (2015). The GeoKnow Generator Workbench: An Integration Platform for Geospatial Data.
3. Lehmann, J. & Corcho, O. (2015). 2nd Special Issue on Linked Dataset Descriptions. Semantic Web Journal.
4. Lehmann, J., Isele, R., Jakob, M., Jentzsch, A., Kontokostas, D., Mendes, P. N., Hellmann, S., Morsey, M., van Kleef, P., Auer, S. & Bizer, C. (2015). DBpedia - A Large-scale, Multilingual Knowledge Base Extracted from Wikipedia. Semantic Web Journal, 6, 167-195.
5. Lehmann, J., Athanasiou, S., Both, A., Rojas, A. G., Giannopoulos, G., Hladky, D., Hoeffner, K., Grange, J. J. L., Ngomo, A.-C., Sherif, M. A., Stadler, C., Wauer, M., Westphal, P. & Zaslowski, V. (2015). The GeoKnow Handbook.
6. Martin, M., Abicht, K., Stadler, C., Auer, S., Ngomo, A.-C. N. & Soru, T. (2015). CubeViz – Exploration and Visualization of Statistical Linked Data. Proceedings of the 24th International Conference on World Wide Web, WWW 2015.
7. Milošević, U. & Stadler, C. (2015). Mobile Semantic Geospatial Visualization and Exploration. Proceedings of the 5th International Conference on Information Society Technology, Information Society of the Republic of Serbia.
8. Patroumpas, K. (2015). Spatial Selectivity Estimation for Web Searching. In J. Gensel & M. Tomko (eds.), W2GIS (pp. 107-123), Springer.
9. Sherif, Mohamed Ahmed., Ngonga Ngomo, A.-C. & Lehmann, J. (2015). Automating RDF Dataset Transformation and Enrichment. 12th Extended Semantic Web Conference, Portoroz, Slovenia, 31st May - 4th June 2015, Springer.
10. Stadler, C., Unbehauen, J., Westphal, P., Sherif, M. A. & Lehmann, J. (2015). Simplified RDB2RDF Mapping. Proceedings of the 8th Workshop on Linked Data on the Web (LDOW2015), Florence, Italy.
11. Vuk, M., Valentina, J. & Dejan, P. (2015). ESTA-LD: Enabling Spatio-Temporal Analysis of Linked Statistical Data. Proceedings of the International Conference on Information Society Technology and Management, Information Society of the Republic of Serbia.

5. Explanation of the Use of the Resources

5.1 Overview of Actual Allocated Resources

Period M1-M30 01.12.2012 - 31.05.2015																						
WP/ Tasks	Type of Activitiy	Beneficiary 1 INFAI		Beneficiary 2 Athena		Beneficiary 3 OpenLink		Beneficiary 4 Ontos		Beneficiary 5 Unister		Beneficiary 6 Brox		Beneficiary 7 IMP		Total Activities (in PM and %)			% of total PM		Start- End (month)	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	A	P	A		
WP1	RTD	25	24,6	22	14,99	5	8,78	40	33,64	17	16,4	4	3,6	--	--	113	102,01	90,27%	20,18%	20,93%	1	36
T1.1		4	4	--	--	--	--	4	2,5	7	7	2	2	--	--	17	15,5	91,18%	3,04%	3,18%	1	4
T1.2		12	12	12	12	--	--	8	9,5	5	5	--	--	--	--	37	38,5	104,05%	6,61%	7,9%	1	18
T1.3		--	--	8	2,84	5	6,77	--	--	--	--	--	--	--	--	13	9,61	73,93%	2,32%	1,97%	1	36
T1.4		9	8,6	2	0,15	--	2,01	28	21,64	5	4,4	2	1,6	--	--	46	38,4	83,48%	8,21%	7,88%	6	36
WP2	RTD	7	7	20	20	29	28,29	--	--	--	--	3	2	--	--	59	57,29	97,1%	10,54%	11,75%	1	35
T2.1		--	--	4	4	--	--	--	--	--	--	--	--	--	--	4	4	100%	0,71%	0,82%	1	5
T2.2		7	7	2	2	--	--	--	--	--	--	--	--	--	--	9	9	100%	1,61%	1,85%	2	20
T2.3		--	--	8	8	7	7,4	--	--	--	--	--	--	--	--	15	15,4	102,67%	2,68%	3,16%	6	24
T2.4		--	--	--	--	7	6,97	--	--	--	--	--	--	--	--	7	6,97	99,52%	1,25%	1,43%	9	31
T2.5		--	--	--	--	7	9,13	--	--	--	--	--	--	--	--	7	9,13	130,5%	1,25%	1,87%	13	36
T2.6		--	--	--	--	8	4,79	--	--	--	--	3	2	--	--	11	6,79	61,69%	1,96%	1,39%	13	20
T2.7		--	--	6	6	--	--	--	--	--	--	--	--	--	--	6	6	100%	1,07%	1,23%	7	18
WP3	RTD	24	26,4	28	18,88	7	4,84	--	--	14	11,3	--	--	--	--	73	61,42	84,13%	13,04%	12,6%	2	34
T3.1		7	7	--	--	7	4,68	--	--	--	--	--	--	--	--	14	11,68	83,4%	2,5%	2,4%	2	30
T3.2		--	--	14	4,88	--	--	--	--	--	--	--	--	--	--	14	4,88	34,86%	2,5%	1%	5	31
T3.3		3	3	14	14	--	0,16	--	--	--	--	--	--	--	--	17	17,16	100,94%	3,04%	3,52%	9	28

Period M1-M30 01.12.2012 - 31.05.2015																						
WP/ Tasks	Type of Activitiy	Beneficiary 1 INFAI		Beneficiary 2 Athena		Beneficiary 3 OpenLink		Beneficiary 4 Ontos		Beneficiary 5 Unister		Beneficiary 6 Brox		Beneficiary 7 IMP		Total Activities (in PM and %)			% of total PM		Start- End (month)	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	A	P	A		
T3.4		7	7.2	--	--	--	--	--	--	--	--	--	--	--	--	7	7.0	102.86%	1.25%	1.48%	13	34
T3.5		7	9.2	--	--	--	--	--	--	14	11.3	--	--	--	--	21	20.5	97.62%	3.75%	4.21%	12	32
WP4	RTD	40	41.25	--	--	--	--	6	4.08	20	17.95	6	4.2	39	32.7	111	100.18	90.26%	19.82%	20.55%	2	36
T4.1		17	17.95	--	--	--	--	--	--	--	--	--	--	--	--	17	17.95	105.59%	3.04%	3.68%	2	26
T4.2		18	17.3	--	--	--	--	--	--	--	--	--	--	--	--	18	17.30	96.11%	3.21%	3.55%	7	30
T4.3		--	--	--	--	--	--	--	--	20	17.95	--	--	--	--	20	17.95	89.75%	3.57%	3.68%	15	34
T4.4		--	--	--	--	--	--	6	4.08	--	--	6	4.2	--	--	12	8.28	69%	2.14%	1.7%	13	34
T4.5		5	6	--	--	--	--	--	--	--	--	--	--	21	15.99	26	21.99	84.59%	4.64%	4.51%	11	36
T4.6		--	--	--	--	--	--	--	--	--	--	--	--	18	16.71	18	16.71	92.83%	3.21%	3.43%	11	33
WP5	RTD	13	13	8	6.33	8	4.26	2	1.7	--	--	27	28.7	10	4.78	68	58.77	86.42%	12.14%	12.06%	3	36
T5.1		6	6	--	--	--	--	--	--	--	--	5	5.01	--	--	11	11.01	100.09%	1.96%	2.26%	3	22
T5.2		--	--	--	--	8	4.26	--	--	--	--	5	6.1	--	--	13	10.36	79.7%	2.32%	2.13%	5	36
T5.3		7	7	--	--	--	--	--	--	--	--	4	4.8	--	--	11	11.8	107.27%	1.96%	2.42%	13	31
T5.4		--	--	8	6.33	--	--	2	1.7	--	--	5	6.7	--	--	15	14.73	98.2%	2.68%	3.02%	15	34
T5.5		--	--	--	--	--	--	--	--	--	--	5	6.09	--	--	5	6.09	121.8%	0.89%	1.25%	7	36
T5.6		--	--	--	--	--	--	--	--	--	--	3	--	10	4.78	13	4.78	36.74%	2.32%	0.98%	25	36
WP6	RTD	12	12	9	9.01	9	7.88	2	0.9	44	36.9	--	--	--	--	76	66.69	87.75%	13.57%	13.68%	3	36
T6.1		12	12	--	--	--	--	--	--	11	11	--	--	--	--	23	23	100%	4.11%	4.72%	3	12
T6.2		--	--	9	9.01	--	--	--	--	11	11	--	--	--	--	20	20.01	100.05%	3.57%	4.11%	3	15
T6.3		--	--	--	--	9	7.88	--	--	11	8.5	--	--	--	--	20	16.38	81.89%	3.57%	3.36%	13	36
T6.4		--	--	--	--	--	--	2	0.9	11	6.4	--	--	--	--	13	7.3	56.15%	2.32%	1.5%	13	36
WP7	RTD	4	3.61	5	1.36	3	3.59	9	7.71	4	3	4	0.9	4	2.77	33	22.94	69.51%	5.89%	4.71%	1	36

Period M1-M30 01.12.2012 - 31.05.2015																						
WP/ Tasks	Type of Activitvy	Beneficiary 1 INFAI		Beneficiary 2 Athena		Beneficiary 3 OpenLink		Beneficiary 4 Ontos		Beneficiary 5 Unister		Beneficiary 6 Brox		Beneficiary 7 IMP		Total Activities (in PM and %)			% of total PM		Start- End (month)	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A			
T7.1		1	1	1	0.55	0.5	0.94	5	4.55	1	0.7	2	0.5	2	1.6	12.5	9.84	78.75%	2.23%	2,02%	2	36
T7.2		1	0.98	2	--	1	0.70	1	0.71	2	1.8	1	--	1	0.87	9	5.06	56.17%	1.61%	1,04%	9	36
T7.3		1	1	--	--	1	1	1	0.8	--	--	--	--	--	--	3	2.8	93.33%	0.54%	0,57%	5	32
T7.4		--	--	2	0.81	--	0.66	--	--	--	--	--	0.4	--	--	2	1.87	93.5%	0.36%	0,38%	1	26
T7.5		1	0.63	--	--	0.5	0.29	2	1.65	1	0.5	1	--	1	0.3	6.5	3.37	51.85%	1.16%	0,69%	1	36
WP8	MGT	21	12.87	1	0.2	1	1.73	1	0.82	1	0.89	1	0.9	1	0.73	27	18.14	67.19%	4.82%	3,72%	1	36
T8.1		3.5	1.5	--	--	--	--	--	--	--	--	--	--	--	--	3.5	1.5	42.86%	0.63%	0,31%	1	36
T8.2		3.5	1.55	--	--	--	--	--	--	--	--	--	--	--	--	3.5	1.55	44.29%	0.63%	0,32%	1	36
T8.3		3.5	3.4	--	--	--	--	--	--	--	--	--	--	--	--	3.5	3.4	97.14%	0.63%	0,7%	1	36
T8.4		3.5	2.17	0.5	0.15	0.5	1.73	0.5	0.42	0.5	0.42	0.5	0.45	0.5	0.41	6.5	5.75	88.4%	1.16%	1,18%	1	36
T8.5		3.5	2.29	--	--	--	--	--	--	--	--	--	--	--	--	3.5	2.29	65.43%	0.63%	0,47%	1	36
T8.6		3.5	1.96	0.5	0.05	0.5	--	0.5	0.4	0.5	0.48	0.5	0.45	0.5	0.32	6.5	3.66	56.23%	1.16%	0,75%	1	36
Total RTD (in PM)		125	127.86	92	70.57	61	57.63	59	48.03	99	85.55	44	39.4	53	40.25	533	469.29	88.05%	95.18%	96.28%		
Total MGT (in PM)		21	12.87	1	0.2	1	1.73	1	0.82	1	0.89	1	0.9	1	0.73	27	18.14	67.19%	4.82%	3.72%		
Total (in PM)		146	140.73	93	70.77	62	59.36	60	48.85	100	86.44	45	40.3	54	40.98	560	487.43	87.04%	100%	100%		
Total (in %)			96.39%		76.1%		95.75%		81.42%		86.44%		89.56%		75.88%		87.04%					

Table 16 – Actual Efforts per Activity Type per Beneficiary for the Full Period (in person-month)

Period M25-M36 01.12.2014 - 31.05.2015																						
WP/ Tasks	Type of Activitiy	Beneficiary 1 INFAI		Beneficiary 2 Athena		Beneficiary 3 OpenLink		Beneficiary 4 Ontos		Beneficiary 5 Unister		Beneficiary 6 Brox		Beneficiary 7 IMP		Total Activities (in PM and %)			% of total PM		Start- End (month)	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	A	P	A		
WP1	RTD	1.74	2.4	1.72	1.84	0.83	3.8	5.42	5.53	0.97	0.4	0.39	--	--	--	11.07	13.97	126.20%	11.73%	11.12%	1	36
T1.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	4
T1.2		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	18
T1.3		--	--	1.33	1.84	0.83	2.19	--	--	--	--	--	--	--	--	2.17	4.03	186.02%	2.30%	3.21%	1	36
T1.4		1.74	2.4	0.39	--	--	1.61	5.42	5.53	0.97	0.4	0.39	--	--	--	8.90	9.94	111.64%	9.43%	7.91%	6	36
WP2	RTD	--	--	--	--	3.58	7.63	--	--	--	--	--	--	--	--	3.58	7.63	213.49%	3.79%	6.08%	1	35
T2.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	5
T2.2		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	20
T2.3		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	24
T2.4		--	--	--	--	1.83	--	--	--	--	--	--	--	--	--	1.83	--	--	1.93%	--	9	31
T2.5		--	--	--	--	1.75	7.63	--	--	--	--	--	--	--	--	1.75	7.63	436.27%	1.85%	6.08%	13	36
T2.6		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13	20
T2.7		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7	18
WP3	RTD	5.96	9	5.91	8.01	1.45	0.16	--	--	4	2	--	--	--	17.32	19.17	110.70%	18.34%	15.26%	2	34	
T3.1		1.45	0.60	--	--	1.45	--	--	--	--	--	--	--	--	--	2.9	0.6	20.71%	3.07%	0.48%	2	30
T3.2		--	--	3.11	1.01	--	--	--	--	--	--	--	--	--	--	3.11	1.01	32.46%	3.3%	0.80%	5	31
T3.3		0.60	0.60	2.80	7	--	0.16	--	--	--	--	--	--	--	--	3.4	7.76	228.24%	3.6%	6.18%	9	28
T3.4		1.91	3	--	--	--	--	--	--	--	--	--	--	--	--	1.91	3	157.14%	2.02%	2.39%	13	34
T3.5		2	4.80	--	--	--	--	--	--	4	2	--	--	--	--	6	6.8	113.33%	6.36%	5.41%	12	32
WP4	RTD	7.01	21.9	--	--	--	--	1.64	1	6	7	1.64	2.2	9.54	7.7	25.83	39.8	154.11%	27.36%	31.68%	2	36
T4.1		1.36	7.5	--	--	--	--	--	--	--	--	--	--	--	--	1.36	7.5	551.47%	1.44%	5.97%	2	26
T4.2		4.5	8.4	--	--	--	--	--	--	--	--	--	--	--	--	4.5	8.4	186.67%	4.77%	6.69%	7	30
T4.3		--	--	--	--	--	--	--	--	6	7	--	--	--	--	6	7	116.67%	6.36%	5.57%	15	34
T4.4		--	--	--	--	--	--	1.64	1	--	--	1.64	2.2	--	--	3.27	3.2	97.78%	3.47%	2.55%	13	34
T4.5		1.15	6	--	--	--	--	--	--	--	--	--	--	4.85	4.99	6	10.99	183.23%	6.36%	8.75%	11	36

Period M25-M36 01.12.2014 - 31.05.2015																						
WP/ Tasks	Type of Activitiy	Beneficiary 1 INFAI		Beneficiary 2 Athena		Beneficiary 3 OpenLink		Beneficiary 4 Ontos		Beneficiary 5 Unister		Beneficiary 6 Brox		Beneficiary 7 IMP		Total Activities (in PM and %)			% of total PM		Start- End (month)	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	A	P	A		
T4.6		--	--	--	--	--	--	--	--	--	--	--	--	4.7	2.71	4.7	2.71	57.71%	4.97%	2.16%	11	33
WP5	RTD	2.21	7	2.4	5.22	1.5	--	0.6	1	--	--	6.2	5.4	5	4.78	17.91	23.4	130.62%	18.97%	18.62%	3	36
T5.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	22
T5.2		--	--	--	--	1.5	--	--	--	--	--	0.94	1.2	--	--	2.44	1.2	49.23%	2.58%	0.96%	5	36
T5.3		2.21	7	--	--	--	--	--	--	--	--	1.26	1.2	--	--	3.47	8.2	236.06%	3.68%	6.53%	13	31
T5.4		--	--	2.40	5.22	--	--	0.6	1	--	--	1.5	1.2	--	--	4.5	7.42	164.89%	4.77%	5.91%	15	34
T5.5		--	--	--	--	--	--	--	--	--	--	1	1.8	--	--	1	1.8	180%	1.06%	1.43%	7	36
T5.6		--	--	--	--	--	--	--	--	--	--	1.5	--	5	4.78	6.5	4.78	73.48%	6.89%	3.8%	25	36
WP6	RTD	--	--	--	--	2.25	4.11	0.5	0.6	5.5	4	--	--	--	--	8.25	8.71	105.58%	8.74%	6.93%	3	36
T6.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	12
T6.2		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	15
T6.3		--	--	--	--	2.25	4.11	--	--	2.75	3	--	--	--	--	5	7.11	142.2%	5.3%	5.66%	13	36
T6.4		--	--	--	--	--	--	0.5	0.6	2.75	1	--	--	--	--	3.25	1.60	49.23%	3.44%	1.27%	13	36
WP7	RTD	0.77	1.22	0.75	0.74	0.6	2.23	1.62	1.05	0.77	0.8	0.72	--	0.72	0.77	5.95	6.81	114.40%	6.30%	5.42%	1	36
T7.1		0.17	0.2	0.17	0.13	0.09	0.49	0.86	0.4	0.17	--	0.34	--	0.34	0.4	2.14	1.62	75.76%	2.27%	1.29%	2	36
T7.2		0.21	0.48	0.43	--	0.21	0.29	0.21	0.15	0.43	0.5	0.21	--	0.21	0.37	1.93	1.79	92.56%	2.04%	1.42%	9	36
T7.3		0.21	0.21	--	--	0.21	0.6	0.21	0.1	--	--	--	--	--	--	0.64	0.91	141.56%	0.68%	0.72%	5	32
T7.4		--	--	0.15	0.61	--	0.56	--	--	--	--	--	--	--	--	0.15	1.17	760.5%	0.16%	0.93%	1	26
T7.5		0.17	0.33	--	--	0.08	0.29	0.33	0.4	0.17	0.3	0.17	--	0.17	--	1.08	1.32	121.85%	1.15%	1.05%	1	36
WP8	MGT	3.5	4.44	0.17	--	0.17	1.08	0.17	0.18	0.17	0.13	0.17	0.1	0.17	0.23	4.50	6.16	136.78%	4.77%	4.90%	1	36
T8.1		0.58	0.6	--	--	--	--	--	--	--	--	--	--	--	--	0.58	0.6	102.86%	0.62%	0.48%	1	36
T8.2		0.58	0.6	--	--	--	--	--	--	--	--	--	--	--	--	0.58	0.6	102.86%	0.62%	0.48%	1	36
T8.3		0.58	1.2	--	--	--	--	--	--	--	--	--	--	--	--	0.58	1.2	205.71%	0.62%	0.96%	1	36
T8.4		0.58	0.6	0.08	--	0.08	1.08	0.08	0.08	0.08	--	0.08	0.05	0.08	0.16	1.08	1.97	181.85%	1.15%	1.57%	1	36
T8.5		0.58	0.84	--	--	--	--	--	--	--	--	--	--	--	--	0.58	0.84	144%	0.62%	0.67%	1	36

Period M25-M36 01.12.2014 - 31.05.2015																						
WP/ Tasks	Type of Activitiy	Beneficiary 1 INFAI		Beneficiary 2 Athena		Beneficiary 3 OpenLink		Beneficiary 4 Ontos		Beneficiary 5 Unister		Beneficiary 6 Brox		Beneficiary 7 IMP		Total Activities (in PM and %)			% of total PM		Start- End (month)	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	A	P	A		
T8.6		0.58	0.6	0.08	--	0.08	--	0.08	0.1	0.08	0.13	0.08	0.05	0.08	0.07	1.08	0.95	87.23%	1.15%	0.75%	1	36
Total RTD (in PM)		17,69	41.52	10.79	15.81	10.21	17.94	9.77	9.18	17.23	14.2	8.95	7.6	15.27	13.25	89.9	119.49	132.91%	95.23%	94.29%		
Total MGT (in PM)		3,5	4.44	0.17	--	0.17	1.08	0.17	0.18	0.17	0.13	0.17	0.1	0.17	0.23	4.5	7.24	160.78%	4.77%	5.71%		
Total (in PM)		21,19	45.96	10.95	15.81	10.37	19.02	9.94	9.36	17.4	14.33	9.11	7.7	15.43	13.48	94.4	126.73	134.24%	100%	100%		
Total (in %)			216.89%		144.36%		183.36%		94.15%		82.32%		84.48%		87.32%		134.24%					

Table 17 – Actual Efforts per Activity Type per Beneficiary for the Current Period (in person-month)

Comments per Beneficiary:

BEN1: InfAI spent 24.77 PM more than the linear average because work carried out in WP3, 4 and 5 required additional resource allocation during the current reporting period. On the one hand, this overspending is balanced by resources previously not spent for WP3, 4 and 5 (i.e. 15,6 PMs in total remaining from Y1 and 2). On the other hand, increased efforts were allocated to software development tasks carried out by graduate students in order to increase the maturity of the tools as outline in Section 1. Since they work only part-time, a greater number of students were hired for the project than planned. This hourly waged personnel is also less expensive than average personnel costs at InfAI, so the slight overspending for the total duration of the project caused by this increase of personnel is cost-neutral and within the financial limits of InfAI's max EC contribution.

BEN2: ATHENA spent 4.86 PM more than the linear average because its use of resources does not follow a linear average allocation in many of the WPs involved. Most effort for WP3 is allocated to the 3rd project year in order to exploit outcomes from other WPs and tasks into the development of Tasks 3.2 and 3.3. Similarly, for WP5, most effort is allocated to the 3rd year.

BEN3: OpenLink spent 8.65 PM more than the linear average because there was extra work performed to make necessary improvements in D1.3.3 and D2.4.1 in M25 (Dec, 2014) and M26 (Jan, 2015) for the review. There was no activity on T2.5 in the previous M19-M24 reporting period thus additional work was performed in this task over this period to catch up, so for the task overall we may still be slightly over the average still with 0.91PMs left for the final period. For T1.4 there was also time spent in updating the Virtuoso builds from version 6.1 to 7.2 for addition to the GeoKnow Generator Stack, which also required the Ubuntu Debian

packages be updated from 12.04 to the new 14.04 stable release and submitted to the stack repository. Note also that in previous years we have had a lower linear average, so this in effect is balancing the average, certainly OGL is still well within its budget.

BEN5: Unister spent 3.05 PM less than the linear average to account for expected higher integration and testing effort in the final months of the project.

BEN6: Brox spent 1.41 PM less than the linear average because work in two deliverables has been delayed and thus PMs have been reserved from M30 for conducting shifted work.

Comments per WP:

WP1: WP1 efforts were 2.09 PM higher than the linear average because of increased efforts in maturing the Linked Data Stack and making it more accessible to third parties.

WP2: WP2 efforts were 4.06 PM higher than the linear average because there was no activity on T2.5 in the previous M19-M24 reporting period thus additional work was performed in this task over this period to catch up, so for the task overall we may still be slightly over the average still with 0.91 PMs left for the final period. There was extra work performed to make necessary improvements in D1.3.3 and D2.4.1 in M25 (Dec, 2014) and M26 (Jan, 2015) for the review. OGL was the only partner with tasks in WP2 during this reporting period.

WP3: WP3 efforts were 1.85 PM higher than the linear average mainly because a lot of effort were programmed (and actually allocated) to the development and finalization of the work in T3.3 that was due in M28.

WP4: WP4 efforts were 13.98 PM higher than the linear average because work carried out in WP4 required additional resource allocation during the current reporting period. On the one hand, this overspending is balanced by resources previously not spent for WP4 (i.e. 12,48 PMs in total remaining from Y1 and 2). On the other hand, increased efforts were allocated to software development tasks carried out by graduate students. Since they work only part-time, a greater number of students were hired for the project than planned. This hourly waged personnel is also less expensive than average personnel costs at InfAI, so the slight overspending for the total duration of the project caused by this increase of personnel is cost-neutral and within the financial limits of InfAI's max EC contribution.

WP5: WP5 efforts were 5.48 PM higher than the linear average because work planned to be conducted in other work packages by Brox has been conducted in WP5.

WP8: WP8 efforts were 1.66 PM higher than the linear average. At InfAI this extra resource allocation is mostly due to the Y2 cost reporting with additional effort needed for the auditing process and at OpenLink due to extra efforts needed for internal project communication. Other partners' overspending is only of minimal impact.