AMBIENT ASSISTED LIVING JOINT PROGRAME

senior ludens

**AAL-2013-6-039**

# SeniorLudens

***Serious Games development platform for older workforce training and intergenerational knowledge transference***

# D5.8
# Final Report M30

| | |
|---|---|
| Workpackage | WP5 – Project management, dissemination, and exploitation |
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# Abstract

The present document aims at detailing the status of SeniorLudens project in the time frame comprised from M25 to M30 both inclusive. This report includes the management information related with the position of the project and the main technical achievements accomplished during the specified period.

This report is the last report of the project. Because of this, it includes a conclusions section reserved to show the general situation of the work done, the lessons learnt and the next steps.

# 1- Executive Summary

The main achievements reached during the reporting period (M13 – M24) can be summarized in the following points:

- Preparation of D2.5 Serious Games development engine in its last version corresponding with the month M25.
- Preparation of D3.4 SeniorLudens platform in its version corresponding with the month M25.
- Preparation of D3.5 SeniorLudens serious game engine and platform technical evaluation report in its version M25.
- Preparation of D4.2 Pilots evaluation results in its last version of the month M30.
- Preparation of D4.3 Recommended actions.
- Preparation of D5.4 Report on dissemination activities.
- Preparation of D5.6 Final Business plan/Business model.
- Preparation of D5.8 Final Report.
- Integration of the third and last release of the developments completed in WP2 and WP3.
- Third validation with users.
- Preparation of the final business plan analysis.

# 2- Account of Progress Made

## 2.1- Workpackage Activities

### 2.1.1- WP2: Serious games development engine design and implementation

The reporting period corresponds with the last 6 months of the project that have been oriented to accomplish the final integration of the different components developed inside the WP2.

The main outcome resulted from the integration process in this WP is the SeniorLudens Game Engine which is considered the module in charge of the games definition, development and execution inside the SeniorLudens system. It is composed by the SeniorLudens Parser which defines the abstraction layer to separate the game definition from the low levels game engines used for the game construction. This component permits to create the games without paying attention to the low level programming tasks and allows building up the games using understandable concepts what eases the process.

Although the SeniorLudens Parser is the core module for the game definition and structure, it is the descriptor structure in which the abstraction is based what simplifies the game creation process. This descriptor structure is shaped by four descriptors broadly defined in the deliverables included in the WP2. Just to mention them from the bottom to top in its hierarchy, we have the world descriptor that defines the entire possibilities with the 3D world defined in the low level game engine. After this, we have the scenario descriptor, which defines the specific objects that are going to be included inside our game from all the possibilities defined in the world descriptor. Going up, we have the task descriptor, which defines the game logic based on the actions that can be performed with the objects included inside the scenario. The last step is the training program descriptor which composes the game by joining tasks with a certain difficulty. With this abstraction layer based on the four descriptors, we can define uniquely a game inside the SeniorLudens Game Engine, through the Parser component.

The SeniorLudens Game Engine also includes three graphical editors to deal with the scenario descriptor, task descriptor and training program descriptor. These are the Scenario Editor, Task Editor and Training Program Editor respectively. These editors have been built using graphical solutions based on the accessibility principles outlined from the WP1 requirements extracted by **CBIM** and **KBO**. These principles are crucial in these tools because they are the representation of the abstraction layer for the users as they permit the creation of content, with the overall objective of reducing the complexity of the game development and also the technical knowledge required.

There are other two tools oriented to the game execution: the Simulator and Trainer. These tools also follows the accessibility principles outlined from WP1, because they are also used by the users, as they are utilized to execute the games defined with the presented abstraction layer. The difference between them resides in the context in which they are used. In the case of the Simulator, it is used during the game development process, and it serves to test the task descriptors and training program descriptors created with the corresponding editors. During the simulation of these contents, the Simulator shows useful information to detect possible existing errors in the content. In the case of the Trainer, it executes the game in the same way, but it is intended for the final trainees users, so it does not display development information and what is more important, it generates users' results for the different tasks defined as part of the game

(defined in the training program). The Simulator does not create results, because it is used in the development process.

During the reporting period we have accomplished the third and last integration of all the tools and components explained in this section to shape the SeniorLudens Game Engine. This integration has been coordinated by YR with the support of **INDRA**, **UPC**, **CBIM, YR** and **KBO** (providing the usability requirements to the different developments). The result obtained is a complete solution for the game definition, development and execution using easy to use abstractions which reduces the technical knowledge to the minimum. It also allows updating and maintaining the games easily resulting in a considerable reduction of costs.

### 2.1.2- WP3: SeniorLudens platform design and implementation

In the same way as the work done in the WP2, the works related in the last 6 months of the project of this reporting period, have been focused on the integration of the final solution related with the SeniorLudens Platform. Besides, these works have been also directed to not only the integration of the different components developed inside the WP3, but also the results obtained in the WP2, basically the SeniorLudens Game Engine inside the SeniorLudens Platform.

The third and last integration have comprised some important modules developed inside the tasks composing this work package. But it is also important to highlight the work done over the collaborative platform itself, as it is the base in which the rest of the modules have been orchestrated to create the final solution.

The Collaborative graphical interface in which the SeniorLudens Platform lies is the pillar in which the rest of the tools are integrated. It includes the security mechanisms to validate and identify the users and the systems as well as the methods for creating new users. The interface is divided into three portals: the management portal oriented to the organizations to manage the content, courses and activities created, the trainee portal directed to the trainees users and to play the different activities in the courses included inside the system. The third portal is the free portal which provides access to non logged users with the intention to show a limited approach of the Trainee portal to illustrate the capabilities of the system.

The SeniorLudens Platform is also comprised by the Social Network based on the Community Engine solution, which is integrated into the Management Portal and Trainee Portal to provide to the users the mechanisms to communicate with the SeniorLudens Community. The integration includes the forums, topics and messages feature which enables to discuss freely with the community and also with the SeniorLudens Platform.

The SeniorLudens Platform also integrates the Users Management defined in the previous reporting period. This component provides the authorization schema based on roles which were resulted from the requirements extraction in WP1. These roles defined in the system permits to organize the access of the different users into the different sections, portals and tools what results in the provision of flexible workflows into the system. Besides, this structure is used for the definition of the organization staff into the system.

The Game Management component is also integrated inside the SeniorLudens Platform, through its main feature, the course catalogue. This component declares two concepts that try to include the SeniorLudens Game Engine solution inside the platform. We can distinguish between Course, as the container that is included inside the Course catalogue, which pursues to transmit knowledge of a determined sector or field to the trainees. These Courses contain

any number of Activities, which are considered the Serious Games in the sector of the Course. An activity is the representation of the training program descriptor, which is the top layer of the games abstraction defined inside the SeniorLudens Game Engine. The integration of these concepts, within the Course catalogue is included inside the three portals. It permits to use the Management portal to manage the games inside the different creator organizations, also to provide access to the games inside the Trainee Portal and the games information in the Free Portal.

The platform also integrates the Users results management into the graphical interface. It is translated into the inclusion of the Analysis Tool inside the Management Portal, to visualize the results obtained by all trainees playing games created and available in the organization, an inside the Trainee portal to visualize the results obtained by the trainee logged into the system. It is also provided a mechanism to assign specific Activities to Trainees with difficulties in the learning concepts absorption. This assignation is done by the Trainer user in the organization in base of the results shown in the Analysis Tool. The integration of this tool has been completed and it has required the connection with the Trainer Tool included inside the SeniorLudens Game Engine, as it is responsible for the generation of the user results during the playing process.

The integration of all these tools defined in WP2 and WP3, has been done based on two developments: The first one is the SeniorLudens Storage Server, which stores all the data used in the platform. It provides the connection to access and store the data for all the components developed in WP2 and WP3. The second one is the implementation of the Managing Tools included inside the Platform graphical interface. These tools are the representations of the different four kind descriptors inside the organization through the Management Portal. In this sense it is the representation of the data stored inside the SeniorLudens Storage Server for the selected organization. Besides these tools, as they are divided into the four possible descriptors defined by the SeniorLudens Parser, provide access to the three editors defined as results of the WP2 in the private context of the different organizations.

This third integration has been leaded by **INDRA** with the support of **CBIM**, **YR**, **UPC** and **KBO** (in the application of the usability principles).

### 2.1.3- WP4: Pilot evaluation

During the reporting period, the works related the WP4 has been focused in the validation of the third integrated release based on the requirements extracted in WP1 and the technical developments covered in WP2 and WP3.

The validation has followed the same schema used for the second validation, by using the four use cases in four parallel locations to validate the results from the perspective of different sectors and target users. In particular it has been done in the following way:

- **INDRA**: Validation of the third release of the integration and the IT use case.
- **FCG**: Validation of the third integrated release and the Rehabilitation use case.
- **CBIM**: Validation of the third integrated release and the Alimentary use case.
- **KBO**: Validation of the third integrated release and Home Safety use case.

Following the same approach of the previous validation, the assessment sessions held with **KBO** users have been designed using an extended methodology which permitted the involvement of the elderly users and advisors in the development of portions of the use case itself. This approach has been followed to determine the validity of the final solution to the

elderly users, from a usability point of view. The results obtained from the four validations have been evaluated by **FCG** with the support of all partners, and have detailed in D4.2 deliverable.

In order to show the contrast among the three evaluations performed in the project lifetime, **FCG** partner (with the support of the rest of the partners) has completed a broad analysis that is included in deliverable D4.3. This analysis includes also technical considerations evaluated at the end of the project.

### 2.1.4- WP5: Management, dissemination and exploitation

During the reporting period, the work done in WP5 has been focused on the preparation of the transition phase between the R&D environments in which the project has been executed to the exploitation phase.

This transition has been analyzed from a double approach: in first case the deliverable D5.6 compiles the final exploitation plan that outlines the strategy for accessing the markets. This strategy evaluates the final integration of the project as a possible exploitable solution as well as the SeniorLudens Game Kit, SeniorLudens Platform and the four use cases as solutions suitable to be exploited individually. The approach evaluates the markets and the competitors, as well as the evaluation of the insertion in the market from a Lean perspective. This lean strategy does not try to push the technology into the market. Instead of that, a learning methodology is followed by means of what the final solution is adapted to the market and users necessities by using a learning loop.

The second approach is the determination of the dissemination activities to promote the final integrated solution and its sub solutions to pave the way for the exploitation of the results achieved after the project execution. This dissemination review is comprised into the deliverable D5.4. This deliverable is based on the works done with the dissemination plan created following the recommendations received in the mid-term review by the AAL CMU. The actions included in this plan has been reviewed and updated not only to verify the fulfillment but also to adapt the pending actions to synchronize them with the exploitation planning outlined in D5.6.

The works included inside the WP5 also includes the work for the preparation of this report in the current reporting period.

The documents and tasks performed in this WP have been coordinated by **INDRA** with the support and collaboration of all partners.

All partners have contributed to the internal reports required for the management of the consortium.

## 2.2- Milestones

| Milestones in this period | | | | | | |
|---|---|---|---|---|---|---|
| **Milestone number** | **Milestone Name** | **Responsible partner** | **WP** | **Achievement date** | **Means of verification** | **Remarks** |
| WP2 – Serious games development engine design and implementation | | | | | | |
| M6 | Third pilots delivery for evaluation | YR | WP2 | 30/04/2016 | Progress Report | Pilot |
| WP3 – SeniorLudens platform design and implementation | | | | | | |
| M6 | Third pilots delivery for evaluation | INDRA | WP3 | 30/04/2016 | Progress Report | Pilot |
| WP4 – Pilot evaluation | | | | | | |
| M7 | Third pilots evaluation | FCG | WP4 | 30/09/2016 | Report | |
| WP5 – Project management, dissemination, and exploitation | | | | | | |
| M9 | Business plan/Business model | INDRA | WP5 | 30/09/2016 | Report | |
| M10 | Final Report | INDRA | WP5 | 30/09/2016 | Report | |

## 2.3- Deliverables

| List of Deliverables in this period | | | | | | |
|---|---|---|---|---|---|---|
| **Delive-rable Number** | **Deliverable Title** | **Editor** | **Reviewer** | **Nature** | **Dissemi-nation level** | **Delivery date** |
| WP2 – Serious games development engine design and implementation | | | | | | |
| D2.5 | Serious Games development engine | INDRA | KBO | Pilot | PU | M25 |
| WP3 – SeniorLudens platform design and implementation | | | | | | |
| D3.4 | SeniorLudens platform | INDRA | CBIM | Pilot | PU | M25 |
| D3.5 | SeniorLudens serious game engine and platform technical evaluation report | INDRA | CBIM | Report | PU | M25 |
| WP4 – Pilot evaluation | | | | | | |
| D4.2 | Pilots evaluation | FCG | YR | Report | PU | M30 |

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|---|---|---|---|---|---|---|
| | results | | | | | |
| D4.3 | Recommended actions | FCG | INDRA | Report | PU | M30 |
| WP5 – Project management, dissemination, and exploitation | | | | | | |
| D5.4 | Report on dissemination activities | INDRA | FCG | Report | PU | M30 |
| D5.6 | Final Business plan/Business model | INDRA | FCG | Report | RE | M30 |
| D5.8 | Final Report | INDRA | ALL | Report | PU | M30 |

## 2.4- Deviations & Modifications from Plan

None.

# 3- Project Meetings

| Project Meetings in this period | | |
|---|---|---|
| **Title / Date and place** | **Attendants** | **Main conclusions** |
| Third Plenary Meeting<br>June 13th 2016<br>Madrid | Salvador Aguilar – INDRA<br>Dani Tost – UPC<br>Ariel von Barnekow – UPC<br>Gary Honegger – YR<br>Marlene Dastych - YR<br>Sara Isernia – FCG<br>Jonsdottir Johanna - FCG<br>Tommaso Migliazza – CBIM<br>Marije Blok - KBO | The plenary meeting accomplished the organization of the work plan for the last phase of the project, which comprised essential tasks like the third development phase, the integration of the different assets and the final validation with users.<br><br>The meeting served to agree a common approach on the existing fronts in the project and for the existing challenges until the end of the project. |

# 4- Dissemination

| Dissemination in this period | | | | |
|---|---|---|---|---|
| **Partner responsible** | **Activity** | **Date** | **Medium and reference** | **Indicative coverage** |
| INDRA (Spain) | Project Web Page | NA | WebPage: http://seniorludens.eu | Public |
| INDRA (Spain) | Twitter and Youtube accounts | NA | @seniorludens | Public |
| INDRA (Spain) | Promotion in Indra intranet | 09/2016 | Public webpage Indra Company. Internal newsletter | 42.000 employees |
| INDRA (Spain) | Promotion in Indra eLearning site – Compartiendo Conocimiento | 09/2016 | Private Indra eLearning site | 42.000 employees |
| INDRA (Spain) | Poster presentation in AAL Forum 2016 | 09/2016 | Poster and attendance to AAL Forum 2016. | AAL Community. |
| YR (Switzerland) | Wearable Tech Show, London | 03/2016 | Networking, Business Partner Evaluation | Tech sector. |
| YR (Switzerland) | ICT4AgeingWell 2016, Rome | 04/2016 | Networking, Business Partner Evaluation | AAL Community. |
| YR (Switzerland) | ESPRM, Lisbon | 04/2016 | Exhibit products and services | European Society of Physical and Rehabilitation Medicine. |
| YR (Switzerland) | ExpoSanita, Bologna | 05/2016 | Exhibit products and services | eHealth Community. |
| YR (Switzerland) | Rehab, Basel | 06/2016 | Exhibit products and services | Rehab Community. |
| YR (Switzerland) | Included Project Information on own homepage | 2016 | | Public |
| CBIM (Italy) | National meeting of Biomedical Research, organized by the Italian Ministry of Health | 04/2016 | Distributed to Research and Healthcare Institutions. | eHealth Community. |

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| CBIM (Italy) | 13° International Conference: e-Government & e-Health (eGeH'16) | 06/2016 | Presentation of the technical architecture of the platform and demo of the use cases | eHealth community. |
| CBIM (Italy) | La Salus ERASMUS+ Project Plenary meeting | 07/2016 | Project presentation, Use cases demo | Research community. |
| UnieKBO (Netherlands) | Workshop 50+ fair | 10/2016 | Project presentation. | AAL Community. |
| UnieKBO (Netherlands) | Article in Nestor | 11/2016 | Report of third validation session in magazine UnieKBO, 330,000 readers | AAL Community. |
| UnieKBO (Netherlands) | Publicity on Facebook and Twitter in test-/validation sessions | 2016 | @uniekbo | Public 2440 followers |
| UnieKBO (Netherlands) | Implementation of a Home Safety game in the regular job of the elderly advisors. | 09/2016 | This dissemination and implementation is co-financed by the Dutch Ministery of Security and Justice. Safety at home is one of their pillars and they stimulate the game as an instrument to work on this. | AAL Community. |
| FCG (Italy) | Presentation and application of health serious game in master medical university courses as simulation of neuro-motor-rehabilitation exam - Università degli studi di Milano | 09/2016 | Project and use case presentation. | Rehab Community. |
| FCG (Italy) | Presentation of pilot results in chapter of the thesis program (Master in Rehabilitation) - Università degli studi di Milano | 11/2016 | Results of pilot usability of technology in clinical context. | Rehab Community. |
| UPC (Spain) | Invited conference on Serious Games at the Catalan Cluster on Health Annual Meeting | 02/2016 | Dissemination to potential clients for superior education | Serious Games Community. |

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| UPC (Spain) | Invited conference on Serious Games at the 1rst Research Conference at the Engineering School ETSEIB | 02/2016 | Dissemination to potential clients for superior education. | eLearning Community. |

# 5- Project Efforts

| Project Efforts in Person/Months in this period | | | | | | |
|---|---|---|---|---|---|---|
| **Partner** | **WP1** | **WP2** | **WP3** | **WP4** | **WP5** | **Total Persons/Month** |
| INDRA | 0 | 0,92 | 1,77 | 4,91 | 6,80 | 14,40 |
| YR | 0 | 19 | 0,7 | 0 | 0,5 | 20,3 |
| CBIM | 0 | 0 | 3,15 | 8,82 | 0,56 | 12,53 |
| KBO | 0 | 0 | 0 | 1,69 | 0,5 | 2,19 |
| FCG | 0 | 0 | 0 | 8 | 0,5 | 8,5 |
| | | | | | | 57,92 |

# 6- Additional issues

The Italian partners CBIM and FCG have signed the National Agreements with the AAL organization, Italian Ministry of Education, Universities and Research, on July 2015.

Until this moment, CBIM received only one payment on July 2016, as part of the soft loan contribution. The participation in the project for CBIM has been entirely self funded until month 28.

FCG will receive its payment only after the project closure.

The partners YR and CBIM have suffered unexpected changes in their staff composition. These situations have been compensated with slight modifications in the efforts in order to perform a seamless transition over the work plan.

# 7- Conclusions

This report is considered as the last step in the project execution. However, the work on the project results through the final integrated solution is not stopping after the finalization of the R&D project SeniorLudens, because the exploitation planning starts just from this point. This planning determines the learning loop in which the exploitability is based through the Lean Startup methodology. This learning loop permits to understand the market necessities, and to adapt the final solution to them in order to reduce the entrance slope. The solution achieved after the project execution is specially adapted for the users, in particular the elderly, in base of the usability requirements extracted and applied into the developments covered in the work plan. However, during this exploitation planning the objective is also to keep learning from the users in the targeted markets to fit the solution to the required necessities. This process intends to convert the R&D result to a viable product.

The final integrated solution is innovative from the perspective of Serious Games creation because of the breakthrough advances of the SeniorLudens Game Engine. This cutting edge perspective has been included inside the SeniorLudens Platform to provide a complete environment to maximize the learning transference between the users and specially oriented to the organizations.

During the three validations with users included inside the work plan, we have learnt from the users, adapting at every stage the initial requirements extracted. This unalterable principle has been pursued during the project lifetime, searching for a technology driven solution based on the users and adapted to them.

These evaluations have taught us the necessity of a training phase. This training phase is considered essential because though the learning slope is much lower than the traditional games development environments, it needs to understand some concepts, like scenario, world, task and training program that are needed for the primary users, and particularly for the games creation.

The four use cases developed in the framework of the project have served us to validate the approach and the solution, as well as to be an excellent presentation of the capabilities included inside the SeniorLudens system. These use cases and the good feedback obtained from the users involved in the validations allow us to be positive about the future of the solution created in the markets.

The consortium has been working like a well oiled machine during the project lifetime what has guaranteed the quality of the result and the excellent adaptability of the final solution. This situation facilitates in great extent the beginning of the new exploitation cycle.