Acronym: ExerG
Project title: ExerG: An innovative digital solution to individually improve physical and cognitive functions using an exergame (video game-based) training in an ecologically valid and safe setting for the geriatric population
Call: AAL Call 2020 (aal-2020-7-48-CP)
Start date: 01 May 2021
Duration: 30 months

D1.2 Project management plan

Nature[1]: P
Dissemination level[2]: PU
Due date: June '21
Date of delivery: June '21
Partners involved (coordinator in bold): **Sphery**, RHF, ZHdK, VASCage, RZM, HCIGG
Author(s): Alexandra Schättin (Sphery)

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[1] L = Legal agreement, O = Other, P = Plan, PR = Prototype, R = Report, U = User scenario
[2] PU = Public, PP = Restricted to other programme participants (including the Commission Services), RE = Restricted to a group specified by the consortium (including the Commission Services), CO = Confidential, only for members of the consortium (including the Commission Services)

Partner list

Nr.	Partner name	Short name	Org. type	Country
1	Sphery AG	Sphery	SME	Switzerland
2	Reha Rheinfelden	RHF	End-user	Switzerland
3	Zurich University of the Arts	ZHdK	University	Switzerland
4	HCI Games Group, University of Waterloo	HCIGG	University	Canada
5	VASCage GmbH	VASCage	Research	Austria
6	Reha Zentrum Münster	RZM	End-user	Austria

Document history

Rev.	Date	Partner	Description	Name
1	18.05.2021	Sphery	Create the document Chapter 1-2	Alexandra Schättin
2	25.05.2021	Sphery	Create the document Chapter 3	Alexandra Schättin
3	01.06.2021	Sphery	Create the document Chapter 4	Alexandra Schättin
4	07.06.2021	Sphery	Document review	Yanick Riederer
5	15./16.06.2021	RMZ	Document review	Barbara Seebacher
6	22.06.2021	Sphery	Final version	Alexandra Schättin

7	29.06.2021	**Approved by Sphery**

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1. Introduction

This document is a delivery of work package 1 (project and quality management) including the tasks 1.1, 1.2 and 1.3. The lead partner of this work package and these tasks is Sphery AG (Sphery). The document describes the project management structures and procedures to be followed within the ExerGetic project. Together with the D1.3 (Project quality plan), this document is a tool at the service of all partners to assist them during the project. The document will be updated during the course of the project when necessary.

1.1. The partnership

ExerGetic is funded under the AAL Call for proposals in 2020, aiming to develop an innovative digital solution that individually improves physical and cognitive functions using an exergame (video game-based) training in an ecologically valid and safe setting for the geriatric population. The ExerGetic consortium consists of 6 partners:

Table 1 - Exergetic project partner list

Nr.	Partner name	Short name	Org. type	Country
1	Sphery AG	Sphery	SME	Switzerland
2	Reha Rheinfelden	RHF	End-user	Switzerland
3	Zurich University of the Arts	ZHdK	University	Switzerland
4	HCI Games Group, University of Waterloo	HCIGG	University	Canada
5	VASCage GmbH	VASCage	Research	Austria
6	Reha Zentrum Münster	RZM	End-user	Austria

1.2. Project goals

The main goal of the ExerGetic project is to develop a user-centered exergame (video game-based) training to individually train physical and cognitive functions in the geriatric population. The project orients on this four unique selling propositions:

- **Personalised (end-user-centred) requirements:** User interface will allow individual physical and cognitive load adaptations. Individual adaptable training load and progression via specific algorithms will allow the integration of predefined training zone(s) and real-time in-exergame adaptation(s). Feedback and reward will be adapted, depending on the individual training performance.
- **Safe training setting:** Ceiling-mounted harness system integrated in the ExerG hardware construction will enable an individual body-weight supported and independent training environment that will allow training without permanent supervision.

- **Ecologically valid and meaningful training setting:** The ExerG will enable concurrent training of physical and cognitive functions as well as multi-sensory stimulation. The training will be close to daily life activities, where environmental stimuli are processed and translated into specific (whole-body) movements. The ExerG will offer an immersive training environment through projections on three walls (front, right and left).
- **Cloud solution:** Controlled data transfer of the training program and results will allow safe, feasible and resource-saving communication.

In summary, ExerGetic has three operational objectives:

- Integrate an innovative digital solution allowing individually adaptable physical and cognitive exercises that have an impact on end users' quality of life
- Develop a solution that meets the needs of our target group by integrating them into the project process
- Shape the solution to become part of an interesting business case for distribution in European countries

Project goals include producing a fully functional prototype along with a roadmap to reach the market. This will be described in the exploitation plan. More information about the project can be found in the description of work document.

2. Project management structure

The project is organized as shown in Figure 1. For proper management and advice, the project will include a steering committee, advisory boards and work package (task) leaders (detailed in section 2.1).
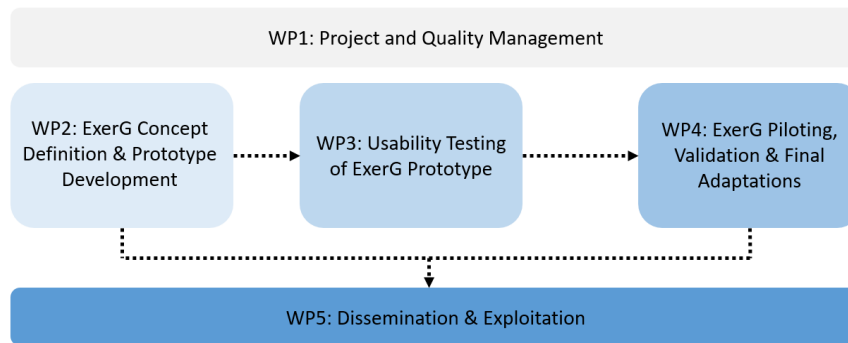
Figure 1 ExerGetic project structure.

2.1 Staff involved

Members of the consortium play specific roles to assist project activities and project management. There are partners who assume specific roles and, within these, a specific person may be assigned the leadership in that role.

- Project Coordinator (Sphery) – Project Manager: Alexandra Schättin & Yanick Riederer
- Dissemination and exploitation Coordinator (Sphery) – Dissemination Manager: Alexandra Schättin & Yanick Riederer
- Steering Committee: Chaired by the Project Manager and consisting of one representative per partner. The Steering Committee provides strategic guidelines and steers the project according to the project objectives. The Steering Committee is the high level management body of the ExerGetic project. It is the highest authority in the project.
- Ethics Committee – Helps to ensure the project's full adherence to ethical values.
- End-users advisory board – Advocates for users' points of view and interests.
- Scientific advisory board – Provides feedback and recommendations regarding scientific aspects during the conduct of the studies

2.1.2. Steering Committee

The committee will be responsible for: (1) monitoring financial budgets and project progress; (2) addressing any issues and conflicts that might emerge during the project; (3) handling any contractual changes and acting accordingly by revising the project plan/objectives. The Steering Committee will meet every six months as well as at the end of the project. During those meetings, the board will discuss the progress of the proposed project in relation to the plan, consider open issues and unforeseen problems, and make decisions if necessary. All partners agree to abide by decisions taken in the Steering Committee meetings. Regarding voting, each member has one vote and decisions will be taken by a majority of at least two thirds of the members.

- Chaired by Sphery – Alexandra Schättin & Yanick Riederer
- ZHdK – Anna Martin-Niedecken & Sonja Boeckler
- RHF – Corina Schuster-Amft & Frank Behrendt
- VASCage – Tina Henneken
- RZM – Barbara Seebacher
- HCIGG – Lennart Nacke & Katja Rogers

2.1.2. Ethical Committee

To ensure full adherence to ethical values throughout the project, an Internal Ethics Committee will be put together. The committee will check adherence to accessibility and social inclusion guidelines to make sure the ExerG is fully in line with ethical guidelines, laws and the medical devices regulation. Moreover, they will check the performed work throughout the project

- Sphery – Alexandra Schättin & Yanick Riederer
- ZHdK – Anna Martin-Niedecken & Sonja Boeckler
- RHF – Corina Schuster-Amft & Frank Behrendt
- VASCage – Tina Henneken
- RZM – Barbara Seebacher
- HCIGG – Lennart Nacke & Katja Rogers

2.1.1. End-users advisory board

- RHF – Corina Schuster-Amft & Frank Behrendt
- VASCage – Tina Henneken
- RZM – Barbara Seebacher
- HCIGG – Lennart Nacke & Katja Rogers

2.1.1. Scientific advisory board

- RHF – Corina Schuster-Amft & Frank Behrendt
- VASCage – Tina Henneken
- RZM – Barbara Seebacher
- HCIGG – Lennart Nacke & Katja Rogers
- ZHdK – Anna Martin-Niedecken & Sonja Boeckler

2.1.3. Work Package leaders

- WP1: Project and quality management – Alexandra Schättin & Yanick Riederer (Sphery)
- WP2: ExerG concept definition and prototype development – Anna Martin-Niedecken & Sonja Boeckler (ZHdK)
- WP3: Usability Testing of the ExerG Prototype – Tina Henneken (VASCage)
- WP4: ExerG Piloting and Validation – Corina Schuster-Amft & Frank Behrendt (RHF)
- WP5: Dissemination and Exploitation – Alexandra Schättin & Yanick Riederer (Sphery)

2.2. Responsibilities

Each partner shall use reasonable endeavour to supply the Project Coordinator and the Work Package Leaders the information, documents and other input that is required to deliver the project to the agreed upon timescales, within cost and quality level.

Each partner will insure to:
- Promptly notify all the partners in the same work package and the Project Coordinator about any significant problem or delay in performance;
- Inform all partners in the same work package and the Project Coordinator of relevant communications it receives from third parties, in relation to the Work Package and/or the project;

Verify the accuracy of any information or materials it supplies and promptly correct any error therein of which it is notified. The recipient party shall be entirely responsible for the use to which it puts such information and materials.

2.3. Project conflict resolution

Project conflicts shall be resolved at the lowest operational level possible in order to facilitate timely solutions. If the internal process fails, the matter can be escalated to formal arbitration as detailed in Figure 2.
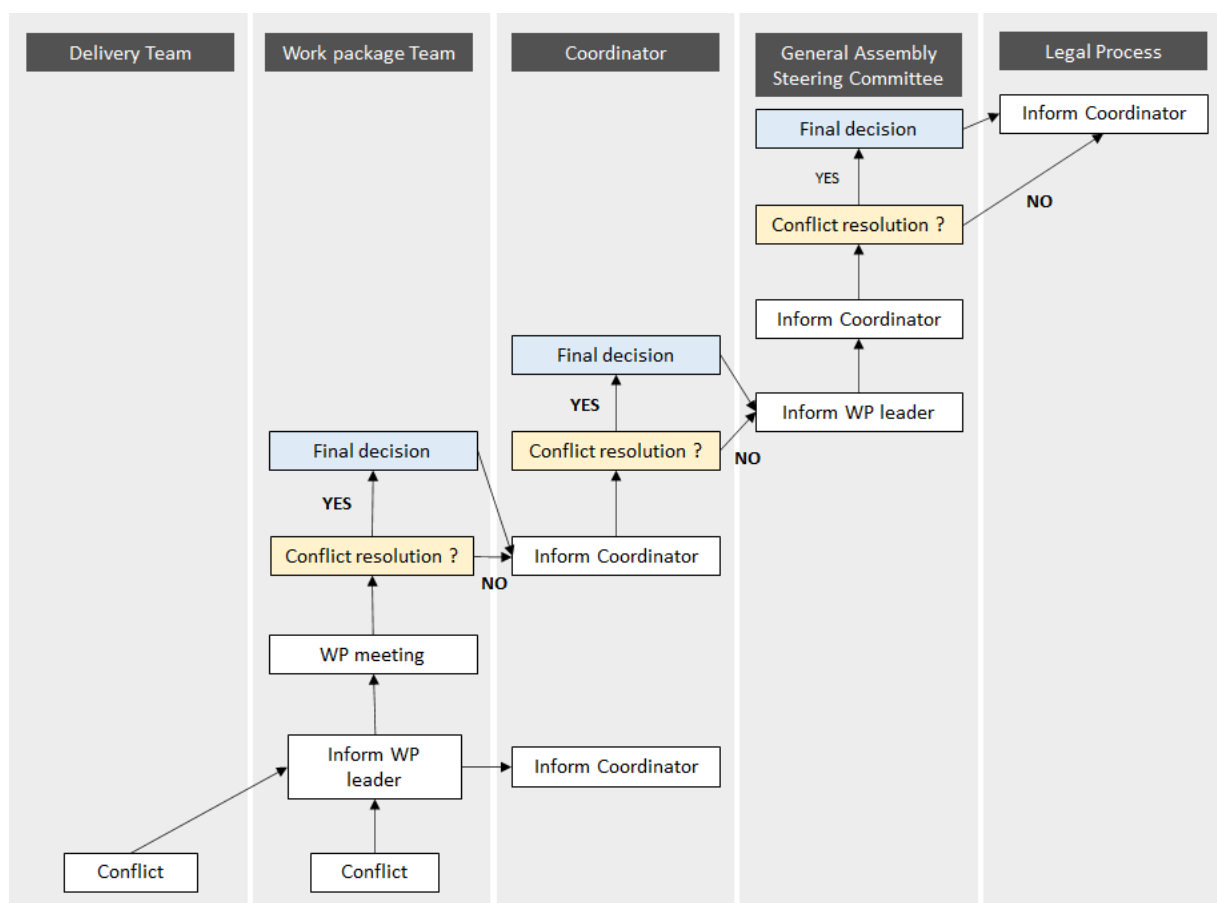
Figure 2 ExerGetic conflict resolution process.

3. Project monitoring

3.1 Project meetings

In order to secure a proper coordination among partners and timely delivery of results, the following project meetings shall take place in the course of the project:

- One Consortium Meeting every second week to shortly update the project team about the work package progress. If not agreed differently, this meeting takes place on Wednesdays from 4-5pm. A poll was performed at the beginning of the project to define the day and time of the meeting. From each project partner, one representative has to be present at the Consortium Meeting.

- Bilateral meetings between two or more project partners to coordinate and discuss specific work package tasks.

- One Steering Committee meeting every six months:
  - Each WP leader should prepare a presentation and provide a report on the work package status and progress (see chapter 4.1).
  - The Project Coordinator will present and provide a report on the project performance according to the key performance indicators as defined in Table 2.
  - Each Project Partner will inform about project events, press releases, publications, patents, demonstrations, etc. (see chapter 4.1.6).

3.2 Project performance monitoring

For each Steering Committee meeting, the Project Coordinator will provide the key performance indicators (Table 2) through which to measure the performance of the project and its execution from different perspectives.

Table 2. Key Performance Indicators.

Performance	Indicator	Period of assessment	Responsible
Partner involvement	% meetings attended (consortium & steering committee; one representative per project partner) Reason(s) for absence	Permanently Reported in each 6 month report	Sphery
Delivery of deliverables and reports	% reports delivered on time No. days delay Reason(s) for delay	At each individual deadline. Reported in each 6 month report	Sphery
Quality of reports delivered	% reports passed quality check % reports requested for resubmission Reason(s) for resubmission	By each individual deadline. Reported in each 6 month report	Sphery
Milestones achievement	% achievement of milestones	By each individual deadline. Reported in each 6 month report	Sphery

Use of the resources	% of deviation from original effort assignment Reason(s) for the deviation(s)	By each individual deadline. Reported in each 6 month report	Sphery
Effective risk management	No. risks mitigated Action(s) to mitigate the risk(s)	By each individual deadline. Reported in each 6 month report	Sphery

3.3 Risk management

The role of risk management activities in the project will be to identify risks timely, assess their consequences (occurrence, impact on cost, results, time, most affected WPs and partners, among others), and develop suitable responses based on corrective courses of action or contingency plans. Risk tracking will thus be made through the different meetings in order to minimize their impact to the widest extent possible. At this stage, we have identified a list of possible risks, which are described in Table 3.

Table 3. Project risk assessment

Description	Impact	Prob.	Remedial actions
End-user risks			
Primary end-users			
Psychological risks	Comparison with other older people may cause a deficit awareness (e. g., regarding the cognitive status, motor function status, communication problems, technological knowledge and experience)	Low	Focus groups will take part in an open and inviting setting. Use of open questions where primary end-users will be directly addressed and encouraged to participate in discussions. Use of an interview guide approved by ethics committees and primary end-users (test interviews, also approved by ethics committees)
Technology-related psychological risks (WP 2-4)	Older people may have a lack of technological knowledge and understanding, potentially leading to feelings of inadequacy, fear and rejection of the ExerG.	Low	Mock-up illustrations, videos, photographs, verbal and written descriptions and explanations and guidance by a therapist will be used to foster end-users' technological understanding related to the ExerG.
Physical risks	Fear of falling, fall risk, mental or physical fatigue	Low	Harness system will be used to reduce fear of falling and prevent participants from falling. An experienced therapist will be present at all times to enhance participants' self-efficacy regarding falling and for additional safeguarding. Training with a gradual increase in difficulty will be used.Periods of rest will be allowed whenever necessary.

Secondary end-users			
Psychological risk	Therapists' different levels of work experience Mental distress regarding one's inability to safe-guard patients in the ExerG prototype	Low	Structured training plans, mock-up illustrations, videos, photographs, verbal and written descriptions and explanations and training sessions for the therapist team will be used to provide a similar level of understanding for all therapists and thus reduce psychological risks.
Technology-related psychological risks	Therapists may have a lack of technological knowledge and understanding, potentially leading to feelings of inadequacy and rejection of the ExerG.	Low	Mock-up illustrations, videos, photographs, verbal and written descriptions and explanations and training sessions for the therapist team will be used to foster end-users' technological understanding related to the ExerG.
Tertiary end-users			
Technology-related psychological risks	Therapists may have a lack of technological knowledge and understanding, potentially leading to feelings of inadequacy and rejection of the ExerG.	Very low	Mock-up illustrations, videos, photographs, verbal and written descriptions and explanations will be used to foster end-users' technological understanding related to the ExerG.
Terminology-related psychological risks	Use of medical, technological or scientific terminology may cause feelings of uncertainty and rejection of the ExerG.	Low	Use of an appropriate language depending on the end-user interviewed may reduce this sort of risk.
Technological risks			
Implementation of solution functionalities	Problems in implementing the solution in the different locations	Low	Usability testing will be performed in WP 3. Related parameters as functionalities, configurations, service availability etc. will be taken into account.
Study location characteristics	Technological problems due to inadequate study locations	Medium	Partners will check their study facilities to counteract the occurrence of any possible problems. This process will happen in WP 1 & 2, so that the facilities are ready for the upcoming studies.
User expectations	The system does not fulfil end-user expectations and needs	Low	Involving end-users from the very beginning of the project will be key to get important feedback about expectations and needs. End-user feedback will be covered and implemented by WP 2,3 & 4.
Study risks			
Environmental settings	Environmental needs may change from study to study	Medium	Partners will check the environmental needs of their study location as characteristics, materials and equipment in the WP 3 & 4.
Results evaluation	Assessments to measure user satisfaction & study outcomes are not suitable	Low	This situation will be avoided by using suitable existing models and research for evaluation of user satisfaction and defining study outcomes.

Management risks			
Project management	Discrepancies between original project plan and reality	Low	Project coordinator will check the project state via periodical internal meetings, progress reports, and internal communication. If needed, corrective measures will be applied to assure the success and timely delivery of the work according to the WPs.
Project consortium	Discrepancies between partners or about the assigned work	Low	Work assignments will be decided in internal meetings. If any discrepancy between two or more partners exists, these will be discussed in internal meetings, and the final decision belongs to the project coordinator.
Partners withdraw	Withdrawal of one or more partners	Low	Partner will be replaced by one with similar skills or the role is taken over by another partner.
COVID	Adjustments of the project due to COVID	Medium	The project partners are aware of the current situation and will make any necessary adjustments to carry out the project successfully. The advantage of this project will be that the ExerG will allow safe training (e.g. sterile cleaning, spatially separated if needed etc.).
Standardization risks			
Adoption difficulties and incompatibility issues	Integration of/Interpenetration of new standards or techniques may be difficult	Low	Partners will inform the project consortium by considering relevant forums and standardisation bodies.
Cost risks			
Costs for real users deployments	The cost of solution deployment can reveal itself to be too high for the market users	Medium	Consortium will try to solve this by providing different solutions at different costs (which may include different versions). Rent and economic capabilities amongst different users can be an important point. Analysing the socio-economic scenarios will provide a clear answer.
Quantification of investment costs for launch and solution maintenance	Price difference amongst countries due to different legislations and other factors	Low	The consortium comprises the required specialists to perform these tasks. Within the project, an intermediate and final business plan will be elaboration (WP5).
Market risks			
Market key aspects evaluation	Lack of good positioning in the market	Low	Analyse all the relevant characteristics related to the potential market, and the position of the solution will be defined accordingly. Previsions on market size and other aspects like competitor studies will be performed. Target market and best marketing strategies will be defined. As a flexible solution, market potential seems to be good, so this risk will be minimised (WP5).
Market key customers and their expectations	Wrong selection, insufficient number or low acceptance of end-users	Low	Users and technical partners will be chosen according to their position in the market. Different end-user profiles to which the solution could be interesting will be taken into account (WP2).
Business model definition for each end-user typology	Identify only a small or limited group of suitable subjects to use the system	Low	Business cases will be elaborated together with the public as well as private organisations to ensure suitable cases for each one of them (WP5).

Final business plan implementation including accounting and payment procedures	Different conjunctures among countries	Low	A business plan will be developed that considers all the received feedback from the validations assuring its suitability for each country, and this is why it will be prepared towards the end of the project (WP5).
Financing requirements for solution launching	Wrong estimations	Low	Evolution of the whole project will give the consortium partners enough perspectives to foresee a proper deployment plan for the European market.

3.4 Target group involvement

For the project to be successful and the ExerG solution to be accepted by the end-users, users' needs and requirements will be taken into account from project onset and the project will strive to achieve the latest recommendations on user involvement for designing, developing and testing the solution across several iterations. The project will take advantage of its special conditions, i.e., having three partners, in three different countries, who will closely work with the end-users. This provides a unique opportunity to design and develop a solution that truly meets end-users' needs and expectations. The project parts are summarized in Table 4 (planned ahead for end-user involvement).

Target groups for this project are: (1) older adults (geriatric population defined by the presence of a geriatric-typical multi-morbidity and an older age - predominantly 65 years or older) as primary end-users, (2) health care services/institutions, e.g., rehabilitation centers, geriatric institutions/organisations, physiotherapists, and general practitioners, as secondary end-users and (3) health insurers or public sector service organizers as tertiary end-users.

Table 4. Activities involving end-users.

Project part	Switzerland	Austria	Canada	Total
Focus groups Collecting the requirements, need and opinions	10 primary 8 secondary 2 tertiary end-users	10 primary 8 secondary 2 tertiary end-users	10 primary 8 secondary 2 tertiary end-users	**30 primary 24 secondary 6 tertiary end-users**
Usability study Assessing the usability of the first prototype	12 primary 15 secondary end-users	12 primary 15 secondary end-users	12 primary end-users	**36 primary 30 secondary end-users**
Pilot randomized controlled trial Assessing the feasibility, attractivity, and preliminary effectivity of the final prototype	12 primary end-users	12 primary end-users		**24 primary end-users**

4. Documentation

4.1. Periodic progress report

A periodic progress report shall be completed every six months at least one week before the Steering Committee meeting. Its contents are to be presented by each work package leader and project partner at the Steering Committee meeting. The Project Coordinator, Sphery, will provide the partners with the necessary templates to fill in.

In summary, progress reports should be drafted every 6 months before the Steering Committee meeting:
- Reporting limited to the previous 6 months
- By Work Package: presenting WP process, main results, deliverables and risk management
- By Project Partner: dissemination activities

4.1.1. Pending issues

Should there be pending issues waiting to be solved, it is up to the WP leaders to present a list of these issues to the Steering Committee during the meeting.

4.1.2. Deliverables and tasks: submitted, in progress and next steps

Each work package leader should list the deliverables submitted during the six months prior to the progress report meeting in the report. If any registered or expected delay on deliverable submission is to be communicated, along with an explanation by the work package leader. The expected date for deliverable submission should also be communicated at the same time.

For each deliverable or task in progress at the time of the report, the work package leader should fill in the following details: task/deliverable number, responsible partner, partners involved, status, scheduled date of completion, estimated date of completion, and additional comments if needed. Furthermore, each work package leader should list the deliverables and tasks for the upcoming six months (until the next progress report meeting), completing the same template.

4.1.5. Risk management

For the risk management, work package leaders will be asked to summarize risks identified during the reporting period (if applicable) and how these were dealt with, according to the table below.

Table 5. Template of risk management table.

WP	Responsible	Occurrence (Period)	Implemented mitigation/contingency plan	Result/Impact

4.1.6. Report of dissemination activities

Project partners incorporate their dissemination activities (e.g. project events, press releases, publications, patents, demonstrators, etc.) into their progress report (for the reporting period). This should be presented to all the partners during the Steering Committee meeting.

Table 6. Template of impact and awareness activities table.

Project partner	Activity	Date	Medium and reference (press, event, newsletter, webpage, etc.)	Reach

4.2. National reports

This is a report at the sole responsibility of each individual project partner and refers to the documents asked by each NFA in accordance with the respective National Grant Agreement.

4.3 Annual central reports

The annual report will be submitted electronically to the CMU and the lead NFA (February of each year). The annual report will include the following sections:

- Administration details (duration, consortium…)
- Deliverables / milestones achieved
- Scientific / technical aspects (performance)
- Impact and awareness activities
- Project financial development

All the information (templates etc.) will be made available by the Project Coordinator to all project partners. The Project Coordinator will be reminded by the CMU in December of each year.

4.4. Mid-term review

The mid-term reviews are mandatory for all the AAL projects. The review serves three main purposes: 1) to evaluate performance and the status of the project against the plan, 2) to provide an opportunity for project partners and AAL representatives to share experiences for further programme development, and 3) to provide an opportunity for the consortium to receive feedback and fresh perspectives on the project, along with new possibilities.

The mid-term reviews shall be scheduled shortly after the end of the project mid-term (month 15). They shall be organised between the Project Coordinator, the CMU and the 'lead NFA'. The Project Coordinator will be reminded two months before the mid-term review by the CMU.

The reviews are non-public events. Two external reviewers will be invited to assess the status of the project and provide recommendations about the next phase. The review meeting will be physical (if possible) and typically last 4 hours. It is desirable for the project to be represented as broadly as possible, with a minimum of one representative for each project partner.

4.4.1 Preparation

The Project Coordinator will provide the following at least two weeks before the review meeting:
- An agenda for the meeting
- A questionnaire on timing, finance, consortia, etc.
- Provide all other relevant materials in electronic form (e.g. updated DoW, Financial Plan, CA, annual reports, deliverables, brochures, links to videos, etc.)
- Replies to the online satisfaction survey (at least 1 reply per partner)

4.4.2 Presentations

The project partners should present:
- Project structure, management and finance issues
- Project content
  - End-users' involvement process
  - Business model(s) and plan
  - Technology development/integration
  - Dissemination and exploitation activities
  - Project management update

All the information (templates etc.) regarding the mid-term review will be made available to all project partners by the Project Coordinator.

4.4.3 Report

A review report signed by the independent experts will be sent to the Project Coordinator two to three weeks after the meeting takes place. The Project Coordinator is requested to respond to the set of recommendations included in the report within three weeks.

4.5. Final review

Two external reviewers (same as for the mid-term review) will be invited to assess the status of the project and provide recommendations for the after-project phase. The reviewers will prepare a set of questions. The project consortium will be asked to replay during a two-hours teleconference call between the reviewers and the coordinator. All deliverables will be assessed. Additional materials can be provided (videos, app, access to website etc.). Furthermore, the project consortium must provide the final project report. The Project Coordinator will be reminded by the CMU two months before the mid-term review.

4.5.1 Report

Publishable Project Results Summary (1 page):
- resulting production/service
- needs / problems the product/service responds to
- targeted groups of users and payers
- technological innovation of the product/service
- social innovation of the product/service
- expected time to market

Confidential Part
- Deliverables submitted & milestones achieved during the project
- Scientific / technical project results
- Business models & indicators
- End-users' indicators
- Other indicators
- Financial information

The report will be submitted electronically to the CMU and the lead NFA within two months (60 calendar days) after the end of the project . The template for this report will be made available by the Coordinator to all partners in due time.

4.6. Report preparation and submission procedures

For each report, with the exception of National reports (see section 4.2), the Project Coordinator will send requests and / or reminders to the project partners, namely to WP leaders. Each partner will be asked to be responsible for and prepare their own reports (e.g., financial, effort, impact, activities). The Project Coordinator will compile all the reports from the partners and submit the final versions to the CMU. Apart from the reports listed above, each NFA may request specific scientific and / or financial reports.