For the correct development of the project, we will make use of the following systems and resources for data acquisition, prototyping and trials design:

WecareLab furniture. For trials design and definition, we will simulate an AAL environment with main household resources before the pilot studies deployment. It is possible thanks to the flexibility of this living lab and the furniture material inside.
Connected devices. Dedicated devices will be developed with current and voltage measurement sensors (power meters), as well as a wireless transceiver to provide data connectivity to the electric home appliance which it will be associated with. This will allow to acquire current and voltage time series associated with such appliance. The form factor of the dedicated device will be that of a male-female plug. Its use, as a power interface to the appliance, will allow to monitor the status of the home appliance, frequency and patterns derived from its use. Daily appliance usage information, along with data from voice-based interactions through conversational assistants, will be used to measure the performance of the elderly in ADL.
Conversational assistants. Taking advantage of these commercial devices, we can acquire data from voice-based people interaction and its communication with the proactive module, facilitating system training and learning, and ultimately providing valuable feedback, also by voice. The proactive layer allows relating and complementing the information on the usage patterns of home appliances, obtained through the connected devices, with additional related questions made through the conversational assistants to reinforce ADL-based caregiving knowledge.
High-performance computing system. Servers-based infrastructure for massive data processing and training of Artificial Intelligence algorithms and procedures that require high computational capacities.

Regarding the additional human resources to be hired, in Section 3.4.1. we provide a detailed explanation about the needs for it.

3.4. Work plan and Timeline

3.4.1. Research and Work teams

Project members
The research team is a **multidisciplinary group** specialized in significant parts of this project: *Jesús Fontecha* [JFD] and *Iván González* [IGD] are PhD on Computer Science. Both IPs have worked together in previous projects and research works. The rest of members in the research team have also previous experience in research projects (national and international) and have collaborated among them. The whole research team is composed by:
1. [JFD][IP1] **Jesús Fontecha Diezma, PhD** on Computer Science. Lecturer (Prof. Contratado Doctor). Expert on Smart Health, mHealth, and Ambient Assisted Living.
2. [IGD][IP2] **Iván González Díaz, PhD** on Computer Science**.** Lecturer (Ayudante Doctor, acreditado Contratado Doctor). Expert on Quantitative Gait Monitoring and sensorized wearables.
3. [JBR] **José Bravo Rodríguez, PhD** on Industrial Engineering. Full Professor. Lead of the MAmI research group and expert on Ambient Intelligence applied to health.
4. [RHL] **Ramón Hervás Lucas, PhD** on Computer Science. Professor (Acreditado como Catedrático). Expert on interactive applications and technology for health.
5. [TMP] **Tania Mondéjar Palomares, PhD** on Psychology. Lecturer (Ayudante Doctor). Expert on assitive technology applied to neuropsychology.
6. [JNO] **Francisco Javier Navarro, PhD** on Medicine, professional Geriatrician at SESCAM and adjunct professor at UCLM Medicine Faculty. Expert on frailty and dementia.
7. [ISC] **Inocente Sanchez Ciudad**, professor and expert on signal processing.

The group of researchers involved in the working plan includes **stable and active members** of the MAmI group [EJR, APG, LCG, APV, ABC and CCD] with contractual relationship with the university. The rest are renowned international researchers in areas related to the project:

1. [EJR] **Esperanza Johnson, PhD** on Computer Science; Research Lab. Technician (PTA) at the WeCareLab. Specialized on Cognitive and Affective Computing, and end-users evaluations.

2. [APG] **Alberto Pinto**. **PhD** on Science of Physical Activity and Sports and adjunct professor at UCLM. Expert on topics related with physical activity and health.
3. [LCG] **Luis Cabañero Gómez**, Last-year PhD candidate (FPI-JCCM) with research topics on healthdata analitics, artificial intelligence and biomedical signal processing.
4. [APV] **Alejandro Pérez Vereda**, Last-year PhD candidate (FPI) with research topics on personal data management applied to health.
5. [ABC] **Alfonso Barragán Carmona**, Second-year PhD candidate (Hired Technician) with research topics in nature-inspired AI Algorithms.
6. [CCD] **Cosmin Constantin Dobrescu**, First-year PhD candidate (Hired Technician) with research topics in body-worn sensor infrastructures and hardware prototyping.
7. [VlV] **Vladimir Villarreal PhD.** (UTP, Panamá): Full-Time professor. Awarded Researcher of the year 2016. PhD obtained in the UCLM. Expert on mobile-based monitoring for health. Director of GITSE research group.
8. [ChN] **Chris Nugent, PhD** (Ulster University, UK): Head of the School of Computing and Professor of Biomedical Engineering. From 2015-2017 Chris was the Director of the Computer Science Research Institute. He was awarded the Senior Distinguished Research Fellowship from Ulster University. His research includes the topics of mobile based reminding solutions, activity recognition and behavior modeling, and technology adoption modeling.
9. [JFav] **Jesús Favela, PhD** (CICESE, Mexico): Dr. Jesús Favela is one of the most prestigious researchers in Mexico. He developed his PhD at MIT, USA and he is an expert on human-computer interaction and physical activity recognition.
10. [IHL] **Irvin Hussein López, PhD** (CICESE, Mexico): Dr. Hussein is specialized in activity tracking and signal analysis. He developed his doctoral dissertation in the INAOE research center.

On the other hand, both [TMP] and [EJR] will take on leadership tasks ([TMP]) and relevant participation ([TMP, EJR]) promoting women integration in the work plan according to their valuable proven skills.

Additionally, **we propose the need for the recruitment of two qualified people**. A computer engineer with electronics and software development skills to support the CDs prototyping and data acquisition, as well as the development of software services and integration of the proactive layer. In the second half of the project, it will be necessary to hire a person specialized in artificial intelligence and data science (with a master's degree recommended) who will support in the development knowledge extraction procedures and analytics, as well as the support in pilot trials execution. To sum up, the total number of months with a necessity of hired technicians is 22. We will positively value the integration of women at this point in order to promote gender balance in the project team.

3.4.2. Multidisciplinary approach

Considering the project members (see Section 3.4.1) and the objectives of the proposal (see Section 3.1), it is necessary to have knowledge and experience in the fields of **Computer Engineering and Health** (contrasted in Section 2.3). The ADL-based intervention, monitoring and knowledge extraction for a smarter caregiving (see project's objectives) require experts from both areas (as the project team's strategy shows). Besides, we have external experts in the work team specialized in the application of technologies in healthcare domain, according to similar projects. In deployment and pilot studies will be fundamental to have social institutions and people working in the caregiving sector. In collaboration with the OPEs, we will manage the multidisciplinary viewpoint to achieve the main objective from health and engineering perspective.

3.4.3. Work packages. Project Schedule

In line with the phases that make up the project (see Section 3.2), we have defined 1+4 Work Packages (WPs). Each WP is guided by a specific methodology (see Section 3.2). In each phase, there can be tasks from different WPs (described in more detail in Figure 3).The WPs identified are the following:

Work Package 0 [WP0]: Coordination, Management, Dissemination and Ethics
Person in charge: Jesús Fontecha Diezma [JFD], and Iván González Díaz [IGD]
Duration: Months 1 - 24
Description: Promote the dynamic and effective interaction of the different project participants, as well as **ensuring that the project's objectives defined in the methodology are carried out**. Project's results will be disseminated according to the **dissemination plan**. Finally, the **ethical and privacy** implications are monitored and ensured.
Identified deliverables: Management documentation [E01], Requirement's report [E02], Dissemination results summary [E03], Security & privacy guidelines [E04], Transference plan [E05], Audit report [E06].

Task 0.1: Requirements and analysis		
Duration in months (mo): 1-3	**In charge:** JFD	**Participants:** Full Research Team, Experts
Task description: To determine the overall management of the project, ranging from the global **requirement analysis**, trials definition and protocols to acquire data and procedures for ADL analysis and intervention. This task follows the user-centered perspective and involves multidisciplinary external experts and OPEs (Observer-Promoter Entities). The inclusion/exclusion criteria for participant recruitment will be defined with the support of OPEs related with end-users. The contingency plan will be detailed in this task.		

Task 0.2: Project Management and Ethics		
Duration (mo.): 4-24	**In charge:** JFD, IGD	**Participants:** Full Research Team
Task description: Project coordination, including compliance with ethical aspects and principles of Responsible Research and Innovation (RRI). The experiments designed in task T4.1 will be proposed to be validated by ethical committee. The task also includes the holding of monthly meetings to follow up on tasks and quarterly meetings to review the progress.		

Task 0.3: Awareness-raising and exploitation		
Duration (mo.): 8-24	**In charge:** JFD, IGD	**Participants:** All
Task description: The advances of the project will be disseminated following the dissemination and internationalization plan (see Section 4.2). In Figure 3, main expected results are indicated from which dissemination items will be released. This task also involves the development of a detailed transference and informative plan (regarding Sections 4.3 and 5.2).		

Work Package 1 [WP1]: Design and development of the ADL-based multi-modal acquisition framework for data monitoring from digital resources
Person in charge: Iván González Díaz [IGD]
Duration: Months 4 - 8
Description: This work package involves tasks related to the development of a comprehensive **multi-modal framework to register, configure, and monitor ADL-related data** from multiple environmental sources. In this project we will work with **own connected devices (CD)** and standard **conversational assistants (CA)** as main sources of data acquisition and interaction. Data monitoring has been divided into two levels of abstraction: 1) low-level: it deals with implicit interaction with plugged-in appliances in a transparent way, and 2) high-level: to manage the interactions by voice in a natural way, mediated by a proactive layer which is detailed in the WP2. This WP is focused on data acquisition and monitoring from primary users during daily living as input to measure ADL performance and related needs.
Identified deliverables: Sensing ontology for ADL monitoring [E11], Multi-modal data acquisition framework [E12], Open CD prototype for replicability [E13], High-level monitoring software services [E14], Low-level monitoring software services [E15].

Task 1.1: ADL-based framework design and adaptation		
Duration (mo): 4-5	**In charge:** JFD	**Participants:** JBR, IGD, CCD, RHL, Hired1, Experts

Task description: To adapt ADL standardized models and scales for project's purpose, including setting the scene requirements and the foundations for ADL analysis, stress, and burden. This task will model monitoring services from heterogeneous sources, people-machine interaction flows and actions to be performed by the proactive layer, based on caregiving needs, from the general to the specific. In this task is imperative to rely on experts and therapists, as well as end-users.

Task 1.2: Device authentication and registration		
Duration (mo): 4-5	**In charge:** IGD	**Participants:** JBR, ISC, CCD, RHL, Hired1
Task description: At a high level of abstraction, the data acquisition framework is made up of several modules and services. This task will deal with configuration and connection of the environmental authorized devices for monitoring and analysis tasks. Each data source device has its own specifications, in terms of the data stream generated, which are propagated during the device registration process. Thanks to this task, all devices distributed in the environment will work in a coordinated way to acquire and monitor data for a further ADL analysis of primary users.		

Task 1.3: Manufacturing and integration of connected devices (CDs)		
Duration (mo): 4-6	**In charge:** IGD	**Participants:** ISC, CCD, ABC, JFD, Hired1
Task description: This task involves the design and manufacturing of CDs prototypes to be used in the project as main mechanisms of low-level monitoring. Based on open standards and licenses, and low-cost approaches, we determine to manufacture and integrate the CDs of the project, since we need to cover the requirements and project objectives in an ADL-based healthcare domain. Therefore, we will not be able to use commercial devices in this case. The background of the project team with the available resources will allow a rapid prototyping (see Section 3.3).		

Task 1.4: Low-level modelling and monitoring		
Duration (mo): 6-8	**In charge:** ISC	**Participants:** IGD, JBR, CCD, LCG, Hired1
Task description: Considering non user explicit interactive and connected devices (CD) such as wireless open smart-plugs in our proposal (see Task 1.3.), we will design a common model for data acquisition and monitoring, and we will develop the corresponding software components to monitor daily consumption data with the aim of detecting use (continuous and/or non-continuous) of plugged-in appliances by primary users in a transparent fashion, in the field of ADL, according to the results of Task 1.1. All monitored data will be used by the processes of the Tasks 3.1. and 3.2.		

Task 1.5: High-level modelling and monitoring		
Duration (mo): 6-8	**In charge:** RHL	**Participants:** JBR, JFD, CCD, ABC, JFav, Hired1
Task description: Following the same approach of the previous task, we will design a common model for data acquisition and monitoring from explicit voice interaction with primary users in an ADL domain. Thanks to the proactive layer developed in the WP2, the user does not need to initiate the conversation, since this layer will be responsible for the direct interaction with conversational assistants (CA) in a more natural way (if necessary). All input data monitored from this task and thanks to the Task 2.4. will be processed according to the Task 3.1 specifications, facilitating the output (by voice) provided by the proactive layer.		

Work Package 2 [WP2]: Modelling of the proactive layer for a personalized healthcare on ADL interactive interventions

Person in charge: Ramón Hervás Lucas [RHL]

Duration: Months 9 - 14

Description: This work package is focused on the **design and development of a model for voice-based interaction, and intervention** fundamentals related to low/high-level monitoring process. It comprises the own model definition, as well as the adaptation and integration of a **proactive module** which is being developed by MAmI research group in collaboration with researchers from CICESE to initially cover other purposes in the framework of EVA project. In this sense, this proactive module will be adapted to work in an Ambient Assisted Living environment

for ADL-based intervention, causing a **disruptive process** in which the proactive layer makes caregiving task **more natural and smarter**. This WP has certain parallels with WP3 since it needs to feed on some results of this.
Identified deliverables: ADL voice-based intervention model [E21], Software module for proactive interactions [E22], Plan for ADL intervention management [E23].

Task 2.1: Entities and elements definition for the interaction		
Duration (mo): 9-10	**In charge:** RHL	**Participants:** JBR, JFD, LCG, APV, experts, end-users
Task description: From the Task 1.1., we will identify and create an ADL-based taxonomy which involve all elements and relationships associated with the "artificial communication", and interaction process between CAs and our proactive layer. Then, in line with expert proposals, a wide battery of specific training phrases will be included in the interactive communication procedure. This task will be able to be reviewed and reimplemented once the system is running to refine the further interaction.		

Task 2.2: Design a model for an ADL voice-based intervention		
Duration (mo): 11-13	**In charge:** JFD	**Participants:** RHL, ABC, APV, IHL, Hired1
Task description: Then, we will create an ontology-based model to be used to manage voice interactions according to the ADL-based framework developed and the Task 2.1. It will be useful to detect issues and needs of the primary and secondary users at home. Also, we model the initial plan for ADL intervention as input of the Task 2.5.		

Task 2.3: Integration and adaptation of the proactive module		
Duration (mo): 12-14	**In charge:** IGD	**Participants:** JFD, LCG, ABC, APV, IHL, JFav, Hired1
Task description: As we mentioned in Section 2.3, in the field of assistive and user's behavior study, MAmI research group has developed a proactive module as part of the EVA project in collaboration with researchers from CICESE institution (Mexico). At this point, we will adapt and integrate such proactive module to act in the domain of this project. This module can be integrated into a software app or as a low-cost hardware piece (as in EVA project case). To do this, we will carry out the necessary technological adjustments and developments making use of Tasks 2.1 and 2.2. In this task, we include JFV as participant (external work team member, closely involved in the EVA project).		

Task 2.4: High-level communication process		
Duration (mo): 12-14	**In charge:** JBR	**Participants:** ISC, JFD, RHL, LCG, IGD, Hi.1, Hi.2
Task description: Once developed models and software components for high-level monitoring (see also Task 1.4.), we will implement a communication layer to deal with the voice-based interaction between CAs and the proactive module. In this sense, an user will be able to initiate the conversation with the system or the own proactive module will be responsible for beginning this and acting as a "natural bridge" between the user and the CA, as long as both elements are in the same field of action within the household.		

Work Package 3 [WP3]: Knowledge extraction on the basis of people-system interaction for a sustainable smart care delivering
Person in charge: Jesús Fontecha [JFD]
Duration: Months 12 - 20
Description: This work package includes tasks related to **data processing and knowledge extraction** (considering training, learning, decision, and prediction features) from monitoring and interaction tasks. We will take advantage of CDs and CAs to analyze and **detect abnormal behavior in ADL performance**, chasing autonomy promotion and quality of life of primary users and **measuring stress and burden** of secondary users. The change in the proposed model of caregiving (regarding the new caregiving economy implications) involves a **technological**

transformation in which artificial intelligence processes is the key **to provide a smarter and sustainable care**.
Both, WP3 and WP4 will benefit from the "*know-how*" and background mainly acquired in M4S National project (for the Tasks 3.1. and 3.2.), and PIA European project (for the Tasks 3.3., 3.4. and 3.5.).
Identified deliverables: AI-based algorithms for knowledge extraction and processing [E31], Software component for primary users' intervention [E32], Software pills for secondary users' intervention [E33], Intervention management plan [E34].

Task 3.1: Low-level and high-level data processing		
Duration (mo): 12-13	**In charge:** IGD	**Participants:** JBR, LCG, ABC, APV, EJR Hi.1, Hi.2
Task description: Data from low-level monitoring (see Task 1.3.) related to CDs, will be used to analyze the energy consumption, not only in "green terms", but also in terms of detecting abnormal behaviors of primary users. In this task, we will normalize and classify incoming (time series) datasets to obtain indicators and metrics, establishing correlations with ADL at home. In addition, a similar data processing will be performed with data from high-level monitoring (see Task 1.4.). In this case, indicators and metrics will come from voice interactions of primary users with CAs and the proactive module. After a voice-to-text conversion, a semantic treatment will be performed to discover needs and facilitate the measurement of ADL standardized aspects.		

Task 3.2: Learning and system reinforcement		
Duration (mo): 14-16	**In charge:** IGD	**Participants:** ISC, ABC, RHL, APG, APV, Hi.1, Hi.2
Task description: In this task, we will develop an expert system based on Artificial Intelligence techniques making use of machine learning and regression mechanisms as support for an early discovery and detection of problems related to the autonomy and independence of primary users while performing the ADL tasks, as well as burden and stress of secondary users in the caregiving process. Also, taking advantage of the interactive elements (proactive module and CAs) and the findings from this knowledge extraction process, the system will be able to determine initial simple actions to carry out, interacting with end-users, as well as to be useful for deeper analysis by the experts.		

Task 3.3: Primary users' intervention core		
Duration (mo): 17-19	**In charge:** TMP	**Participants:** JNO, JBR, JFD, RHL, APG, APV, Hired2
Task description: From monitoring and data analysis results, and leading by the ADL intervention model developed in Task 2.2., the system will provide detailed information to facilitate decision making by experts, as well as actions' triggering to primary users by means of the proactive module (see Tasks 2.3. and 2.4.). These actions will involve the following: 1) to maintain person's autonomy, 2) to improve emotional state, 3) to promote quality of life (QoL), and 4) to have the person connected to the world around him/her, acting as an active subject.		

Task 3.4: Secondary users' intervention core		
Duration (mo): 17-19	**In charge:** TMP	**Participants:** JNO, JBR, JFD, RHL, APG, APV, Hired2
Task description: In case of secondary users such as caregivers, the system can collect information during the caregiving process to be also treated in detail with specific objectives regarding the following: 1) to improve their QoL, 2) to reduce stress and 3) delay the secondary user's burden. Thus, this task gives rise to three software pills to gather explicit data from secondary users, and it can be useful for rapid feedback, e.g., to set alarms, recommendations, or to be important for clinical aspects. Examples of this are related to "*feeling of frustration about the care given*", "*self-esteem assessment*", or "*spare time commitment*", among others (based on standardized scales and instruments). Although the intervention is defined at this level, the assessment procedures take place in Task 4.3. and 4.4.		

Task 3.5: System feeding and people-system intervention management		
Duration (mo): 18-20	**In charge:** JFD	**Participants:** IGD, ChN, JNO, TMP, Hired2, Experts
Task description: Along with (low/high-level) monitoring data and extracted knowledge during the pilot study, we will develop an intervention plan with the aim of detecting care needs and providing feedback to primary and secondary users. Also, thanks to the services already included in the CAs, we can create particular CA routines in response to some predetermined stimulus and knowledge from these sources and procedures: CDs (low-level monitoring), and CAs/proactive module (high-level monitoring). The continuous use of the system and the execution of the intervention cores (see Tasks 3.3. and 3.4.) to measure QoL, and burden among others from the pilot trials, will boost a smarter caregiving choice.		

Work Package 4 [WP4]: Pilot trials: Evaluation, analysis, and impact of the project on elderly people and caregivers

Person in charge: Tania Mondéjar Palomares [TMP]

Duration: Months 18 - 23

Description: In this work package the **pilot study** will be carried out consisting of a set with a minimum of ten **field trials** (in simulated and real households with the system previously deployed). The trials will be conducted with a selected **focus groups** of pairs elderly person – caregiver. Although we propose a short-term evaluation, it will be enough to conclude and find out relevant results about the necessity for this **technological integration, its flaws, benefits, and detailed findings** about autonomy and ADL tasks performance (primary users), QoL (primary and secondary users), burden and stress (secondary users). All of this to study and promote the **digital change in the caregiving** paradigm.

Identified deliverables: Protocol and sample selection criteria for fields trials [E41], Datasets with features from low-level and high-level monitoring [E42], Dataset with features from secondary users' intervention [E43], Analysis measurement reports from the pilot study [E44].

Task 4.1: Field trials design		
Duration (mo.): 18-19	**In charge:** JFD	**Participants:** JNO, JBR, EJR, VIV, TMP
Task description: This task involves the definition of protocols, sample selection of primary and secondary users, and preparation of field trials (see Task 4.2.) according to the criteria and suggestions of the research ethics committee and therapists. ADL traditional tests (e.g. Barthel, Lawton & Brody) will be used to determine the ADL baseline state of primary users (elderly people), as well as standardized scales to measures initial state of stress and burden of secondary users (informal caregivers) (e.g. Rasch model, Zarit interview). Besides, in this task, we will decide the adaptation of the proactive module as a software app, or integrated into a small piece of hardware (either option is feasible and envisaged, so no additional effort will be required). A pilot study with a minimum of 10 trials should be done.		

Task 4.2: Field trials execution		
Duration (mo.): 20-22	**In charge:** TMP	**Participants:** EJR, JNO, APG, IGD, Hired2
Task description: Field trials in controlled environments will be carried out (it includes real and simulated households with primary and secondary users). Although, due to the project constraints, we will develop a pilot study in a short-term context, it will provide the appropriate findings to determine the effectiveness of the system in caregiving improvement, and the subsequent study about drawbacks/shortcomings that the technology can help to overcome and the impact in its integration. We will perform each field trial with at least: 1) one CA, 2) five CDs (distributed according to the most widely used devices and switches at home), 3) one proactive module, and 4) three software pills (for secondary users' measurements).		

Task 4.3: Quality of life measurement on primary and secondary users		
Duration (mo.): 22-23	**In charge:** JNO	**Participants:** TMP, EJR, APG, JFD, Hired2

Task description: ADL-based caregiving is closely related to QoL of primary users. Thus, the knowledge from Tasks 3.1. and 3.2., will be used as complementary method of measurement to traditional ones. In a similar way, QoL aspects of secondary users can be measured thanks to the interactions with the software pills and the involvement with the ADL tasks. In addition, all results and findings from this task will be used by experts and healthcare services for further analysis with the aim of improving autonomy of primary users and achieve more sustainable "at home" caregiving approaches.

Task 4.4: Burden and stress measurement on secondary users		
Duration (mo.): 22-23	**In charge:** JNO	**Participants:** TMP, EJR, APG, IGD, Hired2
Task description: In a parallel way with Task 4.3. and thanks to the software pills described in Task 3.4, based on standardized questions from known scales, we will measure in a complementary way stress and burden aspects of secondary users. As in the previous task, all results and findings from this task will be able to be used by experts and healthcare services for further analysis with the aim of reducing caregivers' stress and burden, achieving a more sustainable caregiving approaches, also for caregivers.		

All work packages considered, Figure 3 shows the complete **time schedule** beginning in November 2022.

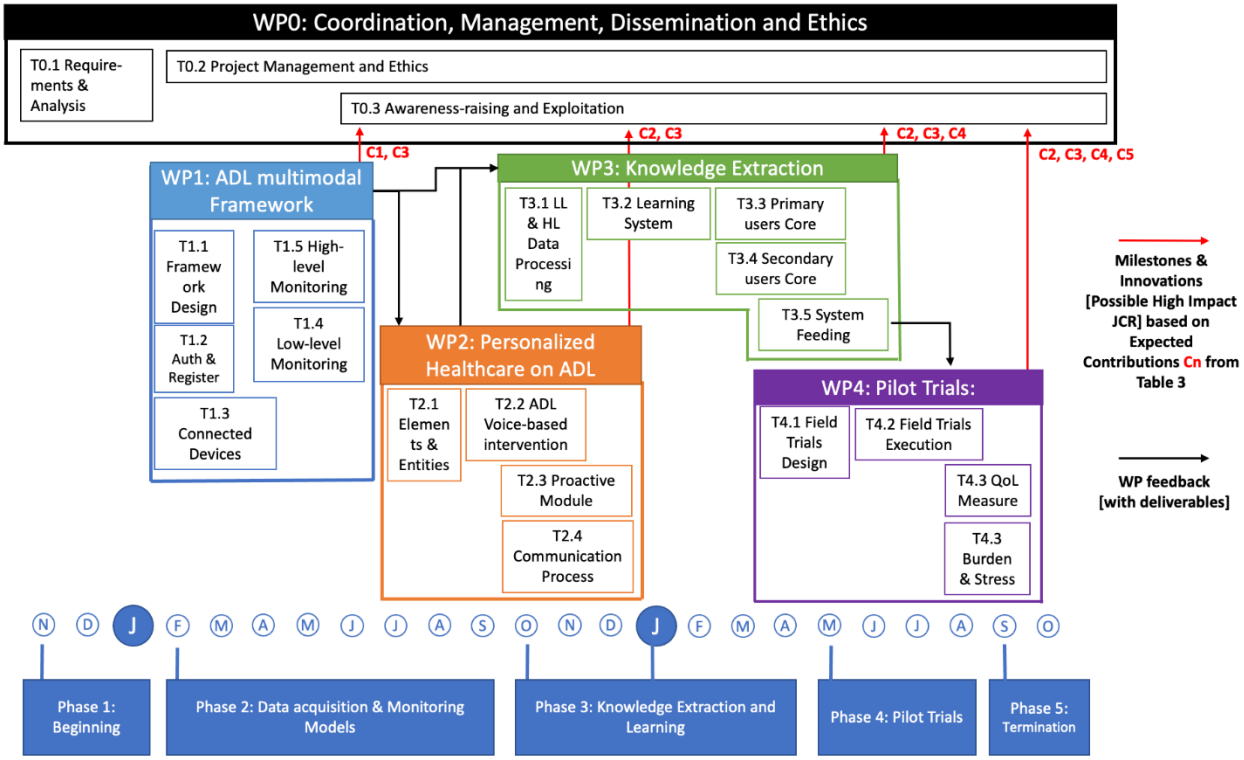

Figure 3. Time schedule with phases and plan. It includes work packages, relationships, and expected results (see Section 4.1)

3.4.4. Risk Analysis and Contingency Plan

The risks associated with this project have initially been studied and will need supervision during the whole project's period. The research team will always seek to identify potential issues early before they cause a real problem. Anyhow, the main responsibility of risk monitoring and consequent actions are on both IPs. During the Task 0.1, the contingency plan will be checked and deeply studied starting from the **initial plan of significant risks** (see Table 2, also considering the most critical phase detailed in Section 3.2):

Severity	Risk description	Objectives and WP(s) concerned	Contingency plan	Risk mitigation options*
Med.	Technical issues from data sources for low/high-level monitoring	SO1, SO2 / WP1, WP2	Review the data acquisition & communication process. Consider alternative low/high-level sources without hinding the rest of the process.	Decrease / Avoid
High	Primary and secondary users recruitment difficulties	SO5 / WP4	Looking for alternative potential participants among our EPOs and centres or households which collaborate with the team in other works.	Decrease / Avoid
Med.	Low knowledge extracted about ADL-based performance and stress/burden factors	SO3, SO4 / WP2, WP3, WP4	Review AI-based processes and trainning. Consider alternative processing and analysis techniques, as well as ways of dealing with interaction.	Decrease / Avoid
High	Unexpected issues in continuous acquisition and processing from pilot trials	SO4, SO5 / WP1,WP2, WP3, WP4	Review the sample, trials scalability & duration, and technological deployment. Modify the trials protocol to make them more manageable without loosing information.	Decrease
Med.	Failures in the use of third - party technologies and devices	SO1, SO2, SO4 / WP1, WP2, WP4	Use alternative devices, less third-party dependent, and make a better use of own technologies and devices when possible.	Decrease
High	Ethical/Privacy issues not considered	SO2, SO4, SO5 / WP1, WP2, WP4	Obtain rigorously participation consent, ensure total privacy and anonymity, and check all progress with UCLM Ethics committee from the project start.	Avoid/ Share

Table 2. Initial risk and contingency plan. (Standardized risk mitigation options according to ISO 27001 risk assessment & treatment)*

4. *SCIENTIFIC-TECHNICAL IMPACT*

4.1. Expected Results Impact

The main scientific-technical innovations and results are aligned with the objectives of the project and related to the identified deliverables from the work packages developed. Table 3 shows a summary about the **main contributions and findings** which could be included in JCR publications, technical reports, software products, and transference elements (see Section 4.2). The results closest to triggering a disruptive and innovative process are: C2, C3, and C5.

Expected result	Type	WPs involved
C1: ADL-based multi-modal data acquisition framework	Technical report; Potential contributions; Software product	WP1
C2: ADL voice-based intervention model and tool for proactive communication	Potential contributions; Software product; Transference item	WP2, WP3, WP4