ICT Seventh Framework Programme (ICT FP7)

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Data Intensive Techniques to Boost the Real – Time Performance of Global Agricultural Data Infrastructures

D1.4.3. Quality Assurance & Risk Assessment Plan

Deliverable Form	
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Document description:	This deliverable will incorporate details about SemaGrow's quality assurance processes. It defines all processes and instruments to be used for the regular quality monitoring and risk assessment of the project in the form of a handbook for project partners. Furthermore, it will include a Critical Path Analysis (CPA) of the main project activities, identifying risk points, and procedures to deal with them. This deliverable will also include the Quality Assurance performance indicators

Document History

Version	Date	Author (Partner)	Remarks
Draft v0.1	14/01/2013	UAH	Document Setup
Draft v0.5	25/01/2013	UAH, NCSR-D	Draft Version
Draft v1.0	16/04/2013	UAH, NCSR-D	Internal Review
Version 1.0	30/04/2013	UAH, NCSR-D	Delivered as D1.4.1
Draft v1.5	15/11/2013	UAH, NCSR-D	Updates, Revisions
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Draft v3.0	15/10/2014	UAH, NCSR-D	Revisions
Version 3.0	31/10/2014	UAH, NCSR-D	Delivered as D1.4.3

EXECUTIVE SUMMARY

This document addresses the Quality Assurance and the Risk Management Plan. The aim of this deliverable is to describe the mechanisms that will be used throughout the project in order to ensure the quality level of the project deliverables and the project outcomes.

This document will also serve as a guide to the project coordinator, in order to ensure that quality reviews will occur at appropriate points in the project, and as a reference for all project partners, in order to understand their responsibilities, regarding the project deliverables and outcomes.

In this context, quality control mechanisms are defined as well as Critical Path Analysis, in order to be easy to identify important tasks and dependencies that are critical for the success of the project. This document will also serve as a detailed guide to the SemaGrow partners in order to establish effective cooperation within the consortium and ensure the highest level of project documentation. Moreover, the document outlines the success criteria for each deliverable, defines the structure of each deliverable, describes the quality review techniques according to PRINCE2 technique and also defines configuration management procedures and change control.

The last chapter of the document is devoted to the potential problems that may occur during the project: It includes not only a detailed description of potential risks, but also management procedures that will be applied to either avoid the potential risk or minimize its negative impact.

This document should be used as a reference by the project coordinator and all project partners.

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LIST OF TERMS AND ABBREVIATIONS

Term/Abbreviation	Definition
Consortium	Overall description of the joint partnership of the SemaGrow parties
European Commission (EC)	refers to the monitoring and co-financing unit of the project in the context of the ICT Policy Support Programme, which is represented by the Project Officer (PO) and any other appointed personnel
Partner	the organisations (including the Coordinator) that have formally committed (through their accession to the Grant Agreement) to carry out the working activities of the SemaGrow project
Quality Assurance	an independent check that the project outputs fit for purpose or meet requirements
Quality Control	the process of monitoring specific project outcomes to determine whether they comply with relevant standards and of identifying ways to eliminate causes of unsatisfactory performance
Work Package (WP)	a set of grouped work activities that have been described Description of Work (DoW), resulting in a number of deliverables

Terms used in a quality context are sometimes interpreted differently or interchangeably by various people. This can lead to misunderstandings. For the purposes of the SemaGrow project management methodology, the terminology used in this deliverable is derived from international ISO 9000 standards.

1. INTRODUCTION

1.1 Purpose and Scope

The present deliverable facilitates Partners cooperation in the project, by defining a set of rules and guidelines for the organisation and delivery of the day-to-day work.

The plan summarises what has to be achieved by the project, aiming of helping all the partners in procedures related to management and quality control. It is a fundamental working tool that every partner is invited to refer to, when a deliverable is to be prepared, a meeting to be organised or a problem to be solved.

1.2 Relation of D1.1 and D1.4.3

The tasks of D1.1 "Project Management Plan" and D1.4.1 "Quality Assurance and Risk Assessment Plan" are closely connected. D1.1 is a general overview of the management procedure of the **SemaGrow** project, whereas D1.4.3 is a reference to everyday management tasks.

1.3 Audience

This deliverable has been created specifically for the SemaGrow Partners, describing the quality procedures to be followed for the duration of the project

1.4 Deliverable Structure

Some content within this plan is derived from the contract and its annexes, while other sections have been defined and written specifically for this document.
The document is structured in the following manner:

Chapter 2: **Quality Approach** – the second chapter outlines the quality planning defining the outputs required by the project, with their respective quality criteria, quality methods and the quality responsibilities of those involved. It also explains the role of Critical Path Analysis and presents how it will be applied throughout the project.

Chapter 3: **Quality Control:** – the third chapter presents the control methods that will be applied in order to ensure the high quality outcome of the project as well the responsibilities of project partners in this area. It details the quality criteria for each deliverable, describes the deliverable development approach and sets out the quality indicators. It also describes the quality review technique based on the PRINCE2 standards and the recording mechanism.

Chapter 4: **Quality Guidelines** – the fourth chapter presents the general principles and guidelines of creating the documentation for the project: it describes the main types of documents, the desired structure and the methods and procedures of configuration management and change control to be used in the SemaGrow project.

Chapter 5: **Risk Management** – the last chapter outlines potential risks as well as presents the detailed description of their nature, contingency and threshold level. Also monitoring mechanisms that will be applied in case any potential risk occurs are presented in this section.

2. Quality Approach

2.1 Planning

Quality Management is defined as the coordinated activities to direct and control a project with respect to quality. The Consortium Lead (UAH) recognises that each of the Partners may have their own documented quality management system; however for ease of coordination the project will put its own quality processes in place.

Quality planning is about defining the outputs required by the project, with their respective quality criteria, quality assessment methods and the quality responsibilities of the involved partners. Quality assurance provides control to the project direction, ensures that the management is of a high quality with respect to the nature of the project and that the project complies with relevant corporate or programme management standards and policies.

The purpose of quality planning is to provide a secure basis for:

- Project Board agreements on the overall quality expectations, the products required with their associated quality criteria, the means by which quality will be achieved and assessed, and ultimately, the acceptance criteria by which the projects products will be judged
- Communicating these agreements unambiguously so all project Partners have a common understanding of what the project is setting out to achieve
- Control i.e. establishing an effective baseline for the projects quality controls and a secure means of achieving deliverables that are fit for purpose

This plan forms (a) a guide for the project coordinator to follow in order to ensure that the quality reviews occur at appropriate points in the project, and (b) a reference for all project partners in order to understand their responsibilities, thus delivering high quality deliverables and outcomes to help **SemaGrow** achieve its goals.

2.2 Quality Assurance

SemaGrow will apply *ISO/IEC 19796-1* to its own operations. IS*O/IEC 19796-1* is a framework to describe, compare, analyse, and implement quality management and quality assurance approaches. It will serve to compare different existing approaches and to harmonize these towards a common quality model. It consists of the following items:

- description scheme for quality management
- process model defining the basic processes to be considered when managing quality
- conformance statement for the decision format

The ISO/IEC 19796-1 standard was developed by the Working Group 5 “Quality Assurance and Descriptive Frameworks” of the standardization committee ISO/IEC JTC1 SC36. The quality standard contains the reference process model “Reference Framework for the Description of Quality Approaches” (RFDQ) to help stakeholders to document and (re-)define their everyday business and processes.

Evaluation within this project is to be both formative and summative. The former is essentially self-assessment and will be carried out by all partners. The summative evaluation will involve external as well as internal evaluation.
SemaGrow outputs and processes will be qualified and quantified according to the quality assurance mechanism that is described in this document. In general, quality assurance in the project will be carried out in two levels: the progress monitoring level, related to monitoring both the formal milestones of the project as well as a set of WP-internal milestones of smaller granularity, and the project output assessment level, related to the assessment of the different output types of the project (e.g. content output, technical/software output, evaluation/validation output, dissemination/valorisation output, scientific output).

There are many areas to be evaluated. These can be divided into two main elements: outputs and processes. Output is what is achieved by the project and whether this represents success or failure – with respect to contractual targets. It could also consider: Innovation – whether anything genuinely new has been developed; Quality of outputs and outcomes; and Impact. Process looks at how outputs were achieved, including: Transnationality – success and partner contributions – value added; Partnership working – overall management and effectiveness of partner contributions; Validity – whether needs of both partners and the project have been met; and Dissemination - whether potential target audiences have been reached and across the consortium. The table below shows performance indicators for the project implementation.

Nature	Methodology for data collection
Effective project management	Questionnaires filled-in through an interview with the partners – six monthly intervals (***UAH***)
Standards adoption	Feedback from partners (***All***) Feedback from liaisons with standards (***NCSR-D***)
Dissemination activities have reached a wide audience of potential targets in all Member States	Completion of valorisation plans and activity reports using standard templates (***All***)
Sustainability & Exploitation Network	Qualitative questionnaire (***UAH, SWC***), targeting potential users of the SemaGrow outcomes, will provide feedback so as to align RTD activities with real market /business needs.
Web site and online dissemination channels	Set measurable goals in terms of numbers of access, download, upload, rating, etc. and evaluate these every three months (***UAH***)
Deliverables	Peer reviews (***All***)

Table 1: Performance Indicators

Six monthly reports will include on-going evaluation of activities and impact (based on the criteria above) and it is anticipated that these areas will be based on data collected not only from partners themselves but also from other organizations, in particular Member States that are participating in the project activities. To achieve this, focus groups will be held – in parallel with piloting activities – in order to provide feedback from stakeholders external to the project. This approach recognizes that evaluation needs to be placed at the centre of the planning and development processes and also that, not only is analysis of information collected for monitoring purposes important, but also evaluation from partners and key stakeholders. Therefore, those involved in the on-going quality assurance and formative evaluation processes include:

- The partnership
- Beneficiary Groups
- Social Partners (representatives of employers and employees)
- Local, regional and national organizations
- Other EC projects
- Other policy makers

2.3 Quality Responsibilities

The SemaGrow Project participants will collaborate throughout the project in order to meet all the **SemaGrow** objectives. Effective collaboration requires central co-ordination, clear rules for communication and unambiguous mechanisms for decision-making. These principles are detailed in "D1.1-Project Management Plan". Whilst everyone on the project has a responsibility to deliver high quality deliverables and project outcomes, the key project roles in this area are the following:

Project Management Board

- Highest level authority when making key quality decisions
- Regularly verify the progress of work, the quality of results and their correspondence with the overall project objectives and time scheduling;
- Set tolerances for the Quality Assurance Sub-Committee
- Decide whether deliverables pass internal review and can be submitted to the Commission

Project Coordinator

- Responsible for day-to-day quality management tasks
- Ensures that Documents Commissions meet quality expectations and acceptance criteria
- Prepares and maintains the product descriptions

- Ensures that Work Package Leaders implement the quality control measures
- Address possible conflicts, looking for the widest internal consensus and taking care that project internal rules are respected, including legal and ethical obligations; in the event that consensus is not reached, apply the rules for problem management and conflict solving.

The Project Coordinator is Prof. Miguel-Angel Sicilia (http://www.cc.uah.es/msicilia/) who is a Professor at the Computer Science Dept. of UAH. Miguel-Angel is currently coordinating the FP7 INFRA agINFRA and the CIP PSP VOA3R projects that are working on the creation of large scale virtual data infrastructures for agriculture and aquaculture. He is the Editor-in-Chief of the International Journal of Metadata, Semantic & Ontologies (IJMSO) and the International Journal of Service Science, Management, Engineering, and Technology (IJSSMET). In 2005 he has launched and has served in various Chairing roles for the annual Metadata and Semantics Research Conference (MTSR) that has a rather applied and multi-disciplinary nature with established domain-specific tracks like the Metadata & Semantics for Agriculture, Food & Environment one that has been organized in MTSR since 2007.

Scientific Manager

- Responsible for the scientific vision of the project
- Responsible for the scientific supervision of the work packages, planning and control of activities
- Responsible for guiding all activities related to the research of the project on intelligent information management topics

Dr. Vangelis Karkaletsis (http://users.iit.demokritos.gr/~vangelis/) serves as the SemaGrow Scientific Manager (SM). Dr. Vangelis Karkaletsis is a Research Director at NCSR-D and head of the Software and Knowledge Engineering Laboratory of the Institute of Informatics and Telecommunications of NCSR-D. He is the Technical Manager of the FP7 ICT NOMAD project on web content analysis for e-government applications, and has served as the Project or Technical Manager in FP projects such as QUATRO Plus, MedIEQ, and OntoSum. He belongs to the Adjunct Faculty of the Dept. of Computer Science & Engineering, University of Texas at Arlington (UTA), USA; also regularly serving as a lecturer in postgraduate courses at the University of Athens, Greece. He has served as the Chair of the 12th Conference of the European Chapter of the Association for Computational Linguistics (EACL-2009), the 6th Hellenic Conference on Artificial Intelligence (SETN-10), and has served in the past as the Vice-chair of the Hellenic Association of Artificial Intelligence (EETN).

Technical Manager

- Responsible for the technical vision of the project.
- Responsible for monitoring the technical development and the integration of all deployed services

Dr. Stasinos Konstantopoulos (http://www.iit.demokritos.gr/people/konstantopoulos-stasinos) serves as the Technical Manager (TM). Stasinos is MEng in Computer Engineering and Informatics (University of Patras, Greece, 1997), MSc in Artificial Intelligence (Edinburgh University, U.K., 1998), PhD on Computational Logic and Language Technology (Groningen University, the Netherlands, 2003) and has been affiliated to the Institute of Informatics & Telecommunications, NCSR "Demokritos" since 2004 through several national, FP6-IST, and FP7-ICT projects. He was previously leading WP3 in the SemaGrow project. He is also actively involved in W3C activities and has participated in various Working Groups and Community Groups, including the POWDER Working Group (2007-2009) where he contributed the logical foundations of the POWDER Recommendation. He currently participates in the newly established CVSW Working Group (2014).

The Quality Assurance Sub-Committee

- Will monitor the WP activities
- Guide the implementation and assessment of milestones and deliverables
- Take necessary actions to adjust, modify and fasten the activity of a Work Package
- Account for feedback from the WP leaders and the Quality Manager
- Decide whether deliverables pass internal review and can be submitted to the Commission

Work Package Leaders

- Co-ordinate the development activities in the corresponding Work Package
- Keep the Board and the Project Coordinator informed about the development and progress status on a regular basis. In particular they shall:
  - technically coordinate the WP, steering it towards its objectives;
  - define the detailed WP plan and objectives and control their execution;

- report about work progress, deliverables, achievements, deviations from schedule, problems, results, following the reporting methodology adopted in the project

A summary of the quality relationship between each of these roles is provided in the diagram below.

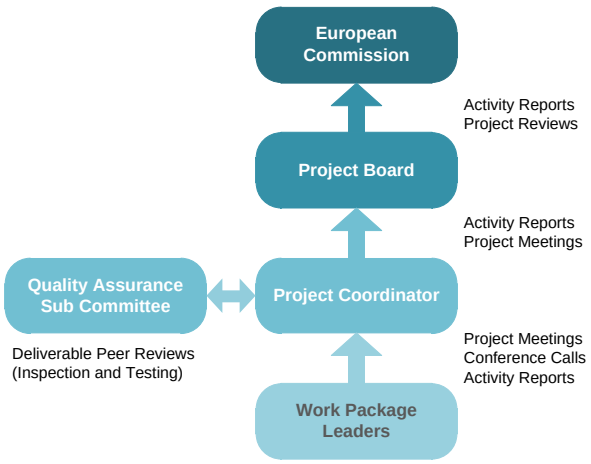

Figure 1: Quality Relationship

Expert Steering Group

The project's **Expert Steering Group (ESG)** has been finalized consists of external experts from relevant scientific, research and technical fields. The **ESG** will need to meet annually with the **PB**, virtually or physically, in order to review the project progress and achievements to date and will advise the project on its future paths. This is why the members of the **ESG** have been selected among key research figures of the Semantic Web and Intelligent Information Management domains. The following persons are the members of the **ESG**:

Dr. Ivan Herman (http://www.ivan-herman.net) graduated as mathematician at the Eötvös Loránd University of Budapest, Hungary, in 1979. After a brief scholarship at the Université Paris VI he joined the Hungarian research institute in computer science (SZTAKI) where he worked for 6 years. He left Hungary in 1986 and, after a few years in industry in Munich, Germany, he joined the Centre for Mathematics and Computer Sciences (CWI) in Amsterdam where he had a tenure position since 1988. He received a PhD degree in Computer Science in 1990 at the University of Leiden, in the Netherlands. He joined the W3C Team as Head of W3C Offices in January 2001 while maintaining his position at CWI. He served as Head of Offices until June 2006, then as Semantic Web Activity Lead until December 2013. Since June of 2013, he is a Digital Publishing Activity Lead. Before joining W3C he worked in quite different areas (distributed and dataflow programming, language design, system programming), but he spend most of his research years in computer graphics and information visualization. He also participated in various graphics related ISO standardization activities and software developments.

Dr. Alfio Ferrara (http://islab.di.unimi.it/homePage/alfio/) assistant professor of Computer Science at the University of Milano, where he received his Ph.D. in Computer Science in 2005. His research interests include database and semi-structured data integration, Web-based information systems, ontology engineering, and knowledge representation and evolution. On these topics, he works in national and international research projects, including the recent EU FP6 BOEMIE (Bootstrapping Ontology Evolution with Multimedia Information Extraction) project, the FP6 INTEROP NoE (Interoperability Research for Networked Enterprises Applications and Software) project, and the ESTEEM (Emergent Semantics and cooperaTion in multi-knowledgE EnvironMents) PRIN project funded by the Italian Ministry of Education, University, and Research. He is also author of several articles and papers in international journals and conferences about ontology management and matching**.**

Dr. Minos Garofalakis (http://www.softnet.tuc.gr/~minos/) is Professor of Computer Science at the School of ECE of the Technical University of Crete in Chania, Greece, and the Director of the Software Technology and Network Applications Laboratory (SoftNet). He also served as the ECE Department Chair for the period 9/2011-9/2013. Finally, he is Member of the Board of Directors of Information Society, S.A., a Greek government organization for advancing large-scale, national-level efforts in Information and Communication Technologies. His current research interests lie in the areas of probabilistic data management, approximate query processing, data streaming, network management, big data analytics and mining, and XML and text databases

2.4 Critical Path Analysis

To understand where and when key quality reviews need to take place, the project has undertaken a critical path analysis (CPA) to show the major dependencies between tasks. The CPA shows the following key milestones:

No	Milestone Name	WP involved	Expected date	Means of Verification[1]
MS1	***Project setup***: Project Management Plan, first version of Quality Insurance & Risk Assessment Plan, first version of Data Stream & Collections, first version of Use Cases, Project website and Fact Sheet	WP1 WP2 WP7	M6	PO, DV (D1.1, D1.2.1, D1.4.1, D2.1.1, D2.2.1, D2.3.1, D7.1.1, D7.2.1, D7.3) (All deliverables were submitted successfully)
MS2	***Initial Testing Methodology & Preliminary Prototypes****:* Intermediate use cases and architecture. Preliminary component prototypes (resource discovery, ontology alignment). Initial rigorous experimental testing methodology (*to be refined and finalized on sync with the evolution of research results*).	All	M12	***(1st Review)*** PO, DV (D1.2.2, D1.3.1, D1.4.2, D2.1.2, D2.2.2, D3.1.1, D3.2.1, D4.1, D5.1.1, D5.4.1, D6.1.1, D7.1.2, D7.2.2, D7.4.1, D7.5.1) (All deliverables were submitted successfully) Official EC Review scheduled for 21 January 2014
MS3	***First version of Functional Prototype***: Preliminary component prototypes (content classification & ontology evolution, heterogeneous distributed semantic querying). Final piloting plan.	WP1 WP3 WP5 WP6	M18	PO, DV (D1.2.3, D3.3.1, D3.4.1,D5.2.1, D5.3.1, D5.4.2, D6.1.2) (All deliverables were submitted successfully)
MS4	***Final Use Cases & Interim Integrated & Evaluated Prototype****:* Use Cases finalized. Interim prototype integrated. Interim sustainability, uptake & marketing positioning plan.	All	M24	***(2nd Review)*** PO, DV (D1.2.4, D.1.3.2, D1.4.3, D2.1.3, D2.3.3, D4.2, D4.3, D5.1.2, D5.4.3, D6.2.1, D6.3.1, D7.1.3, D7.2.3, D7.4.2, D7.5.2) (All deliverables were submitted successfully Official EC Review scheduled for 12 December 2014
MS5	***Prototype integrated in real-life infrastructure & Project Results Assessment****:* Final architecture, Final prototype integrated, evaluated, and deployed. Final sustainability, uptake & marketing positioning plan.	All	M36	***(Final Review)*** PO, UE, DV (D1.2.5, D1.2.6, D1.3.3, D2.3.4, D3.1.2, D3.2.2, D.3.3.2, D3.4.2, D4.4, D5.3.2, D5.4.4, D5.5, D6.2.2, D6.3.2, D6.4, D7.1.4, D7.2.4, D7.4.3, D7.5.3, D7.6)

Table 2: Key Milestones

[1] DV: Peer Reviewed corresponding deliverables. PO: Assessed by Project Officer UE: Evaluated by users

At these milestones, the Project Coordinator needs to review project achievements against the Project Plan to ensure work is on track. Any changes or deviations will need to be reviewed and approved by the Project Board (see chapter 4.4 on Change Control).

3. Quality Control

Quality control focuses on the operational techniques and activities used by those involved in the project to:

- Fulfil the requirements for quality (i.e. inspections and testing)
- Identify ways of eliminating causes of unsatisfactory performance

3.1 Quality Methods

SemaGrow's approach to quality is based upon creating deliverables throughout the project that contribute to delivering the required project output and impact.

SemaGrow will mainly use the "Appraisal" method for determining quality. Through this method the finished products/deliverables are assessed for completeness and fitness. There are two types of appraisal method depending on the extent to which it is possible to define objective quality criteria.

- Testing – if the quality criteria are truly objective and quantifiable
- Inspection – if some subjective judgement is required

A quality inspection is a systematic, structured assessment of a deliverable conducted in a documented and organised fashion. This approach to quality inspection can be used:

- During the development of deliverables
- To mark the completion and approval of deliverables
- To complement testing, e.g. simply for checking test results

An overview of how a quality inspection (review) should be managed can be found in Chapter 3.4.

3.2 Deliverable Descriptions and Quality Criteria

The following table presents the expected deliverables and the partners which are responsible for reviewing the corresponding deliverable.

Del. no.	Deliverable name	Reviewers
D1.1	Project Management Plan	-
D1.2.1	6-monthly Report	-
D1.2.2	12-monthly Report	-
D1.2.3	6-monthly Report	-
D1.2.4	12-monthly Report	-
D1.2.5	6-monthly Report	-
D1.2.6	Final Report	-
D1.3.1	Annual Public Report	-
D1.3.2	Annual Public Report	-
D1.3.3	Annual Public Report	-
D1.4.1	Quality Assurance & Risk Assessment Plan	-
D1.4.2	Quality Assurance & Risk Assessment Plan	-
D1.4.3	Quality Assurance & Risk Assessment Plan	-
D2.1.1	Envisaged Applications & Use Cases	NCSR-D, SWC
D2.1.2	Envisaged Applications & Use Cases	NCSR-D, SWC
D2.1.3	Envisaged Applications & Use Cases	NCSR-D, SWC

D2.2.1	Data Streams & Collections	NCSR-D, SWC
D2.2.2	Data Streams & Collections	NCSR-D, SWC
D2.3.1	Large Scale Distributed Architecture	SWC, UNITOV
D2.3.2	Large Scale Distributed Architecture	SWC, UNITOV
D2.3.3	Large Scale Distributed Architecture	SWC, UNITOV
D2.3.4	Large Scale Distributed Architecture	SWC, UNITOV
D3.1.1	Techniques for Resource Discovery	UAH, SWC
D3.1.2	Techniques for Resource Discovery	UAH, SWC
D3.2.1	Techniques for Ontology Alignment	FAO, DLO
D3.2.2	Techniques for Ontology Alignment	FAO, DLO
D3.3.1	Techniques for Content Classification & Ontology Evolution	FAO, DLO
D3.3.2	Techniques for Content Classification & Ontology Evolution	FAO, DLO
D3.4.1	Techniques for Heterogeneous Distributed Semantic Querying	AK, SWC
D3.4.2	Techniques for Heterogeneous Distributed Semantic Querying	AK, UAH
D4.1	Scalability & Robustness Experimental Methodology	AK, FAO
D4.2	Experimental Report on Current Data Sets	AK, FAO
D4.3	RDF Triple Generator of Realistic Data Sets	SWC, AK
D4.4	Experimental Report on Projected Data Sets	AK, FAO
D5.1.1	Semantic Store Infrastructure	NCSR-D, SWC
D5.1.2	Semantic Store Infrastructure	NCSR-D, SWC
D5.2	Synergetic Semantic Annotation Environment	UAH, UNITOV
D5.3.1	Automatic Rigorous Testing Components	AK, FAO
D5.3.2	Automatic Rigorous Testing Components	AK, FAO
D5.4.1	Integrated SemaGrow Stack API components	NCSR-D, AK
D5.4.2	Integrated SemaGrow Stack API components	NCSR-D, AK
D5.4.3	Integrated SemaGrow Stack API components	NCSR-D, AK
D5.4.4	Integrated SemaGrow Stack API components	NCSR-D, AK
D5.5	Prototype integration with agINFRA	NCSR-D, AK
D6.1.1	Piloting Plan	UAH, NCSR-D
D6.1.2	Piloting Plan	UAH, NCSR-D
D6.2.1	Pilot Deployment	NCSR-D, SWC
D6.2.2	Pilot Deployment	NCSR-D, SWC
D6.3.1	Pilot Trials	NCSR-D, SWC
D6.3.2	Pilot Trials	NCSR-D, SWC
D6.4	Integrated Evaluation Report & Recommendations	DLO, FAO
D7.1.1	Project Fact Sheet	-
D7.1.2	Project Fact Sheet	-
D7.1.3	Project Fact Sheet	-
D7.1.4	Project Fact Sheet	-
D7.2.1	Project Website	-

D7.2.2	Project Website	-
D7.2.3	Project Website	-
D7.2.4	Project Website	-
D7.3	Dissemination & Awareness Plan	-
D7.4.1	Annual Dissemination & Awareness Report	-
D7.4.2	Annual Dissemination & Awareness Report	-
D7.4.3	Annual Dissemination & Awareness Report	-
D7.5.1	Sustainability, Uptake & Market Positioning Plan	UAH, NCSR-D
D7.5.2	Sustainability, Uptake & Market Positioning Plan	UAH, NCSR-D
D7.5.3	Sustainability, Uptake & Market Positioning Plan	UAH, NCSR-D
D7.6	Knowledge Kit	-

Table 3: Deliverables List

3.3 Deliverable Development Approach

Each deliverable will be created according to the set process shown in the figure below. Firstly, the Work Package Leader responsible for a particular deliverable will present the proposed structure of the deliverable as well as the task allocation between project participants to the Project Coordinator for approval. Once the Deliverable Development Plan is confirmed by the Project Coordinator, all Project Partners will focus on providing appropriate content to the partner responsible for the corresponding deliverable. Based on the received input, the WP leader will prepare the final draft of the deliverable and will circulate it to the relevant project partners for feedback, 4 weeks before the deadline of the deliverable. The review period for the reviewers takes one week. Based on received comments, the responsible partner will have a period of one week to undertake all necessary improvements and changes in the document and prepare a pre-final version to be sent for review to partners selected by the Project Coordinator, 2 weeks before the deadline. Reviewers will have 1 week to complete the review. After this period the partner who is responsible for the deliverable has a timeframe of 1 week for the revision and integration of comments and improvement suggestions. Then final version is sent to the Project Coordinator for EC submission.

All reviewers will be asked to comment on the deliverable draft document and undertake overall assessment, evaluate the deliverable against the Technical Annex description and look at the general quality of the deliverable. The table below presents the phases and the timeframes of the deliverable production process:

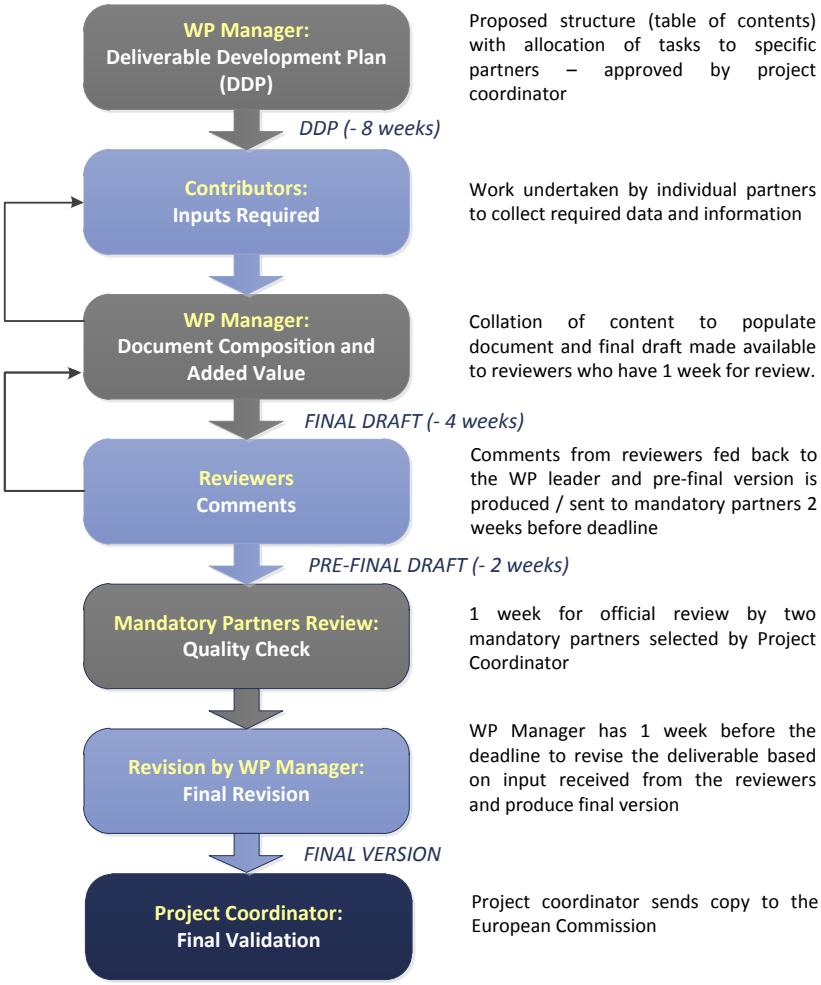

Figure 2: Deliverable Production Process

3.3.1 General & Deliverable Quality Indicators

At the beginning of the deliverable production process, the Project Coordinator will evaluate the Deliverable Development Plan proposed by the Work Package Leader. The Project Coordinator will check the following indicators:

Quality Indicator	Reference
The proposed contents are in accordance with the objectives stated in the Description of Work	SemaGrow DOW
The allocation of the tasks is realistic and consistent with the roles of the partners in the work package/task.	SemaGrow DOW Project meetings
The timetable proposed is realistic and matches the deadline highlighted in the Description of Work	SemaGrow DOW

Table 4: General Quality Indicator

During the production of the deliverable, there may be other intermediate phases where the Project Coordinator is asked to review partial drafts, but because of time constraints this cannot be established as a rule. During the whole process of draft production, each partner will be responsible for checking the quality of the deliverable as it progresses (according to the same indicators in the table below).

The Project Manager and Quality Assurance Sub-committee will evaluate the final draft of each deliverable. The following table provides a short list of indicators that the Quality Manager will use to assess the general quality of each deliverable.

Quality Indicator	Reference
The deliverable is in accordance with the objectives stated in the Description of Work	SemaGrow DOW
The deliverable offers complete documentation on the work done in the corresponding WP/Task	SemaGrow DOW Project meetings
The deliverable is compliant with the templates and editing guidelines as outlined within the Management Plan	SemaGrow D1.1 Management Plan
The deliverable is clear and legible	Editing to cover: • Language and syntax errors • Structure • Use of pictures, tables and diagrams • Clear distinction between body and annexes
The deliverable is complete	Content check covering: • Missing Parts • Non-existent references • Topics not covered • Unclear arguments
The deliverable is useful for the target reader/audience	SemaGrow DOW Project Dissemination Plan
Version history is clear and well documented	This document (for referencing and coding rules)

Table 5: Deliverables Quality Indicators

As a result of this exercise, the Lead Reviewer will prepare a statement summarising the results, the problems found and their severity, the actions taken and the final evaluation of the Deliverable and will feed it back to the Project Coordinator and the WP Leader. This process will be repeated until the deliverable's quality is considered satisfactory.

3.3.2 Work Package Progress Indicators

The Work-package Leader will be in charge of assuring that the work is carried out according to schedule and that the expected deliverables are produced.

The Quality Assurance process is also concerned with discovering and handling errors as early in the project lifecycle as possible. As soon as any risk is identified, the WP leader will define a mitigation strategy as outlined in Chapter 5.

The progress of work will be tracked with the following objectives:

Quality Indicator	Reference
The activity corresponds to the project specifications	SemaGrow DOW This document
Development is consistent with user requirements	User requirements
The development activity is based on a solid work plan	SemaGrow DOW WP work plan
All steps of development activity are fully documented	Monitoring Reports Internal Reports Deliverables

Architecture is available	Internal documents Deliverables
There is a realistic risk assessment and recovery plan	Internal documents

Table 6: Work Package Quality Indicators

3.3.3 Technology Indicators

The SemaGrow service will be evaluated applying the standard indicators as defined by the reference document ISO/IEC 25010:2011: Systems and software engineering - Systems and software Quality Requirements and Evaluation (SQuaRE) - System and software quality models'.

This document sets a number of characteristics and sub characteristics for external and internal quality assessment, as per the following table:

Quality Indicator	Reference
Functionality	**The capability of the software product to provide functions that meet stated and implied needs when the software is used under specified conditions.**
Suitability	The capability of the software products to provide an appropriate set of functions for specified tasks and user objectives.
Accuracy	The capability of the software product to provide the right or agreed results or effects with the needed degree of precision.
Interoperability	The capability of the software product to interact with one of more specified systems
Security	The capability of the software product to protect information and data so that unauthorised persons or systems cannot be read or modify them and authorised persons or systems are not denied access to them
Functionality compliance	The capability of the software product to adhere to standards, conventions, or regulations in laws and similar prescriptions relating to functionality.
Reliability	**The probability that the software will not cause the failure of a system for a specified time under specified conditions.**
Maturity	The capability of the software product to avoid failure as a result of faults in the software.
Recoverability	The capability of the software product to re-establish a specified level of performance and recover the data directly affected in the case of a failure.
Reliability Compliance	The capability of the software product to adhere to standards, conventions or regulations relating to reliability.
Usability	**The capability of the software product to be understood learned, used and attractive to the user, when used under specified conditions.**

Understandability	The capability of the software product to enable the user to understand whether the software is suitable, and how it can be used for particular tasks and conditions of use.
Learnability	The capability of the software product to enable the user to learn its application.
Operability	The capability of the software product to enable the user to operate and control it.
Attractiveness	The capability of the software product to be attractive to the user.
Usability compliance	The capability of the software product to adhere to standards, conventions, style guides or regulations relating to usability.
Efficiency	The capability of the software product to provide appropriate performance, relative to the amount of resources used, under stated conditions.
Time behaviour	The capability of the software product to provide appropriate response and processing times and throughput rates when performing its function, under stated conditions.
Resource utilization	The capability of the software product to use appropriate amounts and types of resources when the software performs its function under stated conditions.
Efficiency compliance	The capability of the software product to adhere to standards and conventions relating to efficiency.
Maintainability	The capability of the software product to be modified. Modifications may include corrections, improvements or adaptation of the software to changes in environment, and in requirements and functional specifications.
Analyzability	The capability of the software product to be diagnosed for deficiencies or causes of failures in the software, or for the parts to be modified to be identified.
Changeability	The capability of the software product to enable a specified modification to be implemented.
Stability	The capability of the software product to avoid unexpected effects from modifications of the software.
Testability	The capability of the software product to enable modified software to be validated.
Maintainability compliance	The capability of the software product to adhere to standards or conventions relating to maintainability.
Portability	The capability of the software product to be transferred from one environment to another.
Adaptability	The capability of the software product to be adapted for different specified environments without applying actions or means other than those provided for this purpose for the software considered.

Installability	The capability of the software product to be installed in a specified environment.
Co-existence	The capability of the software product to co-exist with other independent software in a common environment sharing common resources.
Replaceability	The capability of the software product to be used in place of another specified software product for the same purpose in the same environment.
Portability compliance	The capability of the software product to adhere to standards or conventions relating to portability.

Table 7: Technology Quality Indicators

3.4 Quality Recording

3.4.1 Actions

Actions are specific activities which are required for the project to move forward. They are normally the consequence of decisions made during meetings, of Project Management Board decisions made by e-mail or tele-conference or they may correspond to deadlines set in the Description of Work.
Meeting minutes will contain a record for each action with the following data:

- **WPx:** .Work Package & Work Package Title
- **Partner/s:** The partner or partners responsible for that action.
- **Description:** A short description of the action.
- **Date:** The completion date for the particular action.

3.4.2 Decisions

Decisions are official statements that are approved at the Project Board level. Decisions may affect the project in terms of schedule, budget, corrective or back-up actions, technological choices, etc. The record for each decision will be as follows:

Ref.	WP/task	Decision	Notes

Their status becomes OK when the issue has been solved (usually translated into an Action or a Decision).

4. Quality Guidelines

4.1 Publication Tools

In order to ensure easy access to the project documents and to reduce potential editorial burdens, Microsoft Word and Excel will be used as standard tools for the project, together with MS PowerPoint and Adobe PDF. The minimum version is Microsoft Office 2007 and partners should save the documents in the docx format.

Participants will use electronic mail facilities to enable the distribution of documents by electronic means, thus reducing the delays associated with other methods of distribution.

Note that large attachments to e-mails should be zipped.

The subject of all project e-mails should begin with "[SemaGrow]:" to allow users to filter e-mails using e-mail client facilities.

4.2 Document Types

Within the SemaGrow project, there are three distinct documents types envisaged:

- *Documents for the Agency*: these documents include Deliverables, Interim and Final Progress Reports and Cost Statements.
- *PowerPoint presentations* for internal and external use: e.g. for project meetings, reviews, presentation during workshops, exhibitions, conferences etc.
- *Word documents for internal use*: e.g. Agendas, Minutes, Technical contributions, other contributions etc.

The template to be used for creating and presenting all documents for the Agency (deliverables, progress reports etc.) are available through the **SemaGrow** website. The template and consequently the documents for the Agency will show the following pieces of information on the cover page:

- *Title and Logos*: the title of the document will be shown along with the relevant logos, such as the project logo, the EU flag[2] in order to acknowledge receipt of European Community funding[3] etc. According to the 2008 Project Management Guidelines, the European flag must be given appropriate prominence when displayed together with the project's logo.
- *Partners*: The names of the partners, who contributed to the document.
- *Dates, due and actual*: The due submission date along the actual submission date must be provided.
- *Leading organisation*: The name of the lead organisation for the preparation of the document must be indicated here.
- *Revision*: This field denotes the version of the document which may be in the forms of v1, v2, v01 etc. The value 'Final' denotes that the version of the document is the final and the submitted one.
- *Dissemination level*: In this field the list of persons or groups involved in the document distribution is reported. The dissemination level field can have one of the following possible values:
    - PU: The document is open and public to everyone
    - PP: The document is restricted to the eParticipation Preparatory Action participants, including European Commission services and project reviewers
    - RE: The document is restricted to a specified group
    - CO: The document is confidential i.e. restricted to the consortium members, including Agency and Commission and project reviewers.

[2] http://europa.eu/abc/symbols/emblem/download_en.htm

[3] See Article II of the Grant Agreement

Documents internal to the project may also use this field for indicating the relevant work package with the format *WPx*.

The predetermined structure of each document's contents is broken down in the following sections:

- *History*: The History page will report version, date, modification reason, and organisation/author that have performed the respective modification. Versioning will be kept as follows:
    - Version integers are kept for document submission to the Agency. The first submission of a document to the Agency will be marked as *v1*. If a second submission is needed, this will be v2 etc.
    - Version decimals (in other words, releases) will be used for communication between partners. The first draft version to be communicated within the Consortium will be *vX.1*, the second vX.2 etc.
- *Executive Summary*: An executive summary is a report, proposal, or portfolio, etc in miniature (usually one to two pages). That is, the executive summary contains enough information for the readers to become acquainted with the full document without reading it. Usually, it contains a statement of the problem, some background information, a description of any alternatives, and the major conclusions. Someone reading an executive summary should get a good idea of main points of the document without becoming bogged down with details.

  An executive summary differs from an abstract in that the former's purpose is to inform the reader of the points to be covered in the report without any attempt to tell what is said about them. Covering no more than one to two pages in length, the executive summary is longer and is a highly condensed version of the most important information the full document contains. Both the executive summary and the abstract are independent elements rather than a part of the body of the document. Both are placed at the beginning of the document.

  With the possible exception of the conclusion and the recommendations, the executive summary is the most important part of a report. As such, it should be the best-written and most polished piece of the document. This is because many readers may only look at the executive summary when deciding whether or not to read the entire document. In short, it may be expected that an executive summary will be read more frequently and by more people than the entire document.

  Since the executive summary is a condensation, when creating it, any preliminaries, details, and illustrative examples must be omitted. In this respect, the main ideas should be included as well as the facts, the necessary background to understand the problem, the alternatives, and the major conclusions. Brevity and conciseness are the keys to a well-written summary.

  Therefore, the structure of a comprehensive executive summary would address and incorporate the following points:
    - First, the *objective* and the *scope* of the document are described. In a concise, comprehensive and straightforward way, it is explained what this document aims to do and how this is going to be done. For example "*In this report we identify future research priorities for eParticipation researchers. We do this by first setting the context by providing the trajectory of eParticipation from its early days to current practice. We then consider this current situation*..."
    - Second, the *methodology* and/or the *rationale* of the document are presented in order to provide an overview of how the research results were obtained. For example, "*The research priorities were identified through analysing the literature – both workshop reports and scientific published papers by*..."
    - Third, the main *results/outcomes* of the document are described. For example, "*This coding resulted in six main areas of barriers and challenges which are listed below: Complexity of research field addresses problems*..."
    - Finally, if it is highly necessary some conclusions may be provided.
- *Table of Contents*
- *List of figures*
- *List of tables*

- *List of abbreviations and terms*: a list providing the full titles and/or explanations of the abbreviation and terms used in the document
- *Introduction*: this is a beginning section which states the purpose and goals of the following writing within the document. This is generally followed by the main body and conclusions.
- *Main body*: the main body, as the name suggests, is the most important part of the document. The subject of the document is explored and valid reasons and justifications are given.
- *References*: a reference is a previously published written work within academic publishing which has been used as a source for theory or claims referred to which are used in the document. References contain complete bibliographic information so the interested reader can find them in a library. References are added either at the end of each document or at the end of the relevant section.
- *Annexes*: These sections may contain collection of supplementary material

In order to ensure homogeneity and quality of every document produced by the SemaGrow consortium, apart from the afore-mentioned sections of the templates, attention will be paid to the following

- Headers and footers of each document will be formatted according to template guidelines
- Fonts, paragraphs, bullets, numbered lists etc. will be formatted using the predetermined styles
- Captions to all tables and figures will be used
- Automatic cross-referencing for tables and figures in the main body will be used to ensure readability
- Referencing should follow the IEEE 2006 referencing method or the ISO 690. References in main body should be in the form of [1], [2], etc.

4.3 Configuration Management

File names of documents will follow a specific format to ensure correct communication of the documents without losing track of their circulation. This becomes particularly important for documents that require consecutive contributions from partners and that may circulate frequently and successively within the Consortium

The file name format is:

SemaGrow_ContentDescription_VER	
ContentDescription	A short description of the file's content
VER	Version number (v1, v01, …)

The file name format regarding the Deliverables is:

SemaGrow _Dxy_deliverable name_VER	
Deliverable Name	The title of the deliverable
VER	Version number (v1, v01, …)

4.4 Change Control

Change management is the process for requesting, reviewing, approving, carrying out and controlling changes to a projects deliverables. The process for change control is based upon:

- Responsibilities
- Tolerance for changes at different project levels
- Tools to be used to manage the change process

Any participant in the SemaGrow project may raise a Change Request. The Project Coordinator will ensure they are captured and are proactively managed to conclusion. An initial review should be made to examine the need for the

change, how it could be achieved and what the consequences would be. The most appropriate member of the Project Team would normally perform this review. Based on those conclusions, the recommended action would be proposed which would be one of three possible courses:

- Minor changes within scope can be approved by the Project Coordinator
- Any change affecting the deadline of a deliverable or outcome would need to be reviewed by the Project Director and shared with the Project Board who would confirm the necessary revisions to get the project back on course
- Changes of scope and contract revisions would require the approval of the European Commission

The diagram below highlights SemaGrow's approach to change control.

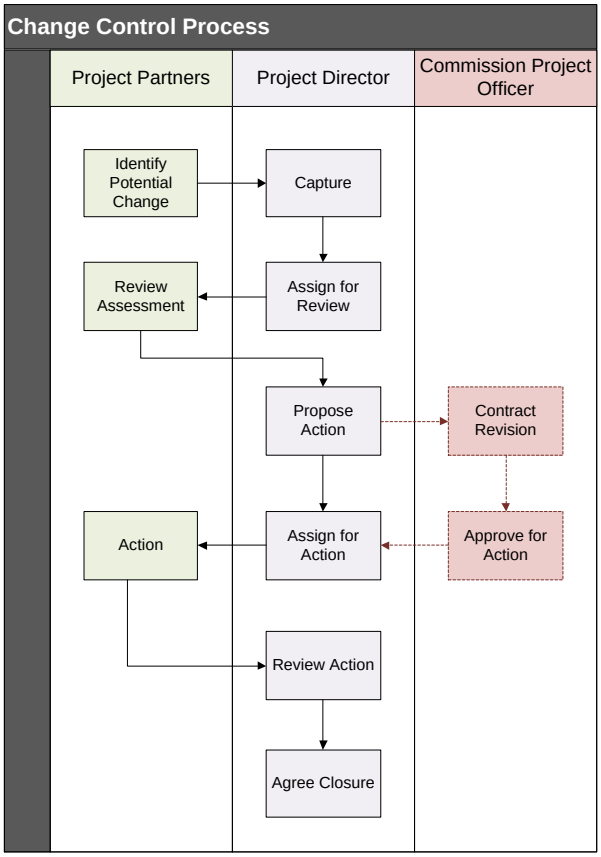

Figure 3: Change Control Approach

5. Risk Management

5.1 Scope

Risk management is concerned with identifying potential problems and eliminating or reducing the damage the realisation of those risks would cause. Failure to adequately manage risks will threaten the success of the project.

Risk management is the responsibility of the Project Management Board, and chiefly of the Project Coordinator. A well-planned approach to risk control will allow the project team to concentrate resources in those areas where risk is high and reduce risks to acceptable limits.

Risk assessment and management will be conducted at the start of the project and also throughout the project lifecycle to ensure that risks are acknowledged and controlled. It is usually impossible to eliminate all risks, but they can be recognised and dealt with. The risk management process requires that each risk is assessed and measures formulated to prevent it (avoidance actions) or minimise its effect (amelioration actions). Both need to be considered because avoidance measures may fail.

As the project proceeds, the nature of risks is changing. Old risks disappear and new ones come up. Consequently, risk management is a continuous process thus risks should be regularly reviewed and reassessed.

5.2 Risk Assumption

The success of the SemaGrow project basically depends on four major assumptions:

1. Funding will not be reduced during the projects lifecycle.
2. Project partners are fully committed to delivering deliverables and achieving the goals of the project and will all sign a consortium agreement.
3. **SemaGrow** aims to use more agricultural data than the volume initially contributed by the data partners, from across Europe/world and open to all interested stakeholders - however the main rigorous testing experiments and results will be on the promised data volume described in Annex II of the SemaGrow DOW.
4. Other FP7 projects will be willing to work in conjunction with **SemaGrow.**

5.3 Risk Assessment

The first step is to identify and evaluate the potential risks in the planned work. At the beginning of each work package (WP) it is the responsibility of the WP Leader to conduct a risk assessment, ensuring that due consideration has been given to all risks associated with the WP which is to be commenced. The following figure explains the process behind risk analysis.

Figure 4: Risk Analysis Process

Risk management in **SemaGrow** will take place at three levels:

1. At the **strategic level**: concentrates on the relation between the project and the consortium with its environment. Risk management at this level is the responsibility of the **Project Consortium (PC)**.
2. At the **tactical level**: concentrates on the WPs' contribution to the project objective. Risk management at this level is the responsibility of the **PC** and the **Project Board (PB)/Work Package Leaders (WPL)**.
3. At the **operational level**: concentrates on the activities within the work packages, which is the responsibility of each **WPL**.

The initial risk factors that can be identified, which may apply to all three levels, are the following:

- **Complexity** - the activities may be too complex to realize.
- **Scope** - the total set of activities may be too large for the partners to realize and/or manage.
- **Capacity** - one or more of the partners may not be able to honour its commitments without the others having the capacity to fill the gap.
- **Reliability** - the project methods and strategies applied could be inappropriate to realize the intended outcomes.
- **Validity** - the outcomes may not reflect the real needs and priorities of the stakeholders
- **Sustainability** - the project outcomes may not lead to a sustainable outcome.

In the risk management elaboration to be carried out within **SemaGrow**, each one of the risk factors will be analysed at each one of the three levels, and will be detailed in terms of: identified and quantified risks; contingency action per identified risk; monitoring mechanism; quantified threshold level; and line of action when threshold is overstepped. It will build on the strategic risk assessment directions that the **PB** and **PC** will be responsible for.

	Complexity	***Scope***	***Capacity***	***Reliability***	***Validity***	***Sustainability***
RISK of Overall project activities	The activities are too complex to realize.	The total set of activities is too large for the partners to realize and/or manage.	One or more of the partners is not able to honour its commitments	The project methods and strategies applied are inappropriate to realize the intended outcomes.	The outcomes do not reflect the real needs and priorities of the stakeholders.	The project outcomes may not lead to a sustainable outcome.
Actions	Review the activities and/or scale down project ambitions.	Prioritize and/or scale down ambitions.	Replace defaulting partners.	Adjust project methods and strategies.	Adjust the project activities and outputs.	Adjust the project activities and outputs.
Decision Maker	PC, SM, TM,PB (*upon agreement with PO*)	PC, PB (*upon agreement with PO*)	PC, PB (*upon agreement with PO*)	PC, SM, PB (*upon agreement with PO*)	PC, PB (*upon agreement with PO*)	PC, SL, PB (*upon agreement with PO*)

Table 8: Sample Risk Methodology

SemaGrow is a research project with partners from several countries and different expertise; hence, the partners had to clearly identify a number of management risks. In order to minimize the risks, the partners have concretized the project proposal as much as possible and have agreed on the global project tasks. Furthermore, an elaborate project management structure has been defined in order to monitor the cooperation between the partners and identify and investigate management risks as soon as possible. In **SemaGrow**, the following potential management risks have been mainly foreseen, and corresponding contingency plans are suggested.

Risk	Probability	Impact	Mitigation and Contingency Plans
Management Risks			
Critical Path Awareness. Within the critical path a delay of a deliverable would result also in a delay of the following development, prototypes, tasks and work packages.	Medium	Low	Monitoring the effort spent and regularly comparing actual and planned achievements, the management team will identify any slippage and ensure that any underestimations of effort are dealt with as early as possible. In the unlikely event of delays or underestimated effort remaining unnoticed and undealt with for longer periods, the management team, in consultation with the EC services, will appropriately adjust the work plan and/or reallocate effort.
Underestimation of the required effort.	Medium	Medium	As above.
Loss of key personnel and delays due to re-hiring.	Low	Medium	Each partner is responsible for making sure that the case of personnel turnover can be handled adequately.
Beneficiary goes out of business or relevant unit of a beneficiary is shut down during the duration of the project.	Low	Medium	If possible, we will aim at finding a suitable replacement partner and rearrange the tasks within the project in agreement with the project officer. If this is not possible, a contract amendment will be aimed for.
Late availability of personnel causing delays in the initial project phase.	Medium	Medium	The initial project deliverables consist of analysis and assessment reports and could be started to work on by already available personnel. Major RTD activities start after M03 of the project. It should also be noted that SemaGrow draws on existing solutions and software, in particular in the first project year. In the unlikely event of delays in the availability of key personnel, the available personnel will temporarily assume more responsibilities and allocate more effort to SemaGrow than originally planned, until the new personnel is available. There is sufficient overlap in expertise both inside and across the SemaGrow consortium members to ensure that this can be achieved.
The worsening global financial situation distracts data providers from providing their resources online as money is fed into other important areas	Low	High	In the extremely unlikely event that organizations such as DLO and the UN's FAO are unable to maintain their repositories on-line, SemaGrow will carry out its pilots over locally stored data provided by these organizations. The technologies will be developed and tested, but their actual deployment delayed until FAO and DLO reinstate their on-line services.

SemaGrow fails to secure external data due to IPR or privacy issues	Low	Low	A considerable volume of relevant data is currently freely available, and more is becoming available every day. Even in the extremely unlikely event that this trend is reversed to the point where there is no relevant public data whatsoever, the data that consortium members have direct access to and/or ownership over (cf. Annex II) is adequate to satisfy the project's development and pilot needs.

Table 9: Management Risks

In **SemaGrow**, the following potential technical risks have been mainly foreseen, and corresponding contingency plans are suggested.

Risk	Probability	Impact	Mitigation and Contingency Plans
Technical Risks			
Failure to meet user requirements. The software functionalities do not meet user requirements.	Low	High	In order to avoid misspecification of software functionalities, **SemaGrow** will follow an iterative development process and involve stakeholders in all stages of the development. In the unlikely event that the drafted requirements turn out to be unsatisfiable within project scope, the requirements deliverable will be updated, providing detailed explanations for the failure to meet the original requirements.
URI conventions in SemaGrow data sources are not amenable to POWDER compression	Medium	Low	**SemaGrow** will increase the expressivity of the extended POWDER formalism, in order to capture more complex patterns. This will add overhead for the execution of the regular expressions, but will only shift the performance curve to a slightly more computationally expensive position, without compromising its scalable shape.
The Dynamic Huffman coding scheme envisaged for indexing sub-strings of URIs is excessively inefficient for new repositories.	High	Low	New repositories will have to go through a (fully automated) stage where initial frequencies are computed. Domain-independent knowledge can also be used to initialize repositories (e.g., http://www is frequent). This will have a slight impact on decoding efficiency, as the initial decoding table has to be loaded, but with appropriate caching this can be kept to a minimum.
Ontology alignment fails to identify usable mappings between data sources	Medium	Medium	Since **SemaGrow** relies on approximations to guarantee efficiency, similar mechanisms will be used to guarantee the *graceful degradation* of the query mapping methods when confronting difficult alignment situations. Furthermore, advanced alignment evaluation methods will ensure that the user application is aware of these approximations, and can request the manual inspection and correction of the mapping model.

Projected data using for rigorous testing proves to be unrealistic	Medium	Low	The projection model and parameters will be continuously monitored and refined by comparing projections with subsequent data made available during the project's lifetime. This will provide us with high-quality model and parameters by project's end, as well as a clear idea about their true accuracy.
User requirements are too ambitious or beyond project scope	Low	High	Consulting effort is foreseen for the scientific and technical director (NCSR-D) to assist user partners in forging requirements that can be met within the scope of the project. In the unlikely event that the drafted requirements turn out to be unsatisfiable within project scope, the requirements deliverable will be updated, providing detailed explanations for the failure to meet the original requirements.
Early RTD successes indicate that even more ambitious user requirements could be met	Medium	Medium	The work plan foresees overlapping specification/development/evaluation cycles, providing the opportunity for the refinement of user requirements.
Integration of the **SemaGrow** tools may prove too difficult for the project's resources.	Medium	High	System architecture will be based on open protocols to achieve maximum flexibility. In the unlikely event that some of the **SemaGrow** tools cannot be integrated, they will be delivered as stand-alone tools. The overall system will be accordingly amended in order to provide the functionality in the absence of these tools.
Risk of 3rd parties publishing similar results as **SemaGrow**, for instance similar open-source tools.	Low	Low	**SemaGrow** will welcome the opportunity for cross-fertilization and result sharing and will divert resources to more ambitious advancements.
New policies by new governments around the use of ICT and research impact SemaGrow either as an opportunity or threat.	Low	High	**SemaGrow** develops foundational technologies that can be applied on a variety of fields and applications. In the unlikely event that new policies void the current application domain, or open up significant opportunities in a different field, the project's exploitation plan will be accordingly updated or extended.
SemaGrow will need to respond to changes in the European programme such as amendments to metadata standards and mapping	Low	Low	**SemaGrow** develops foundational technologies that are not tied to any particular standard and schema.

Table 10: Technical Risks