DOSSIER-Cloud

DEVOPS-BASED SOFTWARE ENGINEERING FOR THE CLOUD

http://www.dossier-cloud.eu

Deliverable D1.1

Project Handbook, Quality Plan

& Risk Management

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EXECUTIVE SUMMARY

The purpose of the **Project Handbook, Quality Plan & Risk Management** document is to provide a single point of reference on the quality that will be governed during the course of the DOSSIER-Cloud project. The deliverable at hand defines the project organization, roles and responsibilities, with emphasis on the quality control and quality assurance activities that will be carried out in relation with risk management issues. It describes how the project will execute its day-to-day activities from a quality and project management perspective. In addition, it ensures that standards and templates are produced and followed, and that processes and procedures are defined with their execution being continuously monitored and improved. A reference is also provided to the necessary mechanisms and structures for the management and administrative coordination of the project, capitalising on the governance, change management, communication plan, project plan, phases and activities, milestones and deliverables, as well as the reporting roles and responsibilities for all the partners. Finally, this document defines the form and way of writing the deliverables and producing dissemination material (e.g., templates, structure, standard format, handling according to dissemination level, etc.), outlines the means of communication and exchange of information between the partners for gathering information from the partners for reporting (both technical and financial) and describes the process to review/accept deliverables.

1. PROJECT SCOPE AND OUTCOMES OVERVIEW

1.1 Introduction

DOSSIER-Cloud is a project that implements a series of coordination and support actions for promoting research in the area of Software Engineering for Distributed Systems development. It brings together two internationally recognized scientific groups from the Netherlands (UvT) and Italy (POLIMI), which collaborate with Cyprus University of Technology (CUT) so as to strengthen CUT's research and scientific profile in the relevant area. The aim of DOSSIER-Cloud is to facilitate transfer of scientific knowledge and expertise, as well as of best research practices from UvT and POLIMI to CUT. The ultimate goal is that the research group of CUT increases its research capacity and prowess, by investigating a number of significant and hot topics in the field of Distributed Systems development. A number of high-quality research results will be produced during and after the duration of the project; this will enable CUT to significantly increase its international standing in the research community, by both achieving related publications in the top-tier scientific journals and conferences of the corresponding research area, as well as by producing new tools that will benefit practitioners in the software industry. Close cooperation between the partners of DOSSIER-Cloud will take the form of knowledge acquisition and transfer through personnel exchanges, organization of workshops and summer/winter schools with lectures delivered from UvT and POLIMI, participation in international scientific conferences/workshops and establishment of strong links with the software industry.

1.2 Project Scope

The scope of DOSSIER-Cloud is depicted graphically in Figure 1: The project targets at directing a fusion of knowledge by the leading institutions (UvT and POLIMI) towards CUT. This will enable CUT research team to produce highly innovative research results for supporting teams of developers that produce, and operators that run and maintain, services or applications on the distributed environment of the Cloud, the latter being implemented in one of the known forms of public, private or community access, or even structured as a federation of Clouds. This support will be provided through a process for designing and implementing the software (Dev perspective) and for performing changes and reconfiguration (Ops perspective). This process will also facilitate smooth interaction and continuous collaboration between the two teams, allowing them to use a set of tools to monitor and measure their activities, either Dev or Ops, so as to assess their efficiency and performance, as well as offering a set of tools to automate a large part of these activities. The leading institutions participating in this project will be kept informed of the future progress of research in CUT by measuring and assessing the efficiency of the Twinning actions performed for knowledge transfer, as well as by being invited to take part in the research activities and in the writing and publishing of the resulting research papers.
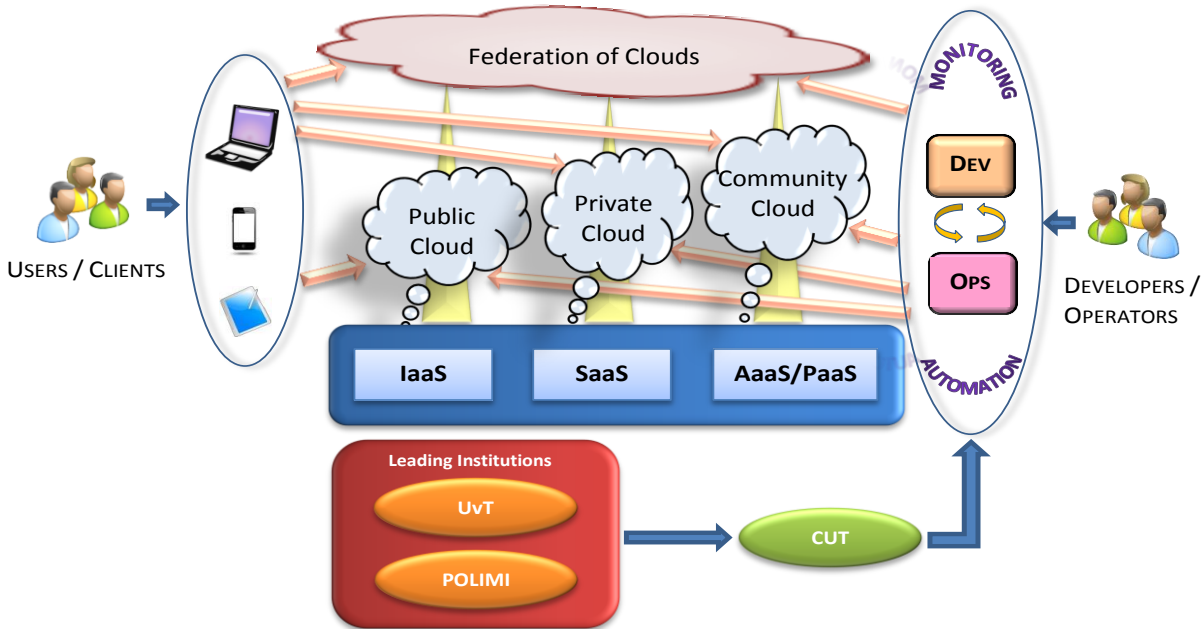
Figure 1. The scope of DOSSIER-Cloud

1.3 Milestones

To keep the project under tight control, the project is structured along five main milestones to mark the completion of a critical phase in the project or a work package. The DOSSIER-Cloud milestones are essentially attached to the successful transfer of knowledge from the two leading institutions to CUT and the formation of a strong scientific background on the topics and sub-topics of interest for executing future research steps as follows:

Milestone 1. **New software process for developing and operating distributed software applications under DevOps principles – To be reached on Month #8:** Thorough study and successful knowledge transfer on distributed software services or applications, distributed software life-cycle methodologies, DevOps principles and workflows, collaboration/communication methods and tools for DevOps teams, reuse of open source modules and tools.

Milestone 2. **Metrics/measurement processes for the DevOps environment – To be reached on Month #14:** Formation of a strong scientific background on the Cloud distributed computing environment, the definition of standardized metrics on the server side as well as the study of the uncertainty associated with client side metrics and their effects on service performance and precision, the study and analysis of DevOps oriented metrics, the definition of standardized DevOps measurement activities and the potential of integration of metrics and measurement activities into a uniform DevOps monitoring scheme.

Milestone 3. **Automation of DevOps activities – To be reached on Month #21:** Development of a solid knowledge base on Cloud quality features and standards, Service

Level Agreements (SLA), issues on Cloud resource management, load balancing and leveling, analysis of the current Cloud pricing policies, aspects of Cloud power consumption and energy preservation, and Cloud load migration policies and (re)configuration.

Milestone 4. **Cloud Service Composition – To be reached on Month #27:** Analysis and deep understanding of adaptive and optimized service selection and composition, automatic synthesis of Cloud services to build larger applications and problems in composing Cloud services residing at multiple distributed environments.

Milestone 5. **Formation of industrial collaboration basis – To be reached on Month #34:** Successful completion of activities for industrial engagement in the project, successful attraction of stakeholders and SMEs, and development of collaborations with practitioners, securing their continuous involvement to support collection and maintenance of real-world experimental datasets.

The DOSSIER-Cloud milestones are explicitly associated with the work-packages and tasks described in the proposal document and schedules according to the project's Gantt chart detailing the timing of the work packages which was included in the proposal.

1.4 Work Package Structure

To meet its objectives, the work in DOSSIER-Cloud is organized in six work packages: One for management (WP1), three for strengthening the scientific knowledge of CUT to tackle the research targets in the corresponding areas (WP2 through WP4), one for engaging practitioners and extending the community basis to facilitate future piloting and extensive experimentation with synthetic data and real-wold case studies (WP5), and, lastly, one for dissemination and exploitation of results (WP6).

Figure 2 shows a Pert chart for the work plan, which illustrates the WP structure and interconnections. The work-plan uses the knowledge required for producing a novel software process (life cycle methodology, people, tools - WP2) as the reference for guiding CUT's knowledge acquisition and research skills development to define metrics and measure DevOps features in a distributed software systems development environment (WP3). The scientific background formed thus far drives the core knowledge required in work package WP4 for automating certain phases or tasks through the production of dedicated software tools. Experimentation and validation is connected to the three core WPs (2 to 4) and builds upon the knowledge gained to analyse and study where, who and how the assessment of the proposed approaches may be performed.
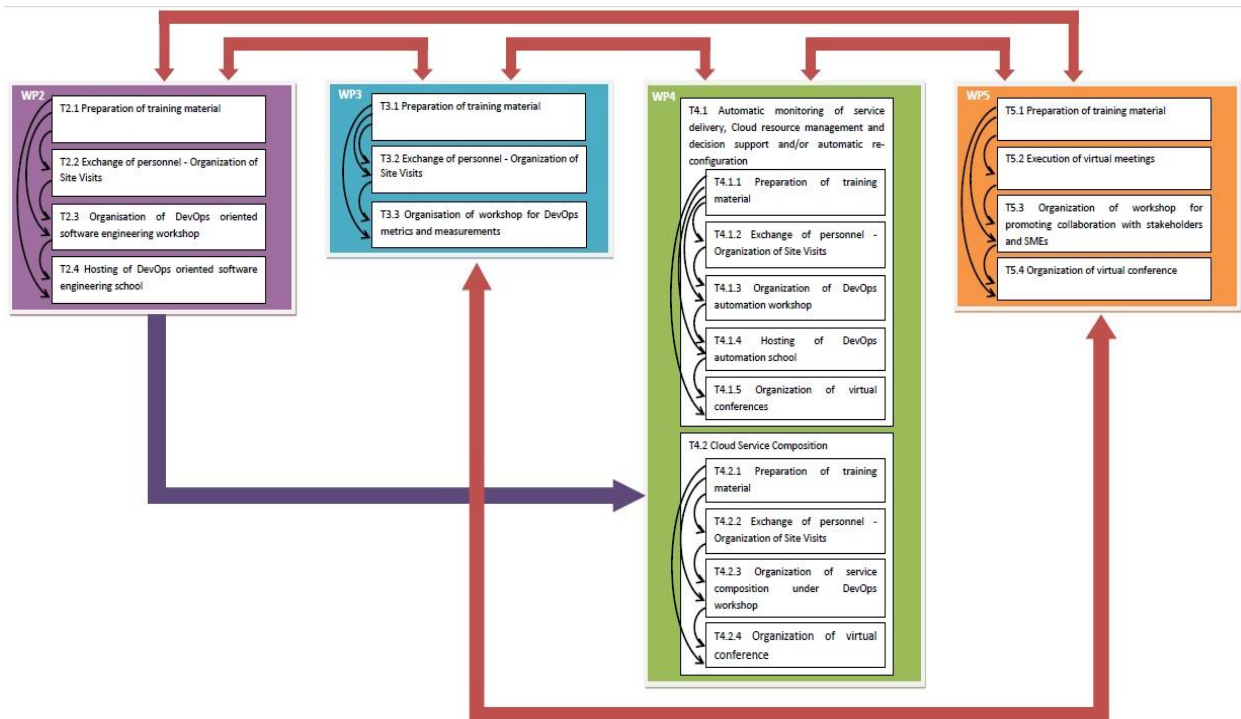
WP2
- T2.1 Preparation of training material
- T2.2 Exchange of personnel - Organization of Site Visits
- T2.3 Organisation of DevOps oriented software engineering workshop
- T2.4 Hosting of DevOps oriented software engineering school

WP3
- T3.1 Preparation of training material
- T3.2 Exchange of personnel - Organization of Site Visits
- T3.3 Organisation of workshop for DevOps metrics and measurements

WP4
- T4.1 Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration
  - T4.1.1 Preparation of training material
  - T4.1.2 Exchange of personnel - Organization of Site Visits
  - T4.1.3 Organization of DevOps automation workshop
  - T4.1.4 Hosting of DevOps automation school
  - T4.1.5 Organization of virtual conferences
- T4.2 Cloud Service Composition
  - T4.2.1 Preparation of training material
  - T4.2.2 Exchange of personnel - Organization of Site Visits
  - T4.2.3 Organization of service composition under DevOps workshop
  - T4.2.4 Organization of virtual conference

WP5
- T5.1 Preparation of training material
- T5.2 Execution of virtual meetings
- T5.3 Organization of workshop for promoting collaboration with stakeholders and SMEs
- T5.4 Organization of virtual conference

Figure 2. Graphical representation of DOSSIER-Cloud's main components interaction for knowledge transfer and acquisition (Pert chart)

Figure 3 graphically presents the work breakdown structure in WPs and their interconnections. The content of the work packages is described briefly below:

WP1 – Project Management: Ensures that all project activities are performed efficiently in a coordinated and integrated manner, within schedule and budget and in a way that all scientific, technological and stakeholder's expectations are fully met.

WP2 – New software process for developing and operating distributed software applications: Describes the actions to enable successful transfer of knowledge from the leading institutions to CUT for luxuriating CUT's knowledge base on technical issues of the Cloud computing environment and distributed software services, DevOps principles and workflows, collaboration and communication issues in DevOps environments, and motivation, leadership and people risk in DevOps teams, as well as gain expertise on open source tools and reuse of existing open source modules.

WP3 – Metrics and Measurement activities (DevOps oriented, Cloud focused): Provides on-site hands on experience on distributed software systems development and operations environments delivered via visits of CUT's staff in the premises of the two leading institutions. It also introduces actions to raise CUT's scientific background so as to analyse and define metrics and measurement activities in such environments by exploiting the scientific knowledge and experience of the leading institutions through training activities and case analysis studies.

WP4 – Automation of build, deployment and operation activities: Provides the mechanisms for elevating CUT's scientific background and research potential that will enable its staff to pursue the goal of automating key phases or activities within the new development software

process of WP2, including implementation and synthesis of distributed apps, their monitoring and assessment according to SLA criteria, their integration with the technical environment and the management of resources in the distributed environment. These mechanisms combine training sessions delivered in workshops and summer schools, as well as exchanges of staff in the participating countries.
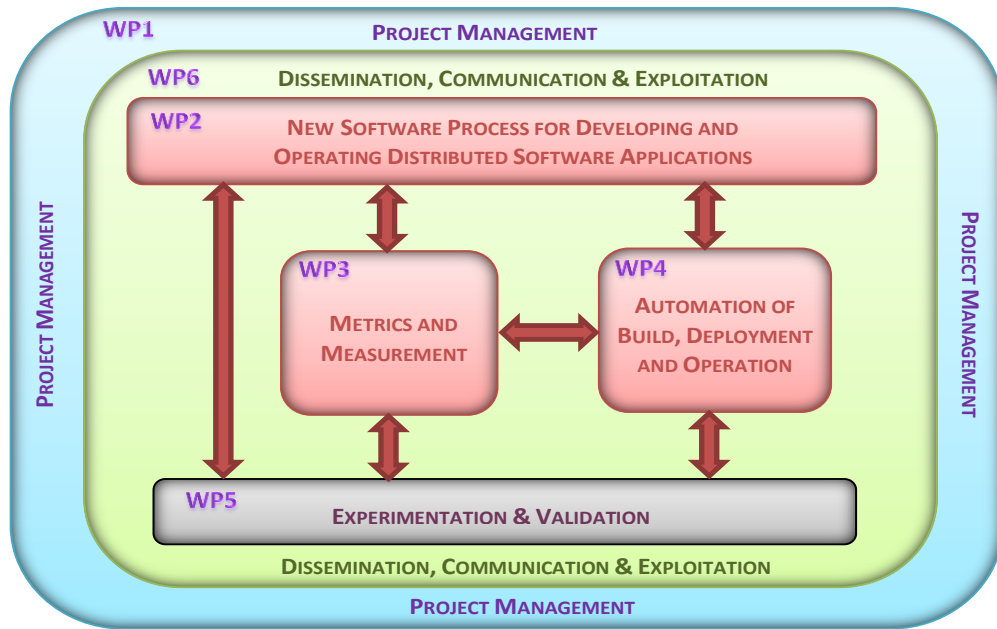

Figure 3. DOSSIER-Cloud work plan and work package structure for knowledge transfer and sharing in the research areas of interest

WP5 – Experimentation and Validation: Suggests methods and actions followed by the leading institutions for developing the basis for experimentation and validation in joint activities with stakeholders.

WP6 – Dissemination and Exploitation: Describes how the knowledge acquired will be disseminated to stakeholders in the software industry and businesses beyond it, demonstrating how they can benefit from the basic DevOps principles and distribution of services, and becoming the flagship for facilitate sustainable engagement of SMEs in future research activities and project discoveries. Also, it includes activities of preparing and presenting short papers or work in progress targeting at receiving feedback from the research community of highly recognized international conferences and workshops.

1.5 Deliverables

Table 1 provides the list of the project's major deliverables.

Table 1. List of DOSSIER-cloud's major deliverables

Del. No	Deliverable name	WP No	Short name of lead particip.	Type	Diss. level	Delivery date (month)
1.1	Project Handbook, Quality Plan & Risk Management	1	CUT	R	PU	2
1.2	Periodic Reports	1	CUT	R	PU	6, 12, 18, 24, 30, 36
2.1	DevOps oriented software engineering training content (talks, lectures, seminars)	2	UvT	D	PU	2, 3, 5, 6, 8
2.2	DevOps oriented software engineering discussions' minutes and notes	2	CUT	R	PU	2, 3, 5, 6, 8
2.3	Survey paper / Technical report on DevOps oriented software engineering	2	CUT	R	PU	8
3.1	DevOps metrics and measurements training content (talks, lectures, seminars)	3	UvT	D	PU	10, 12, 14
3.2	DevOps metrics and measurements discussions' minutes and notes	3	CUT	R	PU	10, 12, 14
3.3	Survey paper / Technical report on DevOps metrics and measurements	3	CUT	R	PU	14
4.1	DevOps automation training content (talks, lectures, seminars)	4	UvT	D	PU	16, 18, 20, 21
4.2	DevOps automation discussions' minutes and notes	4	CUT	R	PU	16, 18, 20, 21
4.3	Software service composition under DevOps training content (talks, lectures, seminars)	4	UvT	D	PU	22, 24, 26, 27
4.4	Software service composition under DevOps discussions' minutes and notes	4	CUT	R	PU	22, 24, 26, 27
4.5	Survey paper / Technical report on DevOps automation and software service composition	4	CUT	R	PU	27
5.1	Collaboration with stakeholders and SMEs discussions' minutes and notes	5	CUT	R	PU	28, 30, 32, 34
5.2	Report on best practices for facilitating the development of collaborations with stakeholders and SMEs	5	CUT	R	PU	34
6.1	Project Website	6	CUT	D	PU	1-36
6.2	Social Networks Accounts	6	CUT	D	PU	1-36
6.3	Project Dissemination Support Materials	6	CUT	D	PU	6-36
6.4	Short papers, posters, work-in-progress papers	6	CUT	R	PU	9-36

Type:

R: Document, report (excluding the periodic or final report)

D: Websites, patents filing, market studies, press & media actions, videos, etc.

O: Software, technical diagram, etc.

Dissemination level:

PU: Public, fully open, e.g. web

CO: Confidential, restricted under conditions set out in Model Grant Agreement

CI: Classified, information as referred to in Commission Decision 2001/844/EC.

2. PROJECT MANAGEMENT

2.1. Overall Project Management Approach

A sound and flexible management structure will be followed for the effective management of the project. As a multinational, multi-cultural collaboration project, DOSSIER-Cloud aims to bring together two internationally leading institutions in terms of excellence in science and research so that their experts deliver high quality knowledge and transfer of best practises to CUT over a time period of 3 years so that innovative research results may be produced.

Transparent decision-making processes are set up focusing on agreeing to the basic training steps from the very beginning and allowing manoeuvring according to the information that will become available at each stage as knowledge transfer and formation progresses. Contingency plans are derived to handle the inherent uncertainty present when addressing research issues through lectures, seminars and tutoring. In addition, clear and realistic decision-making processes, communication pathways and prompt reporting mechanisms necessary to execute successfully every coordination and support action to knowledge acquisition in the sub-areas described earlier and project sustainability are defined and adopted.
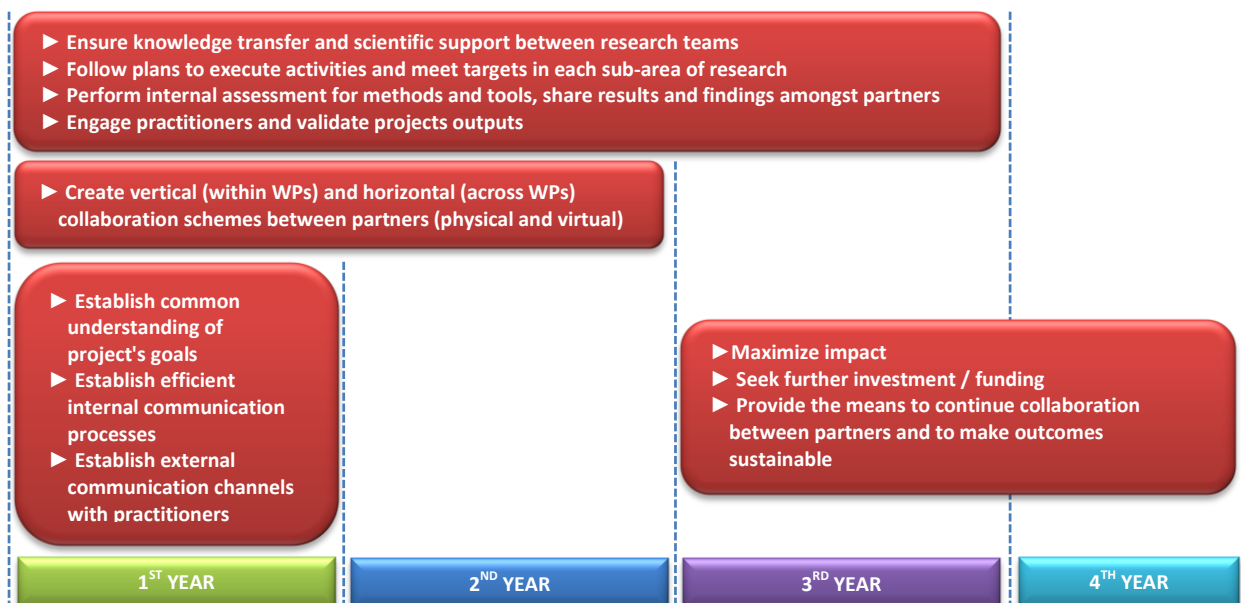

Figure 4. DOSSIER-cloud project management objectives

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The project management structure and processes follow a rigorous approach, shown in Figure 4, to support the project in all its phases throughout the three years and beyond, and to focus and adapt accordingly to the specific objectives and needs of each project phase. More specifically, the first objective is to establish a common understanding of the project's goals amongst its partners. This will be made feasible by establishing efficient internal communication processes, as well as external communication channels with practitioners. These activities will span the first year of the project. During the same time period the second and third objectives will be addressed; the former will span two years and will focus on creating vertical (within WPs) and horizontal (across WPs) collaboration schemes between the partners, both physical and virtual; the latter covers all three years of the project and aims at (a) ensuring knowledge transfer and scientific support between the participating research teams, (b) following specific plans to execute knowledge and expertise transfer activities and meet targets in each sub-area of research, (c) perform internal assessment for methods and tools, and then share results and findings amongst the partners, and, (d) engage practitioners and validate projects outputs in simulated environments and real-world cases. Finally, during the last year of the project the consortium will focus on maximizing the impact of the results and seek further investment/funding so that collaboration between partners is continued and project outcomes become sustainable.

The above mentioned objectives and phases are reflected in the project's milestones described in section 1.

2.2. Project Management Structure

The Project Management Structure (PMS) of the DOSSIER-Cloud shown in Figure 5 is fairly simple as the project involves only three partners. Small research teams will be formed to address the specific research challenges outlined in the tasks described in the work packages; therefore flexibility and smooth coordination are key project management factors. The PMS is analysed in the consortium bodies and roles described below.

Steering Committee (SC)
The SC is the highest decision making board and its main task is the project governance. It consists of one representative of each partner and is chaired by the Project Coordinator. More specifically, the representative of UvT is Prof. dr. ir. M. Papazoglou, POLIMI is represented by Prof. L. Baresi, while the coordinator is Assoc. Prof. A. S. Andreou. This body will have the overall responsibility of all technical, financial, legal, administrative, ethical, dissemination, exploitation, intellectual property and innovation issues of the project. It will monitor and assess the actual progress of the project, while it assumes the overall management responsibility on behalf of the partners, takes decisions on work plan, resource allocation, evolution of the consortium and engagement of industrial partners and stakeholders, identifies breaches, defaulting partners and remedies, and approves appointments to the other consortium bodies.

Project Coordinator (PC)

The PC will be responsible for the overall management, communication and coordination of the entire project. The PC will act as the intermediary between the partners and the European Commission, monitor compliance by the partners with their obligations, control the implementation of the whole project, control the project's resources and budget, handle the financial aspects of the project, control the schedule of activities and the allocation of manpower, ensure the effectiveness of the project's internal communication, apply quality assurance, deal with risk assessment and mitigation plans, undertake quality control of contractual deliverables, ensure that all deliverables will be available on time to the Commission and/or project partners, liaise with and report to the European Commission on all matters concerning the project. The partner CUT will act as Project Coordinator with Assoc. Prof. A.S Andreou, and will work closely with the Work Package Leaders and the SC.
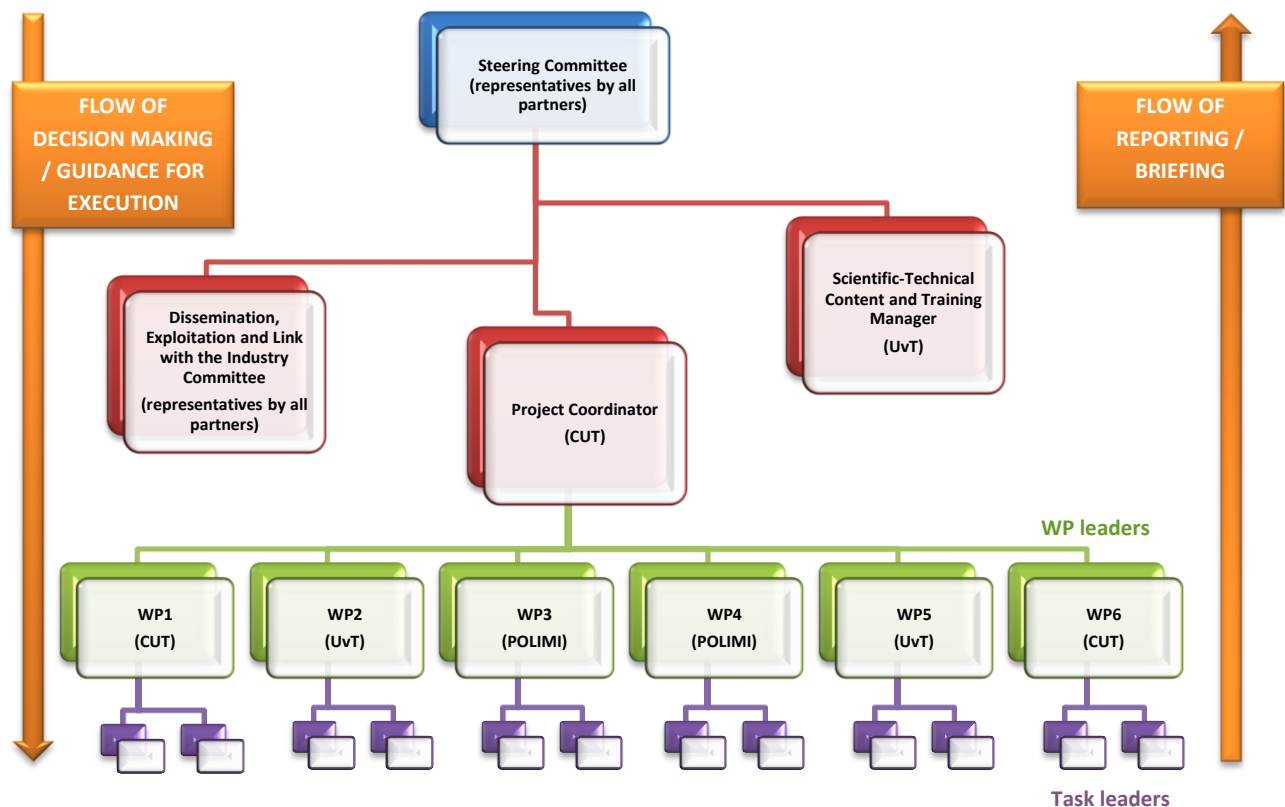
Figure 5. The DOSSIER-Cloud project management structure

Scientific-Technical Content and Training Manager (STCTM)

The STCTM will work closely with the SC and PC, and will be responsible for the overall project scientific and technical content and training activities which will strengthen the scientific background of CUT and create the dynamics for enhancing its research profile. STCTM will ensure the scientific cohesion and research excellence of the project and oversee the organization of the scientific workshops, summer schools and meetings, trainings, material and

content, as well as supervise the quality of deliverables produced by the WPs. The STCTM will be provided by partner UvT and will be Prof. dr. ir. M. Papazoglou who has a long and proven experience in the areas touched upon by DOSSIER-Cloud.

Dissemination, Exploitation and Link with the Industry Committee (DELIC)
DELIC will work closely with the SC and PC, and will be responsible for the dissemination and exploitation of the project's goals, as well as to establish strong links with the local industry activities of the DOSSIER-Cloud project. It will include representatives by all partners with expertise in the commercialization of R&D and with strong links with the local ICT market. DELIC will work to raise public awareness of the project ideas, ensure wide dissemination of the project results, share best practices and lessons learnt with both the wider research community and practitioners, outline the strategy for knowledge management and protection, agree on and develop the overall exploitation plan, identify opportunities to ensure the continuation of the project, e.g., continuation of the collaboration between partners through Erasmus agreements and pursue of further EU or national funding for conducting research and exploiting or marketing its results. DELIC will be actively involved in the activities of WP6 Dissemination, Communication and Exploitation, and will meet in project meetings or workshops or summer schools, and/or on demand (physically or through conference calls) whenever deemed necessary.

Work Package Leader / Task Leader
The WP Leader is responsible for implementing the WP plan and for the scientific and technical integrity of the relevant WP contractual deliverables. The partners that have undertaken a WP/Task leadership role are shown in Section 3.1 and Figure 5. Each WP leader coordinates, monitors and assesses the progress of the work package to ensure that performance, budget, and timelines are met. He/she also proposes the agenda in the respective meetings and approves deliverables produced in the WP. In cooperation with the Project Coordinator and/or Scientific-Technical Manager, work package leaders are responsible for the integration of their results to succeeding tasks or work packages.
The Task Leader is responsible for the coordination of work on associated deliverables, has a similar role to the one of the WP Leader above, though at the level of Task.

2.3. Consortium agreement

Before the start of the project a consortium agreement has been prepared and signed by all partners. This agreement defines specific operational procedures for the different project bodies described above. This includes amongst other aspects the responsibilities of the parties and their liabilities towards each other as well as the governance structure, financial provision, access rights and IPR issues. The consortium agreement also describes the decision making structures and defines the General Assembly is the ultimate decision making body. Decisions taken by the General Assembly include the content, e.g. changes in the work packages, financial issues and intellectual property rights. This body also has the right to decide on the evolution of the partnership (e.g. entry of new partners in the form of stakeholders or other institutions

with no funding obligations), and the project as such (e.g. termination of the project and breaches).

2.4. Project Management Processes

2.4.1. Decision-Making and Conflict Resolution

A voting scheme based on consent and transparency is adopted in DOSSIER-Cloud for resolving conflicts and making decisions. All decision-making bodies with the responsibilities described in the above section (project management structure) are committed to apply these fundamentals. In the course of the project the partners will agree on and develop the technical and scientific content to be delivered as new knowledge to CUT supporting future research ideas. The objective would be to reach agreement first by informal contact, followed by official confirmation via e-mail, letter or agreed written minutes. Decision will be taken at the level that is concerned, e.g. on Task/WP level if decisions affect only the respective Task/WP or will be escalated up to the Steering Committee if they have to do with fundamental changes in the work plan or the approach for knowledge acquisition and transfer of best practises. Any member of a consortium body (described above) shall be represented at any meeting of such consortium body and may appoint a substitute to attend and vote at any meeting. Each consortium body shall not deliberate and decide validly unless all three participating partners are present or represented (quorum). Each member of a consortium body present or represented in the meeting shall have one vote. Defaulting parties may not vote. Decisions shall be taken by a majority of two-thirds (2/3) of the votes cast.

2.4.2. Communication and Collaboration

Internal communication between the project stakeholders will be continuous and will utilize all means available through ICT technology nowadays (email, texting/chatting tools, social networks, videoconferencing tools, etc.), in the appropriate level of detail and format according to the information to be exchanged. Documentation from/to the Commission or other projects, or any other source or type of information deemed relevant (papers, articles, blogs, etc.) will be circulated as appropriate. A dedicated common storage space will be created on open and free access storage platforms (e.g. Dropbox). This space will be used by all partners and will be the central point of reference for the documents that will be produced, shared and circulated for the project. A specific hierarchical tree structure will be used to organize the stored files in specific folders for easy search and retrieval.

For all matters within the scope of the project, there will be no limitations on access to information from the partners. In addition, the project will hold various physical meetings hosted by the partners. At least two to four general meetings are planned yearly to hold planning sessions (within the scheduled trainings, workshops and summer schools) and guarantee consistency and integrity of the project, as well as dedicated workshops for knowledge sharing and technology transfer between the partners. SC meetings will be held in this context.

External communication will be established through the launch and continuous update of the project's website, which will also constitute the central point of communication between the partners and practitioners/stakeholders in the local software market and the general public. The outcomes of the project shall be published as presentations which shall be made available on the project's web-site. These efforts will be accompanied by workshops or meetings with stakeholders and the general public (i.e. in the form of open lectures) which will be held regularly as described in the work plan to raise awareness, ensure high visibility of the project results, and establish the grounds for the use of the results in everyday practice.

2.4.3. Risk Management: Assessment and Mitigation Plans

The success of DOSSIER-Cloud depends on the effectiveness of the risk management process, which will provide the means for monitoring, evaluating and controlling/handling potential project risks. This process will follow proven techniques (such as the Project Management Institute's methodologies, cf. http://www.pmi.org) and a disciplined way of eliminating risks or reducing their likelihood and/or impact through the execution of four major activities put forward in a continuous closed cycle, which will be iterated for each project milestone: (a) Risk Identification: Determining the risks that may affect the project and documenting their characteristics. (b) Risk Quantification (Analysis): Assessing their probability of occurrence and impact and analysing their effect on project objectives. Prioritizing risks is based on the following scales: <u>Impact:</u> Insignificant, Low, Moderate, Major, Catastrophic; <u>Probability of Occurrence:</u> Very Low (≤20%), Low (21-40%), Moderate (41-60%), High (61-80%) and Very High (81-100%). (c) Risk Monitoring and Control: Tracking identified risks and implementing risk response plans throughout the project.

Table 2. Potential risks for the DOSSIER-cloud project implementation

Risk	1	Research targets are broad, complex and/or not adequately addressed	
Description	The project may be overly ambitious and knowledge transfer on the research areas identified may prove difficult to tackle		
WPs involved	2, 3, 4 and 5		
Risk Impact	Major	**Probability of Occurrence**	Low
Proposed risk mitigation measures	• Research investigators are recognized experts in the fields relevant to the project and lead several large-scale projects. They also have adequate scientific and research background to address all training challenges of the project. Partners in DOSSIER-Cloud have been carefully selected on the basis of scientific capacity, research eminence, success record, experience and long-standing contributions to the field. • Progress will be continuously monitored and plans will be adjusted when necessary. • Means of effective communication will be rigorously applied at all project stages. • Appropriate internal reviews will be established to assure the relevance, quality and project performance.		
Risk	2	Ineffective Communication and planning	

Description	The desired level of communication is not achieved and planning of activities suffers
WPs involved	All
Risk Impact	Major	**Probability of Occurrence**	Low
Proposed risk mitigation measures	The project management procedure identifies roles and responsibilities that ensure effective communication at all levels. Frequent progress control exercised by the PC, accompanied by regular dedicated technical meetings and frequent teleconferencing or electronic discussions (e.g. through Skype), will identify any problems or bottlenecks early. This in turn will ensure effective communication and smooth progress. The work plan and WP structure have been planned and defined thoroughly using project milestones to achieve unhindered continuity of work in critical junctions in the project lifecycle. The project follows a sequential, incremental and step-by-step training and knowledge development approach. The two scientifically leading partners, UvT and POLIMI, have long-standing collaborations. A main criterion for their selection, in addition to excellence and expertise, was the ease of communication and integration.
Risk	**3**	**Resources are inadequate to handle the tasks**
Description	The tasks are too many or too complicated to be handled by the resources assigned
WPs involved	All
Risk Impact	Moderate	**Probability of Occurrence**	Low
Proposed risk mitigation measures	Partners in DOSSIER-Cloud are seasoned professionals, researchers and scholars. Especially the scientifically leading institutions (UvT and POLIMI) that will deliver knowledge to CUT have a long distinguished track record in education and research, abundant formal partnerships, and involvement in numerous large-scale projects who have successfully addressed similar problems in the past. Therefore, there is rich experience of the consortium in task scheduling and resources allocation. In addition, the project partners maintain large research networks of personnel, resources and infrastructure that can be drawn upon to mitigate such unforeseen incidents.

The overall management structure of the project and relevant instruments implement several mechanisms to avoid or minimize potential risks. The Project Coordinator with the cooperation of the Steering Committee and the Scientific-Technical Content and Training Manager, as well as of the rest of the project management roles (WP and Task Leaders), will be mainly responsible to handle risks and inform all partners when necessary.

The first iteration of the risk management procedure identified the risks described in Table 3, along with their analysis and mitigation plans to be adopted so as to avoid or minimize their influence on project objectives. This list will be regularly updated as the project progresses.

3.   SWOT Analysis

SWOT is an easy and straightforward tool that provides a general picture of the positive and negative aspects of a project and its environment. SWOT can be a good complementary tool for

analysing the project and redefining its strategy when and if this is deemed necessary. The analysis provides useful information revolving around four main axes, (i) strengths, (ii) weaknesses, (iii) opportunities, and, (iv) threats. The DOSSIER-Cloud's consortium recognizes the importance of SWOT for defining the strategy that will be followed, addressing the following questions during the lifetime of the project:

- How to make best use of strengths and opportunities?
- How to best minimize weaknesses by making best use of opportunities?
- How to make best use of strengths by reducing risk of threats?
- How to best minimize weaknesses even with the expected threats?

Table 4 presents the first SWOT matrix that has been drawn based on collectively analysing the answers provided by the consortium.

The analysis will be revisited on a yearly basis so that the consortium records any changes to the four axes resulting in from the progress of the project.

Table 3. SWOT analysis for the DOSSIER-cloud project

Strengths
• The partners teaming with CUT are two leading institutions in the areas of the project and their scientific knowledge and research expertise, as well as their man-power and technological infrastructure, will significantly contribute to the success of the project.   • CUT's team, as well as of the other two partners, consist of enthusiastic and dedicated people that are research oriented and eager to expand their knowledge.   • There are clear synergies and complementarity between the partners of this project something which will ensure flow of knowledge between the groups and enable smooth interaction in multi-disciplinary scientific topics in the areas of interest.

Weaknesses
• Heterogeneous or incompatible Cloud infrastructure, simulators, platforms and tools between the partners   • Heavy workload and busy schedules for the faculty and senior researchers restrict the options of suitable dates/times for collaborative activities (site visits, discussion, virtual conferences etc.).

Opportunities in External Environment
• Good network of external to the project's consortium research collaborators   • Strong links with industrial collaborators on behalf of the University of Tilburg.   • Lack of standardization in services formal definition offers ample room for proposing new standards to cover this gap.

• CC is a fast moving and growing environment; subsequently the software industry is expected to have constantly increasing demands.
Threats in External Environment
• Cloud computing is a very popular subject, therefore new ideas for solving hot issues may be the research subject of other scientific groups as well • Reluctance of stakeholders, or the software industry in general, to embrace or adopt the results of the project due to strict internal policies followed in companies • There is increased uncertainty related to the fulfillment of all project goals due to the fast growing and constantly evolving nature of the Cloud technological framework and the distribution environment which add to the overall complexity

4. REPORTING

4.1. Activity reporting

Activity reporting assists project management, as well as the European Commission, to monitor project progress, achievement of milestones and difficulties encountered. During the course of the project, activity reporting will be conducted in three forms: (a) Periodic Reports prepared twice, one at the midpoint and one at the end of the project as reported in WP1 (Project Management) to be submitted to the EC; (b) Reports on the training material and discussion minutes/notes that will be prepared in the context of WPs 2, 3 and 4 to be submitted to the EC; (c) Timesheets for the distribution of the effort per partner and the corresponding financial expenditure, to be submitted to the EC.

An overview of the activities conducted in each of the reporting periods will be contained in this document. The document will include a description of the progress concerning the project objectives, milestones and deliverables set for the specific period, any problems found and what actions were taken to solve those problems. Finally, financial reporting will be included in the reports at the end of each year, with justifications of the costs made and financial statements from each partner.

4.2. Types of reports

There are five different categories of reports/deliverables:

  i.   Dissemination
 ii.   Project Management / EU
iii.   Training Material
 iv.   Discussions minutes & notes

v.   Research papers / material

4.2.1. Dissemination reports

The first category involves the material that will be used for disseminating the progress and intermediate results of the project. It mainly involves

- electronic and printed leaflets/flyers (1 or two pages long), banners and posters (1-3m long and 1-2m wide)
- the official project's web-site including general information about the project, its milestones and objectives, description of the consortium, the work activities and the deliverables, as well as photos and videos from training sessions, news and contact information
- social network accounts and appropriate posts (Facebook and Twitter)

4.2.2. Project Management / EU reporting

This category includes deliverables for internal use to manage the project, as well as formal periodic reports delivered to the EU. The former consists of a report on CUT's publications during the last 3 years prior to the start of the project and the present document. The latter involves 2 periodic management reports, one in month 15 when WP2 and WP3 are finished, and one at the end of the project on month 36. An overview of the activities conducted in each of the reporting periods will be contained in this document. Each periodic report will include a description of the progress concerning the project objectives, milestones and deliverables set for the specific period, any problems found and what actions were taken to solve those problems. Finally, financial reporting will be included in the reports at the end of each year, with justifications of the costs made and financial statements from each partner.

4.2.3. Training material reporting

This is the one of the most important category of documents that will be produced in the context of the project. It involves recording of the material that is used during the lectures, seminars, talks and demos performed during site visits, virtual meetings, workshops and virtual conferences which essentially expresses the type, length and depth of knowledge exchanged between the partners.

The training content will be depended on the Key Knowledge Areas that are covered in each work package as described in the proposal. It is noted though that deviation from the KKAs is both acceptable, as well as desirable, in cases where the expertise of the partners or recent scientific and/or research developments within the broader areas covered by the project, which are related to recent work by the partners or the relevant scientific and/or industrial community, necessitate such shifting.

The template that will be used for documenting the knowledge and expertise exchanged trough training activities is provided in Appendix D.

4.2.4. Discussions minutes & notes reporting

This category is the second most important one for the project's report as it records the minutes and notes taken from the discussions performed. The discussions will mainly be performed as follow-ups of previous seminars, talks and lectures, and will involve suggestions for jointly addressing research issues and problems in the Key Knowledge Areas covered. The target of these reports is to document potential research targets and innovative ideas for further investigation.

The template to be used is given in Appendix C. The structure of the relevant documents involves research areas or axes, accompanied by other sources of forms of documents that complement the corresponding material, like published papers or reports, URLs, software tools and platforms, simulators, etc.

4.2.5. Research papers/material reporting

The project targets at the production and publication of research papers in the form of surveys and/or work-in-progress. Since the objective of DOSSIER-Cloud is primarily to share knowledge and expertise among its partners for strengthening their capacity in conducting research and not the production of research papers per se, the number of anticipated research publications is limited. Nevertheless, if the ground for producing innovative research results becomes fertile as the project progresses, then the partners will pursue their publication in highly respectable scientific conferences and journals. The type and length of these papers will vary according to the thematology, the type (conference, journal, book chapter) and the specific instructions to authors for complying with formatting constraints. The production of the relevant documents follows a stable pattern with specific months (e.g., 8, 12, 14, 24, 27, 36) but may also be performed at any stage of the project provided that research ideas are investigated and associated results are developed.

5.   DELIVERABLES MANAGEMENT

5.1. Naming

Each deliverable will be associated with one unique document identifier to ensure effective version control. The deliverable identifier will be used in the deliverable filename. The deliverable identifier for the working versions of the deliverable will be: <descriptive_name>_<version_number>.<extension>. The extensions involve word files (doc), Portable Document Format (pdf) and images/graphics (jpeg, gif, bmp, etc.), or any other form

of material that will be deemed necessary to accompany the project's information stored. The deliverable identifier for the final version of the deliverable will be: <descriptive_name>_final.<extension>.

5.2. Templates

The deliverable templates will be available on the DOSSIER-Cloud dedicated common storage space. The layout and content of the reports shall conform to the instructions and guidance notes established by the European Commission. The templates will be used by all members of the consortium as the backbone for creating a certain internal document or deliverable.
DOSSIER-Cloud's templates are provided in the Appendix and include Project Meeting Agenda, Project Meeting Minutes, Site Visit Agenda, Training Content and Discussion Minutes and Notes. Finally, as regards Timesheets, the partners will use the templates provided by the EU for recording their activities and costing per month.

5.3. Review Process

All project deliverables will undergo the following in the order indicated: All deliverables prepared by the DOSSIER-CLoud consortium, before being submitted to the European Commission, will undergo an official internal review. The review/acceptance process is organized in 4 main phases:
   (i)   Partner responsible for the deliverable - Task Leader and WP Leader
   (ii)   Scientific/Technical Content and Training Manager
   (iii)   Project Coordinator
   (iv)   Steering Committee
Upon final approval by the SC the PC submits the deliverable to the European Commission
The above review process applies to both types of deliverables defined in project description of work: "Report" and "Other".

5.4. Monitoring

The status of the deliverables is continuously monitored at two levels: (a) by the WP/Task leader who is responsible to coordinate his/her team for producing a deliverable on time according to the schedule of the project and with the required level of quality, and (b) by the Project Coordinator. The outcome of monitoring activities shall be visible by all parties.

APPENDICES

APPENDIX A: Project meeting agenda template

PROJECT MEETING AGENDA

Meeting/Project Name:			
Date of Meeting: (MM/DD/YYYY)		Time:	
Meeting Facilitator:		Location:	

1. Meeting Objective

2. Attendees

Name	Department/Division	E-mail	Phone

3. Meeting Agenda

Topic	Owner	Time

4. Pre-work/Preparation (documents/handouts to bring, reading material, etc.)

Description	Prepared by

APPENDIX B: Project meeting minutes template

PROJECT MEETING MINUTES

Meeting/Project Name:			
Date of Meeting: (MM/DD/YYYY)		Time:	
Minutes Prepared By:		Location:	

1. Meeting Objective

2. Attendance at Meeting			
Name	**Department/Division**	**E-mail**	**Phone**

3. Agenda and Notes, Decisions, Issues		
Topic	**Owner**	**Time**

4. Action Items		
Action	**Owner**	**Due Date**

5. Next Meeting (if applicable)					
Date: (MM/DD/YYYY)		Time:		Location:	
Objective:					

DOSSIER-Cloud
DEVOPS-BASED SOFTWARE
ENGINEERING FOR THE CLOUD

Site Visit <Milan, Tilburg>
<month> <days>, <year>

Agenda

<Day1> <date>

09:00 – 13:00 : Talk/Lecture on "<subject> "

11:00 – 11:30 : Coffee break

11:30 – 13:30 : Talk/Lecture on "<subject> "

13:30 – 15:00 : Lunch break

15:00 – 17:00 : Round table discussion

<Day2> <date>

09:00 – 13:00 : Talk/Lecture on "<subject> "

11:00 – 11:30 : Coffee break

11:30 – 13:30 : Talk/Lecture on "<subject> "

13:30 – 15:00 : Lunch break

15:00 – 17:00 : Round table discussion

<Day3> <date>

09:00 – 11:00 : Discussion on research perspectives in the areas covered

11:00 – 11:30 : Coffee break

11:30 – 13:00 : Summary / Closing

APPENDIX D: Training content template

TRAINING CONTENT SHORT REPORT

Workpackage:			
Date: (MM/DD/YYYY)		Time:	
Facilitator:		Location:	

1. Subject / Short Description

2. Attendees			
Name	Department/Division	E-mail	Phone

3. Training Content			
Topic	Type (lecture, discussion, …)	Trainer	Time

4. Pre-work/Preparation (documents/handouts, reading material, etc.)	
Description	Prepared by

APPENDIX E: Discussion minutes and notes template

DISCUSSION MINUTES AND NOTES SHORT REPORT

Workpackage:			
Date: (MM/DD/YYYY)		**Time:**	
Facilitator:		**Location:**	

1. Subject / Short Description

2. Attendees

Name	Department/Division	E-mail	Phone

3. Discussion notes

Topic and targets	Introducer	Time

4. Pre-work/Preparation (documents/handouts, reading material, etc.)

Description	Prepared by