



D1.2c Quality Assurance Plan

Ambient Assisted Living Joint Programme

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Project Acronym: GUIDed

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List of abbreviations (alphabetically)

Abbreviation	Full name
DoW	Document of Work
EE	External Evaluator
FRC	Frederick Research Center
HCI	Human-Computer Interaction
KI-I	Kompetenznetzwerk Informationstechnologie zur Förderung der Integration von Menschen mit Behinderungen
MAT	Materia
MC	Monitoring Committee
PM	Project Manager
QAP	Quality Assurance Plan
QC	Quality Committee
QM	Quality Manager
UCY	University of Cyprus
UI	User Interface
WP	Work Package



Executive Summary

This document serves as the Quality Assurance Plan for the GUIDed project. All the technical and scientific activities of this project will be designed, implemented and monitored in strict accordance with established quality assurance processes. The Quality Assurance Plan lists the specific quality assurance elements that are to be implemented during the project. The quality of the technical and scientific activities of the project will be continuously ensured by following and maintaining this document.

1 Introduction

All of the activities of the project will be designed, implemented and monitored in strict accordance with established quality assurance processes. Specific quality assurance elements will be implemented in the project.

The purpose of the Quality Assurance Plan (QAP) is to ensure that all the technical, scientific and business activities of the project, as well as those that involve user-testing and demonstrators' realization, are performed in accordance to the plan and timeline set out in this project, and are also to the highest quality. Task activities include preparation and timely delivery of outputs/deliverables, contribution to yearly reports and the final report, which describe the achievements of work packages, and preparation and coordination work leading to project and review meetings.

The purpose of the Quality Committee (QC) is the verification and timely detection of problems that might appear within the framework of the activities of the GUIDed project. Moreover, this committee will monitor and evaluate the progress of GUIDed and ensure that all activities are properly enacted in accordance with the QAP. It is required that one person from each WP lead organisation is a member of the QC. Table 1 depicts the members of QC.

Table 1: Members of Quality Committee

Partner Organization	Representative Staff members
UCY	Christos Mettouris
MAT	Marina Polycarpou
KI-I	Stefan Parker
HARPO	Joanna Starosta-Sztuczka
Platus	Daniel Sturmair
Karde	Terje Grimstad

The Quality Manager (QM), UCY, will report to the Project Manager (PM), MAT, while the QM will be also directed by the QC. The QM is responsible for the establishment and control of the project quality procedures, as they are described in this document, hence in charge for implementing and monitoring in-house quality procedures based on the QAP. More specifically, a set of indicators are offered and will be approved by the QC. Once approved, these indicators are the basis for control and any significant deviation to the QAP should be reported to the PM.

The indicators will be monitored continuously and reported to the QC on a 6-month basis in order to ensure that effective progress is being made in all project phases. In case an indicator does not reach its expected threshold, it will be discussed during a live or virtual consortium meeting, and proper corrective actions will be taken. Both quantitative and qualitative impact indicators with short-/long-term perspectives have been set in this regard and are described in the following sections

1.1 Critical risks and mitigation measures

The general approach of GUIDed to address risks relies on distributing the contribution to realizing the goals across lead and participating contributors, which have the proper skill sets and expertise. Also, the Scientific Coordinator has direct responsibility for managing risks.

From the initially identified list (see Table 2) an active list register will be maintained during the course of the project. The risks will be classified by WP and the WP leader will be responsible for managing the risk:

- Each risk will be categorized with Probability (1-5) and Severity (1-5), 1: Low, 5: High.
- Each risk will also indicate other WPs directly affected either by the risk or by the proposed mitigation action.

In addition, and as previously mentioned, GUIDed has established a Quality Comitee (see Table 1) to provide further assurance and advice on risk management and mitigation actions.

Table 2: Preliminary Risk Register

WP1	Risk: R1	Probability: 1	Severity: 4
Description	Partners unable to contribute, delays and failure to meet time constraints.		
Mitigation	<ul style="list-style-type: none"> • Close monitoring, internal reports, task assessment to prevent this. • Re-assign task(s) and/or increase resources to recover time. 		
WP2	Risk: R2	Probability: 1	Severity: 5
Description	End-user recruitment and evaluations not being doctuded in an ethical manner.		
Mitigation	<ul style="list-style-type: none"> • Regular reviewing and updating of the ethical considerations for each task. 		
WP3	Risk: R3	Probability: 1	Severity: 5
Description	GUIDed platform components are not delivered on time		
Mitigation	<ul style="list-style-type: none"> • Early kit assembly, design and specification, provide enough time for developing activities. 		
WP4	Risk: R4	Probability: 1	Severity: 4
Description	Difficulty for elderly users in using the Augmented Reality Features of the mobile app		
Mitigation	<ul style="list-style-type: none"> • Augmented Reality will be designed to be simple to use, usable and easy to understand for novice users. • Augmented Reality must be evident to users that it wil enhance their experience, support them through its features in performing independently their day to day activities. • Consider feedback of elderly users to further optimize the product and its offered services. 		
Description	Abandonment of the mobile app and smart kit by elderly users		
Mitigation	<ul style="list-style-type: none"> • The enhanced experience and the usefulness of the services with Augmented Reality will avoid abandonment of the app and smart kit. 		
WP5	Risk: R5	Probability: 1	Severity: 3
Description	Dissemination and exploitation is insufficient: does not present well the project's added value.		
Mitigation	<ul style="list-style-type: none"> • Regular reviewing and updating of the dissemination and exploitation plans. 		

COVID19 Pandemic Related Risks

Following the start of the project (January 2020), the COVID19 pandemic started to affect travelling. Moreover, recruiting procedures of older adults were affected. Thus, considering the safety of the end-users, data collection procedures were altered. For example, many

planned face-to-face data collection methods were done online or over telephonic interviews instead.

Description 1	<ul style="list-style-type: none"> Partners unable to have face to face consortium meetings.
Mitigation 1	<ul style="list-style-type: none"> Organize online meetings using online videoconferencing tools.
Description 2	<ul style="list-style-type: none"> Data collection from older adults cannot happen physically, as planned.
Mitigation 2	<ul style="list-style-type: none"> Data collection from older adults was conducted either via online interviews and focus groups or telephonically.
Description 3	<ul style="list-style-type: none"> Partners unable to perform the initial setup of the device and platform, and initial testing that services are fully operational.
Mitigation 3	<ul style="list-style-type: none"> Where possible, family member and healthcarers will be instructed with advice/consultancy from consortium partners or sellers of the GUIDed product to setup and conduct testing at the older adults' homes. In cases where this is not possible, one technician from the consortium partners or sellers of the GUIDed product will visit the older adult's home, taking every safety precaution related with COVID19.
Description 4	<ul style="list-style-type: none"> Partners unable to conduct testing and resolving of any practical issues at the older adults' home.
Mitigation 4	<ul style="list-style-type: none"> If necessary, one technician at most from the consortium partners or sellers of the GUIDed product will visit the older adult's home, taking every safety precaution related with COVID19, in order to fix any technical issues.
Description 5	<ul style="list-style-type: none"> Online based education and training offered to the older adults on how to adopt and use the GUIDed services may not be effective without the presence of consortium experts.
Mitigation 5	<ul style="list-style-type: none"> Family members or health care providers to be present during the online education and training of the older adults.

From a project management perspective (WP1), there are a number of common major risks. These are listed (see Table 3), along with several recommended corresponding solutions for each.

Table 3: Project Management Risks and Measures

Risk	Proposed Measures
Insufficient communication, cooperation and synchronization among partners.	<ul style="list-style-type: none"> Well-defined management Strong coordination Active involvement of partners in the management structure Frequent communication
Delays and/or mismatches in developing the project deliverables.	<ul style="list-style-type: none"> Strong control on deadlines by the Coordinator Spare capacity in staff to support delayed partners.
Shortage of human/financial/technical resources.	<ul style="list-style-type: none"> Early warning systems and binding agreements indicating available resources.
Conflict among project partners on not clearly agreed project goals and priorities.	<ul style="list-style-type: none"> Project and scientific coordinators clarified the project goals and priorities well in advance (from the kick-off meeting).

Risk	Proposed Measures
Conflict among project partners on delays in work schedules	The project coordinator created the Project Management Handbook that specifically states the work schedule, responsibilities of partners and deadlines.
Persistent conflict among partners	<p>The partnership will seek to avoid any conflicts by means described above. In case there is a rising conflict, it will be attempted to mediate it by:</p> <ol style="list-style-type: none"> 1. Preparing the parties for resolution: <ul style="list-style-type: none"> ● Acknowledging the conflict ● Discussing the impact ● Agreeing to communicate in a cooperative process 2. Understanding the situation <ul style="list-style-type: none"> ● Clarifying positions ● Listing facts, assumptions and beliefs underlying each position and analysing them 3. Reaching agreement with all facts and assumptions being considered <p>The decisions will be taken in accordance with the best benefit for the project's results.</p>

1.2 Report Incident and actions taken

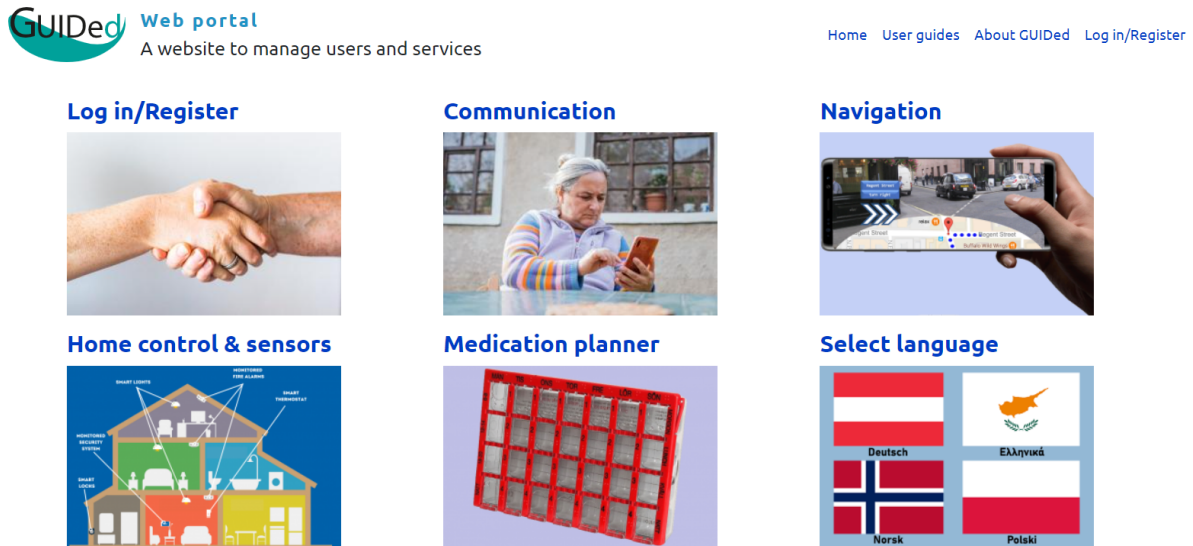
The project management risks and measures, as presented in Table 3 above, came into effect in one particular incident that was experienced between the technical partners of the project.

1. KARDE had suggested to use Drupal as an expert and lead the backend development.
2. All other technical partners were trying to assist KARDE, despite not being experts in Drupal, since the development of the UIs was running late. Hence, all technical partners had administrative rights to access the Content Management System User Interfaces (UIs), i.e. the Guided Web Portal (<https://guided.roztr.org/>) and backend, that Karde was responsible for. It was initially agreed that each partner would need to create the UI pages for their respective services on the Guided Web Portal.
3. The rest of the partners, not being Drupal experts, were learning and experimenting on getting the REST APIs working. All actions were fully reversible but changes made triggered a conflict. KARDE, as the responsible partner of the backend, felt that some changes were not implemented using a correct approach while the remaining technical partners believed they were. This led to a member of the KARDE technical team (who is responsible for the backend) sending an email to the consortium about resigning from the project unless specific conditions were met. With the rest of the technical partners not willing to adhere to these conditions, the project was brought to a standstill from a development perspective.
4. The coordinator arranged meetings (see more detailed explanation below of the process) and the project moved forward with a new process being established that involves a ticketing/request system from all other technical partners to KARDE and a

development server for any technical configurations by other technical partners that upon acceptance are transferred to the production server.

- The technical team have since continued working with ticketing/request system, allowing the project to progress from a technical perspective. At the end of the project and assessment will be done on how effective this approach has been.

Figure 1: GUIDed Web Portal – page listing the services



In this context of the aforementioned incident, the coordinator followed the conflict resolution plan as agreed upon in the Consortium Agreement and had invited each organisation from the technical team to a party-coordinator meeting to briefly discuss their position and needs. Then, a collaborative meeting was held with all parties and the coordinator in order to determine how to holistically best achieve the project objectives, but to also set up a common strategy to promote future collaboration.

In detail, during this process, the coordinator took the required actions by following the proposed measures to deal with conflict among partners in the project:

1. Prepare the parties for resolution by acknowledging the conflict, discussing its impact and agreeing to communicate in a cooperative process;
2. Understand the situation by clarifying positions and listing facts, assumptions and beliefs underlying each position and analysing them;
3. Reach an agreement with all facts and assumptions being considered.

From the individual meetings that were held with each involved partner, the project coordinator noted that both sides had admitted to making mistakes, both sides were well-meant and ready to work constructively on their tasks for the best progress of the project and also highlighted that efficient and quick communication, dialogue and action was necessary for the progress of the project. After the constructive individual meetings with all partners, a way forward/resolution was reached (i.e. the KARDE technical team member responsible for the backend did not resign and the ticketing/request system approach was implemented) that all partners agreed to during these individual meetings. A short meeting with all partners was also held in order to explain the plan on how to move forward.

At the end the conflict was resolved and the project coordinator thanked the involving partners for bringing the conflict to their attention and had also encouraged partners to do so early every time a challenge/conflict arises so that they can assist with its resolution. The

effectiveness of the resolution proposed can only be adequately assessed at the end of the project.

2 Quality Assurance of Technical and Scientific Tasks

The technical and scientific tasks of the project are described in Work Packages 3, 4 and 5.

The GUIDed platform will be extensively tested in different assisted living scenarios based on the individual well-attested needs (e.g., health, safety, mobility, communication) of older adults in different conditions. On the basis of these scenarios different demonstrators will be realized that target to showcase the benefits for the different stakeholders, i.e., device and application vendors, service providers, public authorities, but above all older adults that wish to be able to avoid dependency on family members, nursing homes and friends, preferring to continue to live independently in their own homes.

Using the Key Performance Indicators defined in the GUIDed DoW, quality metrics for each indicator have been defined in the following table. The aim is to ensure that each indicator will be met in a timely, efficient and appropriate manner and reflect the quality we sought to reach upon the inception of the GUIDed project.

Table 4: Quality Assurance for Key Performance Indicators

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
End-user			
Quantitative	Number of pilots set up	2 piloting cycles in the 3 end-user countries (Cyprus, Norway, Poland).	<ul style="list-style-type: none"> We have planned two trials with end-users in order to continuously assess the characteristics of the GUIDed platform. The pilots will be conducted in appropriate premises and by involving relevant end-user partners and carefully selected users, as per the requirements set out in the GUIDed DoW. Testing Phase 1 will be performed in a lab setting to ensure the appropriateness and functionality of the system as well as fine-tune its multifaceted aspects prior to its administration in real-life settings (Living Lab Approach). Testing Phase 2 and based on the experience in the Living Labs, is where end-users will evaluate the characteristics of the GUIDed platform in real-life settings.
Quantitative	Number of end-users involved in the field trials	Test the GUIDed platform in different service configurations and house settings of older adults, based on their individual needs, wishes and any health-related issues.	<ul style="list-style-type: none"> The offered services of the GUIDed platform will function without problems or errors in the houses of the older adults. For this to be achieved, proper tests will be conducted in identical to the houses environments by the

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
			<p>technical team of the project, in order to observe whether the platform can cope with the specifics of the environment, while at the same time the needs, wishes and health-related issues of the primary end-user are met.</p> <ul style="list-style-type: none"> • Different house settings and different user needs/wishes/health related issues will be validated through tests with the platform whose services will be adapted accordingly. • More specifically, we expect to involve: <ol style="list-style-type: none"> a) During Testing Phase 1 <ol style="list-style-type: none"> a. 20 primary users per end-user site (5 out of them for the Living Lab) b. 10 secondary users per end-user site c. 1 tertiary per partner country (Cyprus, Austria, Poland, Norway) b) During Testing Phase 2 <ol style="list-style-type: none"> a. 20 primary users per end-user site (10 x 2 iterations) b. 10 secondary users per end-user site c. 1 tertiary per partner country (Cyprus, Austria, Poland, Norway)
Quantitative	User dropouts	A maximum of 20% seniors and carers will drop out from using the system.	<ul style="list-style-type: none"> • We aim to employ three main strategies to minimize the chances of users to drop out of our testing phases. <ol style="list-style-type: none"> a) Develop a system according to their requirements and needs as set out by the results of T2.1. b) Continuously adapt and improve the system in order to avoid user frustration during their interaction with it. c) Respect users' dignity and personal rights before, during and after their interaction with the GUIDed system and proactively provide for their needs. • Feedback will be collected in case

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
			of dropouts in order to better understand the reasoning behind their decision to stop using the system. This will help in future improvements of the system to help minimize future dropouts for the same reasons.
Quantitative	User satisfaction	90% of the users will express their satisfaction for the GUIDed system using a likert scale questionnaire. Measures i.e. the project's questionnaires will be developed according to a well-researched and validated model, such as the Technology Acceptance Model [1], User Satisfaction Questionnaire, or System Usability Scale.	<ul style="list-style-type: none"> The Technology Acceptance Model for examples is a scientifically validated approach to confirm that the services and technology offered by GUIDed are accepted by the end-users. The model examines the users' Perceived Usefulness (the degree to which a person believes that using a particular system would enhance his or her job performance) and the Perceived Ease-of-Use (the degree to which a person believes that using a particular system would be free from effort). For GUIDed, Perceived Usefulness indicates the degree to which an older adult believes that using the GUIDed platform and services would enhance his or her performance on the tasks to which GUIDed offers solutions through its services. In terms of the Perceived Ease-of-Use for GUIDed, it is the degree to which a person believes that using the GUIDed platform and services would be easy and trouble free. Our consortium opts to employ proactive and reactive measures to enhance users' satisfaction with our product.
Quantitative	User post project involvement	50% of users will express their interest in paying for the system and continue using it.	<ul style="list-style-type: none"> The project will offer a product of great quality at a competitive price. A business plan and business model will be developed during the project that will consider critical aspects contributing to a quality product. Moreover, the business plan and business model will be produced in two distinct phases; intermediate (M15) and final (M30). This enables us to produce an improved and final plan at the end of the project, taking into account results and feedback

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
			<p>from project activities and tasks, such as those that involve end-users.</p> <ul style="list-style-type: none"> • For older people, community groups, families and therapists access to technology that can help in fulfilling the daily duties and activities of these people, improving their well-being and overall condition will be crucial. The technical solution cannot be too complicated, so as not to deter users from using it. The price of the device will also be crucial. • Different variants of the product are planned to be available depending on the user's needs. The full product cost with the hub (includes the middleware software and the AR/VR Android application) and all smart devices is considered. The prices refer to the selection of all five services to be installed at the house and used by the older adult. • The middleware architecture of the smart platform allows users to select the services to purchase based on their needs and the available budget. For example, if the older adult would like to purchase initially only the videoconferencing service (S5) then the cost will be the lowest and this will account only to the purchase of the Smart Hub and its peripherals, as well as the Wide Angle Lens for a more holistic view of the call participants. This is the minimal package/service configuration for the product. In another case, a different user may also want to purchase and use the Smart Sensors for safety reasons. Therefore, the product cost will be relatively higher and the user will have access to the S5 and S4 services. Finally, the user can select also the Smart Bulb (x3) which will cost more than above and will provide access to S5, S4 and S2 services, while in this full package price access to the software services S1 and S3 is also included. This is an initial

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
			estimation of three product packages, which means that during the project execution and the final business plan definition a different set with more product packages and prices could be proposed. A tablet device per kit is also planned to be provisioned.
Technology			
Qualitative	Usability	The learning program will be designed and implemented respecting the special needs and constraints of the older adults to avoid technology abandonment, address technophobia, enable ease of use of the services. Evidence will be collected by monitoring the competence development and assessing the learning outcomes. The system is easy and straightforward to use and accessing its services is intuitive and multi-platform applicable.	<ul style="list-style-type: none"> • About three quarters of older adults lack confidence in their ability to use devices to complete online tasks [2]. Furthermore, studies have found that fear of technology is more prevalent in older generations who did not grow up with computers. Since studies have shown that older adults who face technophobia and avoid technology respond better if they are supported by younger adults (children and grandchildren, local program officers) who assume the role of mentors and help them to overcome their fears, the GUIDed consortium will actively engage secondary users in the project methodology as follows. The 1-day health care professional driven learning program will be designed to continuously support the older adults in adopting and using the technology. The primary aim for older adults is not to abandon the technology. The learning program will be tailored to the specific learning needs and abilities of the end-user, avoiding pressure and anxiety for producing results. • The social communication service (i.e., videoconferencing) will be designed to be easy-to-use by the older adults in order to be able to effortlessly and quickly communicate with their family members, healthcare providers and friends. A simple user interface (UI) design will be pursued (e.g a one-button UI approach). Also, the UI of the respective smartphone/tablet social app of the secondary users will also be designed to be

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
			user-friendly and quick.
Qualitative	Functionality	The core functionalities will be implemented successfully and integrated in a robust product.	<ul style="list-style-type: none"> The Platform and its services will be thoroughly tested after development completes. Platform Verification Testing: After the completion of the software development process, and in order to ensure high quality results, testing and validation techniques on components of the platform are aimed to be applied. To verify the performance of the platform, unit testing on the software components and load testing on the servers will be performed. Unit testing: Unit testing is a well-known software testing method by which units of source code are tested to identify possible bugs and performance issues. By doing so, developers identify and fix software bugs before going live, and make sure each code unit performs the task that is meant to perform. The unit testing method on all the software components/services of GUIDed are going to be applied to ensure a correct function, as well as that they have the desired behaviour both in terms of functionality and performance. Load testing: Load testing procedure simulates heavy traffic towards the servers, aiming to ensure their proper behaviour under heavy load. It is planned to perform tests by simulating realistic traffic from an incremental (as the number of tests progresses) number of end users. Load testing will be conducted only in case the consortium uses own servers, as opposed to using cloud services.
Quantitative	Functionality	Implement and support a maximum of 5 different smart (device-based) services (e.g., smart light) and software services (e.g., telepresence video call), which offer AR functionality as a training for older adults.	<ul style="list-style-type: none"> The final list of smart services will need to be selected in coordination with the end-users by following a co-creation approach, but it will be in accordance to the five categories and the proposed examples described in the project. The technical team is free to define a set of services to propose and describe to the end-users, but

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
			<p>the final selection should be made according to the end-users' needs as expressed to the end-user organizations during the analysis of user-requirements and testing phases. The technical team will provide feedback and approve this final list to ensure that the requested services are both technically feasible and also that do not deviate from the categories, the suggested examples described in the DoW and are in accordance to the effort and budget defined in the proposal. This ensures that the services to be offered indeed meet the end-users needs, wishes and health-related issues.</p>
Qualitative	Successful development (Quality of Service – QoS)	<p>GUIDed system will be developed and integrated in accordance with end- user requirements and business perspectives. The modular, extensible and plug-and-play nature of the platform will be demonstrated via the pilots by enabling to add and remove device and software services dynamically, in the case of future arising needs, as well as for satisfying the diverse requirements of the older adults based on their health status, their aspirations and wishes.</p>	<ul style="list-style-type: none"> • The Smart Middleware of the platform will adapt and extend the services offered by software solutions and plugins developed in the context of open-source projects, as well as develop additional services aiming to provide social interaction functionalities and social presence for older adults. • The software reuse of components and platforms as stated above, will allow the technical team to adopt and use software modules that are solid, bug-free and function properly, and to use these modules as the basis for further development. This process also allows the technical team to proceed faster with developments.
Qualitative	User Interface	<p>The Human-computer interaction (HCI) methods and in particular the simple and easy to use UIs will enable the older adults to adopt and use the services in plain, simple and with the least possible steps and actions. Evidence will be collected by usability tests involving end users.</p>	<ul style="list-style-type: none"> • Technical partners will design, develop and improve the GUIDed system according to end-users characteristics, demands and needs according to literature review, previous experiences, results of previous EU funded projects and active testing with users. For example, according to previous EU funded project results and literature review older adults prefer larger font sizes in interfaces due to visual difficulties, etc.
Quantitative	Smart technology usage	<p>Augmented Reality will be used as a means of user training.</p>	<ul style="list-style-type: none"> • Augmented Reality (AR) is one of the most recent technological advances utilized in the field of

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
			training and education as according to research provides opportunities for experiential learning, learning through context discovery and enhances users' motivation [3].
Quantitative	Reliability	Keeping the failure rate under 1% of total usage. Moreover, the number of errors of the system and the number of failed tasks by the end-users can be measured.	<ul style="list-style-type: none"> Technical partners will proactively and reactively provide for the reliability of the GUIDed platform by designing a reliable and functioning system, performing frequent testings and continuously adjusting to correct bugs or malfunctionings.
Project management			
Quantitative	Schedule	Keep the schedule with a zero-delay concerning all milestones and deliverables.	<ul style="list-style-type: none"> The Task Leaders are responsible for the effective time-management and coordination of the contributions from partners, in order to deliver the final deliverables on time. Hence, Taks Leaders should start the preparations for the production of their deliverables at least one month before its official submission deadline. The process is described in more detail in D1.1 Project Management Handbook.
Qualitative	Outcomes	Meeting or exceeding all the outcomes of the project.	<ul style="list-style-type: none"> Consortium members have created a solid plan in order to reach all expected project outcomes including aspects such as ethics, achievement of milestones, excellence, etc. This plan will be adapted according to the prevailing circumstances in order to be up to date and effective.
Business			
Quantitative	Ready to market	2 years until the product is ready to market.	<ul style="list-style-type: none"> Two piloting cycles in the 3 end-user countries (Cyprus, Norway, Poland) with various end users involved in the project (co-design approach) throughout the duration of the project are to ensure that after the project the product will not need complex development to launch it on the market. Optimal user involvement will be assured through 3 experienced end user organizations (Materia, Karde and Harpo) in Cyprus, Norway and Poland, The 4 participating SMEs (Platus, Harpo, Materia and Karde) will

Type	Parameter	Measurement	Plan to evaluate Quality Metrics
			ensure high impact on the market through their long years of experience in the field and their vast user contacts.
Quantitative	Creation of considerable community around the GUIDed system	At least 5 new end-user organizations will be contacted during the project lifetime to present the system and will provide a positive feedback.	<ul style="list-style-type: none"> Two testing phases in the project duration with involvement of end-user organisations will provide feedback about the GUIDed platform and allow to create a community around the project. The Advisory Board comprising secondary and tertiary users that are supporters of GUIDed since the inception of the project, as well as other end-user organizations that will join the project should help in this aim.
Quantitative	Ready to market	3 new potential end-user organizations will be approached to present the system.	<ul style="list-style-type: none"> The involvement of end user organizations will ensure that end user contacts exist in the countries involved in the consortium and therefore a product can be created that will sell on the diverse markets that exist within the EU.

3 Ethics

The GUIDed consortium has prioritized the emphasis on ethical aspects since it will involve end-users throughout the duration of the project. More specifically, two main channels of feedback regarding ethical standards will be utilized, namely, a) the Ethics Board and b) the D2.3 Report on ethical issues. In regards to the Ethical Board, it will be comprised of experts in ethical requirements and user-involvement who will monitor the compliance with relevant standards and legislations throughout the project duration. Secondly, D2.3 Report on ethical issues will be created from the beginning of the project and will include the steps taken to ensure the effective and appropriate approach towards ethical standards, respecting different legislation and boards for each end-user site.

4 Quality Assurance in WPs

Ensuring that quality assurance is reflected within the tasks of WPs is a priority. Hence, the QM is involved in the monitoring and timely execution of WPs activities in collaboration with the WP leaders and by following the intellectual outputs defined in the form of deliverables and milestones, as these are reported in the DoW. Therefore, the key target is to execute and ensure that the technical, scientific and business activities of work packages WP3-WP5 and the critical tasks of WP2 that involve user-testing and demonstrators' realization are performed in accordance to the plan and timeline set out in the DoW.

4.1 Quality Assurance of Management Tasks (WP1)

The Project Management Handbook (D1.1) provides guidance in achieving the project objectives, effectively managing the progress of tasks and ensuring the timely delivery of project results. As such, it contains information about effective and efficient administration, methods for the delivery of project products (e.g., templates), information about timeline and deadlines, means of storage for documents and also means of communication. It should be noted that it is a dynamic document which will be adapted throughout project progress to reflect the current practice in the GUIDed project. This is an important aspect that contributes to overall quality within this context of management.

Very importantly, the GUIDed project management structure supports quality assurance at all levels. More specifically, it consists of the Coordinator, Technical Manager, Impact Manager, User Research Manager, Work Package Leaders, Executive Board, Advisory Board (AB) and Ethics Board. One can refer to the Project Management Handbook for more detailed discussion on the structure, as well as on the overall management of the project.

4.1.1 Interim Quality Evaluation

D1.2d (Interim questionnaire and results) presents the results of the Quality Evaluation Interim Report. The questionnaire distributed on Google Forms had 17 questions measuring partners' satisfaction on aspects of project management, communication within the consortium, dissemination activities and progress on outcomes. Eight participants from the consortium had participated.

4.2 Quality Assurance of End-User Tasks (WP2)

The WP leader (Materia), in collaboration with the QM (UCY) will monitor the timely and quality execution of WP2 activities regarding to:

- Identifying the main security and privacy issues related to ethics, safety and data collection by the end-users.
- Formulating the ethical board, who will monitor the compliance to ethical regulations throughout the project.
- Recruiting procedures of older adults.

4.3 Quality Assurance of Technical Tasks (WP3)

The WP leader (KI-I), in collaboration with the QM (UCY) will monitor the timely and quality execution of WP3 activities regarding to:

- Assembling the smart kits using existing customizable hardware boards and ensuring compatibility.
- Adapting and extending the services offered by existing software solutions and plugins developed in the context of other projects.
- Integrating the smart kit and platform and software services
- Optimising the product and services.

4.4 Quality Assurance of Technical User-testing and Demonstrators Tasks (WP4)

Whereas in WP4 Scenarios and Demonstrators, the WP leader (Karde), in collaboration with the QM (UCY) will monitor execution of the following activities:

- Defining the scenarios based on the needs and aspirations of the different end-users.
- Identifying and resolving any practical issues at each one of the older adult's' home that can hinder the demonstrator's implementation.
- Performing the setup of the device and platform and testing that services are fully operational.
- Educating and training the older adults on how to adopt and use the services, as well as the Augmented Reality features of the mobile app.
- Definition and Analysis of the Users' Scenarios.
- Product Setup, GUIDed Learning and Demonstrators Implementation.

4.5 Quality Assurance of Technical Business Tasks (WP5)

WP5 Dissemination, Outreach Activities and Commercialisation Plan will assure realisation of following goals:

- Development of the Dissemination and Outreach plans of the project.
- Definition and utilization of the appropriate communication channels for the diffusion of the project results at a local and international level, paving the way for the GUIDed product exploitation.
- Finalization of the commercialization and sustainability plan for the GUIDed product, which will include assessment and analysis of the dynamics for its commercial exploitation.

The WP leader (Platus), in collaboration with the QM (UCY) will monitor the timely and quality execution of WP5 activities regarding to:

- Laying down the exploitation plan, which will formulate the strategy of communication and engagement with the public, including local industry and international fellow researchers with whom the consortium partners have established relationships and research collaborations.
- Identifying target audiences (AAL and AT researchers, industry collaborators, policy makers etc.) and the ways to communicate, explain the potential of the project and its benefits for older adults; especially in partners countries.
- Social networking presence established via a mix of communication methods, including online social networks, webinars, and other media presence (radio, TV) as well as periodic Network's newsletter.
- Monitoring mechanisms established to make sure that the communication is on the right track, so that timely corrective actions might be taken when necessary.
- Formulating an actionable development plan including critical technical and business de-risking activities and prospective funding sources.
- Identifying and documenting the key milestones towards commercial development including direct customer and strategic partner targets.
- Gathering data through the product validation and testing for promotion of technology, preparation of applications for funding marketing and promotion activities and engagement with potential customers, licensees, and strategic partners.

In WP5 deliverables will be produced that will document in detail the business tasks and their related quality assurance practices. These include the Intermediate & Final

Dissemination and Exploitation Plan, and the Intermediate & Final Business plan and business model.

5 Quality Assurance of Deliverables

The process of ensuring the high quality of deliverables produced in the GUIDed project has been thoroughly described in deliverable D1.1 Project Management Handbook, and thus will not be discussed in this deliverable. In this document, the Quality Assurance Template is presented in ANNEX I, in its most updated form. The Quality Assurance Template should be used for the final reviews of all deliverables of the GUIDed project.

The quality of deliverables will be further proven via the authoring of scientific publications in journals and participation at related international conferences in order to present outcomes of the project. In turn, this will stimulate interest in the GUIDed platform. In this regard, open access publishing will be considered.

6 Advisory Board Feedback

During the phase 1 of the project, partners sought feedback from the Advisory Board (AB) members from Cyprus, Norway and Austria. Short interviews were performed in an one to one form. The feedback received was very constructive and assisted the consortium to update and adapt the development of the GUIDed system. The transcript from Cyprus (see Annex 9.2) and Norway interview (see Annex 9.3) as well as some photos from the online interview in Austria (see Annex 9.4) can be found in the Annexes.

7 Conclusions

The present document aims to define and list the specific quality assurance elements that are to be implemented during the GUIDed project. In particular, the quality of the technical and scientific activities of the project will be met and continuously ensured by following and maintaining this document.

The document describes Quality Metrics for all tasks described in the following activities of the project:

- Smart Kit Assembly and Platform Development
- Scenarios and Demonstrators
- Outreach Activities and Commercialization Plan.

The technical team of the project and all consortium members are responsible for consulting the present document in regular intervals to ensure that the implementation of the technical and scientific activities of the project are conducted by following the quality procedures defined in this document.

The Project Quality Assurance Plan is a dynamic document and will be adapted to new updates, information and collaborative decisions taken by project partners which cause alterations in any of its contents in order to reflect the current practices.

8 References



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- [2] S. A. Becker. "A study of Web usability for older adults seeking online health resources," *ACM Transactions on Computer–Human Interaction*, 11(4): 387–406, 2004. doi: 10.1145/1035575.1035578.
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9 Annexes

9.1 ANNEX 1 Quality Assurance Template



Quality Assurance Template

Ambient Assisted Living Joint Programme

AAL JP project number: AAL 2019-6-190-CP

Project Acronym: GUIDed

Project Title: Assisted-Living and Social Interaction Platform (GUIDed)

Project partially funded by AAL Joint programme and “Research & Innovation Foundation” (CY), “The National Centre for Research and Development” (PL), “FFG Forschung wirkt” (AU) and “The Research Council of Norway” (NO) under the Grant Agreement number AAL-2019-6-190-CP.



Deliverable No.	
Deliverable Title	
Deliverable Authors	
Reviewer Name and Organization	
Date of Review	

COMMENTS OF PEER REVIEWERS

1.1. Relevance

Reviewer comment

Author response

1.2. Accordance to user needs

Reviewer comment

Author response

1.3. Soundness of Methodology

Reviewer comment

Author response

1.4. Quality of Results

Reviewer comment

Author response

1.5. Quality of Presentation of Results

Reviewer comment

Author response

1.6. Deliverable Layout/Language

Reviewer comment



Author response

9.2 Advisory board transcript from Cyprus



Wednesday, 24/02/2021

**GUIDed Assisted-Living and Social Interaction Platform (GUIDed)
Presentation and Interview Session**

Advisory Board Member (Technology Expert): Mr. Nicholas Moudouros, Head of Training and Development, nicholas@emphasyscentre.com

Nicholas Moudouros is the Head of Training and Development Department as well as the Head of the Robotics Unit. He is an ICT specialist and an educationalist with advanced studies (MSc) in Computer Science and Data Communication Systems in the UK. He has joined the 'Emphasys Centre' team more than 10 years ago when he started his journey into the world of teaching. He has been fascinated by the impact that a 'teacher' can have on the lives of his students and since then he makes every effort to motivate them and trigger their interest into the field of STEM and Robotics. Nicholas has been involved in the design, implementation and assessment of various professional development courses, as well as tools / applications and has gained great experience working with learners of various ages and abilities. He has successfully managed and implemented numerous EU projects in KA1 and KA2 in the School, Adult and VET Sectors. His current interests lie within the field of robotics, internet of things devices (e.g. Raspberry Pi, Echo Dot) and blockchain decentralized applications. Nicholas is a technology enthusiast and believes in a world where technology, robotics and science-based education can bring humanity to a better tomorrow. Apart from teaching, Nicholas is currently involved in the implementation of Erasmus+ projects while taking a leading role in the quality assurance of products and materials being developed within the organisation.

Main Points and Questions raised:

1) How are the data entered and the services configuration performed in the GUIDed system? Do the older adults do it themselves or it is done for them?

The GUIDed system offers, in addition to the Android app, a backend simple CMS interface using which older adults that feel confident with technology can enter the data and configuration information or secondary users (health experts, family members) can do it for them.

2) AR features and especially the AR navigation is an excellent example of the use of the GUIDed system.

3) How is the configuration of the smart hub and its devices done? Is it done by older adults or is it done for them?

The GUIDed project will perform one-to-one training sessions during which the physical setup of the devices will take place and the older adult will be trained. On the other hand, the AR training expert offers AR behavioural interactions with the services in an easy and straight forward manner. As mentioned for the other services the GUIDed system offers, in addition to the Android app, a backend simple CMS interface using which older adults that feel confident with technology can enter the data and configuration information or secondary users (health experts, family members) can do it for them.

4) Really interesting project. Which sensors and actuators are used in the project?

The smart hub is a RaspPi based kit that connects specific sensor and actuator devices selected in the project through the AsTERICs and OpenHab open source middleware that run on the smart kit. Specific

software plugins were implemented for the selected devices and beyond the project new plugins can be implemented or integrated from the available plugins offered by AsTERICs and OpenHab to extend to new smart devices and capabilities.

More information is provided on the following link to the meeting recording.

Link to interview: [Video](#)

Feedback from the presentation and interview session:

- From the perspective of a Technology expert, what makes the GUIDed project unique and therefore is its competitive advantage?

The usage of Augmented Reality serves as an added value as well as the integration of various technologies into one application which will offer a unique solution addressing various issues which seniors might encounter.

- What would you identify as a barrier for market entry currently for the GUIDed product from a technological perspective?

The end product should be tested thoroughly for it to succeed. Troubleshooting connection issues with other devices and common issues of Internet of Things devices should also be considered and a method for addressing all the issues should be recorded and addressed in text format and also the possibility for video tutorials for troubleshooting would also be welcome.

- Is there anything you would change, remove, add to the GUIDed system?

Communication line through the app for any issues which may arise. Devices which can measure blood pressure and temperature could also be connected to the application and send notifications to physicians and doctors. An option to keep track of the location of the mobile phone and thus the location of the user from a connected device from another family member could also be a welcome addition.

- In your opinion, in what way can the GUIDed project support older people and the society in short and long-term?

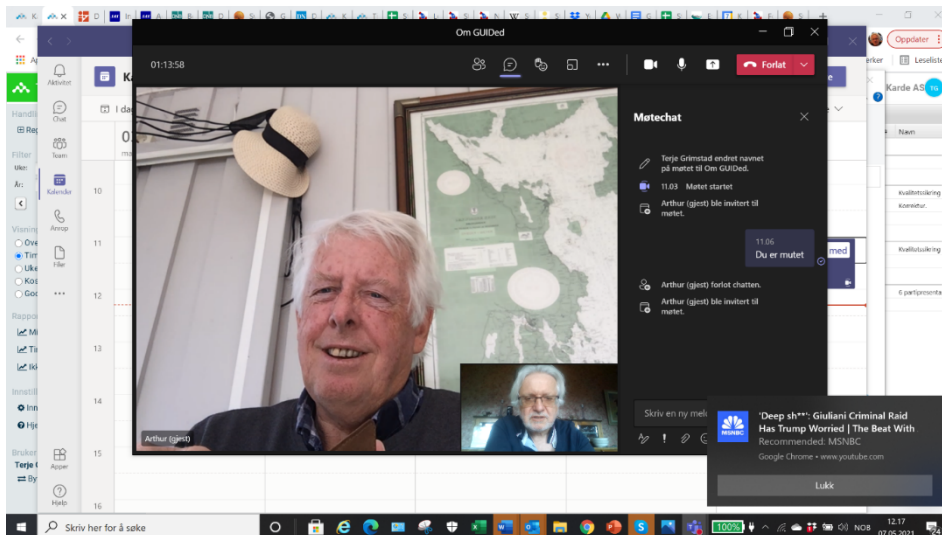
In short term it will offer solutions and make the life of elder adults a little bit easier. In the long term it will make them more independent, improve their psychology and create active citizens.

9.3 Advisory board transcript from Norway

Interview with Arthur Reinertsen, Norway

Date: 7th May 2021

Venue: Teams



Introduction

Arthur had read the hi-fi paper prototype document, so he was well prepared for the interview and the interview questions.

We started the meeting by going through the prototype on shared screen.

Comments to the GUIDed services

During the walkthrough of the GUIDed services the following points were raised.

General comments

- Not all services are highly relevant for Norway. Some of them may need extra functionality to get sales in Norway.
- There is a huge number of apps for GUIDed target. GUIDed may replace many of the apps.

Smart Health service

Good to get reminders about pills.

We must have in mind that Norway has a well-developed system with electronic medicine dispensers which notifies the person that now it is time to take your pills, a sachet with pills is output from the dispenser. If pills are not removed in a certain time, they will be retracted by the dispenser and a message is going to health personnel saying that pills are not taken. If it is judged critical that pills must be taken, health personnel will travel to the home and assist so pills are taken.

However, if you are not enrolled in this public system, reminders may be useful.

Arthur suggests having additional services, link to pharmacy, possibility to order and pay for medicine.

Navigation service

Service must be flexible. You must be able to navigate to everywhere.

To get predefined routes to sites near you seems obsolete. People know where the grocery shop and supermarket are located.

However, if you visit another city which you don't know, this information will be very valuable. E.g., if you enter a hotel, then it should be possible to download such sites to the navigation service of the GUIDed app.

To get additional guidance using AR is regarded very useful.

Home Control Service

There is a lot of such services at the market. Large players like Google and Apple have solutions.

There is smart furniture and smart home appliances.

Arthur has bought a roller blind which he can control up and down with an app and spoken commands to Google. He has also bought an electronic lock which is connected to an app. He has a relative who has made a "complete" home control solution based on Google.

It can be difficult to compete in this area. However, to have one app (e.g., GUIDed) managing all home appliances could be a success.

Another alternative is to find niches where other providers are not strong, e.g., stove control and door locks.

Safety Service

Fire alarm, burglary alarm, water leakage alarm is useful.

Some alarm companies in Norway provide home service with a call centre who calls you if something is wrong. They provide services for burglary (motion detectors) with connection to guards which will visit your house if necessary, fire and smoke with connection to the fire brigade.

One prerequisite for such services is decent internet connection. There are some white spots without connection.

Some people will control safety themselves without using a commercial alarm service which can be rather expensive.

Communication Service

Can be very useful for elders. The GUI must be very simple.

Arthur suggests an alarm button "I need help". E.g., for falls and other unexpected incidents.

Very many elders in Norway have a fall alarm device provided by the municipality for no or a low monthly cost. Based on application.

"Meet other" function. Arthur is hesitant about this function. He thinks it will be a too big step to take the initiative to contact others they do not know in advance.

However, he likes the idea behind this function, to alleviate loneliness. His suggestion is that someone in the "community" takes responsibility. Interest groups can support this, e.g., the Red Cross or local organisations. Some kind of "visit service".

Prepared questions after presentation of what we are doing in the project

1. Are the proposed 5 services relevant in Norway? Which are, which are not? Why one or the other?

All services may be relevant for Norway.

For Home Control Service it will be difficult to compete with the big players like Google and Apple.

Make one GUI which removes differences in the vast number of apps. Often services have too many functions and options. Make it simpler.

Consider additional services:

- Order medicine from the pharmacy
- Order food from grocery shops
- Other e-commerce services

Could be additions to the Communication Service or the Home Control Service with a picture of the e-commerce site you want to visit. Should be configurable.

2. Is there something that quickly / intuitively stands out as a good idea in the technology or the elements of the 5 services?

Reduce complexity, standardise the GUI, one GUIDed GUI instead of many apps.

3. What thoughts pop up after hearing about the idea of supplementing the actual display on the screen with AR? Who can benefit from AR-type supplementary display? What other connections could be relevant than the 5 services?

Make one single GUI is interesting. If AR is an asset for this is unclear.

4. What do you think about "pointing" at the object to bring up AR?

Simplification is good for everyone, so yes, I like the idea.

5. Is something in GUIDed commercially fruitful in Norway? In what context? What hinders commercial success?

GUIDed may be used in Norway.

GUIDed must be focused on the services you will use as a customer.

However, be aware of the big players in the market.

6. Karde is planning to integrate some GUIDed services in Memas. Is that a good idea?

Yes, definitely. Memas is for the time being addressing people with memory challenges, e.g., people with light or beginning dementia. It can also be branded for elders in general. All 5 GUIDed services are relevant for Memas.

7. Are you aware of similar projects / products / initiatives / applications?

Yes, many, Google and Apple mentioned several times for home control. And there are more niche products not covering the whole range of products. You have commercial safety services with call centres.

Recommendation is that GUIDed should provide simplification.

8. If you had to get business around the 5 services (or a smaller selection), what would you do?

Find niches.

9. In Norway, now that the project is in the early stages of development, how would you attack a possible market via "first testers" and the like?

You cannot go to the market with foil ware. You need a market ready solution.

The development is fast, new apps are released every month.

GUIDed must be good enough.

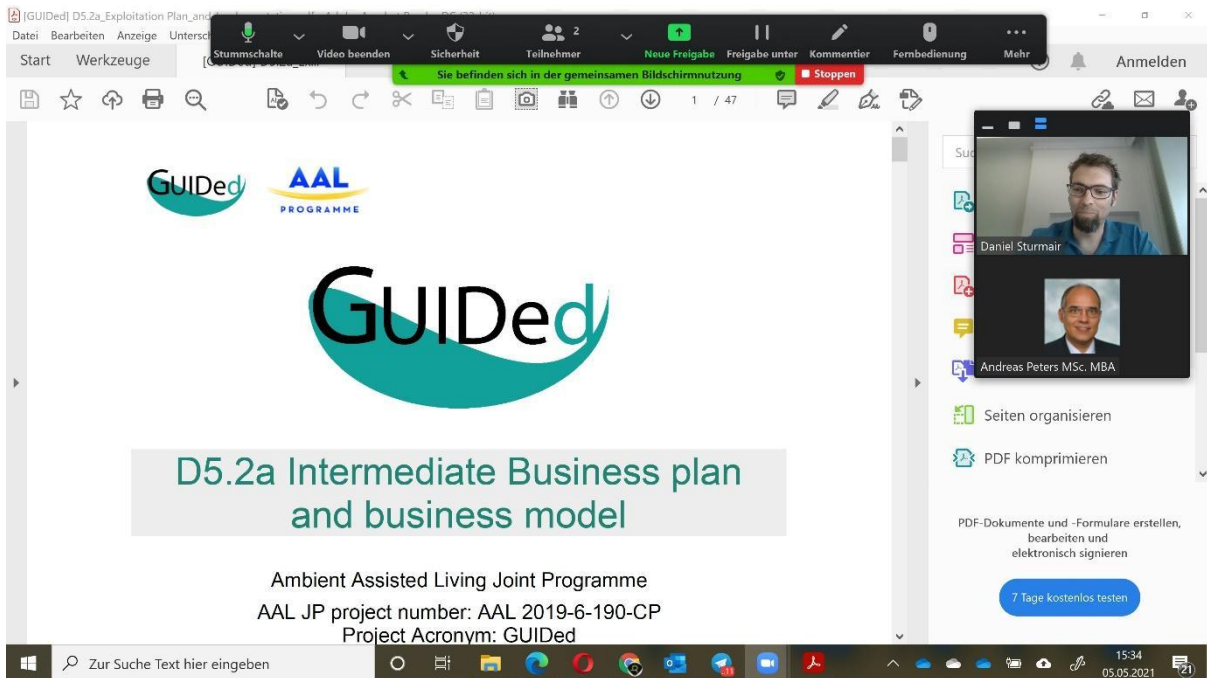
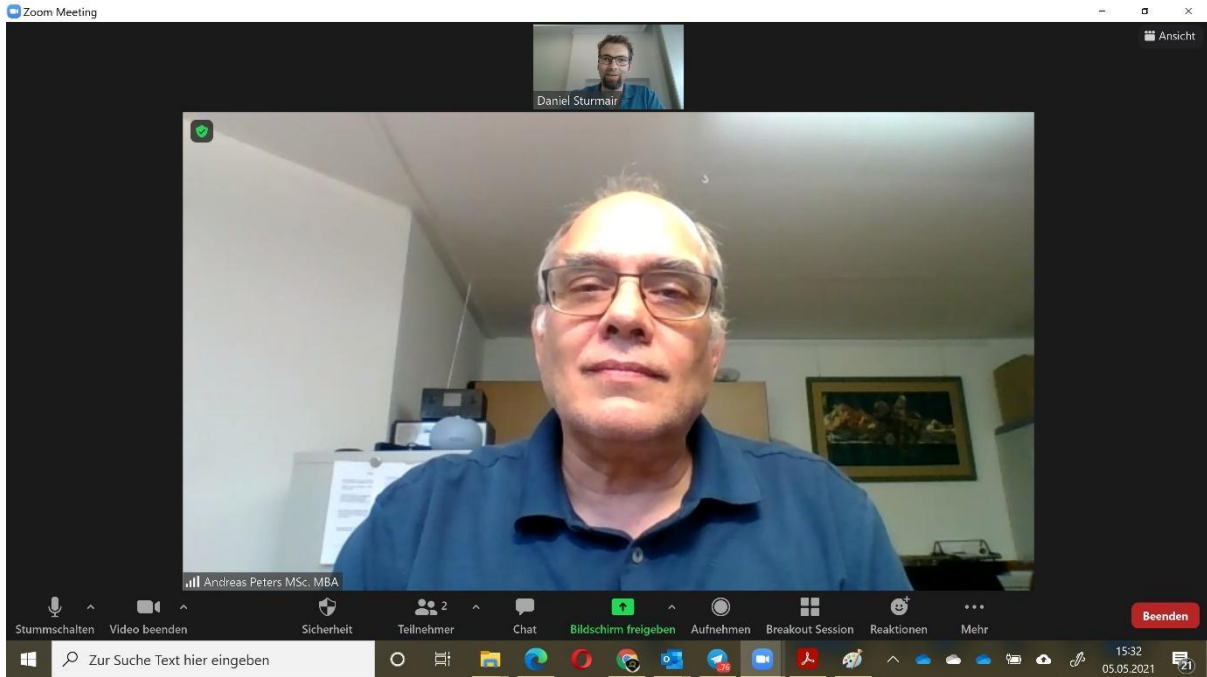
10. If this were your own idea and you had all the power in the project and wanted to reach the market, what would you do now early in the project, and then late in the project when a functional prototype is available?

The focus must be to find the right niche.

Get in touch with market actors which does not have an app ready.

Integrate with others over time.

9.4 Photos from Austria AB meeting



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10) Route to market

The following steps are planned for the current project progress:

1. Finish a MVP (minimal viable prototype) with all services.
2. Creating a list of early adaptors for each country till the end of the year (1.000 / country).
3. We will attend a Pitching-Event for GUIDed to find an Investor.
4. Launching GUIDed (2 Free-Services) after project time.
5. Founding a new company for GUIDed (depends on the Investor).
6. Agreements with hardware manufacturer (Smartphones) for preinstalling the service GUIDed.
7. Finishing other 3 services during Q3-Q4/2022 and establishing a dealer network for the countries.
8. One option could also be only to sell our Know-How from the AR part to google/Smarthome-

Zoom meeting interface elements: Stummschalte, Video beenden, Sicherheit, Teilnehmer, Neue Freigabe, Freigabe unter, Kommentier, Fernbedienung, Mehr, Anmelden. Status: Sie befinden sich in der gemeinsamen Bildschirmnutzung. Stoppen. 41 / 47.

Windows taskbar: Zur Suche Text hier eingeben, 15:35, 05.05.2021.