AAL Project

Indoor and outdoor NITICSplus solution for dementia challenges

WP5: Project Management

D5.3: Quality Assurance Plan

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Abstract:

This document investigates the Quality Assurance Plan (QAP) for the IONIS project. It encompasses all the Quality Assurance procedures that will be followed for the IONIS framework in order to guarantee an excellent quality of performed work, leading to reach the IONIS objectives. It also represents a reference to be used for the permanent improvement of the project processes. Furthermore, it also identifies the Quality Evaluation Metrics (QEMs) to be used by the IONIS consortium. As such, this will guarantee the intended quality of the project work and deliverables.

Keyword list: Quality Assurance Plan, Quality Assurance Model, Quality Evaluation Metrics, Risks management, Contingency Plan, Gantt chart.

Executive Summary

This document investigates the Quality Assurance Plan (QAP) for the IONIS project. It encompasses all the Quality Assurance procedures that will be followed for the IONIS framework in order to guarantee an excellent quality of performed work, leading to reach the IONIS objectives. It also represents a reference to be used for the permanent improvement of the project processes. Furthermore, it also identifies the Quality Evaluation Metrics (QEMs) to be used by the IONIS consortium. As such, this will guarantee the intended quality of the project work and deliverables.

This document is structured as the following:

Section 1: Introduction
The first section enumerates the objectives of this deliverable and gives an overview of the general IONIS Quality Assurance aspects addressed in this context.

Section 2: Project overview
The second section starts from the overview of the IONIS concept to determine its context and the motivations that drives its work, then gives short description of the project Work Packages and deliverables.

Section 3: Project planning
The third section gives an idea about the IONIS project planning in terms of overall management approach and the scheduled project deliverables and their corresponding timing.

Section 4: Quality assurance assessment
In this section an assessment framework is defined for the quality assurance of the IONIS intended work. In this context specific Quality Assurance Metrics (QAMs) are determined in order to evaluate how such assessment will be evaluated. As such, the IONIS QAMs are categorized into two sets: the first one groups the ones related to the IONIS management and the second one encompasses the QAMs that are mapped to the IONIS envisaged platform.

Section 5: Risk management, risk analysis and contingency plans
This section is dedicated for the definition of the set of risks that can be encountered when performing the IONIS work, their quantification (impact, likelihood and level) and the proposed contingency plans for them. The IONIS risks are classified in:

- Managerial risks
- Technical related IONIS platform risks
- End-user services oriented risks
- Market exploitation oriented risks.

Section 6: Conclusions
In this final section, general conclusions regarding the investigations performed in this current deliverable are summarized.

Table of contents

List of figures

List of tables

Abbreviations

AAL	Ambient Assisted Living
CMU	Central Management Unit
DoW	Description of Work
EC	European Commission
EU	European Union
GA	General Assembly
GPS	Global navigation Satellite System
JP	Joint Programme
IONIS	Indoor and outdoor NITICSplus solution for dementia challenges
LBS	Location Based Service
PC	Project Coordinator
PDF	Portable Document Format
QAA	Quality Assurance Assessment
QAM	Quality Assurance Metrics
QAP	Quality Assurance Plan
WP	Work Package

1 Introduction

This document summarizes all the Quality Assurance procedures that will be followed for the IONIS system in order to guarantee an excellent quality of the performed work, leading to reach the IONIS objectives. These quality assurance procedures will be applied to all internal and external results and deliverables. Quality assurance will be the joint responsibility of all project partners at all levels of project activities.

The Quality Assurance procedures that are described in this document are to be seen as a firsthand knowledge guidelines and an internal standpoint of the IONIS consortium to be followed in order to guarantee an excellent quality performed work for the IONIS project. They can be enriched during the IONIS project running and consequently represent a dynamic mean to ensure such requested level of work quality.

One important aspect that this deliverable D5.3 “Quality Assurance Plan” will need to address is the risks that can be encountered in the IONIS system. Indeed, the IONIS project deals with a large number of scientific and technical risks that are related to the technologies relevant to the project. Some of such risks are related to external factors like technology roadmaps and economic and market developments that determine the cyclic character of technology innovations and introductions. Some other risks are rather related to internal research results that could lead to showstoppers in a specific direction.

In this deliverable the main risk factors and their fallback solution for the IONIS project are described as seen by the IONIS consortium today.

2 Project overview

The Indoor and outdoor NITICSplus solution for dementia challenges (IONIS) project addresses precisely aspects that are related to the Ambient Assisted Living Joint Programme (AAL JP), by exploiting the NITICS (Networked InfrasTructure for Innovative home Care Solutions - Call) AAL (Ambient Assisted Living) innovation and extend the platform with new technologies and services for both indoor and outdoor support. IONIS will build on the AAL NITICS platform and thus offer fully integrated and validated solutions for health monitoring, home automation, personal agenda with reminders, alerts, caregiver administrative tools (e.g. administrative tools for several users, sensor settings) and profile. The extended platform will integrate technologies and services that can address dementia specific challenges and offer support to both caretakers and caregivers.

The principal technologies and services brought by IONIS include location based services for indoor localization (e.g. indoor tracking of users and object localization), LBS for object localization, LBS for outdoor localization and geofencing (based on GPS), alerting and easy communication through one-button calls to designated caregivers, sleep quality monitoring through non-wearable sensors, simplified symbol-based interfaces

The resulting IONIS platform will be modular, highly configurable and adaptable. The new solutions are based on turning multi-sensor data into knowledge about behavioral changes through the analysis of securely transferred, stored and accessed measurement data from multiple real-life pilots. This will be achieved through modules of support incorporating tested ICT services, off-the-shelf ICT solutions and developed mature and tested technologies across all modules of support.

The IONIS concept and service modules and its relation with NITICS are illustrated in Figure 1.

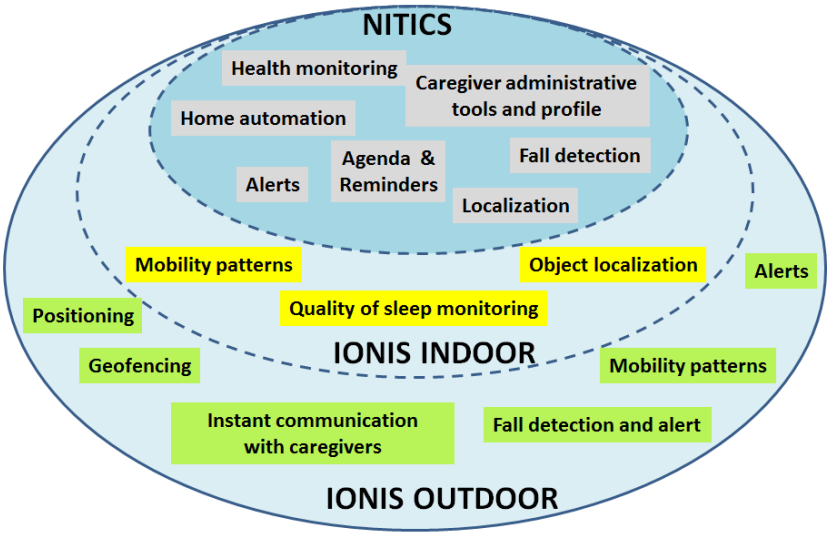

Figure 1: Service modules in IONIS. Grey: original NITICS services; yellow: indoor enhanced services, green outdoor services.

3 Project planning

The IONIS project planning will be implemented into 5 WPs, two of them dealing with the system definition, technical development and pilot deploying, one dealing with the market orientation of IONIS, along with the needed dissemination of results in order to maximize the solution market acceptance success, and one of them related to the project management,. Work Packages and Tasks leaders, milestones, deliverables and risk management are defined in order to keep a track on the project advances and possible deviations, with the aim of assuring IONIS likelihood to build the expected results, both in terms of technical development and market orientation needs.

An overview of the IONIS WPs, their type of activity, their leaders, their related effort and starting and ending date, is given in Table 1.

Table 1: IONIS WPs overview

WP no.	WP title	Type of activity	Lead Partic no.	Lead partic. short name	Person months	Start month	End month
1	End-user analysis and design of service concepts	Research	6	WUT	51	M1	M14
2	Platform design, implementation and integration	Development	3	UPB	97.5	M2	M30
3	Pilots with primary and secondary users	Demonstration	2	CITST	95	M10	M26
4	Dissemination and exploitation strategy	RTD	10	SOFTIC	50	M1	M30
5	Project Management	Management	1	EXYS	30	M1	M30
TOTAL		**5 WPs**			**323.5**	**M1**	**M30**

A workplan that was derived in [DoW] provides an overview of the project planning. WP1 designs end-user services that provide requirements on the platform based on end-user requirements that we will elicit in a multinational survey among elderly, disabled individuals and caregivers. WP3 will develop the platform that provides the movement metrics that these service scenarios need. Platform as well as service scenarios will be tested in the field in WP3 with pilot. WP4 will include dissemination activities and stakeholder

management and business model development, from the very start of the project until its end. Finally, WP5 conducts management (both external and internal) throughout project

Quality assurance is critical in a European multi-national project with limited budget and time. All partners involved will operate to respect Quality standards. Each project member will execute Quality control through their internal standards and procedures. Should a member have difficulties to meet required quality assurance level, the project coordinator may appoint a Project Quality Manager.

Primary quality processes include: Documentation standards and documentation control; Documented program plans; Review processes to examine all key deliverables and documents; Test plans and test processes; Build management and version control; Platform development lifecycle control including tracking of errors and rework cycles.

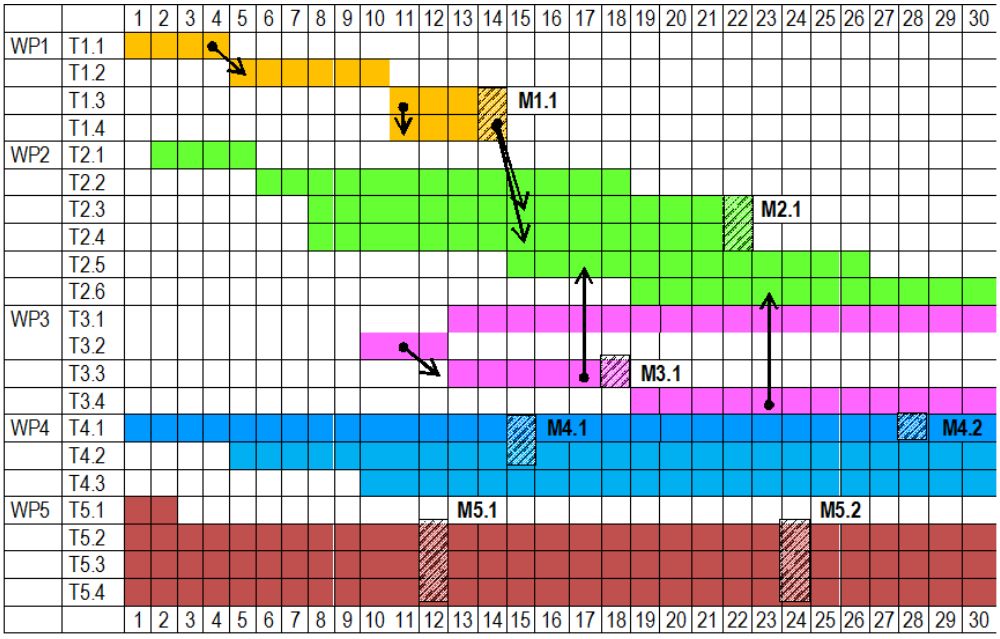

Figure 2: Gantt chart of IONIS project . Arrows indicate WPs interdependencies

3.1 Overall management approach

The IONIS overall management approach is explained in [DoW] and its focus is to accomplish all scientific, technical, organisational, financial, contractual and commercial project goals within the given budget and time constraints. This requires a very efficient, clear and well-structured project organisation. Of particular importance is the clear distribution of responsibilities as well as an efficient communication policy. A thorough project assessment system and an underlying risk management system will assure the proper achievement of the project's objectives. The overall structure and data flow of the project organisation is shown in the following Figure 3.

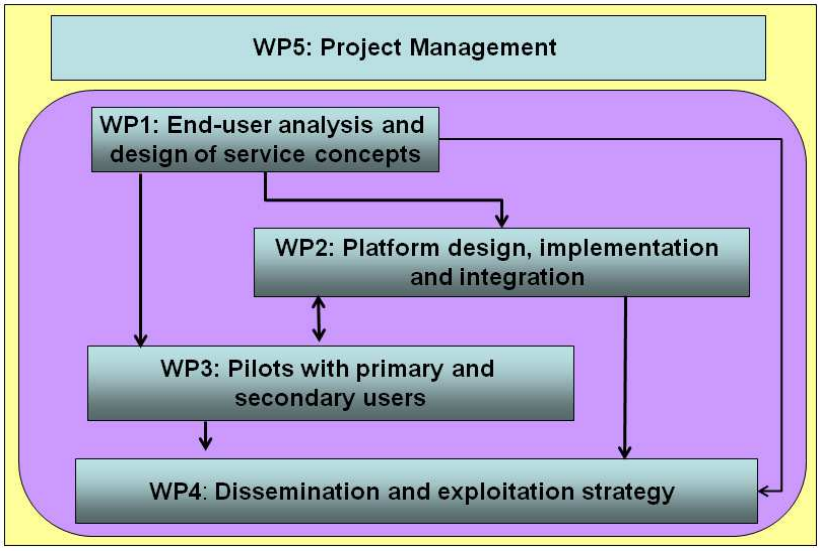

Figure 3: IONIS workpackage interactions

The organisational structure is streamlined in order to reach the following goals:

- Involvement of all project partners in the decision-making procedures;
- A clear and efficient decision structure;
- Mechanisms for the prevention of conflicts and for resolution of disputes; and
- A management which ensures an in-time, high-quality and within-budget project performance.

All of the following mentioned tasks, responsibilities and roles are defined in such a way that unnecessary work load and interaction between the different Consortium's partners is avoided while an efficient and transparent workflow is guaranteed. The different roles and responsibilities within the project are allocated according to the individual strengths and expertise of each project member.

3.2 Project deliverables and timing

The IONIS work will be subject to 24 deliverables that are mapped to its WPs as follows:

- WP1 (4 deliverables)
- WP2 (5 deliverables)
- WP3 (4 deliverables)
- WP4 (5 deliverables)
- WP5 (6 deliverables)

An overview of the IONIS deliverables is given in Table 2.

Table 2: IONIS list of deliverables

Del. no	Deliverable name	WP no	Nature of deliverable	Dissemination level	Delivery date
D1.1	End-user requirements report	1	Report	Restricted	M4
D1.2	Multinational survey	1	Report	Public	M10
D1.3	Conjoint analysis report	1	Report	Restricted	M14
D1.4	Functionalities and service concepts	1	Report	Restricted	M14
D2.1	Report on the system architecture	2	Report	Restricted	M5

D2.2	Report on the core system implementation	2	Report	Restricted	M18
D2.3	Report on the development of the indoor subsystem	2	Report	Restricted	M22
D2.4	Report on the development of the outdoor subsystem	2	Report	Restricted	M22
D2.5	Report on data analysis and smart behavior	2	Report	Restricted	M27
D3.1	Report on the exit strategy	3	Report	Restricted	M30
D3.2	Report on target group and user classification	3	Report	Public	M12
D3.3	Report on pilots setup and module testing	3	Report	Public	M18
D3.4	Report on extended pilots with the integrated platform	3	Report	Public	M30
D4.1	Intermediate Business model/plan	4	Report	Restricted	M15
D4.2	Exploitation plan	4	Report	Restricted	M15
D4.3	Final Business model	4	Report	Restricted	M28
D4.4a	Regular reports on stakeholder concerns and demonstrator sessions	4	Report	Restricted	M15
D4.4b	Regular reports on stakeholder concerns and demonstrator sessions	4	Report	Restricted	M30
D5.1	Internal Communication Infrastructures	5	Report	Restricted	M2
D5.2a	Calendar year report	5	Report	Restricted	M12
D5.2b	Calendar year report	5	Report	Restricted	M24
D5.3	Quality Assurance Plan	5	Report	Public	M4
D5.4	Mid-term review questionnaire	5	Report	Restricted	M15
D5.5	D5.5. Final project report	5	Report	Public	M30

4 Quality assurance assessment

The purposes of the Quality Assurance Assessment (QAA) are:

- to establish a common practice among IONIS partners about quality procedures,
- to assist each partner in implementing such procedures in his environment,
- to provide each partner and the AAL Central Management Unit (CMU) with sufficient insights on the consortium and its quality practices.

4.1 Quality assurance framework

This QAA pursues two objectives:

- to ensure quality of the IONIS project management and consequently, of all its deliverables,
- to furnish measurement criteria that allow the verification of the success of the IONIS project.

The IONIS work shall follow a set of procedures that ensure the quality of deliverables. These procedures are used for the QAA together with other useful administrative information (contacts, document templates, document list, abbreviations, management structure, project Web site, agenda and minutes templates).

It is important to define and use metrics that can enable the IONIS Consortium to measure the success of the project intended investigations. The results of the IONIS project will be measured through a set of success indicator that the consortium has identified.

4.2 Quality assurance metrics

The IONIS Quality Assurance Metrics (QAMs) can be categorized into management-oriented QAMs that are more related to the management procedures that will be followed in the IONIS framework and technical-oriented ones that are mapped to the success of development of the envisaged IONIS platform.

4.3 QAMs related to the IONIS management

The QAMs that are mapped to the IONIS project management can be expressed in terms of level or degree of fulfillment or implementation of several features that are summarized in the following.

- **Level of fulfillment of the role of consortium management bodies**

Several management bodies and were defined in the [DoW] in order to guarantee that the IONIS project is executed in a very professional manner in which also the different commercial partner interests are mirrored. We review here their main features. Such bodies are summarized in **Table 3**.

Table 3: IONIS defined management bodies

Body/Responsibility	Role in the IONIS project
Project Coordination	The Coordinator will chair the GA and provides leadership for the project. He brings in extensive leadership skills and good communication skills in order to mediate the different interests of the collaborating project partners (commercial companies (industry & SMEs),Public organizations, Foundations, Universities/research centres, technology creators, etc.). The Coordinator is the intermediary between the external world (first contact point for the IONIS project) and the IONIS Consortium. He is responsible for the overall scientific management of the project (incl. the technical coordination between work packages). Additionally, he is responsible for the administrative management and project controlling. This especially means: ➢ Setting up of efficient communication structures (e-mail lists; internal communication platform, etc.); ➢ Introducing quality assurance procedures; ➢ Establishing a good project culture (setting up rules of cooperation); ➢ Managing all contractual issues (IPR; exploitation, etc.); ➢ Financial management; and ➢ In time delivery of the project results. He is also responsible for the correct application of all trans-national and national rules within the IONIS project.
General Assembly (GA)	The General Assembly (GA) is the highest decision body within the project. Representatives of all partners and WP leaders (if not the representative of the organization) will be represented in the GA. Each partner organisation has one vote. The members of the GA will have sufficient seniority to take binding decisions (that they do not have to refer back to higher authority at their employing organisation). In the

	case that a member of the GA cannot attend a meeting, they may be represented by a deputy: each partner organisation will nominate its GA member and the deputy at the beginning of the project. The GA will be chaired by the Coordinator. The GA will provide a forum for the project partners to decide on general project policy issues like strategic project orientation, updated work programmes, modifications of the Consortium Agreement, financial allocation of the budget, etc. Additionally the GA will act as the highest conflict resolution level within the project. The GA meets as often as there is a requirement of such a meeting, normally twice a year (unless it decides otherwise). Additionally voting procedures and discussions can be performed either in writing or via telephone (video) conferences.
Work Package Leaders	Each Work Package Leader is responsible for his Work Package. This especially includes: ➢ assessment of progress reports and detailing of work plans; ➢ coordination of research, development and integration issues; ➢ to guarantee that the project tasks are carried out in time; ➢ the translation of technical recommendations into action; and ➢ conflict resolution within the respective Work Package. The Work Package group will convene as often as necessary, but between these meetings stays continuously in contact via e-mail or via telephone (video) conferences.

- **Level of implementation the management processes and corresponding methodologies**

As multinational and multidisciplinary project, the IONIS project has to implement a set of management processes and corresponding methodologies as illustrated in [DoW] in order to reach the aimed assurance quality for its envisaged work, **Table 4**.

Table 4: IONIS defined management processes and corresponding methodologies

Process/Methodology	Description
Communication Infrastructure and Meetings	For the success of the overall project, it is quite important that each project member is kept up to date on the present status of the project, work completed, the next steps, the outcome of meetings, the allocation of tasks as well as has access to all official documents/information. Therefore an efficient and continuous communication is vital for any project. Within the project IONIS the following communication channels will be used beside physical meetings: ➢ e-mail lists and phone calls for regular and daily communication; ➢ an Internal Communication Platform created on google.drive will keep all the information regarding the working workpackages, meeting minute, partners information (mail list, skype Ids, phone numbers). ➢ Telephone (video) conferences in order to intensify team work between physical meetings. Of special interest is the professional organisation of the first project

	meeting (Kick-off meeting). For all meetings a clear and well structured agenda will be circulated among the participants to allow them to prepare themselves for the meeting. After each meeting minutes will be distributed within the project consortium. The chairperson of the meeting will also be responsible to create a productive working environment.
Financial Management	Financial Management covers financial planning, budgeting and monitoring of costs in connection with the different partner budgets. As IONIS is a trans-national project, funding will be provided by the different national funding bodies from Switzerland, Denmark, Sweeden, Poland and Romania. Every partner will be responsible for submitting their cost statements to the national funding bodies. The project coordinator will keep track of the overall project budget and give a signal in case of a deviation.
Quality Management, Reporting and Project Monitoring	All Quality Assurance procedures will be summarized within a so called "Quality Assurance Plan" at the beginning of the project. These quality assurance procedures will be applied to all internal and external results and deliverables. Quality assurance will be the joint responsibility of all project partners at all levels of project activities. If excellent quality is to be achieved permanent monitoring of the work progress and the evaluation of processes and results are highly demanded. This will be carried out in a clear reporting and monitoring framework which will be introduced at the beginning of the project. The goal of this framework is to recognise critical situations (errors, deviations) as early as possible in the project's life cycle. This will enable the Consortium to apply corrective actions or contingency plans (if necessary) in due time.

5 Risk management, risk analysis and contingency plans

Technical/Scientific Management covers all activities to lead, monitor and guide the scientific and technological developments of the project. Day-to-day technical/scientific management is conducted at the technical work package level. It is overseen by the Project Coordination and thereby relates to the general reporting mechanisms. The Work Package leaders will be responsible for setting up and communicating Task and WP plans, holding meetings to start and monitor the work, and preparing reports and Deliverables. The WP leaders will collaborate with the Coordinator to make sure that the work is fine-tuned between WPs.

Additionally it is quite important that potential project risks have to be clearly identified and assessed. These risks can be classified into the following major groups:

- partner problems (e.g. a partner is underperforming or a partner is leaving the project),
- project execution risks (e.g. key milestones or critical deliverables are delayed),
- financial risk (e.g. performing the agreed tasks within the agreed budget),
- technological risks (e.g. key technologies or components are not available at the expected time),
- risks related to a conflict of interests (e.g. Consortium partners cannot agree because of opposite interests),
- market and user related risks (e.g. the market environment or the user views change and makes the results obsolete),
- risks related to competition (e.g. a competing solution comes up and makes the results less valuable).

The risk management is under the Project Coordinator (PC) responsibility. He will ensure, during all the project duration that the project risks are identified and covered by appropriate actions to eliminate or reduce them to a level that is acceptable by the GA. In order to provide the best possible risk management, the PC will follow the ISO31000:2009 guideline [ISO31000]. Figure 4 resumes the risk management process.

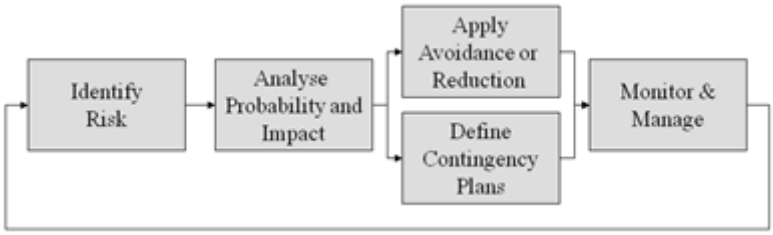

Figure 4: Proposed risk management process

In the following, a risk table is set for all risks probability and major impact on the project itself, possible countermeasures as well as contingency plans are also discussed and proposed by the project consortium. These specific risks will be carefully tracked throughout the execution of the project as "risky items". Risk analysis and contingency planning will be handled by the Project Coordination in cooperation with all partners. The IONIS risks are identified in **Table 5**.

Table 5: IONIS risks

Risk	Contingency plan	Probability	WPs
End-users withdraw from field tests	Replace them with users of the same profile.	Low	5, 3
Services do not meet expectations of end-users	Extensive and well planned surveys in the initial development stages. Optimization during field trials.	Low	3
Stakeholders are not interested or have had disappointing experiences in other projects	WP5 is especially designed to manage that risk by involving stakeholders proactively during the project.	Low	5
Delays in delivering products	Monitor, management, realistic planning, time buffers.	Medium	2-3
Financial risk (e.g. performing the tasks within the agreed budget)	All partners and mainly the CO must review the budget issues and monitor costs during the whole project.	Medium	all
Competitiveness of IONIS solution	Follow-up market survey and adapt solution to meet competition	Low	4
Intellectual properties sharing issues	Clear definition of IP strategy between all the involved parties (consortium agreement) at project start.	Low	4

6 Conclusions

This document defined the set of Quality Assurance procedures that will be used for the IONIS work in order to guarantee an excellent quality for it. As the risks that can be encountered in the IONIS framework should be handled appropriately for the project work success, a specific focus of this document was dedicated for the definition of the set of risks that can occur when performing the IONIS work, their quantification (impact, likelihood and level) and the proposed contingency plans for them.

7 Document History

Date	Changes	Version	Author
08/10/2017	TOC and first draft	1v0	L. Gilardi
14/12/2017	Contributions of partners	2v0	ALL
31/01/2018	Finalization of deliverable	3v0	EXYS

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