Project Title:	**Sensing and predictive treatment of frailty and associated co-morbidities using advanced personalized models and advanced interventions**
Contract No:	690140
Instrument:	Collaborative Project
Call identifier:	H2020-PHC-2014-2015
Topic:	PHC-21-2015: Advancing active and healthy ageing with ICT: Early risk detection and intervention
Start of project:	1 January 2016
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Project reference manual and quality plan

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Lead Author:	Megalooikonomou Vasileios (UoP)
Lead partners:	UoP

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CHANGE HISTORY

Ver.	Date	Status	Author (Beneficiary)	Description
1.0	27/2/2016	Draft	Vasiliki Simaki (UoP)	First Draft
1.1	5/3/2016	Draft	Vasileios Megalooikonomou (UoP)	Several revisions
1.2	7/3/2016	Draft	Vasiliki Simaki (UoP)	Incorporation of comments, second draft
1.3	10/3/2016	Draft	Konstantinos Moustakas (CERTH)	Review and revisions
1.4	12/3/2016	Draft	Vasiliki Simaki, Andreas Kanavos (UoP)	Incorporation of review comments,third draft
1.5	15/3/2016	Draft	Athanase Benetos (INSERM)	Review and revisions
1.6	25/3/2016	Draft	Vasiliki Simaki, Andreas Kanavos (UoP)	Incorporation of review comments, final draft
1.7	28/3/2016	Final	Vasileios Megalooikonomou (UoP)	Finalizing draft

EXECUTIVE SUMMARY

This report constitutes the Deliverable “D9.1 - Project Reference Manual and Quality Plan” of the FrailSafe (Grant agreement No 690140), and presents the management structure, the quality procedures, and the various operational tools of the Project.

The current deliverable is directly connected with "Task 9.1 Project Management" and it is expected to be utilised for the efficient management and quality assurance of all the work done under the FrailSafe project.

This deliverable has two main functions. Firstly, it is considered as the main source of reference for all consortium members covering many of the day-to-day activities and providing links to further information when required. Secondly, it is oriented to the standardization of the main processes of the project, such as, project reports, deliverables, file naming, etc. through the use of agreed procedures and templates.

The main body of this report summarizes the project facts, namely the project’s work breakdown, its inter-dependencies, and the project timetable regarding deliverables and milestones, along with the respective responsible partners. The planning progress is also described on a management level. Furthermore, the description of the Quality Plan is described as it covers the foreseen procedures for assessing the progress of the work within the project, along with corrective actions and contingency planning in case of deviations.

The current report should be considered as a living document as it will be updated regularly through the course of the project in order to address the dynamic needs and requirements for the seamless cooperation of the consortium towards the FrailSafe objectives.

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DOCUMENT INFORMATION

Contract Number:	H2020-PHC–690140	**Acronym:**	FRAILSAFE
Full title	Sensing and predictive treatment of frailty and associated co-morbidities using advanced personalized models and advanced interventions		
Project URL	http://frailsafe-project.eu/		
EU Project officer	Mr. Ramón Sanmartín Sola		

Deliverable number:	9.1	**Title:**	Project reference manual and quality plan
Work package number:	9	**Title:**	Management & Ethics

Date of delivery	**Contractual**	**31/03/2016 (M3)**	**Actual**	31/3/2016
Status	Draft ☐		Final ☒	
Nature	Report ☒	Demonstrator ☐	Other ☐	
Dissemination Level	Public ☐	Consortium ☒		

Abstract (for dissemination) This is a confidential report that summarizes the project facts, namely the project's work breakdown, its inter-dependencies, and the project timetable regarding deliverables and milestones, along with the respective responsible partners. The planning progress is also described on a management level. Finally, the description of the Quality Plan covers the foreseen procedures for assessing the progress of the work within the project, along with corrective actions and contingency planning in case of deviations.

Keywords project's work breakdown, inter-dependencies, timetable, planning progress, quality plan

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LIST OF ABBREVIATIONS AND ACRONYMS

ASB	The Advisory Stakeholder Board of the Project
DM	Dissemination Manager
DoA	Description of the Action
EAB	The Ethics Advisory Board of the Project
EM	Exploitation Manager
IPR	Intellectual Property Rights
GA	The General Assembly of the Project.
PC	Project Coordinator
PMC	The Project Management Committee of the Project.
PQB	The Project Quality Board
QM	Quality Manager
QP	Quality Plan
SC	Scientific Coordinator
STB	The Scientific and Technological Board
SM	Standarisation Manager
TL	A Task Leader
WP	Work Package
WPL	A Work Package Leader

1. INTRODUCTION

This report constitutes the Project Reference Manual and Quality Plan of the FrailSafe project and presents the management structure and tools of the Project in accordance with the ISO 9000 guidelines[i].

This report summarizes the project facts, namely the project's work breakdown, its inter-dependencies, and the project timetable regarding deliverables and milestones, along with the respective responsible partners. The planning progress is also described on a management level. Finally, the description of the Quality Plan covers the foreseen procedures for assessing the progress of the work within the project, along with corrective actions and contingency planning in case of deviations.

Particularly, the first part of this document describes the project's plan from a management perspective as it relates to:

- the roles of different actors in the project and their responsibilities;
- the project's management bodies;
- the information exchange procedures among partners and their coordination;
- the contact points of all partners
- the project's dissemination procedures;
- general guidelines for performing the required day-to-day project management activities.

Through all the above the current deliverable is setting the foundations for the efficient management of the project as it relates to the overall management of the project (Task 9.1). Quality planning is another crucial component for the successful completion of the project objectives. In this direction, the Quality Manager has reviewed all requirements in order to determine the necessary activities that need to be planned. This Plan has been prepared early in the project in order to demonstrate and provide the Consortium with the assurance that:

- The contract requirements and conditions have been reviewed;
- Effective quality planning has taken place;
- The quality system is appropriate.

A brief version of the quality plan of the FrailSafe project, which is the main subject of the D9.2 following the present deliverable, is described in the second part of the documenton in the basis of three main pillars, namely:

- the general quality control measures and actions, such as success criteria, corrective and preventative actions, contingency planning and risk management;
- the quality control of deliverables and documentation, including document types, documents naming, and document templates;
- the quality control of the whole project, including the peer-reviewing evaluation of project's deliverables.

The proposed methodology, which is being presented here, is a revision of a similar methodology already used in previous R&D projects while the proposed management and quality scheme is flexible and well-defined, thus allowing for robust Project monitoring and handling of any problems that may arise.

2. PROJECT OVERVIEW

FrailSafe is proposing a novel frailty management system based on a patient-specific approach that is part of a comprehensive plan to manage and support frailty older people, as well as explore different causes of frailty manifestation. The system will focus on monitoring older people' everyday life in order to capture manifestations related to frailty, and through augmented reality combined with state-of-the–art data mining techniques, it will build a self-adaptive personalized virtual patient model, aiming to unobtrusively help older people improve and/or prevent being frail. This will be achieved by measuring adherence to personalized guidelines that include medical treatment and lifestyle recommendations as well as evaluating the frailty level improvement as an intervention outcome. In detail, a personalised guidance platform will transmit all the measurements to a prediction engine for giving appropriate feedback to the user on how to manage and reduce frailty. The system will leverage on the ongoing integration and miniaturization of sensors to build an integrated holistic frailty self-management framework.

FrailSafe aims to better understand frailty and its relation to co-morbidities; to identify quantitative and qualitative measures of frailty through advanced data mining approaches on multiparametric data and use them to predict short and long-term outcome and risk of frailty; to develop real life sensing (physical, cognitive, psychological, social) and intervention (guidelines, real-time feedback, AR serious games) platform offering physiological reserve and external challenges; to provide a digital patient model of frailty sensitive to several dynamic parameters, including physiological, behavioural and contextual; this model being the key for developing and testing pharmaceutical and non-pharmaceutical interventions; to create “prevent-frailty” evidence-based recommendations for the elderly; to strengthen the motor, cognitive, and other “anti-frailty” activities through the delivery of personalised treatment programmes, monitoring alerts, guidance and education; and to achieve all with a safe, unobtrusive and acceptable system for the ageing population while reducing the cost of health care systems.

FrailSafe Objectives are divided into Medical (MOs) and Technological Objectives (TOs). MOs are related to the identification of quantitative and qualitative measures of frailty and the associated co-morbidities while the TOs concern the development of an ICT solution that will deliver rehabilitation, and ultimately lead to prediction, prevention and self-management of frailty symptoms.

2.1. Project Consortium

The following table summarizes the partners of the FrailSafe consortium along with the contact person details of each organization:

University of Patras (UoP)	
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Brainstorm Multimedia (BRA)	

BRAINSTORM	**Contact person:** Javier Montesa **Email:** jmontesa@brainstorm.es **Website:** http://www.brainstorm.es/
SMARTEX S.L.R. (SMARTEX)	
Smartex	**Contact person: Roberto Orselli** **Email:** orselli@smartex.it **Website:** http://www.smartex.it/index.php/en/
AGE Platform Europe (AGE)	
AGE Platform Europe	**Contact person: Maude Luherne** **Email:** maude.luherne@age-platform.eu **Website**: http://www.age-platform.eu/
Centre for Research and Technology Hellas/Information Technologies Institute (CERTH/ITI)	
	**Contact person: Konstantinos Moustakas** **Email:** moustak@iti.gr **Website:** http://www.certh.gr/root.en.aspx
AgeCare (Cyprus) Ltd (MATERIA)	
MATERIA GROUP CARE - NURSING - REHABILITATION	**Contact person: Ioanna Petridou** **Email:** ioanna_mx5@hotmail.com **Website**: http://www.materia.com.cy/
Gruppo SIGLA S.R.I. (SIGLA)	
Gruppo SIGLA esperienza ed innovazione	**Contact person: Luca Bianconi** **Email:** luca.bianconi@grupposigla.it **Website:** http://www.grupposigla.it/
HYPERTECH S.A. (HYPERTECH)	
HYPERTECH INFORMATION TECHNOLOGY	**Contact person: Kosmas Petridis** **Email:** k.petridis@hypertech.gr **Website:** http://www.hypertech.gr/
Geriatric Department, of the University Hospital (CHU) of Nancy and INSERM U1116 Nancy (INSERM)	

Inserm	**Contact person: Athanase Benetos** **Email:** a.benetos@chu-nancy.fr **Website:** http://www.grand-est.inserm.fr/

2.2. Project Objectives

FrailSafe Objectives are divided into Medical (MOs) and Technological Objectives (TOs). MOs are related to the identification of quantitative and qualitative measures of frailty and the associated co-morbidities while the TOs concern the development of an ICT solution that will deliver rehabilitation, and ultimately lead to prediction, prevention and self-management of frailty symptoms. The MOs of the project are summarized in the following Table 1:

Table 1. The Medical Objectives (MOs) of FrailSafe.

MO1	Better understand frailty and its relation to co-morbidities
MO2	Develop quantitative and qualitative measures to define frailty
MO3	Use these measures to predict short and long-term outcome
MO4	Develop real life tools for the assessment of physiological reserve and external challenges
MO5	Provide a model sensitive to change in order that will facilitate the testing of pharmaceutical and non-pharmaceutical interventions, which will be designed to delay, arrest or even reverse the transition to frailty, can be tested.
MO6	Create “prevent-frailty” evidence based recommendations for older people regarding activities of daily living, lifestyle, nutrition, etc. to strengthen the motor, cognitive, and other “anti-frailty” activities through the delivery of personalised treatment programmes, games, monitoring alerts, guidance and education and estimate the influence of these interventions
MO7	Achieve all with a safe and acceptable to older people system

Measurable Results (MRs): Quantification and evaluation of metrics that characterize frailty. The work packages WP1, WP2 and WP7 are related to the aforementioned MOs. The overall achievement of these objectives corresponds to milestones Ms2, Ms3, Ms4, Ms11, Ms12 & Ms14.

To achieve MO1 and MO2 FrailSafe will extensively measure not only the physical domain of frailty, but also the cognitive, the psychological, the functional, and the social domains. Most of these measures have never been recorded simultaneously before, and consequently, have not been correlated with frailty; furthermore, many of the proposed measures are meant to be real life tools in a real life environment, and such tools are totally lacking in clinical practice. FrailSafe will provide continuous physiological clinical state monitoring of older people based on both embedded and behaviour monitoring sensors. Specifically, FrailSafe will measure:

- cardinal physiological parameters of the cardiovascular, nervous and respiratory systems as well as aspects of the motor and metabolic and arousal/sleep state of the user as her/his case may indicate

- indoor and outdoor activity (using various sensors), locomotion changes within the home to monitor movement frequency/patterns, use of major appliances/objects reflecting reduced movement/use, inefficient movement/object use, etc.
- social interaction (measured by the number of incoming/outgoing phone calls/sms, emails, use of social networks, etc.,) and other social and behavioural parameters (through linguistic analysis of text appearing in e-mails, chat sessions or other electronic message exchanges, monitoring their location throughout the day) while respecting privacy and without becoming invasive.
- physical and cognitive activity through the use of accelerometers and a augmented reality serious game designed specifically for the individual
- self-evaluation (using various tests taken by the individual on a PDA, memory recall tests, button to indicate important episodes (e.g., memory loss, confusion, sudden fatigue), questionnaires performed in an automated way, etc).

In particular for the social interaction particular attention will be paid on the development of a natural language analysis tool that will be able to detect signs of cognitive deficiencies in electronic written text.

The outcome of the analysis of this plethora of data will be a formal and quantitative definition of a frailty metric that will be based on the aforementioned sensing dimensions. For the analysis state-of-the-art data mining techniques will be extended to provide knowledge discovery. The quantitative frailty metric (QFM) will serve as a frailty biomarker.

The quantitative and qualitative measures obtained from FrailSafe will be correlated with the conventional definitions of frailty and will be tested for their sensitivity and specificity to detect risk for transition to frailty i.e., from non-frails to pre-frails, and from pre-frails to frails (MO3). It is also envisaged that the conventional definitions of frailty will be improved and the stratification in risk groups will be expanded. It is also expected that certain measures that are not currently assessed in routine practice, and others that may not be even detected in a single visit by a health carer, can constitute prodromal signs that precede the transition from one to the other stage of frailty (MO3). These prodromal signs can be used either to identify groups of older people at an increased risk for frailty or can be used as proxy outcome measures.

FrailSafe will sense both physiological and behavioural parameters of the individual in an unobtrusive manner both indoors and outdoors (MO4). It will employ a combination of existing unobtrusive body-worn and ambient sensors (wherever applicable) and, novel sensing mechanisms for monitoring a multitude of physiological, behavioural and lifestyle data driven by the practicality of using such sensors with older people. Based on the assessment of physiological reserve and external challenges, i.e., state of an elder at a specific time, a specific intervention strategy will be adopted based on a pool of potential interventions carefully designed by sociologists and healthcare professionals and implemented in the context of the proposed project. Thus, commitment and compliance to the intervention will be by definition guaranteed since the user will do nothing more than typical everyday activities, while FrailSafe will take over the dynamic development of a serious game based on the real world interactions of the user.

Development of a personalized, predictive, physiological and environment-aware virtual patient model (MO5) will be performed that will help to appreciate and formally represent frailty and aging related disorders including major co-morbidities. This model will be able (a) to associate the adopted dynamic parameters with ageing related risks and (b) to assess the proximity of an individual’s behaviour to the goals set by a supervising health professional. In this process we will estimate, analyze and model the relation of specific co-morbidities emphasizing on gait disorders, social behaviour, sarcopenia and frailty.

FrailSafe will estimate the influence of specific interventions (MO6) in the users' quality of life, propose metrics to analyze it and evaluate methods for future interventions. The interventions will be through:

- An Augmented Reality (AR) serious game that will be dynamically synthesized and adapted to the specific individual. The AR serious game will implement several intervention strategies and will challenge the physical, cognitive, psychological, functional, and social domains.
- Recommendations using advanced HCI conversational agents regarding lifestyle, daily activity, exercise, nutrition, etc.
- Providing assistance to comply with medical recommendations
- Adjustment of drugs or drug dosage by the physician based on the objectively measured parameters by FrailSafe

The prototype will be tested and evaluated on a collection of data from a pool of different older people individuals while special emphasis will be given in the proper treatment of privacy, gender and nationality issues.

The main technological objectives (TOs) of FrailSafe are described in Table 2:

Table 2. The Technological Objectives (TOs) of FrailSafe.

TO1	Design and development of hardware components (ambient and wearable sensors, body node coordinator (e.g., smart phone) optimised in terms of ergonomics, user-friendliness compactness, unobtrusiveness and energy consumption that can be used indoors and outdoors providing functionalities for effective yet simple and economical personalized monitoring of the individual patient's condition for purposes of detecting/alerting/averting of frailty events, merged to an integrated system, explicitly taking into account security and privacy issues **(*Measurable Result (MR)*: WP3 & WP6 - Ms5, Ms8, Ms9, Ms10)**.
TO2	Design and development of efficient signal processing algorithms for low level processing including signal enhancement, activity classification, energy expenditure, and behavioural monitoring **(MR: WP3 - Ms6)**.
TO3	Development of a self-adaptive virtual patient model offering optimal services for managing frailty ranging from critical situation management, facilitating social integration to day-to-day self-management and health preservation based on a personalized patient profile **(MR: WP4, WP6 & Ms6, Ms8 - Ms10).**
TO4	Development of a generic monitoring and management infrastructure on which modular services and patient-specific applications will be built **(MR: WP3, WP4, WP5, WP6 & Ms3, Ms5, Ms6, Ms8 - M10).**
TO5	Development of novel methods for the offline management, fusion and analysis of multimodal and advanced technology data from social, behavioural, cognitive and physical activities of frail older people and application of these methods to manage and analyze the large amounts of data collected leading to integrative interpretation and better understanding of frailty, introduction of new quantitative frailty biomarkers as well as frailty metrics, correlation of co-morbidities and frailty, advanced decision making capabilities (DSS) assisting diagnosis by medical professionals **(MR: WP4, WP6 & Ms6, Ms8-Ms10).**
TO6	Development of real-time data management and data mining methods effectively making decision assessing frailty levels, detecting frailty risks and triggering alarms in case of emergency situations (e.g., fall, loss of orientation, incoherent utterances or suicidal manifestations in electronic written text[1]) based on minimal processing of real-time multi-parametric streaming data and economical personalized monitoring guided by a minimal number of sensors and parameters (FrailSafe prediction engine and Risk Factor Evaluation)**(MR: WP3, WP4, WP6& Ms3, Ms5, Ms6, Ms8-Ms10)**.

[1] A speech recognition component is not provided. Incoherent utterances and suicidal manifestations refer to written messages communicated via electronic social media.

TO7	Investigation of processing time, storage and communication trade-offs for real-time analysis at the WBAN or the phone/PDA and use of data reduction and summarization techniques for reducing raw streaming data to secondary or tertiary parameters. Effectively use virtual patient models and results from the offline data mining of multi-parametric data to make real-time analysis more efficient and targeted **(MR: WP3, WP4, WP6 & Ms3, Ms5, Ms6, Ms8-Ms10)**.
TO8	Development of a dynamically synthesized, personalized and highly innovative AR game consisting of different scenarios that will take place in the real world than in a virtual one that measures parameters of behavioural, cognitive and physical domain while implementing various intervention strategies **(MR: WP5, WP6 & Ms7-Ms10)**.
TO9	Extensive testing of the FrailSafe integrated system in several validation scenarios while ensuring compliance with ethics standards **(MR: WP7 & Ms11 - Ms14).**

Measurable Results (MRs): Note that the achievement of each technical objective corresponds to specific WP's and milestones (Ms's), which are also presented above in bold type.

Other objectives of FrailSafe are:

1. Development of effective means for translating intensive non-pharmacological interventions at home settings.
2. Encapsulation of pharmacological interventions when needed, for prevention or treatment reasons.
3. Reduction of the effort needed for the provided healthcare service as well as load of carer and the overall cost spent for the healthcare system in Europe.

In summary, the fusion of the relevant information from all the sources mentioned earlier, is expected to advance our understanding of frailty and the associated co-morbidities, measure risk of frailty, and as such, risk of adverse outcome, provide a model for testing interventions and treatments, provide a model to deliver rehabilitation, and ultimately lead to prediction, prevention or even reversal of frailty.

FrailSafe will not only increase confidence in detecting frailty symptoms and signs, but also will improve motor and cognitive capabilities of older people by providing them with assistive visual and contact feedback while performing dynamically synthesized AR games/rehabilitation programs. FrailSafe will develop an infrastructure on which novel patient-specific services will be integrated in a modular form. The service applications will manage and analyse large volumes of acquired and new multimodal and advanced technology data of older adults and individuals clinically diagnosed with frailty, and further relate the presence of frailty with the possible existence of specific co-morbidities if indicated by the caregiver. Aiming to design personalized, medically efficient and economical e-health services that will improve the self-management of older people, FrailSafe will support their overall health status, and strengthen their social activity. It will also provide means aiding their independent living, ensuring adherence to pharmacological treatments and offering at-home intense non-pharmacological interventions for maintaining/enhancing their cognitive and motor functionalities.

2.3. Project breakdown

The FrailSafe project consists of 9 Workpackages (WPs), each of which consists of up three (3) to seven (7) tasks. The detailed description of each WP and of each task within a WP can be found in “Annex I – Description of Action” of the FrailSafe Grant Agreement.

Appendix 1: Table of WPs and Tasks *:* shows the list of WPs and Tasks along with the leading WP/Task partner.

Appendix 2: Table of Deliverables with Corresponding Reviewers lists all the deliverables of the project together with the corresponding Internal reviewers.

Appendix 3: Table of Milestones summarises the milestones of the project together with their leading beneficiary and the month of delivery.

2.4. Workpackage interdependencies

The FrailSafe tasks are grouped in 9 Work Packages designed to represent and cover the objectives of FrailSafe. The work is divided into three phases: i) Architecture & Basic Research(M1-M12), ii) Applied Research & Development (M12 – M24), iii) Integration & Evaluation (M24 – M36) and horizontal activities (management, ethics, dissemination, exploitation). Project activities are broken down into manageable sections of coherent tasks. The project tasks are grouped in a total of 9 WPs, as described in a subsequent section (3.1.1.1). WP9 includes activities related to Project Management and Ethics. Furthermore, standard activities related to Administrative, Financial management of the project and its consortium will be pursued. The definition of the overall user needs, the architecture, and the system specifications of the FrailSafe infrastructure is covered in WP1. Based on requirements from WP1, WP2 will focus on two fold clinical studies. The first one will be performed for i) grounding the model with experimental data and ii) quantifying and fine-tuning the developed intervention services (WP4), while the second will serve both system optimization and validation purposes (Pilot execution in 3 sites). WP3 will undertake the planning and design of the FrailSafe sensor system. WP4 will focus on the information processing and knowledge discovery from the multimodal data streams. WP5 will create the dynamically synthesized AR games that will be adaptable to the motor and cognitive capabilities of the individual. WP6 will create the FrailSafe integrated system as well as the guidance platform. WP7 will prepare the ground for realistic test of the system, user engagement and create the detailed use-case specifications. WP6 will take input from WP2, WP3, WP4 and WP5 and channel information about progress and system capabilities to the outside world. WP8 will cover all activities related to scientific dissemination, public visibility, exploitation and commercialisation, business models and use cases, as well as both analysis of existing relevant standards, regulations & policies and the possible extensions that might spin out of the work in FrailSafe. Finally, WP9 constitutes the management and ethics effort and will span the full extent of the project. The following diagram (Figure 1) shows the Workpackage Inter-dependencies.

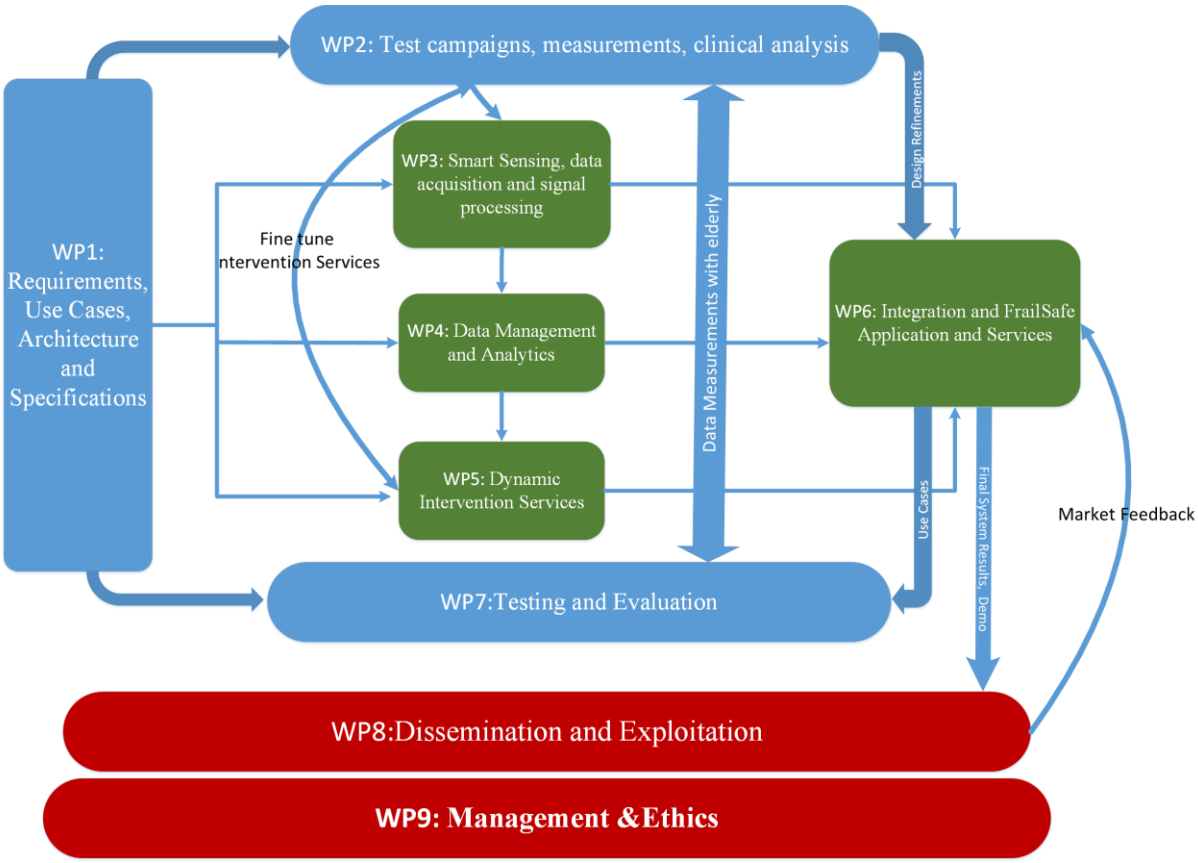

Figure 1. Inter-dependencies of the FrailSafe work packages

2.5. Task Dependencies

Apart from the description of the interdependencies among different WPs, a set of figures below demonstrates the dependencies among tasks. This is a novel approach, in order to highlight the strong influence and dependency among the WPs' tasks, and the importance of each one of them for the seamless implementation of the FrailSafe Project.

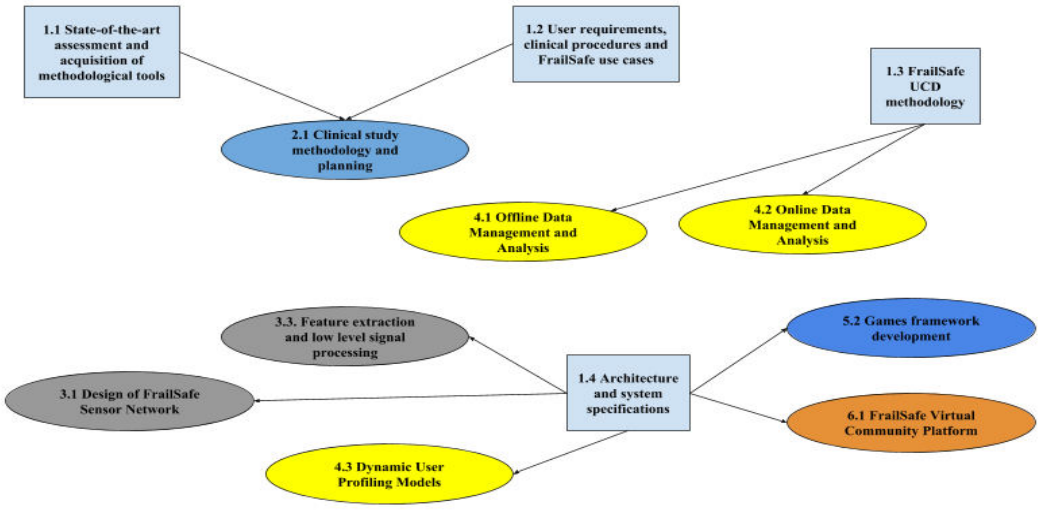

Figure 2. Task dependencies in WP1.

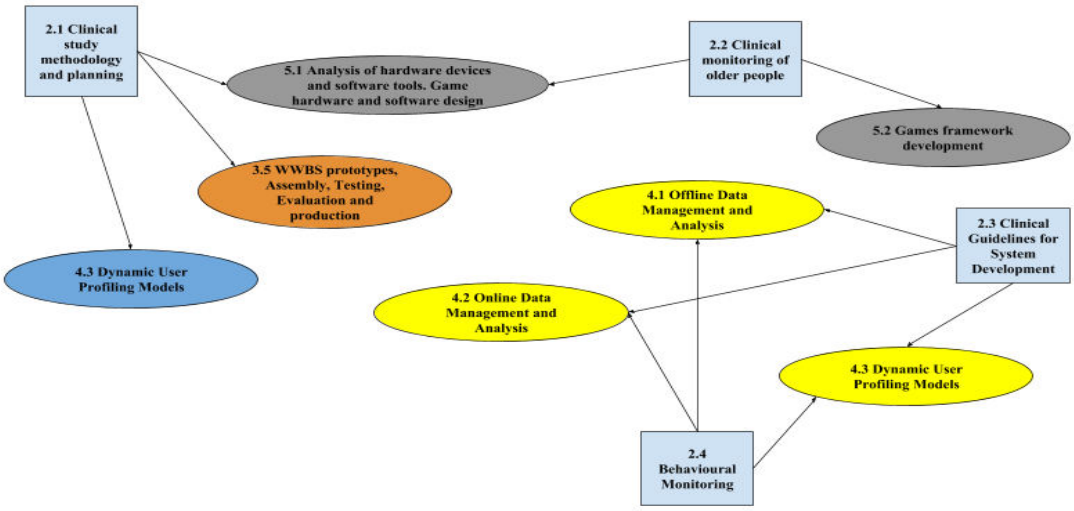

Figure 3. Task dependencies in WP2.

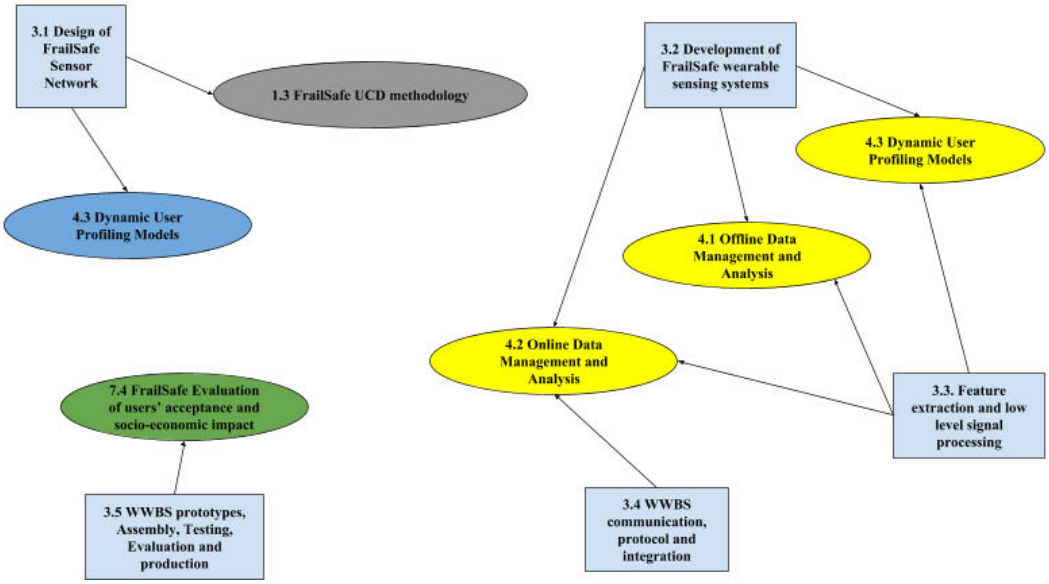

Figure 4. Task dependencies in WP3.

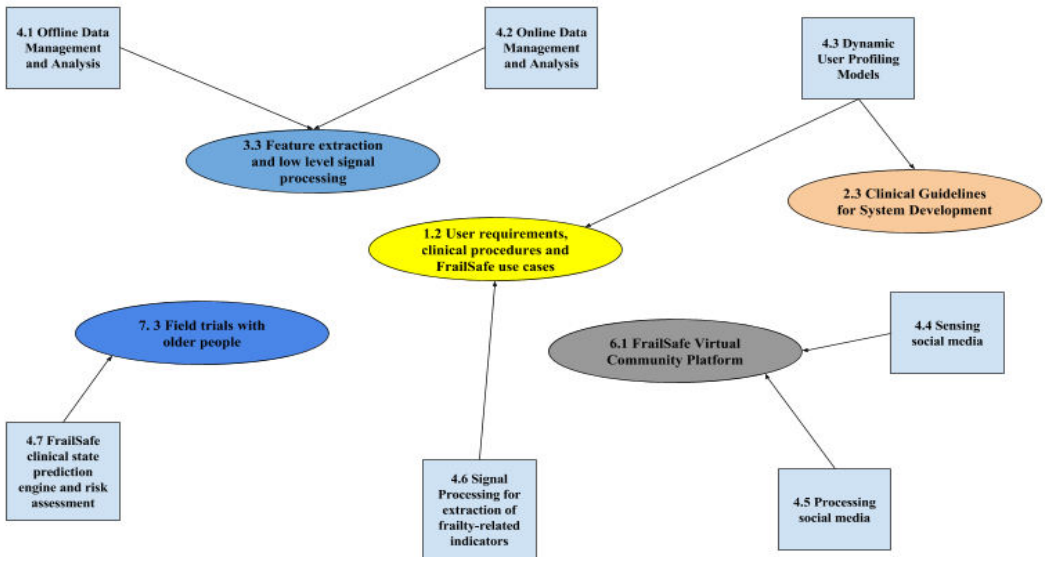

Figure 5. Task dependencies in WP4.

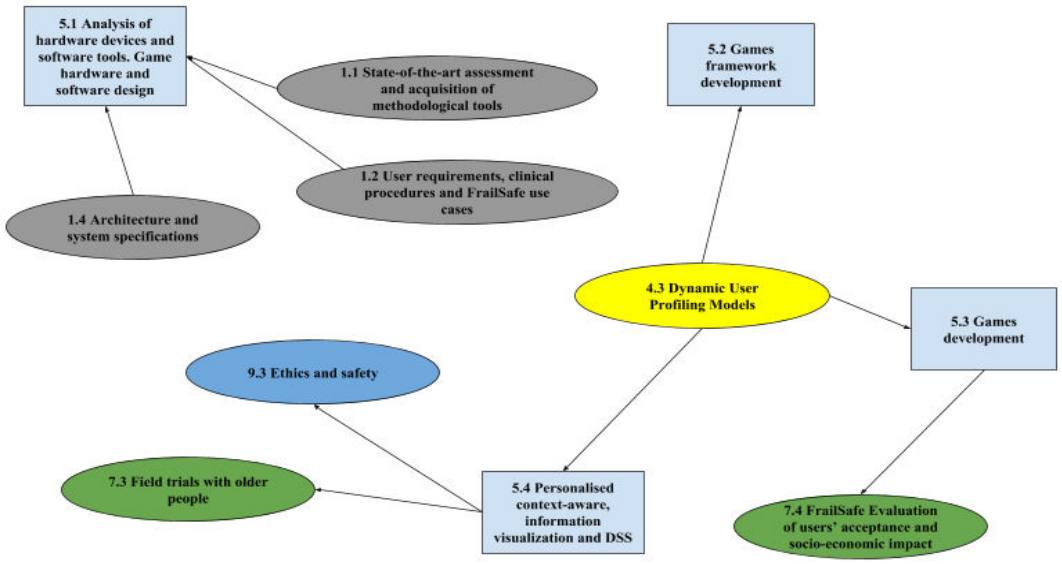

Figure 6. Task dependencies in WP5.

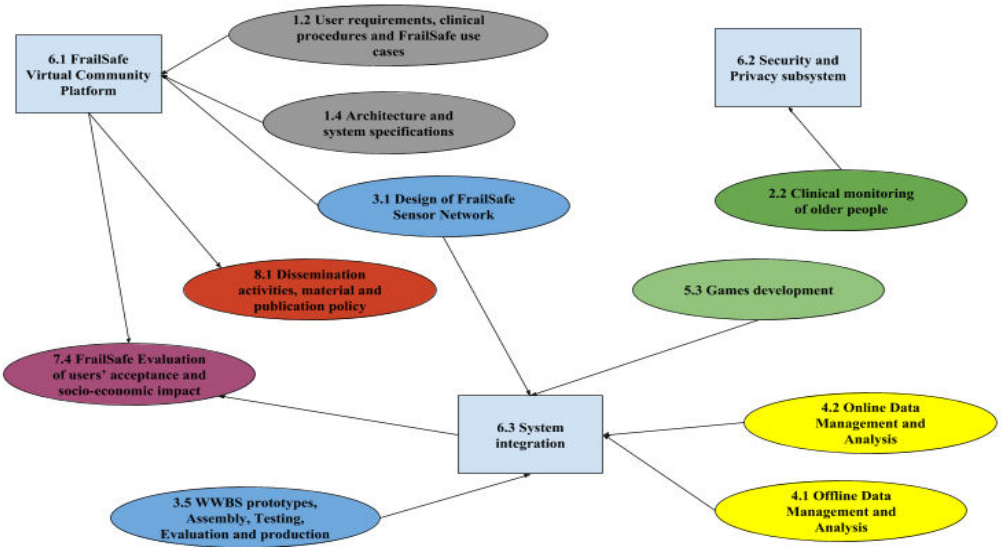

Figure 7. Task dependencies in WP6.

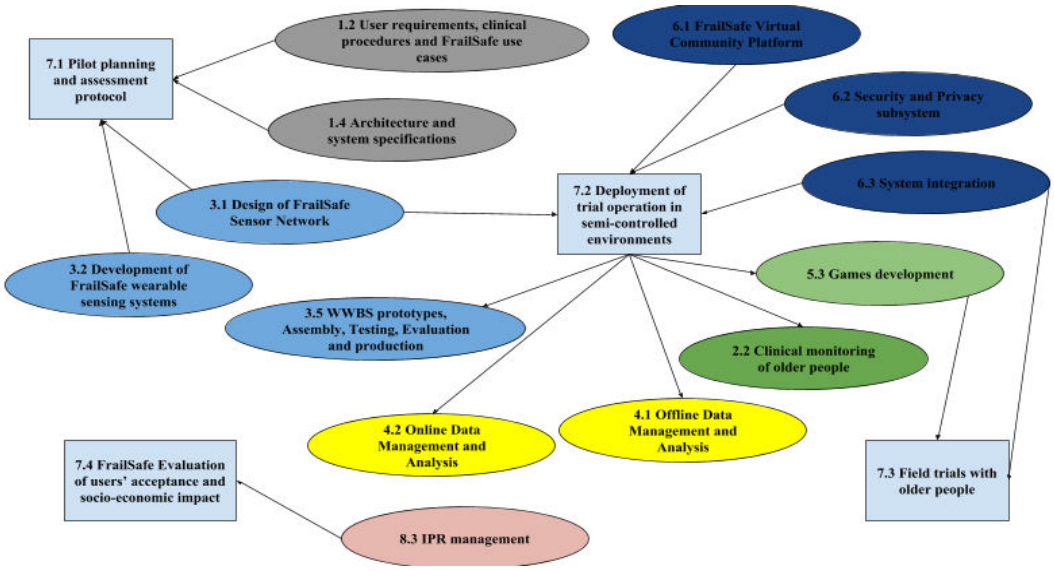

Figure 8. Task dependencies in WP7.

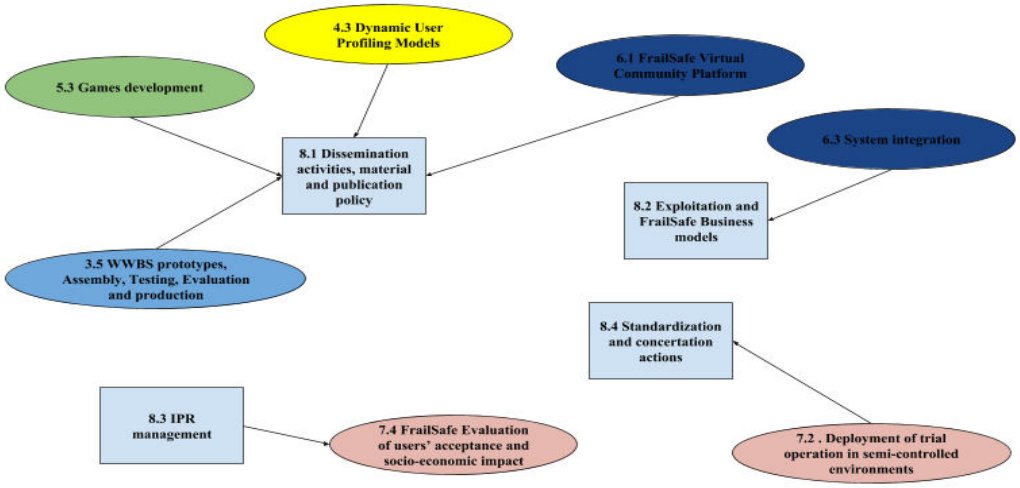

Figure 9. Task dependencies in WP8.

2.6. Project Timetable

The Timeline of the FrailSafe Project is outlined in “Appendix 4: Gantt chart of the FrailSafe project an corresponding leading beneficiaries”.

2.7. Project Measures and Indicators

The FrailSafe overall progress will be continuously monitored, measured and verified based on specific quantitative and qualitative indicators relevant to each of above mentioned medical & technological objectives. The following table summarizes the overall key measures and indicators per work package as they will define the successful conclusion of the related tasks.

Table 3. Key Success Indicators per Work Package of the FrailSafe Project

WP No	Key Success Indicator
1	Review and comparative benchmarking of available frameworks. User requirements and system specifications clearly address FrailSafe needs
2	Both clinical studies completed successfully resulting in data both for quantification and benchmarking data successfully used to quantify and fine-tune the WP5 Intervention services
	Clinical data successfully used to quantify and fine-tune the patient models
3	Successful integration of all sensors and definition of the communication framework). Sensing environment working properly and unobtrusively(100% of related WP1 specs implemented).Sensing environment seamlessly integrated with the FrailSafe system((100% of related specs implemented).
4	Improvement of frailty understanding and quantitative definition of frailty.
	Patient models interoperable and extensible
	Patient models capture both clinical record and physiological data
	Discover new biomarkers associated to frailty.
5	Review and comparative benchmarking of available Game hardware devices and software tools. Game specifications clearly address FrailSafe needs
	Development of the three versions of the game controllers and of the visualization interfacing
	Graphical users interfaces customizable to the user requirements/needs
	Information visualization framework fully parametric and customizable
6	The FrailSafe sensing and intelligent processing modules have been successfully integrated with the FrailSafe Integrated system; System integration completed successfully; all processes available from customizable front-ends.
7	The application scenarios have been successfully developed and highlight the major FrailSafe achievements
	Scientific benchmarking of the FrailSafe framework
8	Dissemination material, including the website, is available. FrailSafe market analysis and business plan highlights the major FrailSafe developments.
	Concertation activities with other projects and initiatives with similar objectives have resulted in benefit for all involved parties and new joint initiatives
9	Smooth administrative and technical management

	All potentially emerging ethical and safety issues successfully addressed

A more detailed picture of the key success measures and indicators that are very useful for the assessment of the project progress and are going to be also used by the project consortium for measuring progress of the FrailSafe developments, is presented in table 4 below:

Table 4. Key success measures and indicators of the FrailSafe Project.

WP No.	Indicator	Success Criteria		
		Year 1	Year 2	Year3
General Success Indicators associated with WP8 and 9				
Number of publications, number of workshops organized by the consortium and audience size, number of conferences attended, number of leaflets and newsletters, website, size of user forum, membership to biometric organizations and forums/ - to disseminate project concept, vision and innovation - to spread out the outcomes and achievements of the project to all interest groups		1. Web site of FrailSafe available (Month 3) 2. Project dissemination material available (posters, leaflets) as defined in WP8 3. At least 2 presentations of project objectives and results (conference proceedings, etc.)	1. Workshop Organization with external participants. Vast consensus of consortium and several experts on project business scenarios and use cases 2.At least 4 papers published in conference proceedings 3. Over 1500 web visits /month (on average) 4. Project draft video available 5. Tweets on important updates of the website and public information	1. At least 7 papers published in conference proceedings and prestigious scientific review journals 2. Acceptance by consortium end users (aim is 90%) 3. Project Video available through web site 4. Over 1500 web visits /month (on average)
Delivery of an effective, pragmatic and viable business & exploitation plan for project results uptake and commercialization potential		FrailSafe draft dissemination exploitation strategy and decisions	Revised versions of dissemination and exploitation	1. Agreement & Signature of Final Dissemination and Exploitation Plans including Business Plans 2. Exploitable products available and exploitation strategy for each of them
Increasing public interest in FrailSafe concept measured by web server logs		500-1000	1000-5000	Over 5000
General Success Indicators associated with WP1-7				

WP1 (Requirements, Use Cases, Architecture and Specifications)	Review and comparative benchmarking of available frameworks.	80%	100%	
	User requirements and system specifications clearly address FrailSafe needs	70% of user requirements and FrailSafe needs identified through questionnaires and first phase of test campaign	100% of user requirements and FrailSafe needs identified through questionnaires and first phase of test campaign	
WP2 (Clinical studies, measurements, clinical analysis)	Percentage of clinical studies completed successfully resulting in data both for quantification and benchmarking data successfully used to quantify and fine-tune the WP4 data management/analytics and WP5 Intervention services	40%	100%	
	Standardization of the procedures and protocols for the	100%		

	clinical studies and objective measurements of performance collected through various means and analyzed			
WP3 (Smart Sensing, data acquisition and signal processing)	Integration of sensors and definition of the communication framework	40%	100%	
	Sensing environment working properly and unobtrusively	30% of the supported sensing capabilities ready and functional	100% of the supported sensing capabilities ready and functional	
WP4 (Data Management and Analytics)	Completion of data analysis algorithms based on specific physiological input parameters	30%	100%	
	Measurable improvement of the developed approaches with respect to	Key performance indicators identified for benchmarking	10-30% improvement	

	the SoA schemes in a simulated environment			
	Percentage of developed elderly models that capture clinical and physiological data	20%	80%	100%
	Number of physiological variables of the elderly models linked to frailty		2	4
WP5 (Dynamic Intervention Services)	Review and comparative benchmarking of available Game hardware devices and software tools	80%	100%	
	Development of the game controllers and of the visualization interfacing	20%	100%	
	Graphical users interfaces	20%	100%	

	customizable to the user requirements/needs			
	Information visualization framework fully parametric and customizable	10% of the functionality available in the first year for demonstration purposes	60% of the functionality available including visualization of the metrics currently available	100% of the functionality available including all metrics envisaged in FrailSafe
WP6 (Integration and FrailSafe Application and Services)	Completion of FrailSafe sensing and intelligent processing modules integration		30%	100%
WP7 (Evaluation)	Number of novel biomarkers and frailty metrics identified based on information visualization		1--3	3--5
	Percentage of number of users with positive feedback on the FrailSafe system	Key performance indicators identified for benchmarking user feedback	More than 60% of the participants	More than 90% of the participants

3. ORGANISATIONAL MANAGEMENT STRUCTURE OF THE PROJECT AND COORDINATION AMONG THE PARTNERS

This section will describe the FrailSafe Project Management that will be executed by a set of project management instruments comprised of different members and having different responsibilities.

3.1. Overall Management Structure and Procedures

The management of FrailSafe project is based on three main coordination activities, namely:

- coordination of different project tasks and activities;
- quality assessment regarding project's initiatives and;
- control of work flow of each work package.

The ultimate goal of organisational management structure is to ensure the fulfilment of project's objectives as well as maximize the effectiveness of derived outcomes. It is noted that any modifications or potential risks concerning the project structure will be managed throughout the early stages of the project and proactive planning will be implemented for the proper diffusion and exploitation of the FrailSafe outcomes throughout and after the project lifecycle.

The main project management instruments are

- The Project Management Board (PMB) consisting of the Project Coordinator (PC), the Scientific Coordinator (SC), the Quality Manager (QM), the Dissemination Manager (DM), the Exploitation Manager (EM) and the Standarization Manager (SM). These members constitute the strategic level of the FrailSafe project management and are in charge of decision making related to project objectives and outcomes, to the contractual responsibilities with the European Commission and finally to any considerable project changes.
- The Project Quality Board (PQB) consisting of the Project Coordinator (PC), the Scientific Coordinator (SC), the Quality Manager (QM), the Standardisation Manager (SM) and a representative of older persons (chosen by the General Assembly from names suggested by the organisation representing and working with senior citizens in the project). The PQB has an assisting role to the General Assembly.
- The General Assembly (GA) is the ultimate and main decision body of the project and it is chaired by the Project Coordinator (PC), and consists of representatives of all participants. This panel encompasses the diversity in the project's consortium and will be the foundation for the successful cooperation for the fulfilment of the tasks' objectives and production of the expected outcomes. This board is also responsible for the implementation decisions taken from the other boards and activities to be undertaken for realizing the project.
- The Scientific and Technological Board (STB) is composed of WorkPackage Leaders (WPL). It is responsible for discussing and leading the technological aspects in day-to-day technical work, managing the dependencies between various tasks, coordination of technical progress
- Advisory Stakeholder Board (ASB) is a board of industrial members as well as stakeholders from outside the consortium, established and appointed by the General Assembly in the first months of the project. This board is responsible for the project's assessment, steering, revision of deliverables, and consultancy, and the commercial exploitability of the projects' results.
- Ethics Advisory Board (EAB) or Ethics Committee is a board responsible to pre-approve the informed consents, all stages of experiment implementations, as well as

data handling approaches. All project's investigators will agree to abide to the "FrailSafe Ethics Committee" recommendations.

The different roles of the above described managerial structure were defined in order to avoid any possible overlaps and strengthen their complementary. In this direction, their main responsibilities are described analytically in the following sections in order to clearly define their different but complementary roles within the project.

3.2. Project Coordinator (PC)

The PC is mainly responsible for the following tasks:

a) The preparation of quarterly, annual and final reports (administrative part);

b) Collection and consolidation of project financial statements;

c) Preparation of Consortium meetings;

d) Representation of the Consortium towards the EU;

e) Distribution of the EU financial contribution.

In addition to the above the PC is charged with the following responsibilities:

a) Administration, preparation of meeting minutes;

b) Provision of the chairman of the Plenary Board, and follow-up on its decisions;

c) Sharing of any documents and information connected with the Project between all the related partners;

d) Decision whether a partner has to provide to the PC a bank guarantee or a parent guarantee, based on the financial situation of a partner;

e) Establishment of detailed management work plans for the Project;

f) Day-to-day running of the Project;

g) Overseeing action plans and monitoring timely execution before their due date and within the given resources;

h) Proposing resource and/or time shifts between Beneficiaries and Tasks;

i) Interacting with the EU and the parties about the Project, including the submission of the Deliverables, Progress Reports and Cost Statements.

Based on the fact that the FrailSafe project includes many partners from different countries and backgrounds UoP will use highly experienced staff for the financial control and the secretariat of the project. In addition the Project Office will provide feedback to the partners upon request and in a timely manner and will issue guidelines from the start of the project and will revise them, when necessary. Finally, this service may organise, upon request, remote training courses and seminars for the managerial and administrative personnel of the Partners. The Coordinator is the interface to the EU and external actors and is responsible for the timely and high quality delivery of all technical reports (Deliverables, Progress Reports, and Final Report) and financial / administrative reports (cost statements, Project review reports) to the EU.

Taking the above responsibilities into consideration, the role of the Project Coordinator & Project Manager is assigned to Prof. Vasileios Megalooikonomou of UoP.

Prof. Vasileios Megalooikonomou received his B.S. in computer engineering and informatics from UoP, Greece in 1991, and his M.S. and Ph.D. in computer science from the University of Maryland, Baltimore County, USA, in 1995 and 1997, respectively. He has been on the faculty of Johns Hopkins University, Dartmouth College, Temple University and

recently UoP, Greece where he is now a Professor. He has co-authored over 160 refereed articles in journals and conference proceedings and three book chapters. His main research interests include biomedical informatics, data mining, data compression, pattern recognition, and multimedia database systems. Prof Megalooikonomou is a member of the ACM, SIAM, SPIE, and OHBM. He received a CAREER award from the National Science Foundation in 2003 to work on developing data mining methods for extracting patterns from medical image databases. In the US he has served as a principal investigator (PI) or a co-PI on 8 research projects supported by the National Science Foundation, National Institutes of Health, Pennsylvania Department of Health and the Lockheed Martin Corporation with a total budget of $4.5 M. During the last 3 years he has served as the scientific coordinator of the FP7 ARMOR project (http://armor.tesyd.teimes.gr/welcome) and the BIOMEDMINE project (http://mdakm.ceid.upatras.gr/web/biomedmine/home).

3.3. Scientific Coordinator (SC)

The aim of the SC is to help the PC in the monitoring of the pace of the work, to guarantee the compatibility and complementarily of the followed approaches, preside in technical meetings and propose mitigation strategies to scientific problems. The Scientific Coordinator will co-chair the Scientific & Technological Board (STB) along with the STB chair which Prof. Moustakas from CERTH and the PC and will coordinate the basic and applied research activities of the project. The SC will ensure that research directions are pursued compliant with user needs and requirements of the final solution and ensure a smooth transfer of research results to the development phase. The SC will also lead scientific dissemination activities.

The Scientific Coordinator:

a) will be acting on defining the qualitative and quantitative aims of each Task;

b) will be checking the proposed methodology and work-pace;

c) is responsible for the compliance between different subsystems and applications.

Taking all the above into account the role of the Scientific Coordinator is assigned to Dr. Athanase Benetos of INSERM

Dr. Athanase Benetos is a full Professor of Internal Medicine and Geriatrics, since 2002.He also serves as head of the Department of Geriatrics at the University Hospital of Nancy since 2007 and as head of the Hospital-University Federation on Cardiac and Arterial Aging (FHU-CARTAGE) created in 2015. He is a senior Researcher at the National Institute of Biomedical Research unit (INSERM) U684 (currently renewed as INSERM UMR S1116) at Nancy since 2005 and head of the Geriatric section of the Centre of Clinical Investigations of CHU of Nancy (CIC-CHU). Prof. Benetos received his PhD from the University of Paris VI and was a Research Fellow at Boston University from 1984 to 1987. He was Senior Consultant in Hypertension at the Broussais Hospital, Paris, from 1988 to 2002. He was also Chief of the Epidemiology Department of the Centre Médicald'Investigations Préventives et Cliniques, Paris, from 1995 to 2002. Prof. Benetos is member of several French national and international medical societies and has positions in several international peer- reviewed journals. He has authored more than 311 publications in peer-reviewed international scientific journals and has participated in several scientific books on the topics of telomeres, hypertension, cardiovascular risk and arterial aging. His research interests include biomarkers of ageing, telomere dynamics, epidemiology, genetics and treatment of the age-related changes in large arteries, as well as the role of hypertension and other risk factors on cardiovascular morbidity and mortality.

3.4. Quality Manager (QM)

The QM is responsible for the administration of the Quality Plan, and has the authority to identify problems during internal audits. The QM is the person who has the authority to manage, perform and verify all quality work. This is documented in the quality manual and is meant to encompass the following aspects:

- Devise a detailed Quality Control Strategy and Criteria for each Project Deliverable;
- Consult WP Leaders on the expected technical and cost-benefit characteristics of the WP Deliverables at the beginning of the Project. Update these requirements continuously during the projects timeline;
- Reassure the conformity of all Consortium Deliverables with the initially defined criteria, and guarantee that they are in accordance with the "FrailSafe Grant Agreement - Description of Work";
- Initiate any required action in order to prevent the occurrence of any non-conformity;
- Identify and record any relevant problem;
- Initiate, recommend and/or provide solutions through the reporting system;
- Monitor and control further processing, delivery or installation of any preferred solution to ensure that any reported non-conformance has been corrected.

Based on the above the role of the Quality Manager is assigned to Prof. John Ellul of UoP

Assoc. Prof. John Ellul obtained his medical degree from the University of Parma, Italy in 1987. Whilst working in hospitals in United Kingdom, he completed his Specialization in Geriatric Medicine and Gerontology (1991) in the University of Parma, Italy. He holds a Doctor of Medicine degree University of Liverpool, UK (1996). He obtained the specializations in General Medicine (2001) and Neurology (2007) in Greece. Dr. Ellul works in the Department of Neurology of the University of Patras since 2001. His research activities in cerebrovascular diseases include the identification of prognostic factors (genetic/inflammatory/markers of atherosclerosis) for stroke severity and functional outcome in patients with ischemic strokes. He has a special research interest into movement disorders and he has participated in studies of the wider effects of deep brain stimulation in patients with Parkinson's disease, dystonias and tremors. Dr. Ellul has participated in international multicentre trials (i.e., IST, PROGRESS, PROFESS, PERFORM), has been a holder of a research grant from the "Karatheodoris programme" (2005-2007) and has participated in the European NEUROWEB programme (2006-2008). He has published over 65 articles in international peer reviewed journals with almost 800 citations (excluding citations from multicentre studies), and two book chapters. Dr. Ellul has a strong involvement over the last decade with the Geriatric and Gerontology Society of Southwest Greece; he has always been a member of the board, president (2010-2014) and since 2014 he serves as a vice-president. Geriatric and Gerontology Society of Southwest Greece is an active, scientific, non-profit society working with elderly and their families.

3.5. Dissemination Manager (DM)

The Dissemination Manager is responsible for the strategic design, implementation and management a range of on-line & off-line communication strategies targeting the engagement of the media toward the dissemination of the projects goals and outcomes to the intended target groups. The DM should always take into account the multidimensional

nature of the project and work towards the dissemination of its results to patients and their families, doctors and medical researchers as well as companies and institutions in the medical field and in the field of technology, as well as the general public. The main responsibilities of the DCM can be summarized on the basis of the following list:

a) Develop strategic communications planning for promotion and dissemination of the FrailSafe goals and objectives as well as the outcomes and results of the project;

b) Work closely with the targeted groups and project stakeholders for the design of an efficient and effective dissemination strategy;

c) Develop promotions and communications liaising with other EU projects in the areas of health and technology;

d) In conjunction with the web team, create, adapt, improve and optimize web communication;

e) Coordinate all activities towards dissemination of project results (website, brochures, flyers, scientific publications, events)

f) Be the main responsible for the participation to cultural events and conferences

g) Maintain connections to other projects and inform the consortium about relevant activities from outside the project

Based on the above the role of Dissemination and Communication Manager is assigned to Maude Luherne of AGE Platform Europe

Ms. Maude Luherne, Projects and policy officer for long-term care and elder abuse. Since 2009 she coordinates projects in the field of the fight against elder abuse and the quality of long-term care services. She is also in charge of voicing older people's organisations opinions and involving users in research projects in the field of integrated care, ICT and care, and in palliative and end of life care. She is finally responsible for activities of dissemination and communication, as well as preparing policy recommendations and policy briefs in research projects.

3.6. Exploitation Manager (EM)

The Exploitation Manager is responsible for the systematic and sufficient exploitation of the FrailSafe results and outcomes as they form during the lifetime of the project. The role of the EM will be to work towards the commercial success of the project outcomes. A plan for the exploitation of the FrailSafe system will be developed and is going to be regularly updated with the input of the related stakeholders and the project consortium. Furthermore, the EM will be responsible for the protection of any intellectual property arising from the work of the FrailSafe project. In detail the role of the EM can be summarized as follows:

a) Undertake the responsibility to submit high-quality and competitive proposals for the exploitation of project outcomes during the course of the FrailSafe and based on the input from stakeholders and the project consortium

b) Work towards exploitation opportunities and stimulate ideas on exploitation means in the research domains of the project by identifying potential scientific research collaborating networks.

c) Identify synergies in the activities of the project with other national and European entities and projects that could produce a unified and innovative product to be exploited.

d) Develop a clear exploitation plan to secure the project’s Intellectual Property, and ensure its sustainability beyond its lifetime.

e) Cooperate with initiatives aiming to boosting competitiveness, entrepreneurship and innovation, at European level.

f) Contribute to the activities required for disseminating target project results, and ensure visibility of the project's outcomes in the field of commercialization.

The Exploitation Manager will also maintain proper management of IPR in the consortium, which will be specified in the Exploitation plan.

Based on the above the role of Exploitation Manager is assigned to Mr. Kosmas Petridis of HYPERTECH

Mr. Kosmas Petridis, MSc, has received his Bachelor of Science in Computer Science from University of Crete (1996) and his Master of Science in Advanced Computing & Communication Systems from Aristotle University of Thessaloniki (2008). He has been actively involved in EU-funded research since 2000 as a research associate in Centre for Research and Technology Hellas/Information Technologies Institute (CERTH/ITI). Since 2007 he is Project Manager at HYPERTECH and he has significant experience, acting as IT manager and technical team leader in numerous national and international commercial and R&D projects in the fields of web and mobile development, business intelligence and analytics.

3.7. Standardisation Manager (SM)

The Standardisation Manager is responsible to coordinate all activities towards standardization (involvement in standardization bodies, technical recommendations, etc.) in the consortium. He will cooperate with all partners that are represented in standardization bodies and will establish connections with further relevant institutions. He will further lead the definition of the standardization plan in the consortium. His concertation activities are to establish links to current, relevant projects.

Based on the above the role of Standarisation Manager is assigned to Dr. Cristiana Degano of SIGLA

Dr. Cristiana Degano (Eng. Degree, PhD) (female) is the Chief of "Research & Development" Division of GS. Currently, her main research activity deals with requirements analysis of health systems, particularly devoted to users' centric analysis, mHealth applications and sensor networks. She is member of scientific and technical board of Transit Pole, member of the Steering Committee of SIIT PMI district, teacher of several courses in the area of "Automatic Control" and "Automated Manufacturing", supervisor of several Laurea Thesis. She was consultant of several companies and public entities (D'Appolonia, TRT Trasporti Milano, Chamber of Commerce of Genova, Enterprise Europe Network – ALPS Liguria).

3.8. Project Quality Board (PQB)

The Project Quality Board consists of the Project Coordinator (PC), the Scientific Coordinator (SC), the Quality Manager (QM), the Standardisation Manager (SM) and a representative of older persons. The Representative of older persons is chosen by the General Assembly from the names suggested by the organisation representing and working with senior citizens in the project (AGE). The PQB has an assisting role to the General Assembly.This board ensures that all project outcomes (e.g. milestones, deliverables, tools, internal reports) are of high quality, while they are responsible of detecting and managing important deviations concerning planned resources and results. Since they constitute the quality assurance committee, they are equipped with a comprehensive quality plan delivered early in the project and addressing related issues.

The initial representative of older persons is Liz Mestheneos (liz.mestheneos@gmail.com). She is member of the organization 50+ Hellas in Greece and former President of AGE Platform Europe. With an academic background, she has very good knowledge of EU projects, the topic of care for older persons and new technologies. In case she cannot attend meetings or contribute, she will be replaced by Mrs. Judy Triantafillou (judy.triantafillou@gmail.com), also member of 50+ Hellas and with a long experience in the field of care for older persons.

3.9. General Assembly (GA)

The General Assembly will have overall responsibility for the financial and administrative aspects of the project. This panel encompasses the diversity in the project's consortium and will be the foundation for the successful cooperation for the fulfilment of the tasks' objectives and production of the expected outcomes. This board is also responsible for the implementation decisions taken from the other boards and activities to be undertaken for realizing the project. In particular, the committee will:

(a) Decide on the strategies of the project within the framework of the contract;

(b) Assess the impact of any changes to the contract or its terms suggested by the European Commission and respond accordingly;

(c) Review the policy and strategies of dissemination and publicity, in particular with regard to releasing project information to the outside world.

The GA is chaired by the project coordinator (PC) and the project Scientific Coordinator (SC) and is formed by one representative from each partner of the consortium. GA is the main administrative decision-making body of the consortium. It is in charge of all formal decisions regarding relations with external organisations, policies for promotion of results, and administrative arrangements. In order to minimise management overhead and project costs, partners are required to take part only in meetings concerning their affairs. Any partner is obliged to consult the GA prior to any action or decision that might affect the overall architecture of the software or the "public" image of the consortium. Each member of the assembly has one vote, but can also transfer this vote to another member of the committee. This is done on a per-decision basis.

The initial GA synthesis is:

Partner Short Name	GA Representative	Email address
UoP	Vasileios Megalooikonomou	vasilis@ceid.upatras.gr
BRA	Javier Montesa	jmontesa@brainstorm.es
SMARTEX	Roberto Orselli	orselli@smartex.it
AGE	Maude Luherne	Maude.Luherne@age-platform.eu
CERTH	Konstantinos Moustakas	moustak@iti.gr
MATERIA	Marina Polycarpou	agecare@cytanet.com.cy
SIGLA	Cristiana Degano	cristiana.degano@grupposigla.it
HYPERTECH	Kosmas Petridis	k.petridis@hypertech.gr
INSERM	Athanase Benetos	a.benetos@chu-nancy.fr

Each GA Member may, if absolutely necessary, be represented at GA meetings by a representative (from the same organisation) who will act and vote on his behalf. All GA Members have a single vote.

The PCC decisions that require a majority of 2/3 after anonymous voting include:

a) Change of a Deliverable, Task, WP or time plan.

b) Acceptance of a new partner in the Consortium.

c) Exclusion of a partner from the Consortium.

d) Substitution of a physical person that belongs to the Key Persons of the project. Key Persons are considered to be the: Project Coordinator, Scientific Coordinator, and Quality Manager.

e) Change of a Beneficiary's budget over 20% of its original value.

Simple majority from the GA is required in order to:

a) Change a contractor's budget under 20% of its original budget.

b) Transfer of funds between activities WPs.

c) Proceed to any other decision not mentioned above.

If the need arises for the GA to vote on an issue before the next planned meeting, then the PC shall arrange for a tele-voting procedure (e.g., through the exchange of emails).

3.10. Scientific and Technological Board (STB)

The Scientific and Technological Board (STB) is chaired by CERTH. It is composed of work package leaders. The task of this board is to discuss technological aspects in day-to-day technical work, as well as managing the dependencies between various tasks and coordination of technical progress. The STB will be led by CERTH, supported by the PC and the SC.

The initial STB synthesis is:

WPs	**WP Leaders**	**email**
WP1	Konstantinos Moustakas	moustak@iti.gr
WP2	Athanase Benetos	a.benetos@chu-nancy.fr
WP3	Roberto Orselli	orselli@smartex.it
WP4	Andreas Kanavos	kanavos@ceid.upatras.gr
WP5	Javier Montesa	jmontesa@brainstorm.es
WP6	Luca Bianconi	luca.bianconi@grupposigla.it
WP7	Ioanna Petridou	ioanna_mx5@hotmail.com
WP8	Kosmas Petridis	k.petridis@hypertech.gr
	Maude Luherne	Maude.Luherne@age-platform.eu
WP9	Vasileios Megaloikonomou	vasilis@ceid.upatras.gr

3.11. Advisory Stakeholder Board (ASB)

The Advisory Stakeholder Board, chaired by BRA, is a board of industrial members as well as stakeholders from outside the consortium, established and appointed by the General Assembly in the first months of the project. This board is established and appointed by the General Assembly in the first months of the project. It is maintained by the ASB coordinator of the project (BRAINSTORM) and consists of the industrial members as well as stakeholders from outside the consortium. The ASB's major responsibilities:

- project assessment, steering, revision of deliverables, and consultancy
- monitor and control that the project outcomes maintain commercial exploitability of results
- assist and facilitate the decisions made by the General Assembly (non-disclosure agreement)

The initial ASB synthesis is:

ASB's member name	Information
Jim Playfoot	Director of Strategy & Ideas Jim is co-founder of White Loop and a technology implementation expert with 15 years' experience consulting and managing large public and private sector projects. He is also a respected communications expert, has been widely published and is emerging as one of the UK's leading social entrepreneurs. Jim founded and is the CEO of the Creative Network. He also writes regularly on innovation, creativity and communication.
Dr. Malena Fabregat	PHD in Sociology of Health and specialist in Socio-Technological Change. She is also Advanced Studies Diploma in Educational Psychology. Since 2001 to date has participated in 33 research projects I + D + I, highlighting those funded by the European Commission.
Filios Savvides	Is a UK Chartered accountant, an ex auditor and banker. He is currently active in a broad spectrum of activities, including active ageing, youth employment and training, and environmentally related grass roots projects. He is President of Materia Group (a private sector social business for the elderly), a director at Tigadoo (a private sector social business for the young), a Board member of Gerontology Research Centre (GRC) and the President of Youth Employment / Training Foundation (IEEN).

3.12. Ethics Advisory Board (EAB)

Ethics Committee is a board responsible to pre-approve the informed consents, all stages of experiment implementations, as well as data handling approaches. All projects' investigators agreed to abide to the "FrailSafe Ethics Committee" recommendations. An experienced ethics supervisor provided by INSERM will constitute the project Ethics Advisory Board supervisor, assisted by external experts, if needed. His major role is to oversee all relevant issues and to train participants on how to abide with the recommendations of the Ethics Manual.

The initial EAB synthesis is:

EAB's member name	Partner short name	Contact
Athanase Benetos	INSERM	a.benetos@chru-nancy.fr

Kimon Volikas	MATERIA	kvolikas1@gmail.com
John Ellul	UOP	ellul@upatras.gr
Vasileios Megalooikonomou	UOP	vasilis@ceid.upatras.gr

3.13. Intellectual Property Rights (IPR) Working Group

The IPR Working Group which will be refined during 1st year and completed by M12 is chaired by HYPERTECH. There is already an informal agreement as to a mechanism by which the rights to intellectual property of each partner should be commensurate with the amount of effort each partner will contribute to the development of exploitable outcomes. Baseline for IPR negotiation: BRA has background ownership of the real-time graphics engine to be used in the 3D gaming platform. With respect to foreground, the main integrated developments are presented in DoA. During IPR negotiations a mechanism will be agreed whereby the remaining partners will be compensated and a vehicle will be established for the exploitation of the FrailSafe product/services. The IPR Working Group comprises a representative from each partner organisation.

The IPR WorkingGroup synthesis is:

IPR Working Group member name	Partner short name	Contact
Panos Sabatakos	HYPERTECH	p.sabatakos@hypertech.gr
Christiana Degano	SIGLA	cristiana.degano@grupposigla.it
Roberto Orselli	SMARTEX	orselli@smartex.it
Elena Morant	BRAINSTORM	emorant@brainstorm.es
Athanase Benetos	INSERM	a.benetos@chru-nancy.fr
Filios Savvides	MATERIA	fsavvides@cytanet.com.cy
Dimitrios Tzovaras	CERTH	dimitrios.tzovaras@iti.gr
Ilenia Gheno	AGE	Ilenia.Gheno@age-platform.eu
Vasileios Megalooikonomou	UOP	vasilis@ceid.upatras.gr

3.14. WORK PACKAGE COMMITTEES

In the FrailSafe project there are eight (8) Work Package Committees (WPC); one for each non-management WP of the Project. Each WPC consists of the WP Leader and one representative for each Task leading Beneficiary. The role of this committee is to resolve any WP internal conflicts and coordinate work distribution among different Tasks of the WP in question. WPC are chaired by their corresponding WP Leader. WPC will meet (WP technical meetings) on a regular basis (usually, as mentioned above, in conjunction to meetings of the GA) upon suggestion of the WP Leader and agreement of the PC.

3.14.1. Responsibilities of WP Leaders

Each work package leading beneficiary will be represented by one person, namely the WP Leader (i.e. eight physical persons in total, one for each non-management FrailSafe WP). Table 5 lists all the workpackages of the FailSafe project together with the respective responsible partner. WP Leaders are responsible for their WP's management. They may arrange technical meetings for their WP, usually in conjunction to meetings of the GA (e.g. one day before or after) to reduce travel costs, unless it is necessary to travel to a certain location for a specific technical reason. Each WP Leader will confer and collaborate with the corresponding WPC

The WP Leaders have the following functions:

a) managing and co-ordinating the work within the WP;

b) ensuring that the Deliverables of the WP are produced and delivered according to the Project plan;

c) producing periodical control reports and sending these to the PC;

d) proposing detailed work plans for their WP;

3.14.2. Responsibilities of the Task Leaders

Task Leaders are responsible for performing the work as described in the individual Tasks of the Project. Each Task Leader is responsible for conducting the task at hand, communicating with contributing partners and asking for input and feedback and for editing Deliverables, Internal Reports that are stemming from the task in question.

Task Leaders are responsible for delivering Deliverables and other products in due time to the QM and, thereafter, for implementing the changes proposed after the peer review process as defined by the Quality Plan.

3.15. Project Office

In order to satisfy Project Coordination core responsibilities outlined in the previous Section 3.2, a Project Office will be organised by UoP, offering services such as financial control, secretariat, external relations, and help-desk to the partners. More specifically, the project office will provide the required administrative assistance in the implementation of the project in order to coordinate the working groups and ensure that the project delivers the expected results. It will be responsible for all contingencies and will manage corresponding actions. To this end, EU financial contribution will be collected and disseminated and project financial statements will be prepared. The project office also collects the partner inputs for the financial statements. It is part of project management and is managed by the project coordinator. Thus, this part is undertaken by UoP (Prof. V. Megalooikonomou), who has a profound experience in coordinating big consortiums and will use highly experienced staff for the financial control and the secretariat of the project.

3.15.1. Administration Office

The Administration Office (ADO) includes Financial Control and Secretariat, located at the coordinator premises, UoP.

The **Financial Control** will be in charge of monitoring the Annual Cost Statements and obtaining the FrailSafe Partner MMs and expenditure on a Quarterly (3-month) basis. The Financial Control Office will also respond and provide critical feedback to the Partners, the

GA's roles assigned to satisfy efficiently project's objectives. Finally, it will utilize specialized software for scheduling and reporting and organise training sessions if necessary to support staff towards meeting all Commission specifications.

This **Secretariat** service will be linked to the project's site, to receive process and disseminate all requests from Partners and the EU on daily basis. It will organise project meetings, workshops and reviews. It will also administer Calls of Tenders or central equipment provision or specifications, Non-Disclosure Agreements (NDAs) for external experts, new Partners inclusion, etc.

The additional services implemented by the aforementioned groups are outlined in the following sections.

3.15.2. External Relations

This is an additional and independent service, administered by the Secretariat, the Dissemination Manager and the project Exploitation Manager. In particular, they will receive and organise the feedback coming from all the external resources (i.e. questions on project concept and results through the Internet, relation to the Press and the Media, possible exploitation opportunities), including follow-up of concentration activities with other projects and of activities of relevant standardisation bodies, Enterprise or Public User Fora in the project related domain.

3.15.3. Help-Desk

The FrailSafe project includes many partners from different countries and backgrounds. Therefore, the Project Office will provide feedback to the partners upon request and in a timely manner and will issue guidelines from the start of the project and revise them, when necessary. Finally, this service may organise, upon request, remote training courses and seminars for the managerial and administrative personnel of the Partners.

3.16. Project Meetings

The GA will meet roughly every six months (2 plenary meetings per year) and will review the overall progress so far and take necessary decisions. Issues related to IPR, new partners inclusion or exclusion and key persons substitution (i.e. Project Coordinator, etc.) will be decided unanimously (except from the Partner affected). Only Main Partners will take part in the Plenary meetings and will retain the right to vote for issues raised whether in the Plenary or in the General Assembly.

The Quality Control Board will not meet regularly, but only when its opinion is required, and will be called by the Coordinator. Work package leaders will organise Technical Workshops with the possible participation of external experts, for the timely and appropriate execution of the relevant work and the coordination of the partners involved. The Technical Workshops will be organised in the course of the project and based on the technical needs and difficulties of the project so as to facilitate the communication between the consortium and address any issues on the basis of the multidisciplinary nature of the consortium. After the identification of any technical need that requires the scheduling of a workshop, the consortium should decide on the details (Date, Duration, Participants etc) based on the specific issue, its urgency and the related partners. These meetings will be a combination of small group meetings covering specific topics such as systems architecture, requirements, standards, as well as plenary project workshops.

3.17. Project Management Tools and Reporting

The Coordinator will use Microsoft “Project Manager” or other similar software system of relevant capabilities, in order undertake full scheduling, budgeting control both for the purposes of the project and the partners themselves as well as for reporting towards the European Commission Services.

Regular updates will be carried out as per the requirements of the contract, and various tables and graphics schemes will be used to demonstrate project progress along with resources employed and costs. The typical graphics include Gantt chart, Network diagram, various histograms or other tools depicting resources employed and/or costs.

The abovementioned tools to be used will depict deviations from planned project targets including delays or early finishes and their impact on the overall progress will be evaluated to implement the necessary corrective actions if applicable.

Results and recommendations will be communicated to the Coordinator and to the Work package leaders so that the corrective actions can be taken in a timely manner in order to achieve optimum performance.

Six-monthly and Annual Reports and Updates of the detailed Implementation Plan will be additionally submitted to the Commission, where detailed reporting and the progress achieved during project execution will be demonstrated using the above-mentioned software.

3.18. Information Flow and Exchange

The information for the project will be exchanged through:

- Semi-annually progress reporting among all partners and to the European Commission;
- Reporting by the project coordinator to the European Commission;
- Meetings of the GA for the contractual and administrative execution and monitoring of the project;
- Meetings of the relevant partners for the execution/monitoring of the scientific coordination progress;
- Working group events and seminars;
- Electronic communication or virtual meetings based on existing instruments.

Details will be exchanged within and between work packages through email and by meetings. A high quality web site has been established for internal and external communication. Each working group and work package leader will disseminate the outputs and results during the transnational meetings and via the email, in order to let each partner know the project activities, and the products that have been developed. Moreover, there will be bilateral exchanges amongst partners on specific issues. All communication will be documented by appropriate instruments, e.g. minutes of telephone conferences. The documentation will be provided to the involved partners within 5 working days. Every meeting will have a minute taker.

The emailing list **FrailSafe** has been established to facilitate communication among consortium partners and it includes everyone involved in the FrailSafe project.

The FrailSafe website is available at http://www.frailsafe-project.eu and comprises the main dissemination and communication channel maintained by the Coordinator and the Project Office. The FrailSafe website includes the public area where useful information is distributed to the wider audience regarding the concept, its participants, related activities, project results etc. and is mainly used for the dissemination of the project.

In addition to this, the FrailSafe website includes the knowledge portal intended for the internal communication and documentation among partners regarding the scientific &

technological work of the project. These private pages of the FrailSafe website can be accessed using the credentials sent by the site administrators.

3.19. Risk Management and Contingency Plans

The FrailSafe methodology relies on prevention and is designed so as to provide inherent mitigation strategies for the potential risks. For a research project with partners from several countries and with different expertise a number of project management risks can appear. The degree of innovation contained in the project may also imply additional technical risks. However, a problematic situation will be addressed as soon as possible and at the lowest possible level, while it is brought to the immediate attention of the Project Management panel. The Risk Management and Contingency Plan, as well as the Quality Control Plan will be handled both at a WP level, as well as centrally within the respective task of WP9.

The WP leader is responsible of evaluating the specific risks opposed to the specific WP implementation and proposes to the Quality Manager specific mitigation strategies and contingency plans. The expected significant risks and related contingency plans as reported in DoA are shown in the following Tables.

Table 5. Management Risks (WP8 & WP9)

Description of risk	WP(s) involved	Proposed risk mitigation measures
Conflicts within the consortium	WP9	Decision-making mechanisms are described in section 3.2.2. Early definition of common project vision and exploitation requirements.
Delays and/or administrative oversights	WP9	Compliance with Milestones and regular communication in meetings and phone conferences will avoid missing deadlines. Coordinator experienced in EU projects, aware of possible management issues.
Partner(s) decide to leave project	WP9	Competencies are covered by more than one partner, allowing backing up work in case of any partner leaving the consortium or failing to deliver work according to its declared responsibilities.
Low communication among partners	WP9	Utilize more often interactive communication means, like direct phone communication; also regular teleconferences and face-to-face meetings.
Delayed submissions of deliverables	WP9	Coordinator follows a strict policy quality management and will minimize the risk of delays from the early beginning
Lack of interest by Policy makers	WP8, WP9	Full involvement in project workshops and seminars.
IPR conflicts	WP8, WP9	Intellectual property issues will be analysed and managed and communicated among all consortium partners
Technical outcomes not commercially viable	WP8	Early definition of Exploitation plan and establishment of Advisory board for steering project in commercial directions and assessing the project

Insufficient dissemination of project results	WP8	Continuous monitoring by Dissemination Manager and communication among work packages to identify common publishable results during the whole period of the project.

Table 6. Technical Risks (WP1-WP7)

Description of risk	WP(s) involved	Proposed risk mitigation measures
Dealing with smart sensing devices, smart phones and AR applications, could be unaccepted and obtrusive	WP3-WP6	Comfort of the users while experiencing the FrailSafe novel solutions will be a top priority; training sessions will be planned before starting the clinical campaigns.
Selected technologies are not adequate	WP2, WP3, WP6	The architecture design will be built on user functional requirements matching interoperability and integration specifications. The selected technologies have to require the identified functional requirements. Most of technologies are off the shelf or functioning prototypes have already been developed (e.g. wearable sensors).
Prototypes not ready in time for pilot evaluation	WP3, WP5, WP7	Prototypes will be deployed at user's sites as soon as integrated system is available allowing early hands-on experiences and advance knowledge of the system prior to actual evaluations.
Feature extraction not sufficient for significant physical and cognitive state estimations	WP4 -WP7	Involving additional sensors and adaption of sensor and fusion algorithms
Models of the different aspects underperforming	WP4, WP7	The data obtained to learn models of affect and learning will be further analysed with additional data mining and machine learning techniques to better exploit available data. More emphasis will be given to dimensionality reduction including variant feature extraction and selection that will be tested and compared. In addition, sample size estimation in the initial design steps will allow defining the exact needs of the amount of data to be collected.
Affect data from WP4 come too late and delay work in WP7	WP7	BRA has a strong experience in creating adaptive games and development has been foreseen in cycles and with participatory design. Therefore inputs can initially be simulated to avoid delays and integration can be performed at a later stage

Except for the expected significant risks, a set of unexpected factors could raise emergency cases during the project (not timely completion of the various tasks, serious delays of deliverables, etc.). In these cases, a reallocation of resources can be considered. If the Coordinator envisages that these problems could jeopardise the project's objectives or have negative impact on its overall activities, an emergency Core Group meeting will be called to address the emergency. The proposed solution for an emergency case will be communicated to the participant related to the origin of the problem and the whole consortium as well.

According to the answer of the participant, the Core Group must decide whether he will be maintained in his role or not. In both cases, an appropriate revision of the Work plan will be decided and communicated to the Commission for acceptance.

4. QUALITY PLAN

4.1. Introduction

Quality planning and control is an integral part of management planning for the successful realisation of the project. The Quality Plan (QP) describes the actions and measures that will be taken by the Consortium, in order to ensure the high quality level of the project outcomes and its full conformance with its contractual requirements.

In this direction, the PQB has reviewed all requirements in order to determine the necessary activities, and has prepared the QP in order to demonstrate and provide the Consortium with the assurance that:

a) The contract requirements and conditions have been reviewed,

b) Effective quality planning has taken place,

c) The quality system is appropriate.

The QP is applicable to all the project's activities, and strict compliance with it is mandatory for all participants of the FrailSafe project. In order to ensure the relevance of the quality plan, the QM should conduct quality system reviews throughout the duration of the project, and especially when contractual changes occur. The Quality Plan is a controlled document, and amendments to it shall be submitted to the PC for approval. The QM ensures that the quality plan is available to all concerned and that its requirements are met.

This section specifies the activities to be implemented, including their sequence, in order to ensure that the project and its deliverables conform to its requirements. Those responsible for ensuring that the required activities are carried out, and the resources, which are crucial for their successful completion are identified within the subsequent chapters of this document. The Quality Plan includes explanation, necessary to show how quality requirements for activities are met. A list of such activities is given below:

- Management responsibilities
- Quality Plan Review,
- Quality system,
- Document, data control and product identification and traceability
- Inspection and testing,
- Control of non-conforming prototype / deliverable,
- Corrective and preventative action,
- Internal quality audits.

4.2. Quality System Review

The Quality system is reviewed within GA meetings and will focus on the prevention of deviations during each task of the project. In such reviews, the following issues will be taken into account:

- Results from project audits;
- Results from internal audits;
- Official project Deliverables;
- Corrective action requests from all the above;
- Preventive actions on all the above;
- Project prototype deficiencies and subsystems/parts problems;
- Adequate training of the staff of the project's partners for the tasks undertaken;

- Adequate resources for the tasks undertaken.
- Complaints
- Supplier problems
- Ethics, Health and Safety Issues
- Introduction of new quality plans

The outcomes from the above shall be discussed at GA meetings, and discussion minutes shall be kept by an appointed PQB member and should include:

- Satisfaction with the audits, corrective actions and the results of complaints
- Dissatisfaction and requirements for further auditing or more corrective actions
- Satisfaction with the corrective actions taken by the relevant partner(s).

4.3. Project Quality Board

The Project Quality Board (PQB) is also responsible for checking and evaluating the quality of reports and deliverables, which are expected to have a significant influence on the successful outcome of the project. The PQ board will review the project activities and deliverables in order to address the following issues:

- Requirements of the project;
- Organizational structure of the project;
- Co-ordination between the partners;
- General measures and actions taken;
- Planning and control;
- Control of the quality of the deliverables;
- Quality control of the project;
- Files and archives;
- List of quality forms to be used.

The main goals of the QP will be the following:

- Provide to all concerned a guide for the actions required by each one involved,
- Exhibit the performance of the project's quality plan in accordance to the contractual requirements,
- Assign internal members of the Project Quality Board to review specific deliverables.

The PQB will be responsible for the co-ordination and supervision of implementing measures for the quality assurance. Also, it will be responsible for the project's quality assurance matters. In accordance with the contractual agreements, the project's quality management plan will be prepared, defining organizational structure, flow of the quality system and the quality management procedures to be applied. The Quality Board will be chaired by the Project Coordinator. Apart the PC, it is consisting by the Scientific Coordinator (SC), the Quality Manager (QM), the Standardisation Manager (SM) and a representative of older persons (chosen by the General Assembly from names suggested by the organisation representing and working with senior citizens in the project). The PQB has an assisting role to the General Assembly. Internal members will be appointed from the PQB for the purpose of reviewing specific deliverables and reports. These are senior researchers of the project partners with extensive expertise on the subject of the specific deliverable, excluding of course its authors.

In addition to the above members other internal members will be appointed from the PQB for the purpose of reviewing specific deliverables and reports. These are senior researchers of the project partners with extensive expertise on the subject of the specific deliverable.

Moreover, members of the different forums of the project will be used as reviewers especially for the public deliverables.

It should be mentioned that project members are obliged to conform to the quality plan and that the procedure for its final approval will be given by the consortium. Furthermore, at least two reviewers will be assigned for each project's deliverable. The PQB meetings will mostly take place through communication media rather than in person meetings.

The sections "Deliverable Peer Review and Evaluation Criteria", as well as the "Control of Reporting and Documentation" are described in the "Deliverable 9.2: Project Quality Plan" in details.

APPENDIX 1: TABLE OF WPS AND TASKS

Table 7. Work packages and Tasks with Corresponding Leaders

WP/Task	Lead Beneficiary
WP1 Requirements, Use Cases, Architecture and Specifications	CERTH
T1.1 State-of-the-art assessment and acquisition of methodological tools	CERTH
T1.2 User requirements, clinical procedures and FrailSafe use cases	MATERIA
T1.3 FrailSafe UCD methodology	CERTH
T1.4 Architecture and system specifications	SIGLA
WP2 Clinical studies, measurements, clinical analysis	INSERM
T2.1 Clinical study methodology and planning	INSERM
T2.2 Clinical monitoring of older people	UoP
T2.3 Clinical Guidelines for System Development	MATERIA
T2.4 Behavioural Monitoring	INSERM
WP3 Smart Sensing, data acquisition and signal processing	SMARTEX
T3.1 Design of FrailSafe Sensor Network	SMARTEX
T3.2 Development of FrailSafe wearable sensing systems	SMARTEX
T3.3. Feature extraction and low level signal processing	CERTH
T3.4. WWBS communication, protocol and integration	CERTH
T3.5. WWBS prototypes, Assembly, Testing, Evaluation and production	SMARTEX
WP4 Data Management and Analytics	UoP
T4.1: Offline Data Management and Analysis	UoP
T4.2: Online Data Management and Analysis	UoP
T4.3: Dynamic User Profiling Models	CERTH
T4.4 Sensing social media	UoP
T4.5 Processing social media	UoP
T4.6 Signal Processing for extraction of frailty-related indicators	UoP
T4.7: FrailSafe clinical state prediction engine and risk assessment	UoP
WP5 Dynamic Intervention Services	BRA
T5.1 Analysis of hardware devices and software tools. Game hardware and software design	BRA

WP/Task	**Lead Beneficiary**
T5.2 Games framework development	BRA
T5.3 Games development	BRA
T5.4 Personalised context-aware, information visualization and DSS	CERTH
WP6 Integration and FrailSafe Application and Services	SIGLA
T6.1 FrailSafe Virtual Community Platform	UoP
T6.2 Security and Privacy subsystem	SIGLA
T6.3 System integration	SIGLA
WP7 Testing and Evaluation	MATERIA
T7.1. Pilot planning and assessment protocol	MATERIA
T7.2. Deployment of trial operation in semi-controlled environments	INSERM
T7. 3 Field trials with older people	MATERIA
T7.4 FrailSafe Evaluation of users' acceptance and socio-economic impact	UoP
WP8 Dissemination and Exploitation	HYPERTECH
T8.1 Dissemination activities, material and publication policy	AGE
T8.2 Exploitation and FrailSafe Business models	HYPERTECH
T8.3 IPR management	HYPERTECH
T8.4: Standardization and concertation actions	SIGLA
WP9 Management &Ethics	UoP
T9.1 Project Management	UoP
T9.2 Risk management and contingency planning	UoP
T9.3 Ethics and safety	UoP

APPENDIX 2: TABLE OF DELIVERABLES WITH CORRESPONDING REVIEWERS

Table 8. FrailSafe Deliverables and Reviewer assignments

Del. №	Deliverable name	Lead Beneficiary	Type	Due Date	Reviewer	
					1	2
1.1	Analysis of current practices	CERTH	R	M6	INSERM	UoP
1.2	User requirements, use cases, UCD methodology and final protocols of evaluation studies	CERTH	R	M12	INSERM	UoP
1.3	FrailSafe technical specifications and end-to-end architecture	CERTH	R	M12,M24	MATERIA	SIGLA
2.1	Clinical study methodology	INSERM	R	M6	HYPERTECH	SMARTEX
2.2	Clinical guidelines formalized	MATERIA	OTHER	M18,M27	INSERM	UoP
2.3	Completion of quantification campaign	INSERM	OTHER	M18,M25	MATERIA	UoP
2.4	Behavioural Monitoring	INSERM	OTHER	M18	UoP	MATERIA
3.1	Definition of sensor components and communication strategy	SMARTEX	R	M6	HYPERTECH	BRA
3.2	Preliminary WWBS prototype	SMARTEX	R/ DEM	M15	SIGLA	CERTH
3.3	Final WWBS prototype	SMARTEX	R/ DEM	M24	CERTH	UoP
4.1	Offline analysis of data	UoP	R/ DEM	M18,M24	CERTH	SMARTEX
4.2	Online analysis of data	UoP	R/DEM	M18,M24	CERTH	SMARTEX
4.3	Dynamic User Profiling models and Patient modelling and representation framework	CERTH	R	M6,M12	UoP	SIGLA
4.4a	Linguistic Corpus	UoP	OTHER	M18	HYPERTECH	SIGLA
4.4b	LingTester Test Results –	UoP	R	M18,M24	CERTH	SMARTEX

Del. №	Deliverable name	Lead Beneficiary	Type	Due Date	Reviewer	
					1	2
	Active (on-line) mode					
4.5a	LingTester (Prototype)	UoP	DEM	M12,M24	SIGLA	HYPERTECH
4.5b	LingTester Test Results – Passive (off-line) mode	UoP	R	M18,M24	SIGLA	HYPERTECH
4.6	Signal processing algorithms for extraction of frailty related indicators	UoP	R/DEM	M12,M24	SIGLA	HYPERTECH
4.7	FrailSafe Decision Support System	UoP	R/DEM	M24, M28	CERTH	SMARTEX
5.1	Analysis of hardware devices and software tools. Game hardware and software design.	BRA	R	M6	HYPERTECH	CERTH
5.2	Beta version of the Synthesized AR game system.	BRA	DEM	M16	UoP	HYPERTECH
5.3	Final Synthesized AR game system	BRA	DEM	M24	CERTH	SIGLA
5.4	Personalised context-aware,Information Visualization	CERTH	R/DEM	M24, M28	UoP	BRA
6.1	FrailSafe Virtual Community Platform	UoP	R/OTHER	M28,M32	BRA	SIGLA
6.2	FrailSafe mHealth Integrated version	SIGLA	R/DEM	M18,M25, M32	HYPERTECH	BRA
7.1	Assessment protocol	MATERIA	R	M20,M26	HYPERTECH	BRA
7.2	Small-scale evaluation report	INSERM	R	M22	UoP	MATERIA
7.3	Field trials report & Socio-economic guidelines	MATERIA	R	M36	INSERM	UoP
8.1	Dissemination Plan and FrailSafe dissemination material	AGE	R	M3, M12, M24, M36	HYPERTECH	SMARTEX
8.2	Project Web Presence	HYPERTECH	DEC	M3	SIGLA	BRA
8.3	Exploitation Report and FrailSafe Business models	HYPERTECH	R	M24,M36	UoP	CERTH

Del. №	Deliverable name	Lead Beneficiary	Type	Due Date	Reviewer	
					1	2
8.4	IPR Protection Plan	HYPERTECH	R	M12,M24	SIGLA	BRA
8.5	Standardisation and concertation activities report	SIGLA	R	M24,M36	HYPERTECH	SMARTEX
8.6	Data Management Plan	HYPERTECH	R/DEC	M6,M24 M36	SIGLA	UoP
9.1	Project reference manual and quality plan	UoP	R	M3	CERTH	INSERM
9.2	Project Quality Plan	UoP	R	M3	INSERM	CERTH
9.3	Periodic Management Reports	UoP	R	M6,M12, M24,M30	All	All
9.4	Project First Report	UoP	R	M18	All	All
9.5	Project Final Report	UoP	R	M36	All	All
9.6	Ethics, Safety and mHealth Barriers (regulation, legislation, etc.) Manual	UoP	R	M5,M36	INSERM	MATERIA

APPENDIX 3: TABLE OF MILESTONES

Table 9. Milestones with corresponding lead beneficiaries and delivery dates

Milestone number	Milestone name	WP number	Lead beneficiary	Delivery Date
Ms1	Web site available	WP8	HYPERTECH	M3
Ms2	Definition of requirements, use cases and UCD methodology available.	WP1	CERTH	M9
Ms3	Definition of system architecture and specifications	WP1	CERTH	M12
Ms4	Initial data measurements from recruited patients	WP2	INSERM	M12
Ms5	First version of the FrailSafe sensing infrastructure	WP3	SMARTEX	M12
Ms6	First version of the data processing and analysis platform	WP4	UoP	M18
Ms7	First version of AR game system	WP5	BRA	M18
Ms8	First Integrated System Prototype	WP3-6	SIGLA	M18
Ms9	Second Integrated System Prototype	WP3-6	SIGLA	M24
Ms10	Final Integrated & Optimized System Prototype	WP3-6	SIGLA	M32
Ms11	Definition of evaluation scenarios and applications	WP7	MATERIA	M32
Ms12	Definition of exploitation scenarios. Signature of Exploitation Agreement	WP8	HYPERTECH	M36
Ms13	Business plan and market analysis	WP8	HYPERTECH	M36
Ms14	Frailsafe outcomes evaluation	WP7	MATERIA	M36

APPENDIX 4: GANTT CHART OF THE FRAILSAFE PROJECT AN CORRESPONDING LEADING BENEFICIARIES

Figure 11. Gantt Chart of the FrailSafe project

[i] ISO 9000 - Quality management. http://www.iso.org/iso/iso_9000