SWAMP

SMART WATER MANAGEMENT PLATFORM

Project nº: 777112

WP7

D7.1 Quality and risk management plan

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30 November 2017	0.2	Markus Taumberger (VTT)	Workplan and Project Organisation added
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13 March 2019	1.1	Juha-Pekka Soininen (VTT)	Update of risk table and consortium data
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Internal review history

Date	Reviewer	Summary of comments
9 December 2017	Carlos Kamienski (ABC)	Approved with minor changes
20 December 2017	Juha-Pekka Soininen (VTT)	Approved with minor changes
23 March 2019	Carlos Kamienski (ABC)	Approved
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Table of contents

1. Executive Summary

This deliverable D7.1 Project quality and risk management plan results from Task 7.3 Quality and risk management and creates a practical guide for members of the *SWAMP* consortium.

It covers processes, standards and review mechanisms for deliverables, reporting, monitoring and planning within the project, and provides overviews of the project goals, objectives and structure. The document details the project organisation in terms of groups, membership, roles and responsibilities.

2. Introduction

2.1. Purpose and context of this deliverable

This document D7.1 Project quality and risk management plan creates a practical guide to be used as a single point of reference by members of the *SWAMP* consortium. Its main purpose is to describe the project standards and procedures, which the consortium has agreed upon and are committed to follow.

2.2. Scope

Specifically, this document addresses project quality issues and the risk management plan by providing:

- Overview of the project and its objectives
- Project organization, describing structure, roles, assigned personnel and responsibilities
- Quality plan, including review processes
- Project procedures, including meetings, documents and financial reporting
- Project risk analysis and management.

SWAMP is a 36 months Research and Innovation Action. As the project progresses, this document will be reviewed and revised as necessary.

2.3. Relationship to Description of Action

Although this document includes references to the Description of Action (DoA), the two documents are complementary in purpose. While the DoA focuses on the technical objectives, content and resources of the project contractually agreed with the European Commission, the focus of this document is to guide consortium partners in the practical processes and quality standards for the work undertaken within the project.

3. Project Definition

3.1. Purpose

SWAMP will apply existing IoT solutions (i.e. FIWARE and SOFIA) and other related technologies for smart water management in precision irrigation domain. The generic IoT and data analytic solutions will be adapted to application domain needs by using four pilots as a source of requirement and needs. Novel extensions to IoT, such as using autonomous IoT devices (such as drones), will be developed for specific identified problems of the agricultural and water distribution domains that arise from the large geographical areas of systems and the characteristics of water as a common resource. The developed elements will create a smart irrigation platform for an asset to new business possibilities in water management related use cases. In the *SWAMP* project, traditional and mobile applications for end users such farmers and water distribution system operators will be developed and tested in pilots.

3.2. Partners

The *SWAMP* consortium consists of the following partners:

Table 1: Partners

Beneficiary number	Beneficiary name	Beneficiary short name	Country
1 (European Coord.)	VTT Technical research centre of Finland	VTT	FI
2	Intercrop	ICRO	ES
3	University of Bologna	UBO	IT
4	Consorzio di Bonifica dell'Emilia Centrale	CBEC	IT
5	Quaternium	QUAT	ES
6 (Brazilian Coord.)	Federal University of ABC	ABC	BR
7	Centro Universitário da FEI	FEI	BR
8	Federal University of Pernambuco	UFPE	BR
9	LeverTech Tecnologia Sustentável	LEV	BR
10	Brazilian Agricultural Research Corporation	EMBR	BR

A directory of the main project contacts is included in Annex A1.

3.3. Objectives

The main objectives of the *SWAMP* project are: 1) to develop IoT based methods and approaches for smart water management in precision irrigation, and 2) to pilot the approaches: two pilots in Europe and two pilots in Brazil. The main objective divides into following sub-objectives:

1. Reducing water consumption by enabling Smart irrigation systems that optimise the water consumption based on irrigation need, amount of water supply, and future expectations of development of both need and supply.
    a. Improving the accuracy of situation-awareness and predictions both in water distribution system and farming by increasing the coverage of monitoring. This involves integrating a variety of heterogeneous sensors and actuators into a single IoT platform, such as typical fixed sensors (e.g. in a wireless sensor network (Akyildiz et al 2002)), moving sensors (e.g. on-the-go soil sensors (Adamchuka 2004)) and also flying sensors (e.g. drones, as in the Internet of Flying Things concept (Loke 2015))

   b. A knowledge base that integrates agronomic, edaphic and weather information, as well as micro watersheds. The system must be able to use this knowledge base to perform spatially differentiated, so that to achieve a rational use of water and energy, as well as higher agricultural productivity.
   c. The integration of cloud data (i.e., large-scale weather forecast at raw resolution over large irrigation areas) with ground-based data provided by distributed heterogeneous sensors. This will enable a more flexible and case-related evaluation of water needs taking into account cultivation types, local conditions (e.g., humidity, soil characteristics, cultivation conditions, etc.), farmer needs and irrigation infrastructures.
   d. Reducing water leakages, enhancing water quality, water reserve management and smart pressure management in order to reduce energy costs as well as costs incurred in disaster management such as flooding or drought.
2. Reducing the negative effects of irrigation and water consumption. When irrigation is not done properly, it may lead for example to waterlogging, ground subsidence, percolation and superficial runoff of agrochemicals, and soil salination. The project aims at moving towards green irrigation, where both the environmental requirements are taking into account and the waste of water is minimised.
3. Developing a flexible and easy to use platform that provides both aggregated and at-site specific information to water network managers and farmers for an efficient water use. This platform will be designed in order to provide information at different hierarchical levels, which are also interconnected to provide higher efficiency:
   a. a first level dedicated to the management of the water distribution system (i.e., users in this case can be authorities or consortia in charge of the land reclamation system, basins, etc.), in which case the platform provides information defined considering weather forecasts and water needs aggregated over large areas with a given lead time;
   b. a second level dedicated to final farmers with detailed and site-specific information concerning the amount and scheduling of irrigation with a aim to maximising the profit, and the crop production.
4. Instantiating an ecosystem of services using the core functionalities of the platform which will create new possibilities of analysis the behaviour of the customers in business to business (B2B) and business to consumer (B2C) context. This will not only allow water management and irrigation companies to perform the necessary optimizations in the system but also enable customers to better analyse the way water consumption is affected via different environmental factor and identify the potential bottlenecks in achieving the expected performance levels. This includes also developing new business models for using IoT in smart water management settings that may be explored by different industrial sections, including state-owned and public bodies, in favour of benefitting the population of involved countries.

3.4. Constraints

The project is constrained by:

- Budget – Funding as agreed with the European Commission and Rede Nacional de Ensino e Pesquisa - Brazilian National Research and Education Network (RNP)
- Time – Outputs must be available within 36 months.

3.5. Assumptions

Project assumptions are as follows:

- No external dependencies impact on the project deliverables
- Any budget overruns are the responsibility of individual Partners

- All the necessary skills and time can be made available within the Consortium to allow it to deliver on time
- Suitable domains and users are available for testing the product
- The project deliverables will be suitable for exploitation in the anticipated markets on completion of the work pending commercial completion.

4. Approach and Project Plans

4.1. Technical approach

The activity will follow an iterative approach, which serves well to produce working prototypes and allows progress follow-up in annual evaluations. Project work packages are broken down into manageable phases of coherent tasks.

4.2. Project work package structure and work plan

The work will be carried out in seven work packages (WP), the structure is illustrated in *Figure 1*.

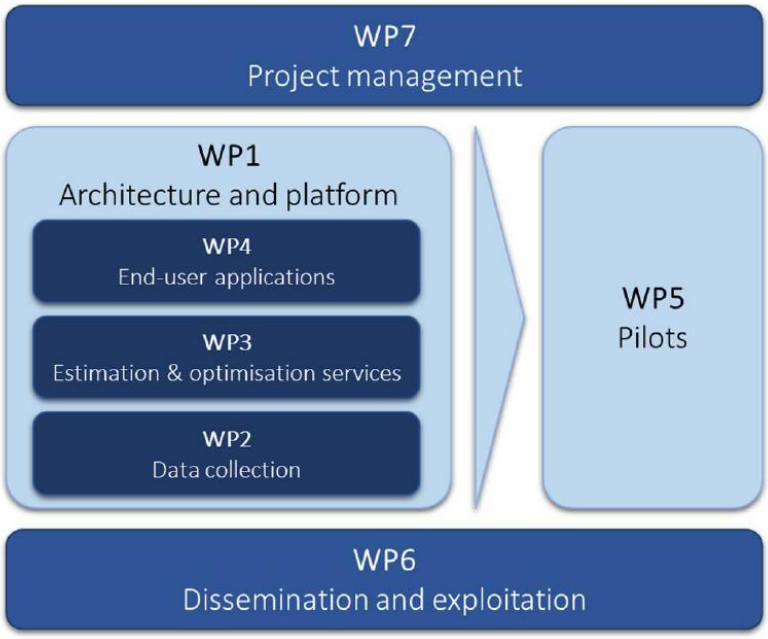


Figure 1: Work package structure

WP1 Architecture and Platform defines the architecture for smart water management platform and integrates its main components from WP2 and management services. The platform is the baseline for end-user applications in WP4 and pilots in WP5.

WP2 Data Collection studies, adapts and implements the data collection capabilities needed in pilots in WP5 using existing IoT platforms and solutions as a baseline. New ideas will be developed for communication infrastructure and to the use of autonomous drones and robots as a part of monitoring and actuation system.

WP3 Estimation and optimization services will focus in developing knowledge needed both in irrigation and water distribution. These services will create the smartness of the platform (WP1) and the basis of the value proposition for end users in WP5.

WP4 End-user applications develops the application for end-users in WP5 pilots. The applications are based on the services and results of WP1, WP2 and WP3.

WP5 Pilots will specify, implement, deploy, and execute the four pilots. It will be also responsible for evaluation and assessment activities.

WP6 is responsible for dissemination, communication and exploitation activities supporting the impact creation.

WP7 is for the management of the project.

4.3. Major milestones

The major milestones are as follows:

Table 2: Milestones

Milestone number	Milestone name	Work package(s) involved	Expected date	Means of verification
m1	Kick-off	WP7	M2	Kick-off meeting held.
m2	Specified	WP1, WP5	M6	Pilot specifications and platform.
m3	Targets exist	WP2, WP4, WP6	M12	Application specification and the role of drones specified. Impact measures planned.
m4	Infrastructure and knowledge	WP1, WP2, WP3, WP4, WP5, WP6, WP7	M18	Mid-term review held. Infrastructures for pilots existing. Initial versions of platforms, IoT, optimisation services, and applications exist.
m5	Pilots running	WP3, WP4, WP5	M24	All pilots actively running.
m6	Feedback exists	WP2, WP3, WP4, WP5	M30	Technical results achieved. WP2, WP3, WP4 completed.
m7	Finished	WP1, WP5, WP6,	M36	Encapsulation and evaluation ready. Results have been accepted by EU and RNP.

4.4. Work packages

The work packages are listed below:

Table 3: Work package list

Work package no.	Work package title	Lead partic. no.	Lead partic. short name	Person months	Start month	End month
WP1	Architecture and platform	6	ABC	46	M02	M36
WP2	Data collection	1	VTT	57	M06	M30
WP3	Estimation and optimisation services	3	UBO	30	M01	M30
WP4	End user applications	8	UFPE	37	M03	M30
WP5	Pilots	10	EMBR	96	M01	M36
WP6	Impact creation measures	6	ABC	42	M01	M36
WP7	Management	1	VTT	31	M01	M36
				339		

The PERT diagram in *Figure 2* depicts the project.

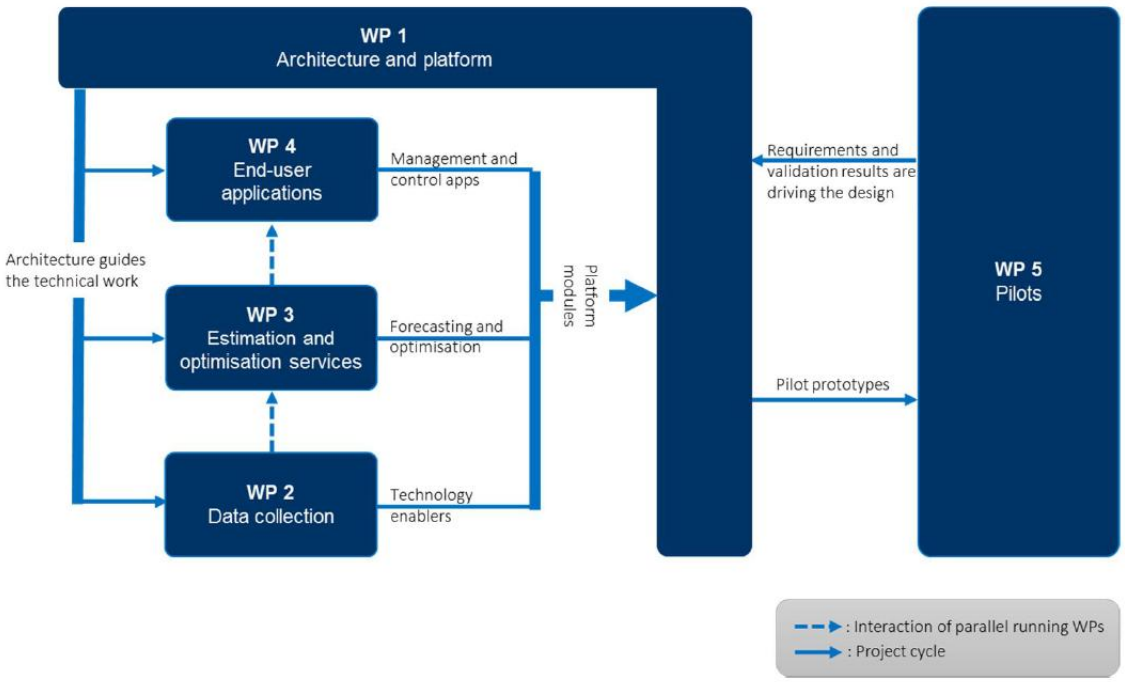


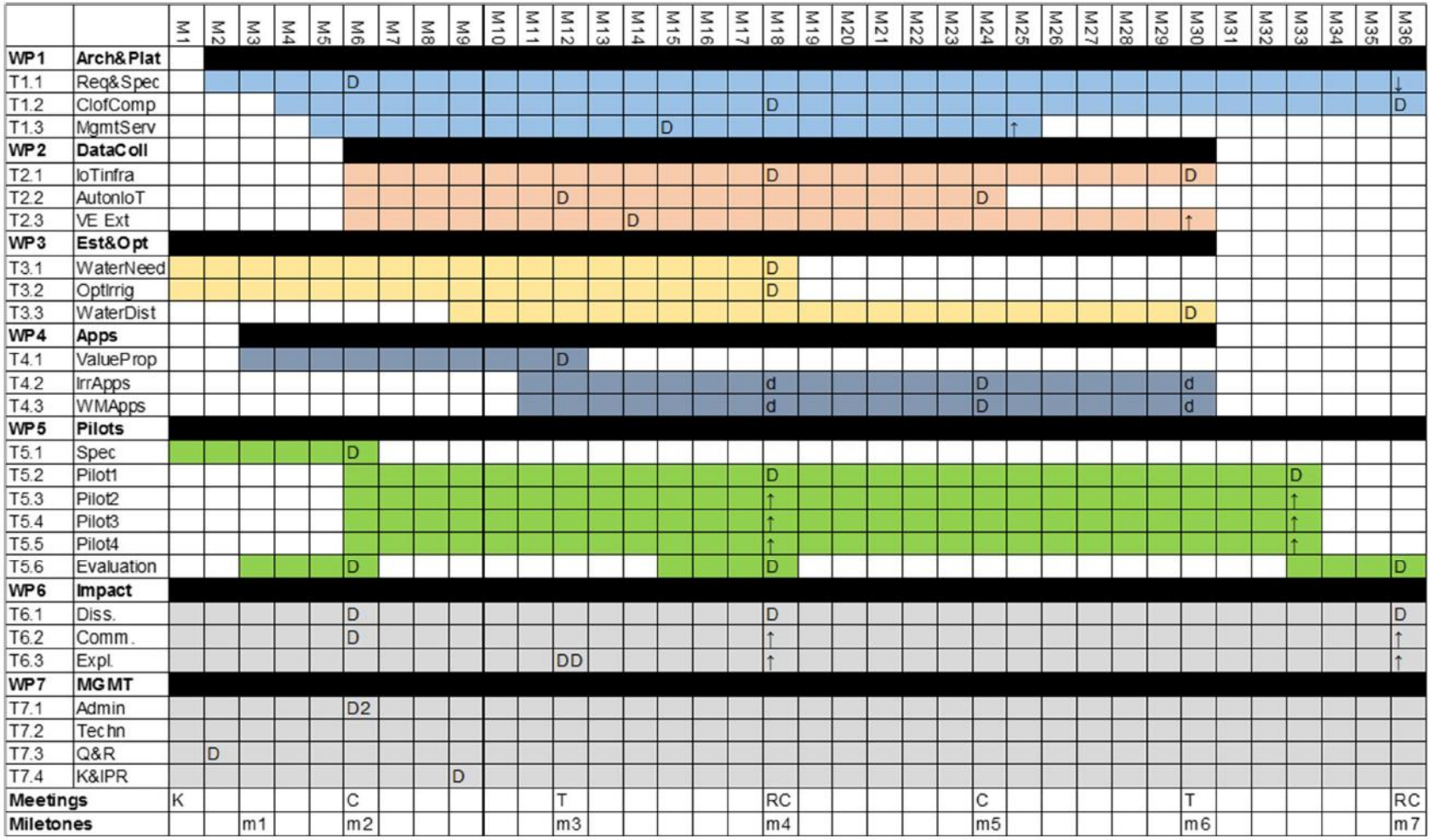
Figure 2: PERT chart

4.5. Project plans

Detailed project plans for the project are set out below. These form the baseline plan against which progress will be monitored, and any changes agreed upon. In the second amendment the schedule in the next page was modified so that instead of review at M18 there will be reviews at M12 and M24.

4.5.1. Gantt chart with deliverables plan

Table 4: Gantt chart with deliverables – WP1-7



4.5.2. Effort plans

Project effort by contractor appears in Annex A2.

4.5.3. Budget plans

Budget plans are shown in the Annex A3.

5. Project Organisation

5.1. Management structure

The project's management structure and supporting procedures have been designed to specifically deal with the strategic and operational management requirements of a highly technical and multidisciplinary innovation action. Such type of project calls for a strong management structure with strong focus on objectives and milestones, highly knowledgeable technical management skills and strong focus on risk management. The project management activities are implemented along these guidelines in WP7.

The project management activities will ensure that the project properly coordinates its multi-party, iterative approach and that the work is completed within the terms of the contract with the European Commission. This will include ensuring that:

- Appropriate agreements and management framework are in place between the partners,
- All the projects activities are properly coordinated with appropriate levels of legal, contractual, ethical, quality, financial and administrative management of the Consortium
- Proper operational project management is provided throughout the project and the project's work is completed to the expected timescales, resource usage and quality levels
- Appropriate reporting to the European Commission and RNP is undertaken.

An experienced management team from the co-ordinating partners VTT and ABC have been identified for the project.

5.2. Approach

The project is well focused and therefore a lean structure to manage the project is chosen. In the *Figure 3* the project management structure is illustrated including the responsible persons:

The main administrative body of the *SWAMP* Project is the Project Steering Group. VTT acts as the Coordinator of the project, having a major role in the daily management of the project. More detailed description of each consortium body and the duties and responsibilities are provided below and will be agreed in the Consortium Agreement (CA) in more detail.

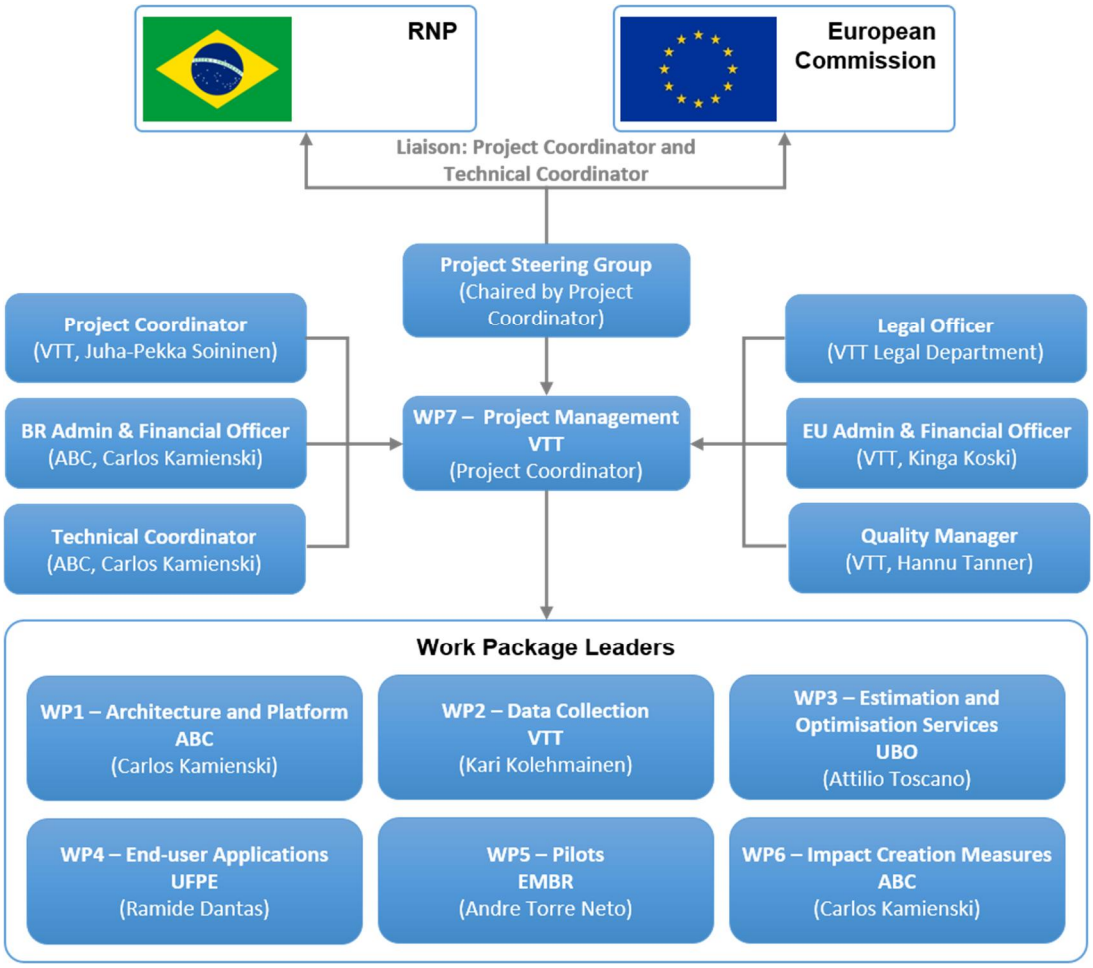


Figure 3: Project management organisation

5.2.1. Project Steering Group

The Project Steering Group (PSG) is the decision-making body of the Consortium. The PSG consists of the Coordinator and one representative of each participant. The PSG will meet at least twice per reporting period.

5.2.2. Project Coordinator

The Project Coordinator will manage the project's administrative, financial and legal activities as well as quality assurance. VTT will provide the project coordination as a part of the Management Work Package. VTT has extensive experience in various EU projects. VTT has a unique EU team (15 professionals), which supports project managers of EU funded projects in all financial and administrative aspects during the lifecycle of the project. VTT's legal counsels prepare the Consortium Agreement (CA) of the project and advise in contractual and IPR matters.

5.2.3. Admin & Financial Officers

The BR Administrative Manager from UFPE has been appointed for the Brazilian side from VTT for EU side. The Administrative Managers will be responsible for the administration of the internal EU and Brazil Consortiums, including ensuring the proper completion and consolidation of the cost claims for Brazilian and EU partners. The Administrative Managers will act as a support to the Project Steering Group and will attend its meetings.

5.2.4. Technical Coordinator

The Technical Coordinator has the responsibility of the overall coordination of the project's technical progress. The main tasks of the Technical Coordinator will be to secure the continuous alignment of commonly understood and agreed project results with the projects vision and the overall technical objectives. The Technical Coordinator will also perform the coordination and integration of the technical work performed in each of the work packages in order to secure a smooth and trouble-free integration of components.

5.2.5. Quality Manager

A Quality Plan will be produced at the start of the project and this document will govern the quality procedures for the whole project. It will define a set of rules for the organization of the day-to-day work, including the procedures to be used, the reporting mechanisms, the organization of meetings, and the preparation of documentation for submission to the Commission. It will also contain a process description for project deliverables, with the procedures for internal review and the quality metrics against which the deliverable will be assessed. To ensure impartiality of the quality assurance process the Quality Manager will report to the Project Steering Group.

5.2.6. Work Package Leader

The project is organised into work packages (WP) concentrating on research, development and innovation and exploitation work. Each WP has been further divided into tasks. The Work Package Leaders are responsible for the progress of the work conducted in their WPs.

5.2.7. Planning and internal reporting

The project will be executed according to an established and proven project management approach based on this Project quality and risk management plan and a detailed project plan to be regularly updated.

The Project quality and risk management plan defines the activities and resources necessary to ensure that the quality requirements of the project are met. It defines quality standards, quality requirements, quality assurance methods, quality assurance activities and configuration management. It will also define policies for identifying threats on the project and for implementing corrective actions.

The project plan will cover the complete project duration and will be refined and agreed with the European Commission and RNP each year. It will contain a detailed work plan setting out the duration and inter-dependencies of work packages and tasks defined for the period, and the anticipated resources required to complete each task within a particular timescale. Each Work package Leader will be responsible for preparing and managing a detailed work package plan and to submit it to the Project Coordinator, who will check the overall coherency across work packages.

5.2.8. Progress control

The Project Steering Group will meet as necessary and agreed, usually every six months, and as a minimum at the key milestones of the project such as completion of each work package. The Project Coordinator will report progress control to the PSG.

For each period the Project Coordinator will submit a detailed progress and financial report to the European Commission and RNP together with cost statements and audit certificates as required under the contract.

The delivery of major deliverables in the project has been aligned with the expected external project reviews. A first review will be held at month 18 in order to allow the timely payment of pre-financing by the EU and the final review will be held at month 36.

5.2.9. Work package and task direction

Due to the structure of the project running in different countries, strong emphasis on work package autonomy and management will be enforced. Clear objectives have been established for the outcome of each work package and interfaces to other work packages have been made as simple as possible in order to create transparency and promote responsibility among project managers. The work in each work package is under the responsibility of a single partner who designates a Work package Leader to lead the work. The work packages are split into a set of tasks; the main responsibility for each main task will reside with a single partner with each task being assigned a Task Leader. The Work package Leader organises the work on the tasks between the concerned partners and is responsible for achieving the objectives and producing the work package deliverables on time.

The Work package Leader organises workshops and meetings within the work package in close liaison with the other work packages. Meetings will be called as often as needed for ensuring effective work progress; however electronic conferencing facilities will be used as much as possible to limit travel expenses. Other meetings will be organised at task level by participants involved in the task. The Project Coordinator continuously oversees that integration of the different components of the overall platform is progressing according to plan and that overall project objectives are achieved.

5.3. Ways of working

5.3.1. Information flow

One key factor for the success of the project is ensuring that both internal communication between partners and external communication towards outside entities is effective and maintained throughout the project. External communication consists of the dissemination of all project results through publications, project websites, conferences, events and the establishment of links to similar projects and SME affiliations. Internal communication will be achieved through meetings, workshops, teleconferencing and the exchange of electronic messages. Documents will be prepared using appropriate tools that enable collaborative editing and version control. Additionally, the project web site will provide access to a repository of all versions of the produced documents, providing a reliable reference for all partners.

The project will commence with an intense phase of communication and information exchange between partners during the project kick-off meeting. The kick-off meeting will be planned for an approximate duration of 2-3 days. The purpose of the kick-off is to ensure a common understanding of all administrative and technical aspects of the project, in order to set the foundations for a successful project implementation. During the kick-off, the Project Steering Group will also decide which electronic tools are to be used throughout the project.

The flow of communication between *SWAMP* members will be implemented in a scalable way by periodic meetings of the Project Steering Group, regular technical meetings and workshops within each work package, and teleconference and email exchange (main form of communication between partners).

5.3.2. Decision making

The PSG will operate according to the following principles based on the H2020 DESCA consortium agreement model:

- each member of the PSG shall have one vote
- the PSG shall not deliberate and decide validly unless two thirds of the members are present or represented
- the responsibilities and authority of the PSG shall be set out in the Consortium Agreement (CA), including
    - decisions relating to changes in the Description of Action
    - evolution of the Consortium

- actions required for non-performing or underperforming participants
- processes relating to the coordination of IP management and the distribution of EU funding

The detailed decision-making procedures in the Consortium Agreement (CA) aim to minimise the risk of problems arising during the implementation of the project. The mechanisms for the resolution of any emerging conflicts will be resolved based on the CA procedures.

6. Quality Plan

6.1. Quality management

This document installs a Quality Plan that will govern the quality procedures for the whole project. It defines a set of rules for the organisation of the day-to-day work, including the procedures to be used, the reporting mechanisms, the organisation of meetings, and the preparation of documentation for submission to the Commission and RNP. It also contains a process description for project deliverables, with the procedures for internal review and the quality criteria against which the deliverable will be assessed.

6.2. Quality control

All work in the project will be carried out in accordance with the project DoA, the quality systems of the relevant Partner, and this Project Handbook.

The work will be performed by qualified personnel and in a professional and correct way. This means that:

- Necessary and available input is obtained and taken into account
- Relevant methods, techniques and tools are applied
- Measurements, tests and analyses are performed in accordance with standards, rules and specifications and/or good practice
- Interpretations and conclusions are technically sound and logically correct
- Checking of the work performed and its results is carried out, including self-checking and internal verification
- Non-conformities and errors are reported to the appropriate personnel unless satisfactory corrections can be made on the spot.

Quality control is ensured through a rigorous and standardised approach to both internal and external deliverables. The Project Coordinator will be proactive with a focused interaction with Partners and the Commission's and RNP's Project Officers.

The Project Coordinator will maintain a project level plan, which will be updated by inputs from work package leaders, Project Steering Group members, and the Project Coordinator's own judgement.

Work package leaders will maintain plans for their area responsibility, in a format compatible with that of the high-level project plan. Project meetings or teleconferences will take place, as required by the work plan.

6.3. Deliverable review and approval

The mechanism for ensuring quality within the project will be centred on the deliverables to be produced. The overall aim of this approach will be to ensure that all formal and working deliverables are fit for the purpose for which they are intended:

- Quality of individual deliverables defined in the quality criteria contained within each deliverable produced
- Testing the fitness for purpose of each product is also contained in individual deliverable descriptions, and will be achieved by use of formal and informal Quality Review procedures.

6.3.1. Review process

The process for approval of deliverables is:

1. Internal review: For each deliverable, two internal reviewers must be assigned by the work package leader. Internal reviewers must not have been contributors to the deliverable that they review, and must be selected for their knowledge and insight of that deliverable. Reviewers' comments must be documented and copied to the author. The author must respond by accepting or rejecting changes. All reviews should be completed within 2 weeks of receipt.
2. Work package leaders: Having been reviewed by the designated internal reviewers the deliverable will be accepted by the work package leader, assuming it meets the quality criteria.
3. Project Steering Group: Certain designated deliverables are forwarded for acceptance by the Project Steering Group following acceptance at work package level. These are:
    a. Project Management deliverables
    b. Items with an external interface – dissemination and exploitation
    c. Major technical items.

If/as deemed appropriate, an external reviewer will be contracted to perform their review providing feedback as to the suitability and 'fit for purpose' requirements laid down within the work package/deliverable plan.

6.4. Evaluation and assessment requirements

Evaluation and assessment within *SWAMP* will be co-ordinated within WP7, which is led by VTT. This work package will:

- Assess and evaluate the project's performance against set criteria and baseline measurements, including the Objectives provided in the DoA
- Organise effective and impartial internal peer-review and assessment of project progress
- Prepare for and participate in external peer-review and assessment activities
- Evaluate the project against the achievement of its set objectives and measure its successfulness
- Collect and prepare input to the projects final valuation and assessment report.

7. Project Procedures

This section describes standard procedures for communications, meetings, document production and reporting.

7.1. Project communications

The project consists of a geographically distributed group of Partners, and so requires some skill in managing effective communications. The responsibility for completing project deliverables has been delegated through the project structure, and so project management communications patterns should be aligned with this model.

The Project Coordinator co-ordinates project management information exchange within the project, principally with the Project Steering Group and Work package Leaders. Routine communications are via email. Telephone and face-to-face meetings are used as required, both as part of the formal project process, and to manage unplanned events. Routine project updates are disseminated through the fortnightly highlight reporting process.

Externally the main point of communications contact is the Commission Project Officer, using email, with face-to-face contact for formal reviews.

Work package Leaders co-ordinate work package information exchange with the partners within their work package, and with the Project Coordinator. Their main channels of communication are agreed within the work package team.

7.2. Change control

Any proposed change to a deliverable in terms of scope or delivery date must be presented to the Project Coordinator as a Request for Change:

- Requests for change should be made via the highlight reporting process, using the 'issues' heading of the report. It should set out the nature of the proposed change, reason for change, and impact on the project as a whole
- Requests will be discussed between the Project Coordinator and the partners involved in the relevant work package to assess implications in terms of impact and risk to the project
- The Project Coordinator will send a decision in writing to the initiator of the request, and where necessary amend plans accordingly.

Where such a proposed change has a material impact on the project, this request will be put to the Project Steering Group for consideration.

7.3. Project meetings

7.3.1. Notification

Convening meetings:

The Coordinator shall convene ordinary meetings of the Project Steering Group at least once every six months and shall also convene extraordinary meetings at any time upon written request of any Member.

Notice of a meeting:

The Coordinator shall give notice in writing of a meeting to each Member as soon as possible and within at least 30 calendar days preceding an ordinary meeting and 10 calendar days preceding an extraordinary meeting.

Sending the agenda:

The Coordinator shall send each Member a written original agenda within at least 10 calendar days preceding the meeting; additions to the agenda by a Member have to be received by the Coordinator 5 calendar days before the meeting at the latest. The Project Coordinator will distribute such additions to the Members by email only.

Adding agenda items:

Any agenda item requiring a decision by the Members must be identified as such on the agenda.

Any Member may add an item to the original agenda by written notification to all of the other Members within at least 7 calendar days preceding the meeting.

During a meeting of the Project Steering Group the Members present or represented can unanimously agree to add a new item to the original agenda.

Any decision may also be taken without a meeting by circulating to all Members a written document, which is then signed by the defined majority of Members (see Article 6.3.3 of the Consortium Agreement).

Meetings of the Project Steering Group can also be held by teleconference or another telecommunication means.

Decisions may only be executed once the relevant part of the Minutes is accepted according to Article 6.3.5 of the Consortium Agreement.

7.3.2. Recording and circulation

All project meetings should be prepared and recorded by the organiser of the meeting, using the standard templates for ‘Agenda’ and ‘Minutes’, downloadable from the project Wiki at:

Meeting documentation should:

- Indicate the time, place and purpose of the meeting
- List the Attendees
- Document all significant agreements and actions, with responsibilities and due dates, where feasible
- Be produced in a timely fashion (target of within 10 working days) to be useful to the work all Partners. As long as they are useful, they do not need to be perfect publishable English.

Minutes should be circulated as a minimum to the participants, the Project Coordinator and relevant Work Package Leader(s) and be referenced in the partner report during which the meeting occurred.

7.4. Document management

7.4.1. Document preparation

All *SWAMP* documents will be identified with the *SWAMP* acronym and logo, contract number, date, unique document name and number, as indicated in the standard template downloadable from the project SharePoint pages.

All reports will be delivered on time and document the work done and its results. The documentation will be correct and sufficiently detailed. This means that:

- The scope of the work is covered
- Premises for the work are stated as well as any limitations
- The results are described and documented in sufficient detail

- Uncertainties in the results are reported, or at least indicated
- Interpretations and conclusions are clearly, and unambiguously identified and stated figures, illustrations and tables are relevant
- Text is written in clear and understandable language
- Documents are structured and give reference to other supporting documents
- Partners contributing to the content are clearly identified.

Those preparing reports should discuss the contents with all contributors and other participants concerned with the task, and to take account of their comments. Circulation of a draft for comment is recommended, where feasible.

They will be:

- Be written in English for use amongst the Partners. Documents for public dissemination will be in their appropriate language
- Include sufficient identification in line with the DoA & standard template to ensure that there cannot be any confusion on what they are
- Include versioning and a sufficient Document History to unambiguously identify their status and state of completion or change. It is also recommended that colour coding be used to indicate finalised sections and comments/notes
- Use standard formats while under development and review, such as Microsoft Office or other standard formats agreed and accessible by all Partners. Final versions for submission to the Commission must be uploaded to the project SharePoint pages in PDF format
- Use the *SWAMP* logo, but only as indicated and agreed by the *SWAMP* Project Steering Group
- Use the Commission Logos only as indicated in the Contract and Reporting Guidelines.

7.4.2. Document format

Documents under the scope of this Quality Plan (internal and external deliverables plus project working documents) are subject to specific quality procedures regarding the layout and typographic features of the document when viewed or printed.

Deliverables and reports should be distributed in one of the following formats:

- Word Document (DOC or DOCX)
- Portable Document Format (PDF)
- LaTeX.

The PDF format is advised for final, non-editable versions and DOC and LaTeX for intermediate versions. Documentation that has to be distributed externally to the Consortium and thus must not be editable will have to be distributed in Portable Document Format (PDF).

Several document templates have been created which must be used. The templates are available on the project Wiki:

- Deliverable template:
  A sample deliverable exemplifying the layout and typographical features of the cover page, executive summary page, header, footer and heading levels to be employed in a MS Word template file (.dot file) is available on the SharePoint pages. The deliverable template may be updated or revised from time to time and it is the responsibility of each Partner to always use the latest published template.

- Presentation template:
  Presentation slides should also conform to the layout and typographical features of the cover and regular slide samples created. These sample slides are as a MS PowerPoint template file (.pot file) on the Wiki. The presentation template may be updated or revised from time to time and it is the responsibility of each Partner to always use the latest published template.
- Agenda template:
  Agendas for project meetings should use this template which has the layout and typographical features defined. Available on the SharePoint pages in .doc, .docx, and .dot.
- Minute template:
  Minutes should be recorded using this template which has the layout and typographical features defined. Available in on the SharePoint pages.doc, .docx, and .dot.

7.4.3. Document control page

In addition to their filenames, deliverables (intermediate and final, internal and external) will be further identified with a suitable control page arranged in the format shown in Annex A4.

7.4.4. Document storage

All competed project documents will be placed on the Wiki, with a copy sent to the Project Coordinator. Back-up copies of all such documents will be held on the server of the coordinating Partner.

7.5. Project's logo and graphical layout

All project outcomes (reports, documents, presentations, website, etc.) must use the project's logo and graphical logotype. Logo will be available in the following graphical formats for web pages: GIF, JPEG and PNG and in TIF and EPS format for cmyk printing.

7.6. Deliverable submission

All *SWAMP* Deliverables must be delivered to the Commission on or before the Delivery Date as indicated in the DoA.

To achieve this:

1. The responsible work package leader will upload a final draft of the deliverable to the wiki and notify all members of the Project Steering Group, at the latest 2 weeks prior to the Delivery Date, which is the last day of the indicated project month (M1 = November 2017).
2. The responsible authors will finalise the text based on the feedback from the internal reviewers and will upload the final complete text to the SharePoint pages and notify the Project Coordinator, at the latest one week before the Deliverable Date.
3. The Project Coordinator will formally submit the deliverable to the Commission as follows:
   a. Upload the final version to the EU portal
4. The Project Coordinator informs all Partners and ensures that the Deliverable is copied to the appropriate location on the Wiki.
5. The Project Coordinator retains the electronic versions of ALL documents (deliverables, reports, etc.) as more copies may be subsequently requested by the Commission - such as for reviews.

8. Reporting

8.1. Internal reporting

8.1.1. Maintaining project plans

To ensure the maintenance of up to date plans each work package leader will be responsible for preparing and managing a detailed work package plan and maintaining a risk log. This will be submitted to the Project Coordinator for checking for alignment with other work package plans.

Any variations to this plan must be agreed through the project Change Control process.

8.1.2. Management reports

As a means of providing a regular update on progress to all Partners, routine reporting will take place as follows:

1. Each Partner will produce a bi-annual report at the end of each six months period to cover achievements and actual or potential problems, and plans for the forthcoming period. This will be uploaded to the Wiki within five working days of the end of the period
    a. As a more closely update for management purpose the above reports will be updated monthly. Reporting briefly the achievements and work of each partner in this month within five working days of the end of the period
    b. The report should consist of full sentences explaining the background of decisions and not just bullet points.
2. Each Work Package Leader will produce a bi-annual report at the end of each six months period to cover achievements and actual or potential problems, and plans for the forthcoming period. This will be forwarded to the Project Coordinator within two working days of the end of the period
3. The Project Coordinator will use this to provide a brief project level update for the Project Steering Group, within two days of receipt of these reports.

8.1.3. Exception reports

Where a work package Leader identifies that a deliverable will not be available to the agreed timescale, an exception report must be made to the Project Coordinator. Where this will have a significant impact on the project plan, the Project Coordinator will inform the Project Steering Group.

8.1.4. Issue/risk reports

Each work package will maintain a risk log, which will be submitted to the Project Coordinator on a quarterly basis, for consolidation as part of the main project risk log. The project risk log will be maintained by the Project Coordinator and presented at Project Steering Group meetings, or where necessary by exception.

8.2. External reporting

8.2.1. Project review

SWAMP will have a review at M12, M24 and M36 (final review). M18 deliverables will be reviewed in intermediate document review.

Arrangements for these reviews will be managed by the coordinating Partner.

8.2.2. Financial statement

Each European partner must complete a “Form C” financial statement at the end of each project period.

8.2.3. Audit certificate

Partners are also required to obtain an Audit Certificate to accompany their annual Form C financial statement.

8.3. Online resources

The following online resources are available to support *SWAMP* partners:

1. Project website (http://swamp-project.org). The website is one means by which the project is able to communicate with external stakeholders and disseminate information. The website stores technical developments and documents, shares events and invitations to join a dedicated mail group/interest group. The site also displays any presentations given by consortium members in conferences or workshops held in Europe, Brazil or anywhere in the world. The website will also contain information about academic and technical papers that members of the project are expected to write, to be presented at conference and trade shows, and published in leading academic and technical journals.
2. European Commission H2020 website (http://ec.europa.eu/programmes/horizon2020/) provides information and guidance concerning the Horizon 2020 Programme.
3. SWAMP SharePoint pages. The purpose of this is to provide a central repository for project documents, both work in progress and completed, accessible to all Partners during the life of the project.
4. SWAMP open source repository. Source Code Management (SCM) that will help supporting quality and daily collaboration of the project.

9. Risk management

The following key project risks have been identified and remedial actions foreseen as set out in the table below. Updating of risks and more detailed risk analysis will be performed during the project.

Table 5: Identified risks and remedial actions

Risk	Probability	WPs involved	Precaution and Action
The big picture provided by the SWAMP architecture is not enforced in all work packages	Medium	WP1	WP1 leader must immediately report to the Project Steering Group, so that correctly, measures can be taken and the consistency of the work packages with the overall architecture are maintained.
Integration of existing technology is more time-consuming than expected	Medium	WP1	WP1 leader must carefully monitor the progress in the integration of existing technology (FIWARE, IMPReSS, etc.) so that corrective measures and replacements can be done before it causes cascading delays.
IoT Communication and Storage Substrate provides low performance levels	Low	WP2	A distributed communication and storage substrate made of cloud services and fog nodes may incur in low performance, which can be dealt with effort in fine-tuning and performance analysis experiments to detect bottlenecks .
The reliability of IoT nodes is not adequate for actuation in water distribution system	Medium	WP2, WP5	The scope of actuation will be kept limited and secured so that major disasters will not happen, without constraining the demonstration of technology.
The operation time, payload weight and range of drone is not yet adequate for all intended use	High	WP3	Details of pilots are adjusted with the characteristics of drones and the focus will be put on achievable targets.
The content and performance not attractive for end-users	Medium	WP4, WP5	Ensuring that the specification of both pilots and application are done in close co-operation with end-users and other stakeholders.
Participation of end-users not active enough	Medium	WP5	Emphasising the communication activities towards end-users and improvement of the messages towards them.
Changes in the consortium	Medium	All	Tasks assigned to the leaving participant will be reallocated among the Consortium or new participant will be invited and integrated to the Consortium
Risks related to delays, poor execution, contract breach or conflict of interests	Medium	All	Proper procurement procedures and selection criteria; clearly defined decision-making mechanisms, agreements and conditions.

Flying a drone may not be possible at a pilot site	High	WP5	Permission for flying will be applied. test flights are done in pilots where implicit or explicit permissions are available.
On field devices has issues related to power and battery capacity and communication reliability	Medium	WP5	Project put specific attention to end-to-end service monitoring and power budget and reliability issues during design. More effort will be put in deployment and management services.
Maturity of FIWARE components is below expected and it causes implementation and integration problems.	High	WP2, WP5	The SWAMP system will be built on top of FIWARE core components and focus will be put on being able to test the IoT in precision irrigation. The other features that are needed in commercial systems such as maintenance and deployment easiness are done with lower priority.
Linked Data capabilities of FIWARE do not allow integration of SEPA as planned	Medium	WP2, WP4, WP5	Project will try the integration and examine the interoperability solutions. In the worst-case, some features of the platform and application will be duplicated in order to ensure successful pilots.
Merging of soil based and crop based water need and irrigation planning approaches will not work	Medium	WP3, WP5	Project develops two approaches targeted for different pilots. We try maximising the use of common elements and try to set up the comparison of approaches at least in some pilots.
Collaboration with commercial variable irrigation system providers turn out be too slow or difficult	Medium	WP5	Project will try to find alternative providers or solution that can be prototyped by the project.

During the the project, all project participants, and in particular the Project Coordinator and Work Package Leaders, will be responsible for raising any material or perceived risk as part of the normal reporting. All risks and issues will be registered in the project's risk log and the status and mitigation of each risk element will be reviewed regularly as a working document and reported at each Project Steering Group meeting. The Project Coordinator will manage and maintain the risk management log.

The project plan, updated each year, will also contain an updated Risk Management Plan, which will report the project's strategic and technological risks and the identified corrective actions.

10. Conclusion

This deliverable describes in detail the management structures and procedures for the *SWAMP* project. It clearly defines the roles and responsibilities for the different partners in the consortium. In addition, the procedures for maintaining a high quality of the project outputs have been defined in the Quality Plan and project risks have been analysed and their impact and the appropriate actions have been defined.

The partners of the *SWAMP* consortium will be able to use this deliverable as a guide and a reference in relation to project organisation, working procedures and structures.

Annex A1 – Directory of Project Steering Group Contacts

Organisation	Name	Role in project	Email	Phone
VTT Technical Research Centre of Finland	Juha-Pekka Soininen	Project Coordinator, Chair of Project Steering Group Leader of WP7.	juha-pekka.soininen@vtt.fi	+358 40 730 59 21
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Consorzio di Bonifica dell'Emilia Centrale	Paola Zanetti	Project Steering Group	pzanetti@emiliacentrale.it	
UFABC – Federal University of ABC (Brazil)	Carlos Alberto Kamienski	Brazilian Coordinator. Technical Coordinator, Leader of WP 1 and WP6	carlos.kamienski@ufabc.edu.br	+55 11 4996-0179 +55 11 9-8101-8106
UFPE – Federal University of Pernambuco (Brazil)	Ramide Dantas (Paulo Adeotado)	Project leader at UFPE; Leader of WP4	rasd@cin.ufpe.br	
FEI - Centro Universitário da FEI (FEI)	Rodrigo Filev Maia	Project leader at FEI	rfilev@fei.edu.br	+55 11 9-9697-9634
EMBRAPA – Brazilian Agricultural Research Corporation	André Torre Neto	Leader at EMBRAPA; Leader of Workpackage 5	andre.torre@embrapa.br	
LeverTech Tecnologia Sustentável	Helder Gaudêncio	Leader at LeverTech	helder.gaudencio@levertech.com.br	+55 61 3366-5367

Annex A2 – Effort by Partner

Partic. no.	Partic. short name	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total per partner (PM)
1	VTT	12	17	2	4	6	4	12	57
2	ICRO	2	-	-	4	16	3	1	26
3	UBO	7	7	13	7	7	5	1	47
4	CBEC	2	-	-	-	15	3	1	21
5	QUAT	9	14	-	4.5	6.5	3	2	39
6	ABC	16	8	-	2	4	13	10	54
7	FEI	1	10	-	-	11	2	1	25
8	UFPE	1	-	10	17	2	2	1	33
9	LEV	1	-	-	3	2	4	1	11
10	EMBR	2	-	5	-	24	3	1	35
Total per WP (PM)		53	56	30	41,5	93,5	42	32	348

Annex A3 – Document Control Page

Document revision history

Date	Issue	Author/Editor/Contributor	Summary of main changes
1 March 2015	0.1	Name(s)	
	1.0		Final version submitted to the European Commission

Internal review history

Date	Reviewer	Summary of comments
10 March 2015	Name of reviewer 1	
	Name of reviewer 2	