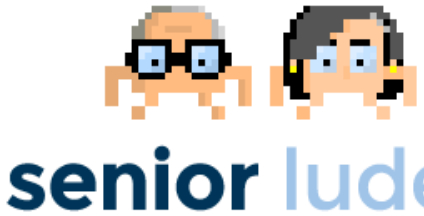
AMBIENT ASSISTED LIVING JOINT PROGRAM



AAL-2013-6-039

SeniorLudens

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

D4.2A
Pilots evaluation results
M13

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Abstract

The main objective of the present document is the evaluation and representation of the results obtained from the first evaluation session planned from the onset of the project.

Along the first part of the document a brief description of the platform and games implementation at first evaluation is presented together with the methodology provided to test the learning objectives achievement for each use case (IT, companies, hospital/clinical and home caring and traditional food production).

The following part is focused on the specific testing methodology adopted for this evaluation (participants and the tools specific procedure employed).

Finally, the results to the platform and the games usage are shown and explained. Results are presented in terms of functionality and user experience both of the platform and of the use-cases; results regarding the achievement of specific learning objectives are also reported in relation to the three games implemented.

The last part of the document will present the evaluation procedure used for this specific evaluation with the informed consent and the questionnaires separated in different annexes.

1- Introduction

In the previous part of the SeniorLudens project we worked on the design and implementation of the platform in relation to the user requirements defined by interviews, focus groups and literature researches.

In accordance with the user-centric development methodology of SeniorLudens we planned to test the platform implementation along the whole validation phase at three different times. To test whether the platform development is in line with user requirements, we defined the guidelines for the pilot testing phase of the SeniorLudens across the whole validation phase (M13-M30) (see D4.1 “Standard protocols for testing the serious games engine and platform”). Specifically, we focused on usability and user experience such as the main constructs that have to be assessed for each module developed and integrated in the platform (Senior Ludens Game Kit , SLGK - with Scenario Editor, Simulator, Trainer and the games correlated with each use-case; and web platform, SLWP, with the web frontend, social network, Task Editor, Program Training Editor and Training Analysis Tool). The general methodology (standardized scales, its related models, and *ad-hoc questionnaires*) to be adopted in whole evaluation phase was previously described (Deliverable D 4.1).

In the present document we present the status of the platform implementation along with the specific methodology to test the functionality of the developed modules and the effectiveness in reaching the first learning objectives of the serious games already developed.

In this deliverable (D 4.2A) we report results of the first pilot evaluation (M13) of the platform and the games in order to verify whether user requirements have been achieved and adequate the development of the platform consequently. Successively, there will be, as later phases, two pilot evaluations more along WP4 (M21, M30) in order to gradually verify the improvements of the platform and the games in relation to their compatibility with users’ needs and perceptions.

2- Platform and games implementation at first evaluation

2.1- Platform

The platform was projected as a collaborative hub for development, deployment, use and evaluation of serious games on which users have the possibility to share their experiences with SeniorLudens community.

The current status of the platform in this first validation has comprised most of the essential features that will be provided to organizations to manage their SeniorLudens platform instances.

The platform has been divided into two main elements which separate the different functionalities provided in the system.

- **Storage server:** This component provides the storage mechanisms that are used by all the rest of modules integrated inside SeniorLudens platform. It is an essential element in the project infrastructure as it stores the data in three different schemas: SL platform database, where all the data related with web platform is stored; SL Descriptors database, which stores the data referred to the file descriptors that creates the serious games; and SL Game Results database, which is in charge of accumulating the data associated with the user results produced in the play process by the users.

  In the first evaluation was evaluated the both first databases, providing the access to the web platform to its data and to Task Editor to store and retrieve the information related with the descriptors.

- **Web platform:** This component is in charge of the visual interface with the user. It manages the access to the different elements included in the system, and is intended to be the main interface between the user and the SeniorLudens Platform.

  In this first validation the Web platform has followed a twice objective, as it has two different web portals to be assessed: Trainee portal, which provides access to the Trainees to the game catalog and consequently to the games and the play environment; and Management portal, which is used by the game creation responsible users in each organization to manage the users, games and profiles. It also includes a complete role hierarchy that enables the organization to separate the duties inside the organization.

  The main elements integrated in the management portal for the first evaluation are the following:

  - **User Profile**: It manages the user profile in both portals (Management and Trainee). It facilitates the users to create new users in the system and provide the access to update this profile.
  - **Organization profile**: This element is in charge of updating the organization profile with the required information. This information is available to query by the users.
  - **Organization management:** It is also integrated the organization management, in charge of the creation of new organizations, as well as for the unification of all the data available in SeniorLudens platform related to organizations, making them accessible for the rest of the modules and visualizations.
  - **Users management**: This element is responsible of providing the mechanisms to add/ update/ delete user roles inside the organization hierarchy chain. These user roles are intended to divide up the responsibilities in the game creation process for the organization.

- **Game management**: This module is in charge of maintaining the game catalog. It also provides some features in this first release: it is able to publish/unpublish games from catalog; it differentiates between public and private games, visualizes the game details and allows creating new games. It is bound with the user role chain, so only determined users with specific roles have access to some actions. The game creation also responds to an approval workflow based on states, which eases the game creation and its direct connection with the user roles in organization.

2.2- Use case 1: IT companies

2.2.1- Implementation of Use case 1 at first evaluation

The use case GrowYourProject is aimed at providing formation on the management of projects in ICT companies. Trainers will be current Senior Project Engineers that will design training tasks for newly arrived engineers. The training will encompass the three steps of development of a project: managing, planning and tracking.

The main challenge of the use case is to bring a metaphoric vision of Project Managing in order to offer a wider perspective of this work and make training more attractive and visually pleasant. Specifically, the game will happen in a virtual farm and Project managing concepts will be represented through farm tasks.

2.2.2- Methodology to test use case 1 learning objectives achievement

The first version of our use case shows the following features:

Environment:

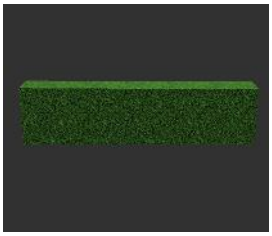
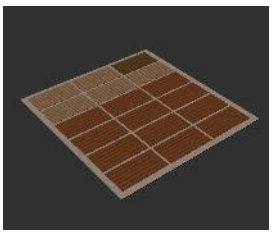
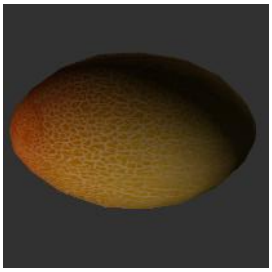
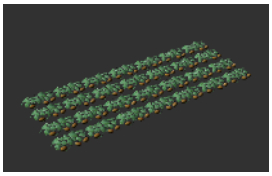
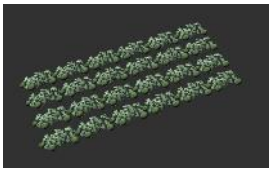
The environment reproduces a countryside landscape with a farm and plots where different types of seeds must be planted and grown to fulfil with the order of surrounding supermarkets. By opposite to other use cases, here the view is isometric with the camera elevated, located at a large distance from the ground to provide a global view of the whole scenario. Future versions of the interface will provide zoom in and out on the scenario.

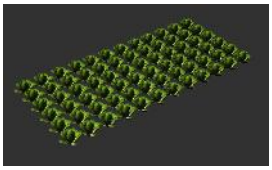
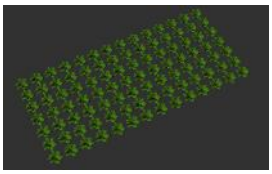
Figure 1 IT use case scenario

Objects:

For the first evaluation version of the IT use case some of the objects were implemented:

Type of objects	Name	Thumb	Actions *
Static objects	Landscape		
	Barn		
	Masia *Traditional Catalan Rural House*		

Structure elements	Fence		• Pick • Drop
	Bush fence		
Plot	Plot		• Drop *(place)* • Plant *(place)*
Crops	Melon (fruit)		Crops: • Pick • Drop • Destroy • Plant *(direct object)* Crops on plot: • Collect
	Melon (on plot)		
	Watermelon (fruit)		
	Watermelon (on plot)		

	Strawberry (fruit)		
	Strawberry (on plot)		
	Lettuce (vegetable)		
	Lettuce (on plot)		
	Spinach (vegetable)		
	Spinach (on plot)		
	Maize (cereal)		

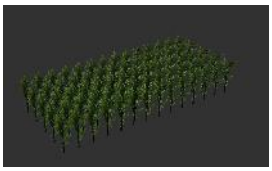
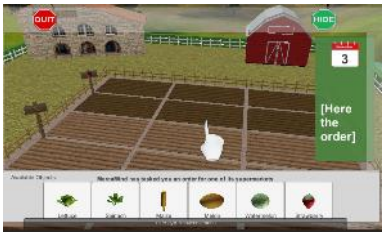
	Maize (on plot)		
	Wheat (cereal)		
	Wheat (on plot)		
2D interface	Tools Menu		• Select Crop • Hide Menu • End game

Table 1 Objects in IT use case

* Besides the specific actions of each object, all the objects have the following actions:

- Touch
- Navigate
- Remove

Actions:

The implemented actions of the first version of the IT use case game are the following:

- Plant

This action allows the user plant a type of crop on the plot. It creates an instance of the object on the plot you click.

Sentence	Alice plant melons on plot_9 *Subject + verb + direct object + place*	
Requirements	The plot is empty.	
Parameters	Crop	The name of the type of crop to plant
	Position *(Optional)*	The specific position to put the crop object. As default, the center of the plot to plant.

Type	Atomic

Table 2 Plant action in IT Use Case

- Collect

This action allows the user collect the crops planted on the plots.

Sentence	Alice collect the melons *Subject + verb + direct object*
Requirements	The plot is planted.
Parameters	None
Type	Atomic

Table 3 Collect action in IT Use Case

- Select Crop

This action allows the user to select a crop from the tools menu. If they already have a crop selected, it will be replaced with the new selection.

Sentence	Alice selects (crop) melon *Subject + verb + direct object*
Requirements	
Parameters	None
Type	Atomic

Table 4 Crop action in IT Use Case

2.3- Use case 2: Hospital/clinical and home caring

This use case takes place in the field of patients' motor and cognitive rehabilitation performed by physiotherapists in a hospital environment. It aims for:

- The familiarization of primary-users (Senior Physiotherapists, SPTs) with new technologies: primary users will translate task oriented rehabilitation protocols into standardized procedures to be adapted to technological solutions. They will accomplish management roles in designing of the game. Some of them will also familiarize with the game itself as a trainee.
- The intergenerational transfer of the SPT's knowledge to young physiotherapists (YPTs, secondary users): The YPT will be virtually trained on appropriate rehabilitation procedures using the serious game developed by the SPTs, benefiting from this knowledge transfer. Some of them will also support the SPTs in the designing of the game.

2.3.1- Implementation of Use case 2 at first evaluation

The first version of our use case shows the following features:

Environment:

The environment consists of a classic physiotherapy gym presenting static objects with a decorative function and interactive objects, useful to the user to fulfill the game objectives.

Static objects consist of a physiotherapist writing desk with a PC monitor that shows the clinical chart (see below) of the patient. In front of the writing desk there is the treadmill, where the patient is waiting to work out.

Figure 2: A frontal view of the virtual environment of the Rehabilitation use case.

The principal *interactive object* of this first version of the game is the clinical chart of the patient that appears on the PC monitor of the physiotherapist. The first part of the chart reports the diagnosis, the possible secondary diagnosis, the demographic characteristics, the reason for recovery and the anamnesis of the patient. The second part reports the results of the patient on relevant clinical evaluation scales covering several domains: activities and participation, body functions and cognitive functions.

This first version of the game offers three clinical charts describing three different patients.

Roles of the characters in the environment:

There are two principal characters in the scenario: a physiotherapist (the user predefined avatar) and a patient.

- The *physiotherapist* character is in a first person perspective (the trainee). Through this character the user is able to explore the patient's clinical chart and to define the correct rehabilitation procedure by interacting with a PC monitor. In this first version of the game, only the functionalities of the physiotherapist here described are implemented. *In the following versions of the game the therapist will also be able to control and supervise the rehabilitation procedure of the patient.*

- The *patient* is a person (a woman or a male) who wears a tracksuit and is waiting on a treadmill for his/her training session to start. The rehabilitation session will take place only in case the therapist assigns the patient to a correct rehabilitation procedure according to her/his pathology. In this first version of the game the patient has no active role in the scenario.

2.3.2- Methodology to test use case 2 learning objectives achievement

Table 5 shows the main learning objectives that were implemented for the first evaluation of the use case and the correspondent criteria for the their evaluation. Additional learning objectives will be provided and presented in the next deliverables (D4.2B and C, evaluation sessions at M21 and at M30).

Id	Brief description	Metrics	Acceptance criteria
1	To be able to read clinical charts		
1.1	To be able to extract from the clinical chart the relevant information for *motor* rehabilitation	-	-
1.2	To be able to extract from the clinical chart the relevant information for *cognitive* rehabilitation	-	-

Table 5 – Learning objectives Use case 2 for the first evaluation

Table 2 describes the game procedure the trainee goes through in order to answer to the learning objectives of the game.

Id	Name	Description	Task	Learning objectives	Space
1	Familiarization	A video showing the right steps to accomplish the tasks of the game is presented to the trainee.	Watch the video	-	Virtual world
2	Anamnesis	The physiotherapist (trainee) is shown the clinical chart of the patient on a PC monitor.	Read the clinical chart	1.1, 1.2	In the training room at the desk
3	Ability to interpret the results of the clinical scales	The physiotherapist (trainee) is shown the patient's score on the clinical scales on the PC monitor.	Read the clinical scales results	1.1, 1.2	In the training room at the desk

Table 6 – Procedures of Use case 2 for the first evaluation

The *ad-hoc* questionnaire measuring the learning objectives achievement is included in Annex I/II (D.2).

2.4- Use case 3: Traditional Food Production

This use case is based on Bagolino's traditional cheese, a village in the province of Brescia (Italy). This food product is seasoned between 6 and 12 months, with cylindrical form and smooth hard crust with yellow-orange color or dark brown. It's processed during aging with uncooked linseed oil; straw-yellow pasta in winter and dark yellow in summer, because the milk used is made by cows located in mountain pastures. Pasta has a compact texture tending towards to granulose during the aging.

2.4.1- Implementation of Use case 3 at first evaluation

The first version of our case shows the following features:

Environment:

The production of Bagòss as typical cheese is made with cow's milk (the animals are mainly brown race bred and locally fed with hay in Bagolino's area located in province of Brescia (Italy).

This cheese is produced - all year long – in an artisanal farm, composed by two small spaces. First space with natural light is organized in a laboratory with traditional work instruments and the second is an aging room.

To carry out the entire process is needed 1 person.

The principal *interactive object* of the first version of the game is to obtain the filtered milk.

Roles of the characters in the environment:

There is a principal character in the scenario: a trainee.

- The trainee is an apprentice that acquires information through a learning process (video) and then repeats it gradually by means of an interactive environment.

2.4.2- Methodology to test use case 3 learning objectives achievement

Table 7 shows the main learning objectives that were implemented for the first evaluation of the use case and the correspondent criteria for their evaluation. Additional learning objectives will be provided and presented in the next deliverables (D4.2, evaluation sessions at M21 and at M30).

Id	Brief description	Metrics	Acceptance criteria
1	Obtain filtered milk		
1.1	To be able to put the colander on the basin(empty) that will contain filtered milk	Colander's dimension must be bigger than basin one	

1.2	To be able to take the box with raw milk located near the main door		
1.3	To be able to pour raw milk into basin (to obtain filtered milk)		

Table 7 – Learning objectives Use case 3 for the first evaluation

The following table (Table 8) describes the game procedure the trainee goes through in order to answer to the learning objectives of the game.

Id	Name	Function	Appearance	Parameters	Number instances	Thumb
0	Box	To contain raw milk(just milked)	Plastic	Quantity of milk(full)	1	
1	Colander	To filter milk	Inox		1	
2	Basin	To contain filtered milk	Inox	Quantity of milk Time	1	

Table 8 – Procedures of Use case 3 for the first evaluation

The Game's Questionnaire presented to the users is reported in Annex I/II (D3).

3- Testing Methodology

3.1- Procedure

Participants took part in the evaluation session in their own organization. They were tested individually by a SeniorLudens expert who had also the role of introducing them to the product. Each session lasted about 60 minutes for primary users and 45 minutes for secondary users. It took place in a quiet room studied for preserving participant's concentration in order not to not invalidate the evaluation session. In line with this purpose, the room offered the correct enlightenment's degree, a writing desk with a computer provided with SeniorLudens with a mouse device. The user accessed the platform and the games in a Firefox or MSExplorer navigator (not Google Chrome).

During the validation session the researcher guided the user in the exploration of the SeniorLudens Platform following the indications reported in ANNEX I/II (Internal protocol to be used in first validation session). At the same time, the user was free to explore the SeniorLudens Platform using the mouse device. In order to take part in the evaluation session each participant was asked to read and sign the informed consent approved by Local Ethical Committee (Annex I/II, A).

The pilot evaluation session consisted of three different phases: ***pre-game (or test, since not all of the users did play a game), in-game (/test) and post-game (/test)***. The ***pre-game*** phase provided that the participant filled in two questionnaires recording participant's personal characteristics and aptitudes for technology usage and participant's personal skills and motivation in using SeniorLudens. The ***in-game*** phase consisted of the platform/game experience and *ad-hoc* questionnaires on the modules functionality. Finally, the ***post-game*** phase included the administration of different scales to assess the user experience in interacting with the system.

All questionnaires and scales are briefly listed in the tools section (see section 3.2). Figure 3 describes the phases and tools of the evaluation procedures.

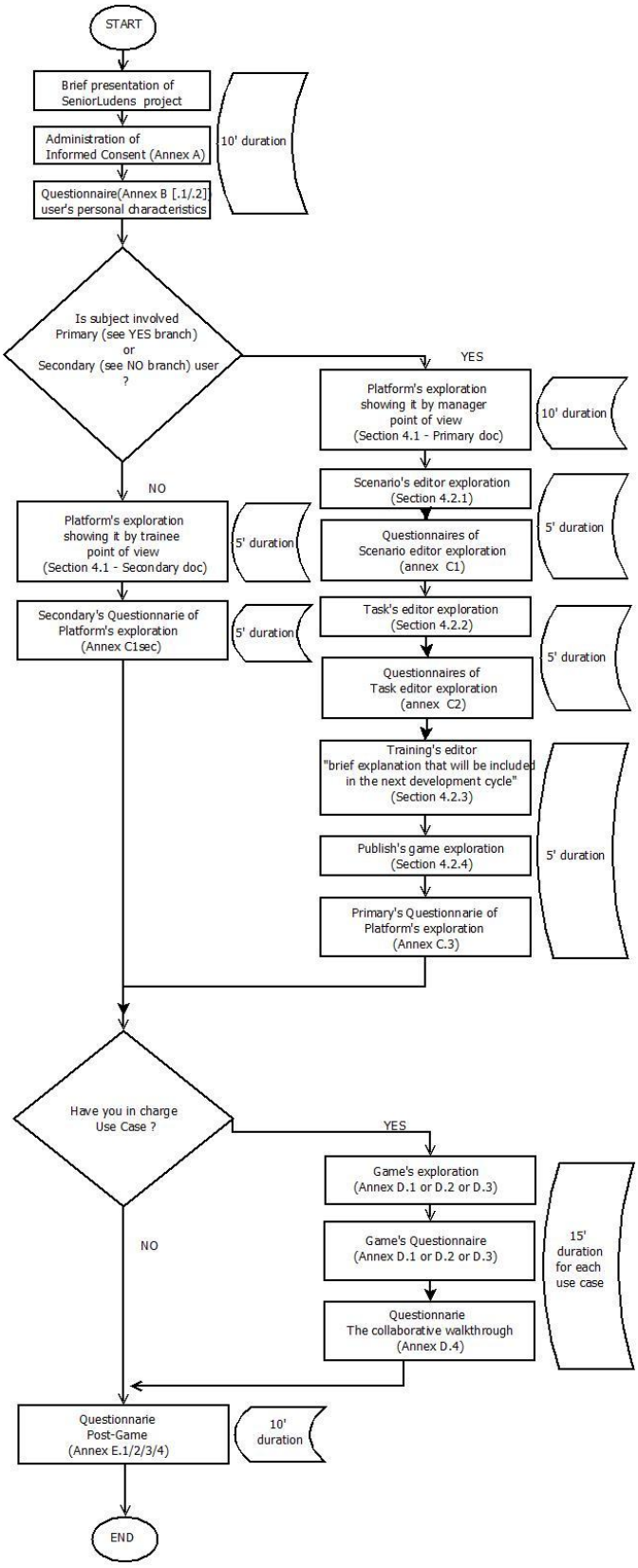


Figure 3: The test session flow

3.2- Tools

In the previous deliverable (D4.1) tools selected for the evaluation of the user experience in the interaction with the system were described. In the present deliverable we report the results of these tools administrated in the first validation session throughout the three validation session phases.

Pre-game phase:

Both primary and secondary users were invited to sign the Informed Consent (Annex I/II, A) and to answer the Questionnaire user's personal characteristics (Annex I/II, B.1)

In-game phase:

Primary users were invited to complete the Questionnaire of scenario editor exploration (Annex I, C1), Questionnaire of task editor exploration (Annex I, C2), Questionnaire of platform exploration (Annex I, C3) and, if they were involved in the evaluation session in one of the organizations responsible of the use cases, the Game Questionnaires (Annex I, D1, D2, D3) relative to the specific use case and the Collaborative Walkthrough (Annex I, D4) are administrated them.

The secondary users, by experiencing the platform only by a trainee point of view, are asked to answer to a short Questionnaire of platform exploration (Annex II, C1sec), the Game Questionnaire (Annex II, D4) and to the Collaborative Walkthrough (Annex II, D4).

Post-game phase:

Both primary and secondary users are asked to complete the System Usability Scale (Annex I/II, E1), Intrinsic Motivation Inventory (Annex I/II, E2), Flow State Scale (Annex I/II, E3) and Positive Affect and Negative Affect Schedule (Annex I/II, E4).

4- Participants

4.1- Demographics

The participants of first pilot phase were recruited in the four organizations as depicted in the following Table (Table 5, 6).

The group is composed by two sub-groups: primary users and secondary users, respectively with a manager role in platform and game usage and with a trainee role. The two following tables show the number of participants in each sub-groups taking part to validation for each organization and their role in it.

Responsible	Primary Users			Work experience
Name [Country]	*[Professional Figure]*	*[N]*	*[Role in Organization]*	*[Years; mean±SD]*
INDRA [Spain]	R&D consulting Manager	2 4	software engineer (3) technical (2) manager (1)	18.45±9.68
FCG [Italy]	Physiotherapist	6	senior PT (4) senior researcher (2)	27.83±4.07
CBIM [Italy]	Engineer	2	manager (2)	27.50±10.61
UnieKBO [The Netherlands]	Policy Advisor Data manager Remedial teacher	1 1 1	senior employee (3)	38,66±3.27
total		***17***		

Table 9 – Sub-set of user's participants to the first evaluation

Responsible	Secondary Users			Work experience
Name [Country]	*[Professional Figure]*	*[N]*	*[Role in Organization;(N)]*	*[Years; mean±SD]*
INDRA [Spain]	R&D consulting Manager	2 4	Technical (2) Engineer (2) Manager (2)	16.00±8.46
FCG [Italy]	PT	6	Interns (6)	0.60±0.8
CBIM [Italy]	Graduate Engineer	8 1	Young researcher (8) Project manager (1)	2.44±1.88
UnieKBO [The Netherlands]	Secretary Engineer Administrator Policy Advisor	2 1 1 1	Senior employee (5)	38,8±14,67
total		***26***		

Table 10 – Sub-set of secondary user's participants to the first evaluation

4.2- Habitual use of technology: Users' baseline

In order to have a baseline regarding the usual aptitude for technology usage, we administrated an *ad-hoc* questionnaire measuring how often participants benefit from different new technologies such as internet, PC, Smartphone, social network, tablet and videogames and their competence level toward these ones. Both groups (primary and secondary users) are invited to indicate the regularity and competence level regarding technology usage with a 4 points scale (respectively, 1=always, 2= sometimes, 3=rarely, 4=never and 1=expert, 2=competent, 3=beginner; 4=no competence). Furthermore, we compare the primary users aptitude in technology usage with secondary users one.

Following figures (Figures 4-11) show the frequency of each response point by primary and secondary user. Data were analyzed separately for each of the organizations.

Overall, by analyzing data, we can say that Italian results show:

- a more frequent usage of Internet, PC and Smartphone than Social Network, Tablet and Videogames;
- a more frequent usage and competence of secondary users than primary ones.

The Dutch data show a similar pattern,

- except for the little use of the Tablet: that technology is used just as much as the Internet, PC and Smartphone.
- However, less common are the respondents with Social Network and Videogames.
- Among secondary users, more differences exist than among primary users.

On the contrary, Spanish results demonstrate:

- a larger usage and competence about Videogames, Tablet and Smartphone than the other new technologies.
- a more usual technologies usage of primary users.

ANNEX B1:
Q1: How often do you use the following technologies and/or tools?
[INDRA – Primary and Secondary User]

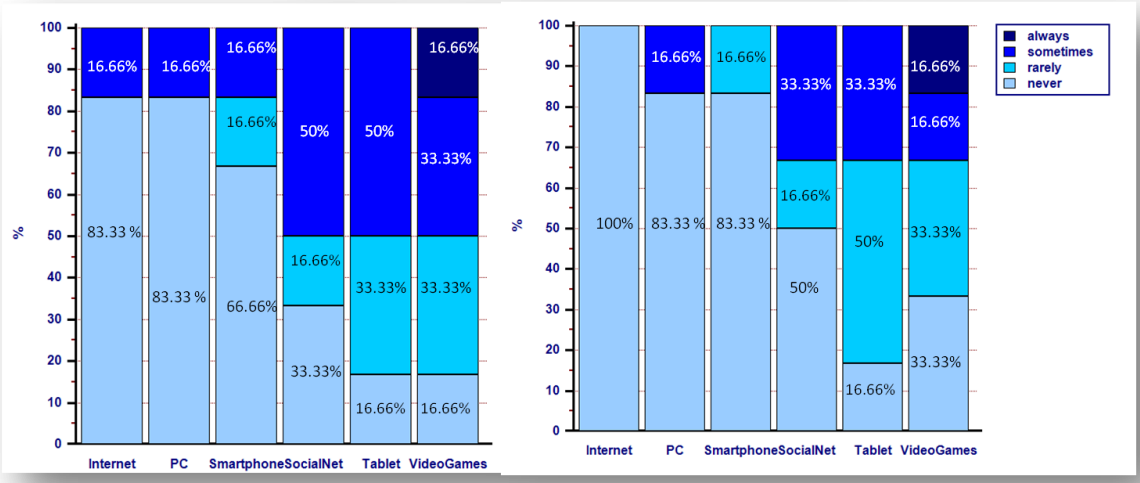


Figure 4– INDRA primary users (left) and secondary users (right) baseline regarding habitual use of technology

ANNEX B1:
Q1: How often do you use the following technologies and/or tools?
[FCG – Primary and Secondary User]

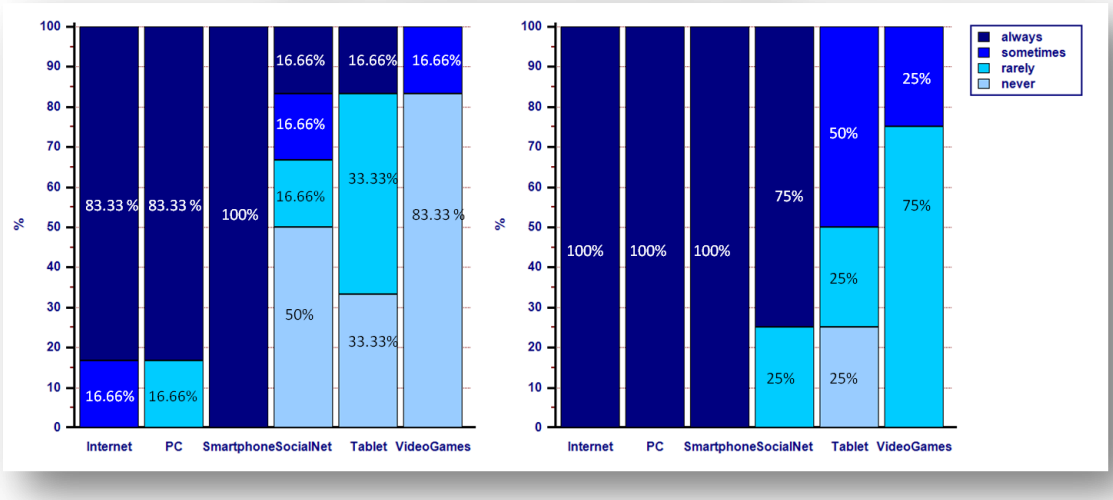


Figure 5 – FDG primary users (left) and secondary users (right) baseline regarding habitual use of technology

ANNEX B1:
Q1: How often do you use the following technologies and/or tools?
[CBIM – Primary and Secondary User]

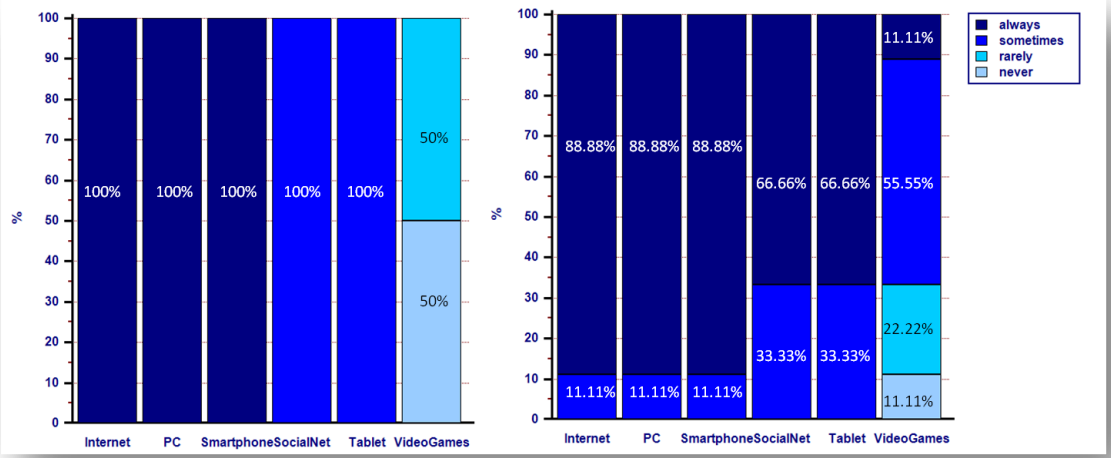


Figure 6– CBIM primary users (left) and secondary users (right) baseline regarding habitual use of technology

ANNEX B1:
Q1: How often do you use the following technologies and/or tools?
[UnieKBO – Primary and Secondary User]

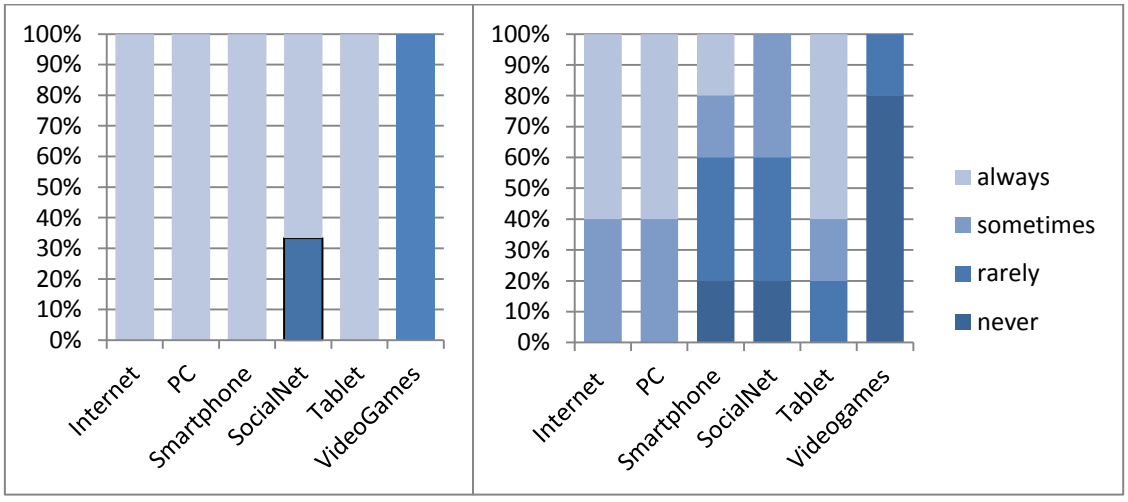


Figure 7 - UniekBO primary users (left) and secondary users (right) baseline about competence in using new technologies

ANNEX B1:
Q2: Which is your competence in the use of use the following technologies and/or tools? [INDRA- Primary and Secondary User]

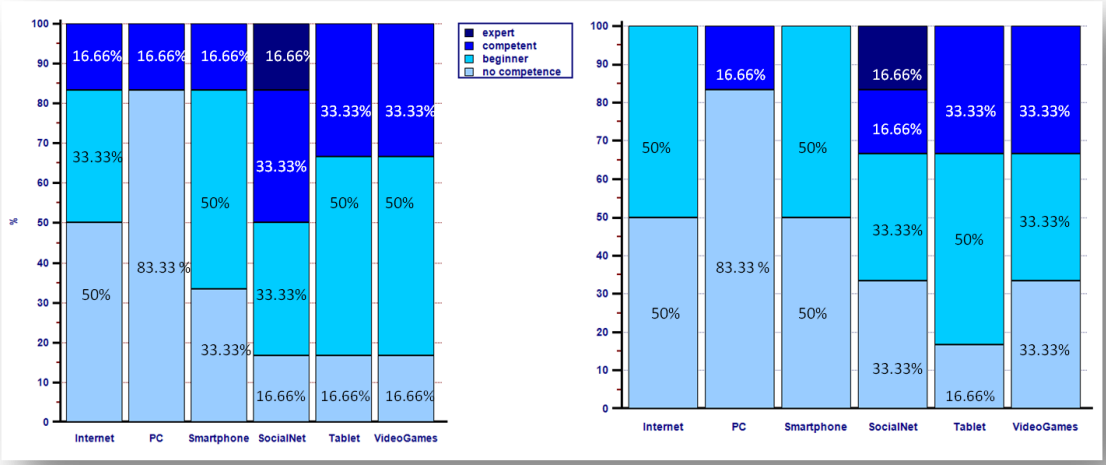


Figure 8– INDRA primary users (left) and secondary users (right) baseline about competence in using new technologies

ANNEX B1:
Q2: Which is your competence in the use of use the following technologies and/or tools? [FCG- Primary and Secondary User]

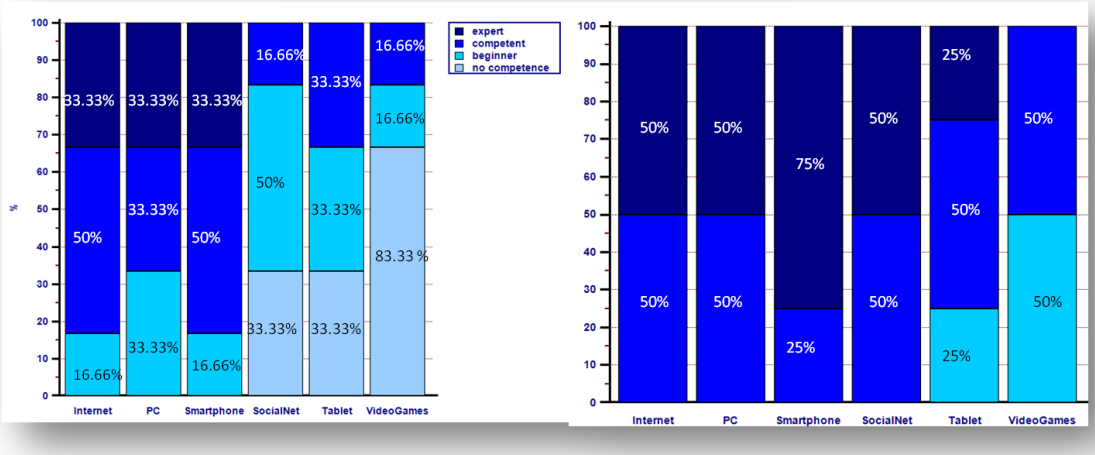


Figure 9– FDG primary users (left) and secondary users (right) baseline about competence in using new technologies

ANNEX B1:
Q2: Which is your competence in the use of use the following technologies and/or tools?
[CBIM- Primary and Secondary User]

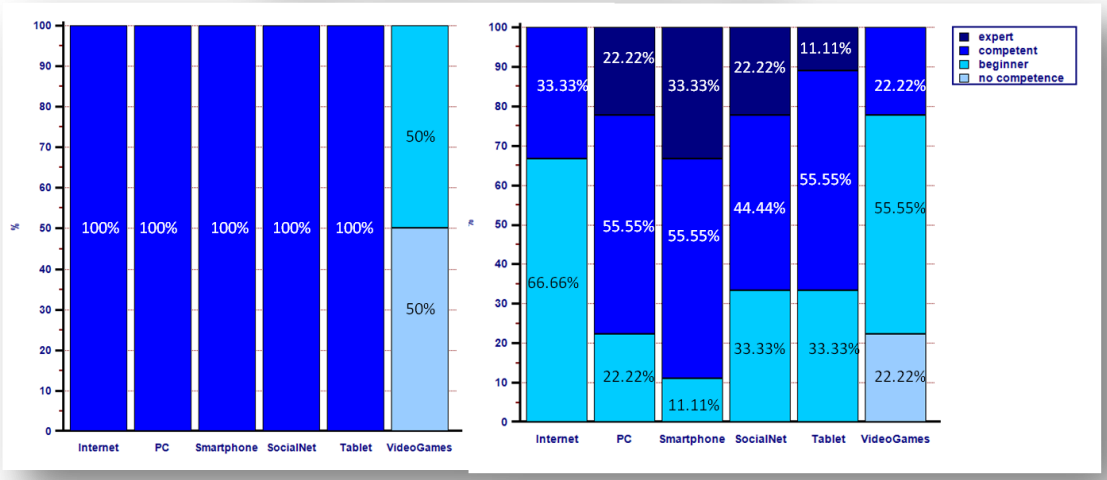


Figure 10– CBIM primary users (left) and secondary users (right) baseline about competence in using new technologies

ANNEX B1:
Q2: Which is your competence in the use of the following technologies and/or tools?
[UnieKBO – Primary and Secondary User]

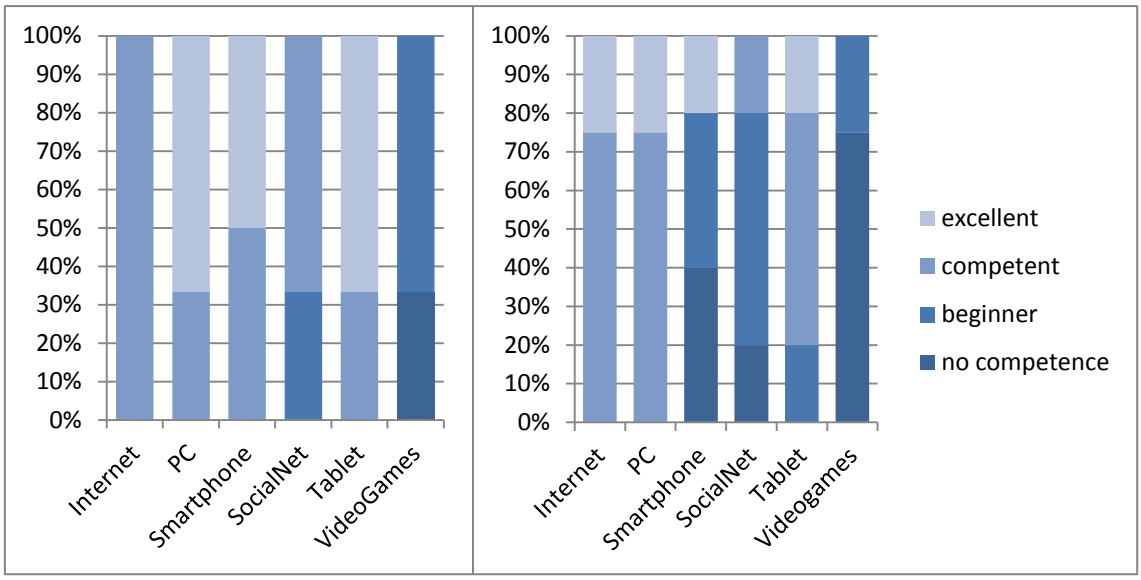


Figure 11– UnieKBO primary users (left) and secondary users (right) baseline about competence in using new technologies

5- SeniorLudens modules and tools: results

5.1- PRIMARY USERS: MANAGER

The evaluation of platform modules has been carried out through ad-hoc questionnaires administration in order to analyze the functionality of each module. The questions included in the questionnaire are adapted to the implementation state of the product. Given that they have a manager role in platform usage, primary users are asked to answer to several ad hoc-questionnaire regarding scenario editor, task editor and platform functionality by a manager point of view. Furthermore they are asked to answer to qualitative questions in order to give us a feedback about different ways to improve SeniorLudens.

5.1.1- Results for Scenario Editor

The Scenario Editor is the SeniorLudens tool needed to create different scenario configurations. These configurations will allow repeating tasks in visually different scenarios, as far as the different configurations include the set of objects involved in the actions. They will also allow creating new tasks specific to each configuration. Variations introduced by scenario configurations are essential to avoid player's boredom and to promote adherence to the games.

Users that create scenario configurations are Trainers with the corresponding permissions. The Scenario Editor is implemented as a SeniorLudens game. Thus, it does not require programming skills.

There is one Scenario Editor Game for each SeniorLudens World. They all have the same structure and differ only on the set of objects that can be located in the scenario, because each set of objects is specific to a particular world. In this deliverable, we describe the first validation procedure for the Scenario Editor first prototype of the use case *Grow Your Project*. It could have been done with any of the existing worlds.

5.1.2- Implementation of Scenario Editor at first evaluation

The first implementation only covers the most important features of the scenario editor, interface, put objects in the scenario, move objects around the scene and save the scenario configuration.

Interface:

The interface of the scenario editor shows the non-static objects available in the world, and some buttons: to hide the scenario editor, to save the current configuration, to close the game, to change the way the user interacts with the environment (not implemented) and to browse the objects by category. This interface is available as an object in the SeniorLudens Warehouse and can be use in any environment.

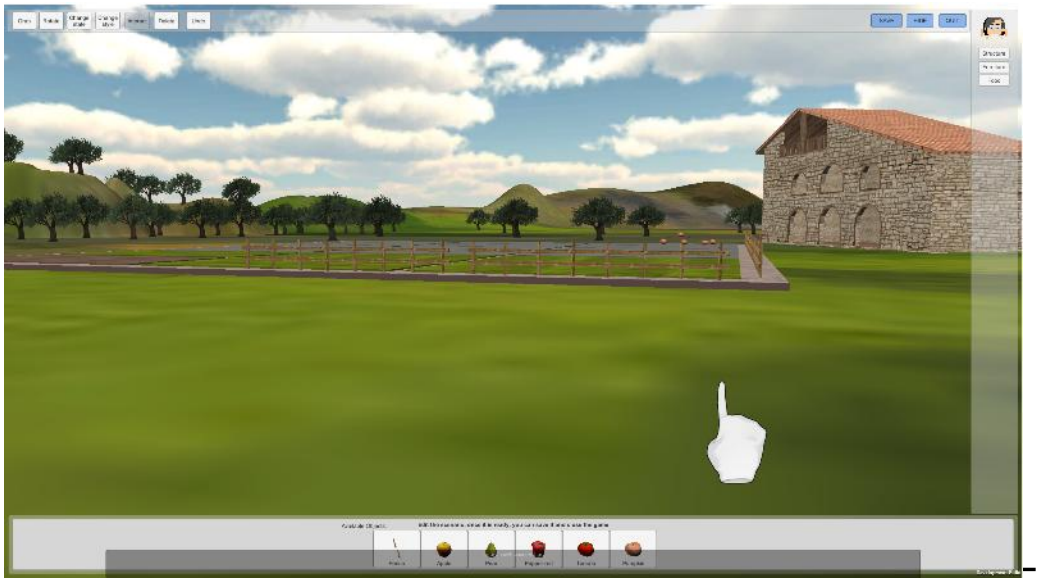


Figure 12-Scenario Editor interface on the IT Use Case environment

Actions:

The implemented actions of the first version of the Scenario Editor are the following:

- Select object from scenario editor: This action allows the user to select an object from the scenario editor interface.

Sentence	Alice selects (object from scenario editor) melon *Subject + verb + direct object*
Requirements	None
Parameters	None
Type	Atomic

Table 11 Select action in Scenario Editor

- Save scenario configuration

This action allows the user to save the current scenario configuration.

Sentence	Alice saves (the scenario configuration) *Subject + verb + direct object*
Requirements	None
Parameters	None
Type	Atomic

Table 12 Save scenario action in Scenario Editor

5.1.3- Methodology to test scenario editor learning objectives achievement

Table 13 shows the main learning objectives that were implemented for the first evaluation of the use case and the correspondent criteria for their evaluation. Additional learning objectives will be provided and presented in the next deliverables (D4.2B and C, evaluation sessions at M21 and at M30).

Id	Brief description	Metrics	Acceptance criteria
1	To be able to create a scenario configuration		
1.1	To be able to move around the scene		
1.2	Understand how the scenario editor interface works		
1.3	To be able to place objects on the scene.		

Table 13 – Learning objectives Use case 2 for the first evaluation

The following table (Table 14) describes the game procedure the scenario editor goes through in order to answer to the learning objectives of the game.

Id	Name	Description	Task	Learning objectives	Space
1	Familiarization	The scenario editor can move around the virtual world environment.	Discover the world	1.1	Virtual world
2	Scenario Editor Task	The scenario editor can show and hide the scenario editor interface in order to place objects on the scene.	Learn how to use the scenario editor interface	1.2, 1.3	Virtual world

Table 14 – Procedures of Use case 2 for the first evaluation

The 'Scenario Editor *ad-hoc* questionnaire' is in common at all three use cases and is composed by items measuring the intuitiveness, usability and easily in using Scenario Editor.

Primary users are asked to answer questions regarding Scenario Editor functionality through a 5 points scale (1= totally disagree, 2= disagree, 3= I don't know, 4= agree, 5= totally agree).

The following figures (Figure 13 and Figure 14) depict the frequency of each response score in the participants group for each item.

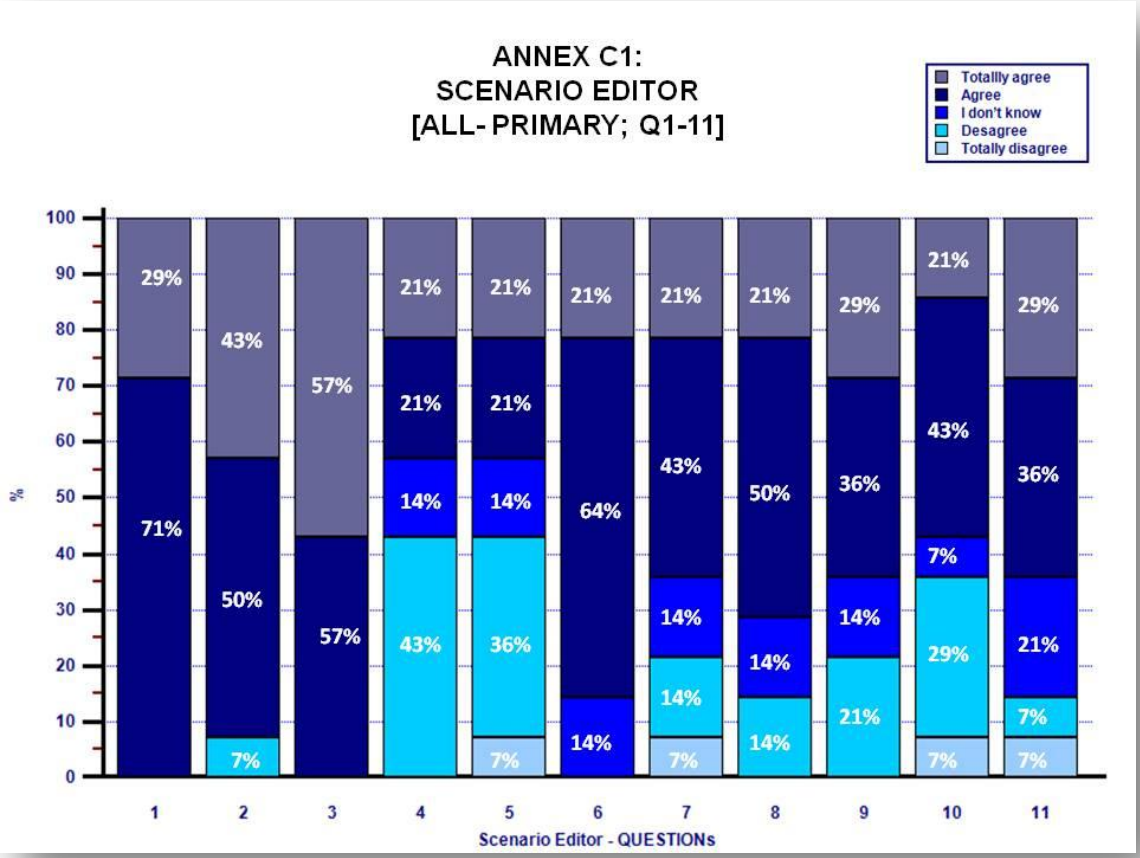


Figure 13 – response score frequency of primary users in Scenario Editor ad-hoc questionnaire (item 1-11)

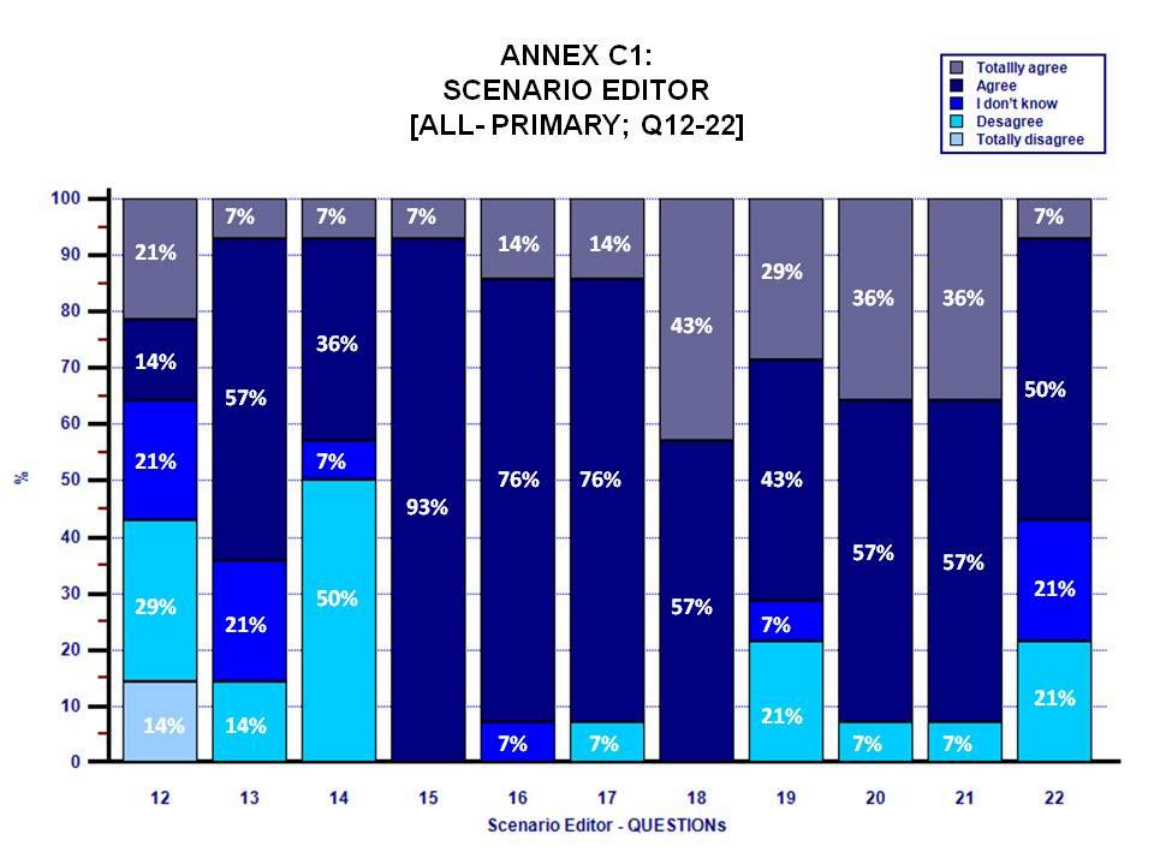


Figure 14 – response score frequency of primary users in Scenario Editor ad-hoc questionnaire (item 11-22)

As depicted in the Figures above, primary users report high scores regarding functionalities of Scenario Editor. The range of the frequency of the answer “Totally agree” and “Agree” is, respectively, 7%-57% and 14%-93%.

5.1.4- Results for Task Editor

In this phase of SeniorLudens implementation, during task editor exploration, primary users are asked to experience the available functionalities as using Blocky to plug blocks together, duplicating and deleting them, modifying an existing task descriptor, creating a new one and putting action modules in parallel. The evaluation areas that are included in the task editor questionnaire in this specific first validation session are in line with the state of implementation of the module.

The Task Editor ad-hoc questionnaire doesn't diverge among the three use cases and it's composed by 8 items measuring the user's ability to understand and use the Task Editor.

Primary users are asked to answer questions regarding Scenario Editor functionality through a 5 points scale (1= bad, 2= insufficient, 3= sufficient, 4= good, 5= excellent).

The following graphic depicts the frequency of each response score in the participants group for each item.

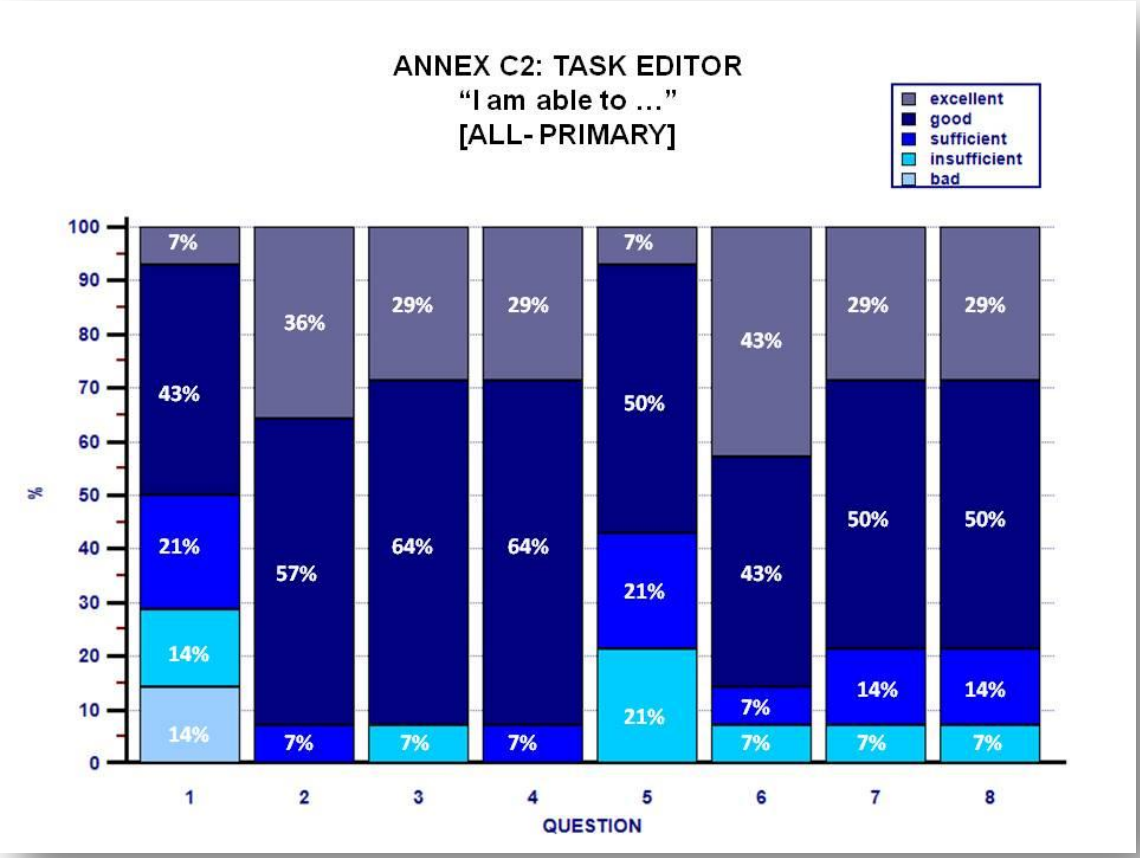


Figure 15 – response score frequency of primary users in Task Editor ad-hoc questionnaire

On the basis of the results showed in the Figure 15, we assume that participants have evaluated the task editor characterized by a good functionality overall. The range of the frequency of the answers "Excellent" and "Good" are, respectively, 7%-43% and 43%-64%.

5.1.5- Results for web frontend (administration portal)

In order to verify whether platform fits the functionality requirements, primary users are asked to answer to *ad-hoc* questions about their experience in platform exploration.

They are asked to choose among 5 response alternatives: 1= bad, 2=insufficient, 3=sufficient, 4=good, 5=excellent. This questionnaire is composed also by two qualitative questions in order to collect different ways to improve the module by user's point of view. The responses reported are analyzed and the most significant of them are described below.

The overall functionality of the platform was tested by two groups of primary users. On the one hand the platform was assessed by the primary users from the use case organizations, who also tested the platform as a Task or Scenario Editor and answered the corresponding questionnaires. On the other hand, the platform was reviewed by senior elderly advisors who didn't do any other task than taking a general look on the platform from a primary user point of view. The both groups will be described separately since both have their own opinion and ideas.

The questionnaires for both groups were based on the same main questionnaire, but for the elderly advisors a relevant selection was made, since not all the tasks could be explained extensively without doing the associated tasks. However, in this group more attention was paid to the free questions and general recommendations of the respondents on the platform.

Primary users from use case organizations

In order to facilitate the analysis, we grouped the first 20 items (exploring the user ability to platform usage and to understand its different functionalities) in the first graph (Figure 16) and item 21 to 24 (measuring general platform functionality) in the second graph (Figure 17).

The following graphics depict the frequency of each response score in the participants group for each item.

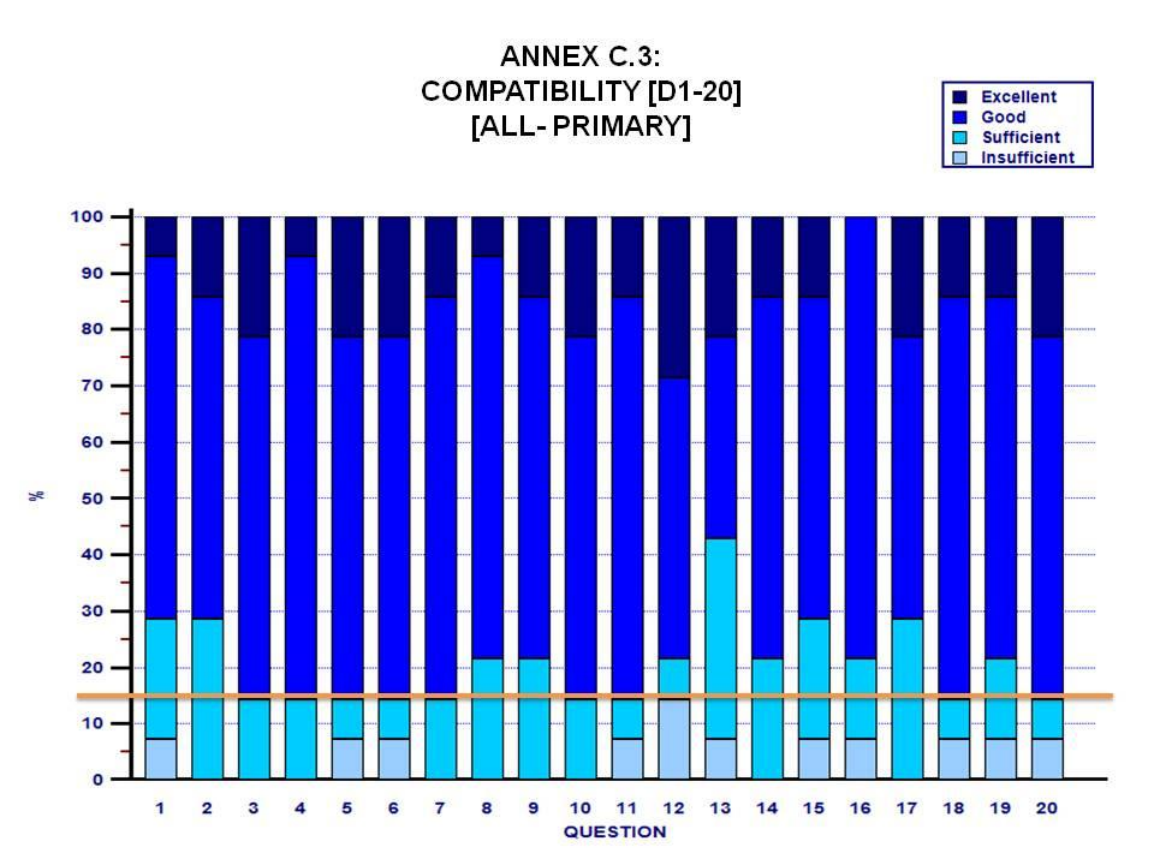


Figure 16 – response score frequency of primary users in the *ad-hoc* questionnaire about Platform functionality (items 1-20). The orange line highlights the percentage beyond which the users report "excellent" and "good" answer.

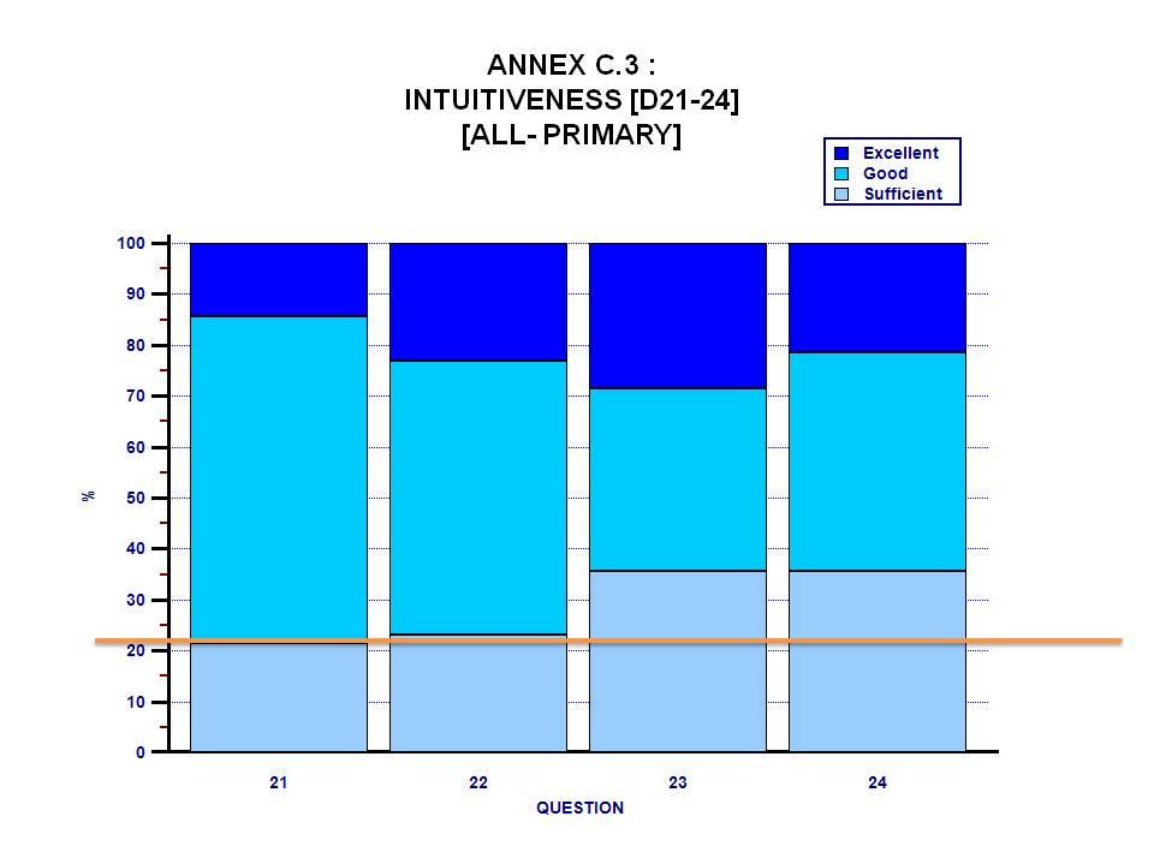


Figure 17 – response score frequency of primary users in Platform *ad-hoc* questionnaire (items 21-24). The orange line highlights the percentage beyond which the users report "excellent" and "good" answer.

Figure 18 – percentages of qualitative answers of ad-hoc questionnaire about platform functionality

As depicted in Figure 16 globally, for each items of the first part of the questionnaire, users report a consistent amount of "Excellent" and "Good" answers. The frequency range of the answer "excellent" is about 16%-25% and the "good" one is about 30%-80%. Similarly, the second part of the questionnaire (Figure 17) reports a considerable amount of "excellent" and

"good" responses. The frequency range of the answer “excellent” is about 15%-30% and the “good” one is about 30%-65%. These results demonstrate that the functionality of the platform, as the level of platform compatibility with user’s ability and intuitiveness, is well structured.

By analysing the free answers regarding functionality of the platform, 50% of users highlight that much commands have to be included as many voices in the menus and notifications. The other 50% users report that some aspects have to be modified as the variance of colours, the size of the images and the name of some commands (Figure 18).

Senior elderly advisors from primary user point of view

In the pilot with the senior elderly advisors, more attention was paid to qualitative data. First, the test they did existed of a very general walk through the platform rather than concrete tasks. Therefore many of the questions were hard to answer for them on a Likert Scale. The users needed more information to be able to give their opinion. Secondly, the amount of these general test users was reduced (only 3). This amount is more suitable for a qualitative analysis. In the graphics below (Figure 19 and Figure 20), frequencies on answers were presented as absolute numbers, since percentages seem not useful with this amount.

Like in the analyses above, we grouped the first 20 items (exploring user ability to platform usage and to understand its different functionalities), from which these users answered 16 relevant ones, in the first graph (Figure 19) and the item 21 to 24 (measuring general platform functionality) in the second graph (Figure 20). The response on the open questions (item 25 and 26) will be presented in the text below the Figures.

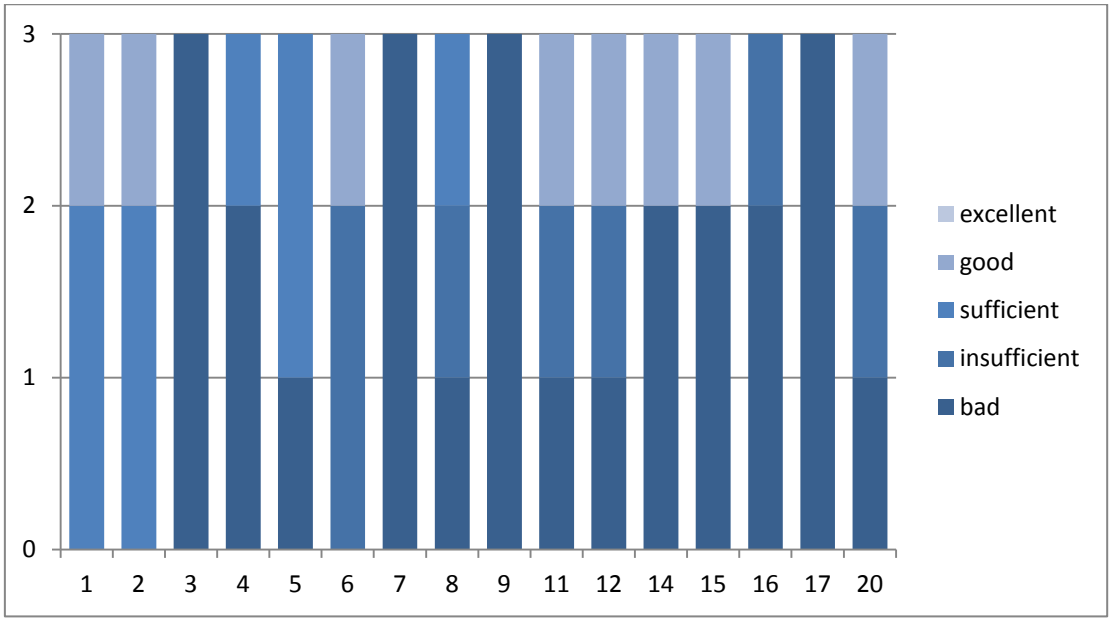


Figure 19 – response score frequency of primary users in Platform ad-hoc questionnaire (items 1 t/m 20)

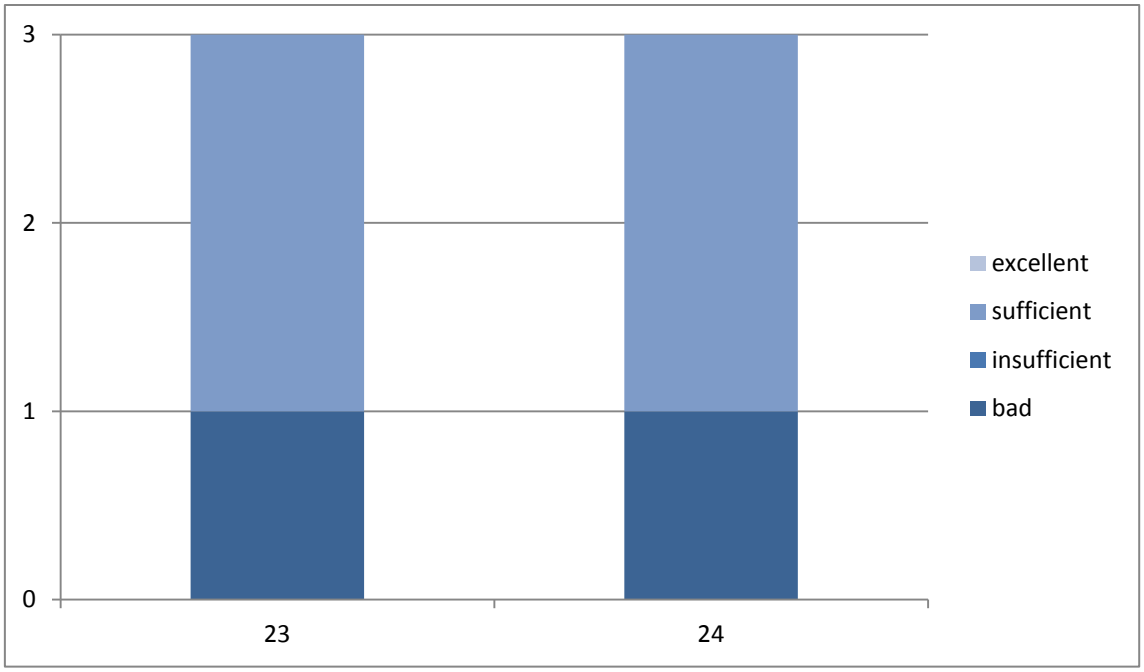


Figure 20 – response score frequency of primary users in Platform ad-hoc questionnaire (times 23 & 24)

When we look to Figure 19, we see a spread distribution among both the respondents and the questions. However, in general the test-users are not so positive. Not for any item, more than one person gives the score 'excellent'. For four items (3, 7, 9 17), all three test users gave the score 'bad'. These four questions do concern the visualization, addition of images and pictures. (PL_3: 'I am able to visualize my user profile'; PL_7: 'I am able to visualize the organization profile'; PL_9: 'I am able to visualize the game deployed in the organization'; PL_17: 'I am able to visualize all the users included in the organization').

When we look to Figure 20 we see a kind of summary of the previous figure, although slightly more positive. Two of the respondents say the SeniorLudens Platform is sufficiently usable and understandable, one says it is insufficient.

The test users mention several recommendations to improve the use of the platform. Most are related to the possibilities the platform has in this stage, especially for this group of test users. Some quotes of the participants are:

"I can imagine that playing games to teach competence to other colleagues can be fun and useful at the same time. But in this stage it was still a little bit boring, I couldn't play or design a game myself yet".

Other recommendations were related to the unclearness of the rights different user roles have. The primary test users were told that they had more rights than their secondary user colleagues, but they were not able to design and add new games. The users were a bit confused how that should work. Some quotes illustrating this:
"Which games do belong to my organization? Can I also play games belonging to other organizations?" "What about my employees, what do they see?" "Maybe the distinction can be made clear(er) with colors"

.

5.2- SECONDARY USERS: TRAINEE

The secondary users, interacting with the platform from a trainee point of view, were asked to answer the Platform *ad-hoc* questionnaire for this group of users. They were asked to evaluate the platform functionality relative to modules they had experienced. The same as in the part with the primary users, two groups of secondary users were involved in this part. On the one hand the platform was assessed by the secondary users from the use case organizations, who also tested one of the games. On the other hand, the platform was reviewed by senior elderly advisors who didn't do any other task than taking a general look on the platform from a secondary user point of view. Results of both groups will be described separately since both have their own opinion and ideas. Questions for both groups were based on the same main questionnaire, but for the elderly advisors a relevant selection was made, since not all the tasks could be explained extensively without doing all the associated tasks. However, like in the primary user part, in this group more attention was paid to the free questions and general recommendations of the respondents on the platform.

5.2.1- Results for web frontend (trainees portal)

The Platform *ad hoc* questionnaire was composed by 9 items to be scored on a 5 point Likert Scale (1=bad, 2= insufficient, 3=sufficient, 3=good, 4=excellent).

Secondary users from use case organizations

In the following graphic (Figure 21) the frequency of each response point for each item is reported.

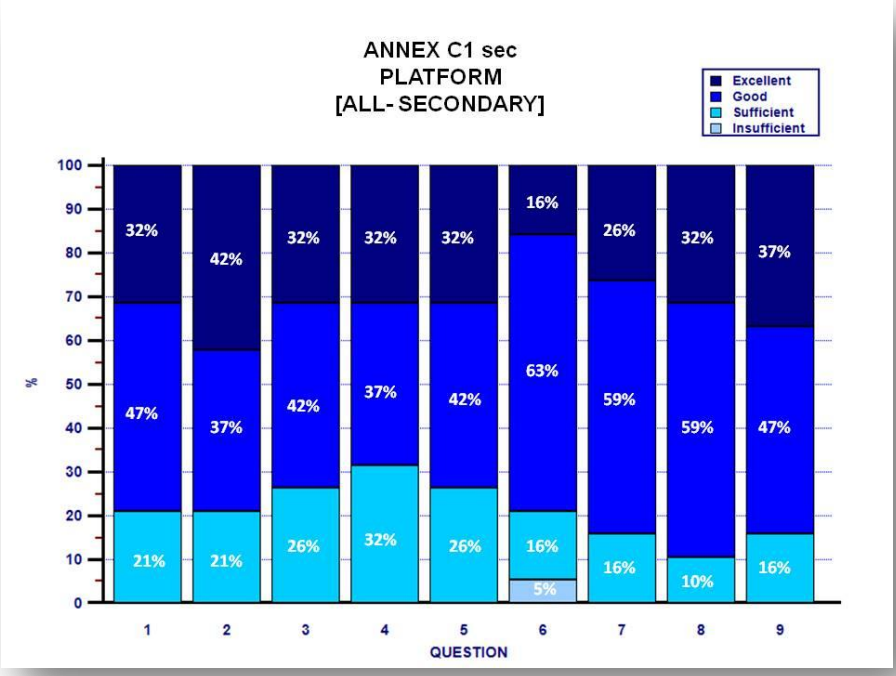


Figure 21 – response score frequency of secondary users in Platform ad-hoc questionnaire

As for the primary users, secondary users demonstrate the functionality of the platform, by reporting a considerable amount of "excellent" (range: 16-42%) and "good" (range: 37-63%) answers.

Senior elderly advisors from secondary user point of view

In the pilot with the senior elderly advisors, more attention was paid to qualitative data, for the same reasons as mentioned in the pilot with the primary users. In this part, an amount of 5 senior elderly advisors tested the platform from a secondary user point of view. In the graphic below (Figure 22), frequencies on answers were presented as absolute numbers, since percentages seem not useful with this amount.

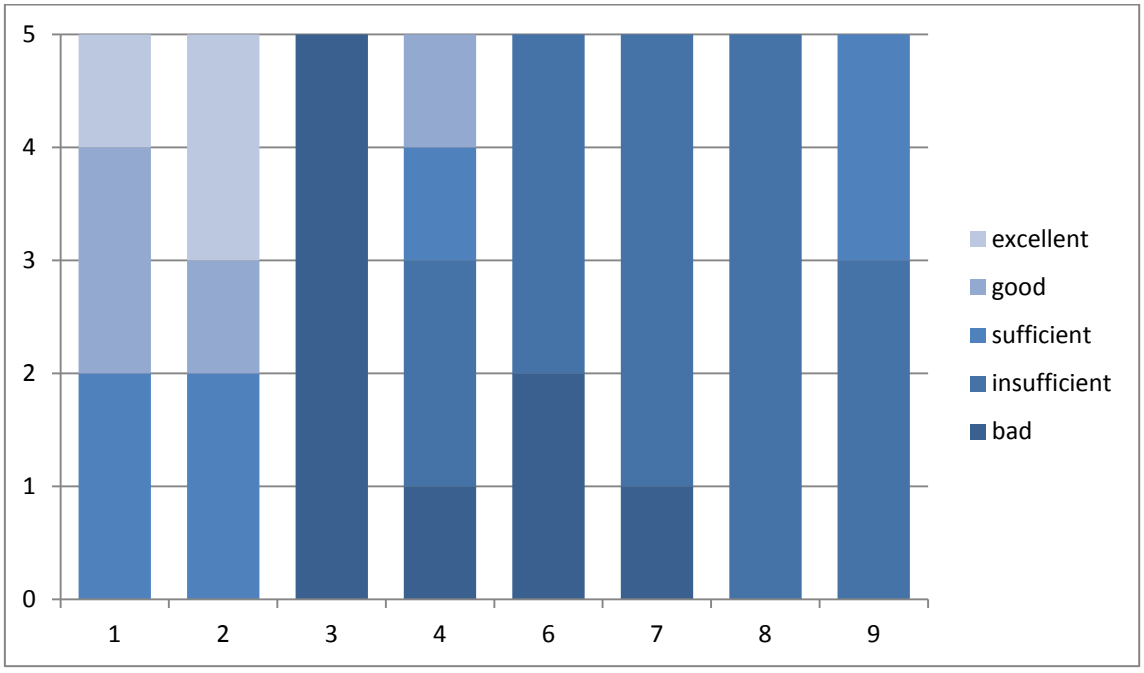


Figure 22– response score frequency of secondary users in Platform ad-hoc questionnaire

When we look to the figure above, we see – similar to the primary users- a lot of distribution among both respondents and questions. However, in general the test-users are slightly more positive than the primary test users. The first two questions (PL_sec1 = I am able to log in the Trainee Portal; PL_sec2=I am able to check the game catalog) are answered quite positive by all the users. However, when it comes to more concrete questions, the positive answers decrease. For item 3 (PL_sec3= I am able to visualize my user profile) all respondents score 'bad', like the primary users also did. For item 4 (PL_sec4=I am able to update my user profile) the test users do not score high either. It is not clear if it is a lack of competence of the (elderly) user or of the system. In contrast to the primary users, the secondary users don't think the platform is sufficiently usable. Only two of the five respondents think that it is sufficiently understandable.

The secondary test users have well mention recommendations to improve the use of the platform.
Most are related to the possibilities the platform has in this stage, especially for this group of test users. Some quotes of the participants are:

"It made me insecure that the Platform was still in a preliminary phase. When I was not able to complete tasks, I didn't know if it was due to a lack of my competences or that it was just the state of the system; for instance the effort to add an image to my user profile or organization"

Other recommendations were related to the unclearness of the rights different users have. It is not sufficiently clear which games the user is allowed to play. Some quotes illustrating this: *"Which games can I play?" "Can I also play games belonging to other organizations?" "Do I need a code to log in in a certain game or can I play all visible games?".*

Furthermore, some questions were raised about privacy and ethics. Some quotes illustrating this: "Who can see me playing a game?" "Is my manager able to see it if I log in at night?" "How can the manager be sure that it is me playing the game if I do it at home?" "Can I be fired if I do not succeed in the exercises within the game?

Conclusions: differences and similarities between test users

In general we can say that the senior elderly advisors (both primary and secondary) are less positive about the functionalities of the platform than the first groups of test users. The users of the use case organizations were also (more) positive about the specific items about the visualization in which were scored very low by the elderly advisors.

Causes for this pattern may be that the elderly advisors were not trained and therefore instructed adequately to execute specific tasks, but more to take a general look and walk through the system including some small tasks – which was experienced by the testers as a bit vague. The use case users were more forced to visualize profile/organization/users, which helped them eventually to figure out how to do so.

Another reason may be that the platform for the elderly advisors was not related to their own job, which was the case for the use case testers. Maybe this made it more lively and dynamic for the last mentioned group.

Recommendations for the next phases of test and validation may be to make a more dynamic and concrete test for the general testers as well or to make the questions for them really more general. The tasks (a little general and vague) and the questions (concrete) did not match enough in this current pilot. This made the test users insecure and might cause them to drop out in a next session.

6- GAMES Results

We have prepared a different *ad-hoc* questionnaire relative to the game functionality and to learning objectives achievement for each specific use cases.

6.1- Use case 1: IT companies

This validation session has been based on a use case *ad-hoc* questionnaire adapted to the current level of implementation of the game.

6.1.1- Functionality results

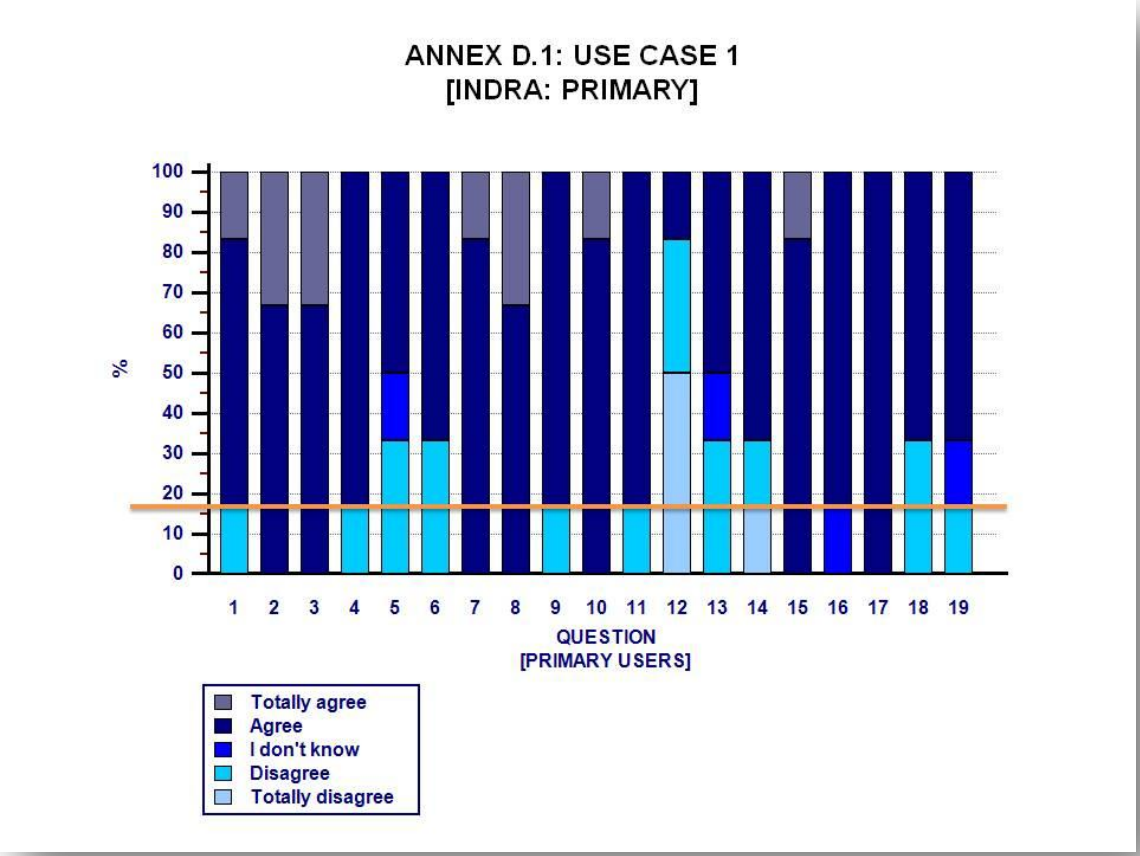


Figure 23 – response score frequency of primary users in use case 1 *ad-hoc* questionnaire. The orange line highlights the percentage beyond which the users report "excellent" and "good" answer.

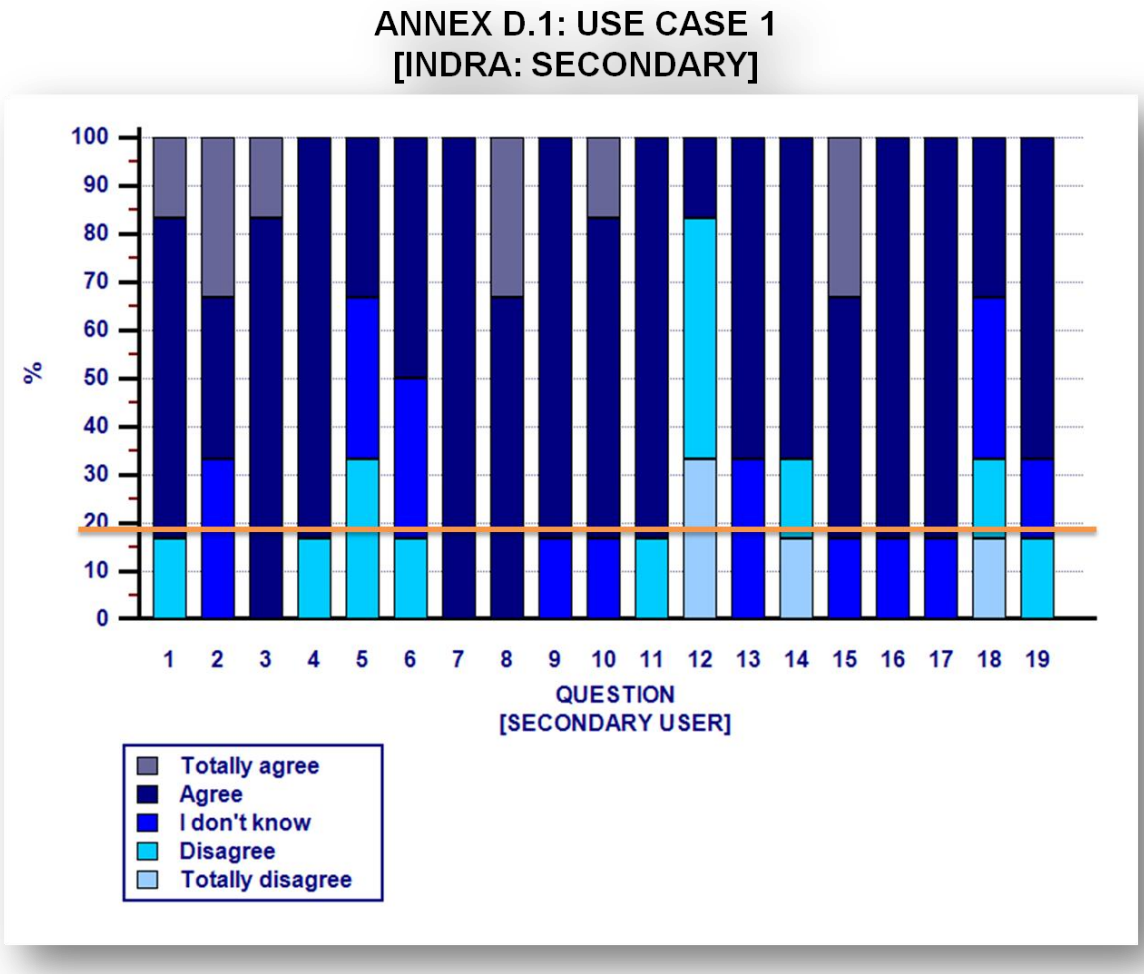


Figure 24 – response score frequency of primary users in use case 1 *ad-hoc* questionnaire. The orange line highlights the percentage beyond which the users report "excellent" and "good" answers.

As depicted in the Figure 23 and Figure 24, users reported a consistent amount of "Totally agree" and "Agree". This result demonstrated that both primary and secondary users found a high level of functionality of the use case.

6.1.2- Results of learning objectives test

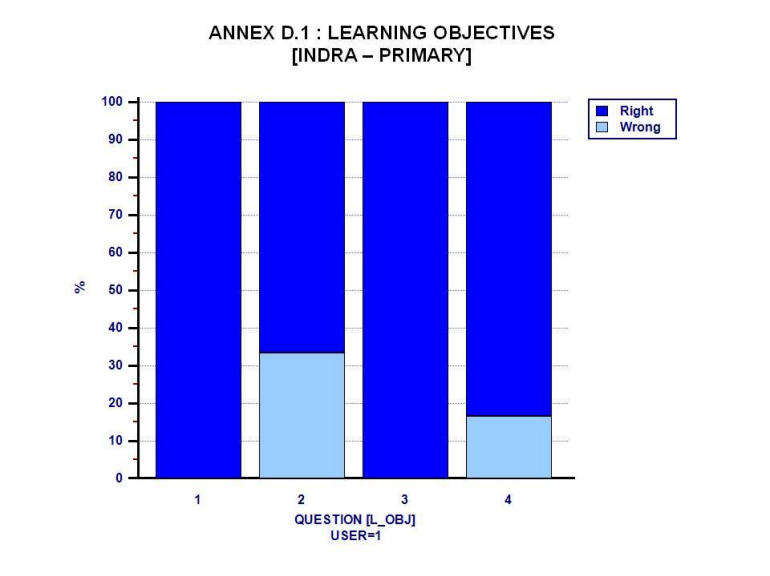


Figure 25 – Frequency of right and wrong responses of learning objectives *ad-hoc* questionnaire of primary users

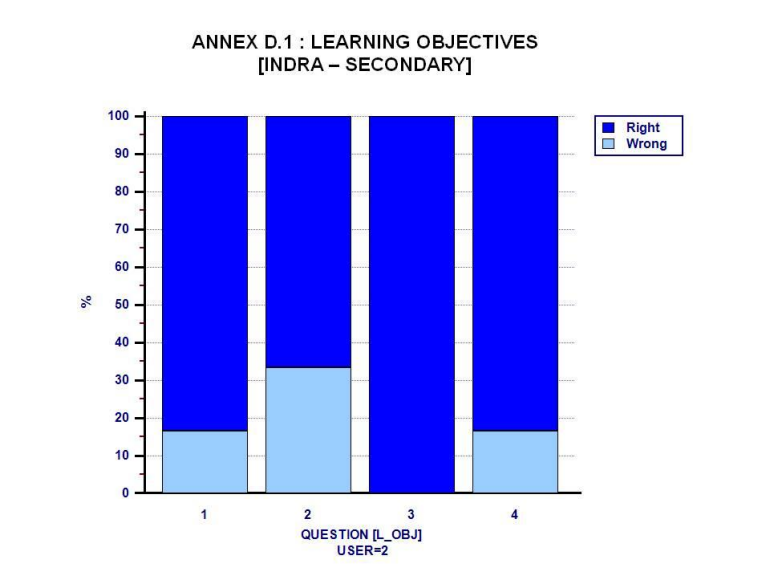


Figure 26 – Frequency of right and wrong responses of learning objectives *ad-hoc* questionnaire of secondary users

The analysis regarding learning objectives achievement highlights a good performance both of primary and secondary users. The results didn't report a significant difference between the amount of right answers and wrong answers of primary and secondary users.

6.2- Use case 2: Hospital/clinical and home caring

The use case 2, at its current state of implementation, aims at train users to be able to extract from health report the relevant information for motor and cognitive rehabilitation. To verify this purpose, we administrated an *ad-hoc* questionnaire composed by two parts: the first one measuring the use case functionality and the second to investigate whether the learning objectives were achieved.

6.2.1- Functionality results

The items of the first part of the ad-hoc questionnaire about use-case functionality (item 1-10) assess the user's ability and easiness to perform the task. Users are invited to answer to questions through a 5 points scale (1= totally disagree, 2=disagree, 3= I don't know, 4=agree, 5=totally agree). The questionnaire, furthermore, reports two qualitative questions in order to give to the user the possibility to point out the game most difficult part and its more pleasant part. In the following graphics (Figure 27, Figure 28) are depicted the frequency of each response score of each first 10 items chosen by primary users and secondary users.

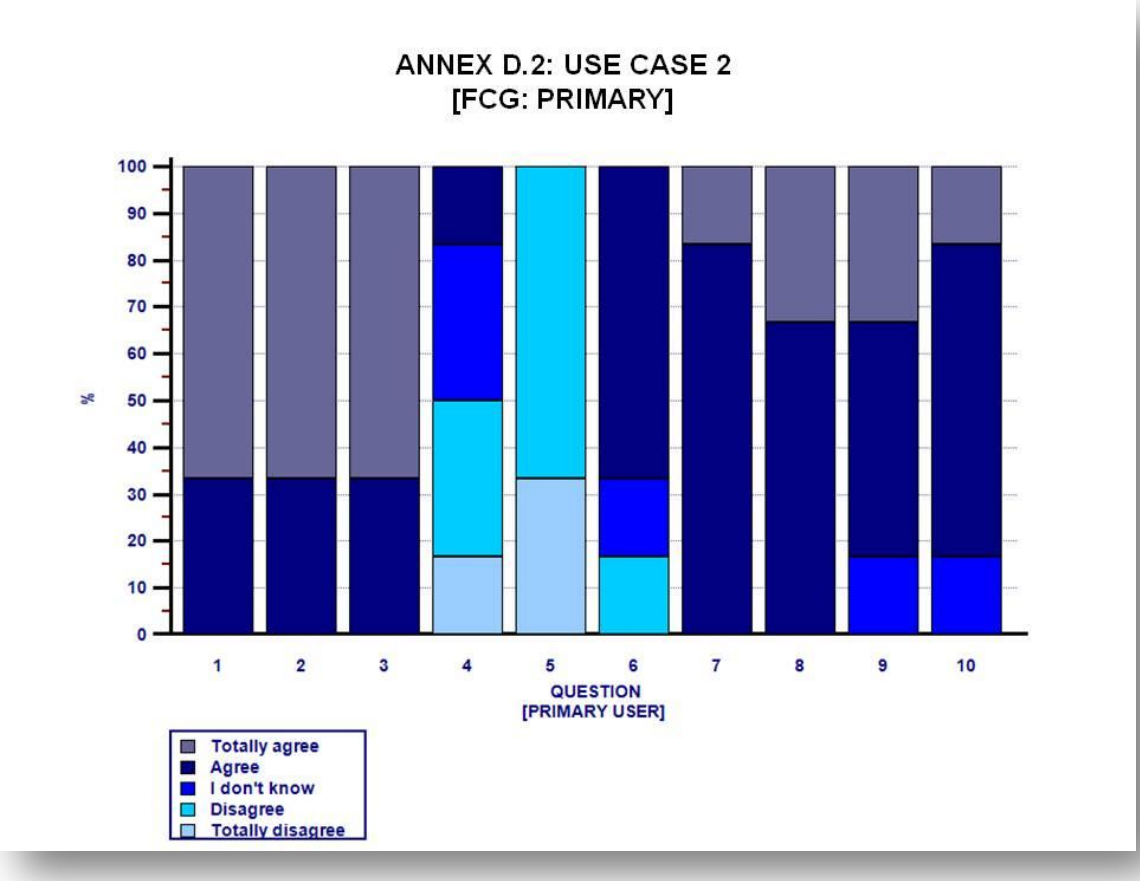


Figure 27 – response score frequency of primary users in use case 2 *ad-hoc* questionnaire

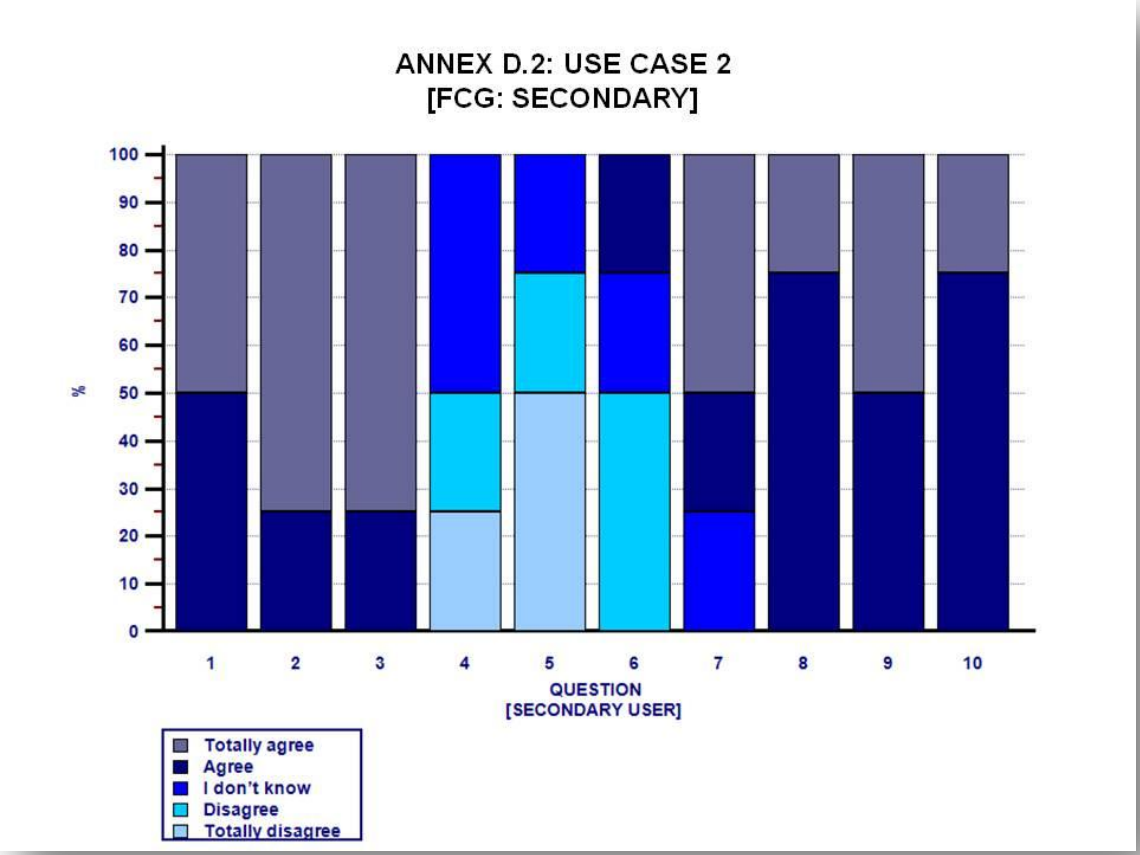


Figure 28 – response score frequency of secondary users in use case 2 *ad-hoc* questionnaire

Overall, on the basis of the analysis, we can say that both primary and secondary users evaluated use case game as easy to play and compatible with their ability.

The results report no significantly statistical differences between user groups in easiness and ability to perform the task.

6.2.2- Results of learning objectives test

The second part of the questionnaire reports 4 items measuring the learning objectives achievement. Users were asked to choose among three response alternatives, by selecting the right index relative to a motor and cognitive clinical patient information.

In the following graphics (Figure 29 and Figure 30) we analyzed the frequency of right and wrong responses reported by primary users (left) and secondary users (right).

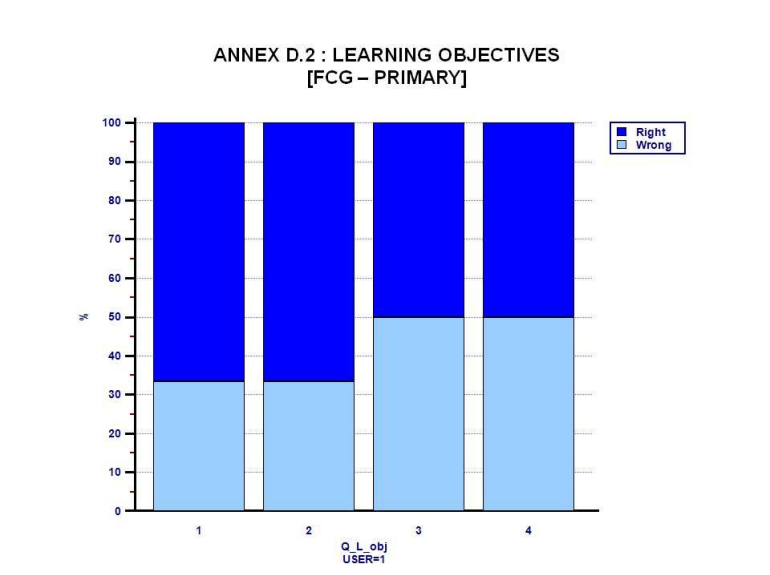


Figure 29 – Frequency of right and wrong responses of learning objectives *ad-hoc* questionnaire of primary users

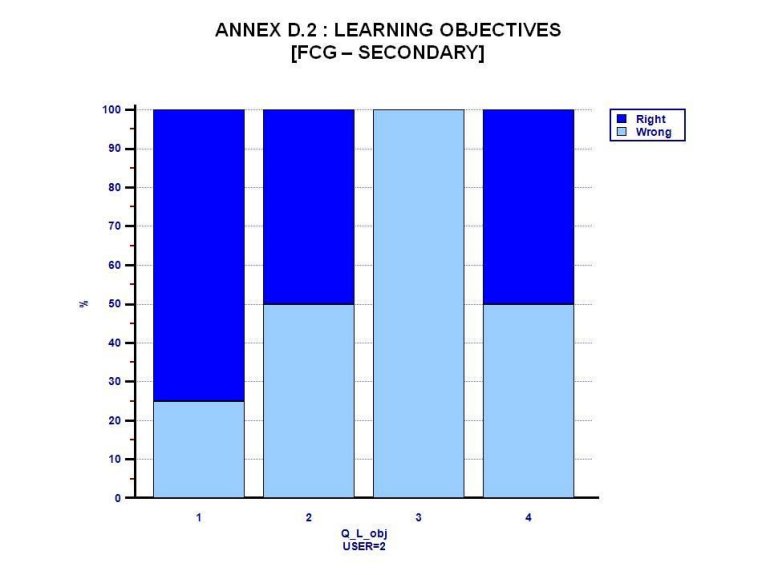


Figure 30 – Frequency of right and wrong responses of learning objectives *ad-hoc* questionnaire of secondary users

Besides the analysis doesn't report a significant difference between users' groups, the questionnaire show a better performance of primary users than secondary ones.

6.3- Use case 3: Traditional Food Production

In the current implementation of use case 3, users are able to explore a prototype of the game. The main areas on which the first implementation has refined are: use case access mode, use case browser compatibility, environment's design, position of the objects within the environment, type and contents of the instructions and game navigation methodology. In order to evaluate the usability requirements, the game *ad-hoc* questionnaire aims to verify whether the different game functionalities developed are perceived usable by users. In line with this purpose, the *ad-hoc* questionnaire measures the user's ability in interacting with the environment, understanding instructions, detecting objects, moving in the space and the easiness perceived in playing. In order to collect crucial feedback from users, two qualitative questions, requiring to report the more pleasant part of the game and the more difficult one, are included.

6.3.1- Functionality results

The ad-hoc questionnaire functionality items (item 1-13) assess the user's ability and easiness to perform the task. Users are invited to answer to questions through a 5 points scale (1= totally disagree, 2=disagree, 3= I don't know, 4=agree, 5=totally agree). The questionnaire furthermore reports two qualitative questions in order to give to the user the possibility to point out the game most difficult part and its more pleasant part.

In the following graphics (Figure 31, Figure 32) are depicted the frequency of each response score of each first 10 items chosen by primary users and secondary users.

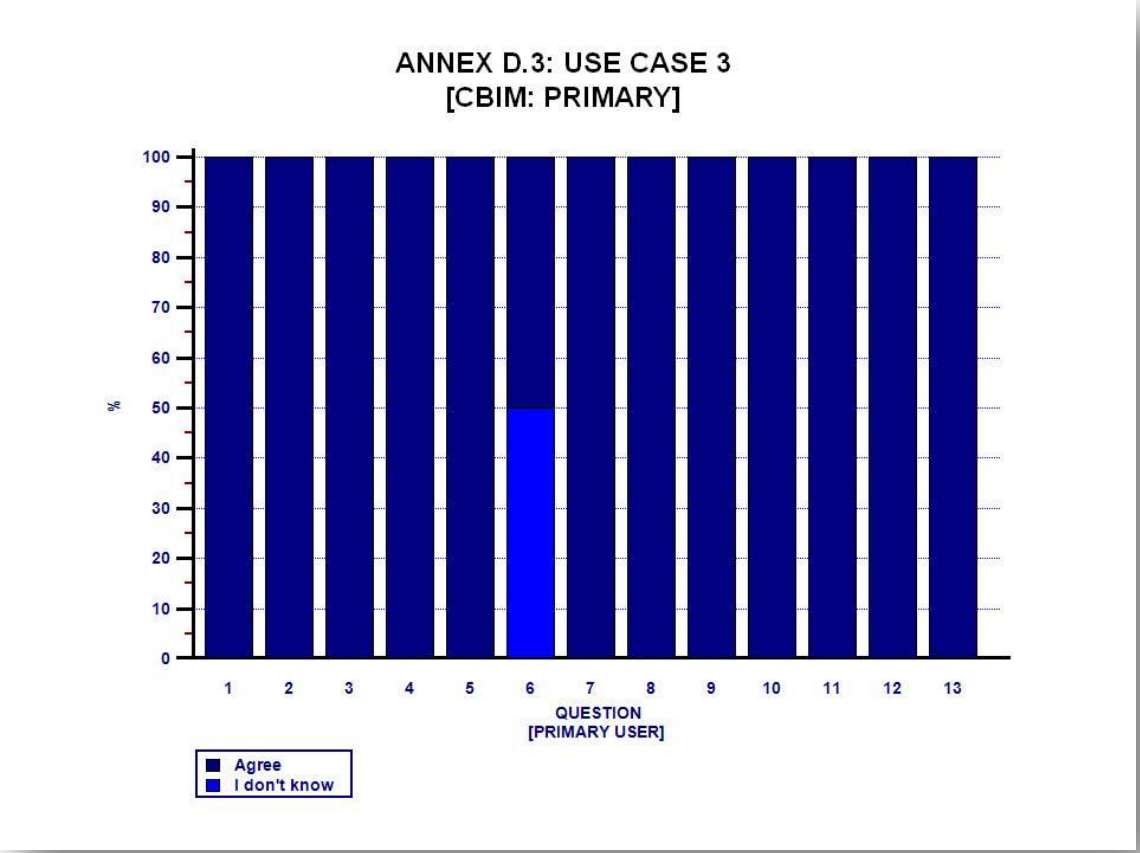


Figure 31 – response score frequency of primary users in use case functionality *ad-hoc* questionnaire.

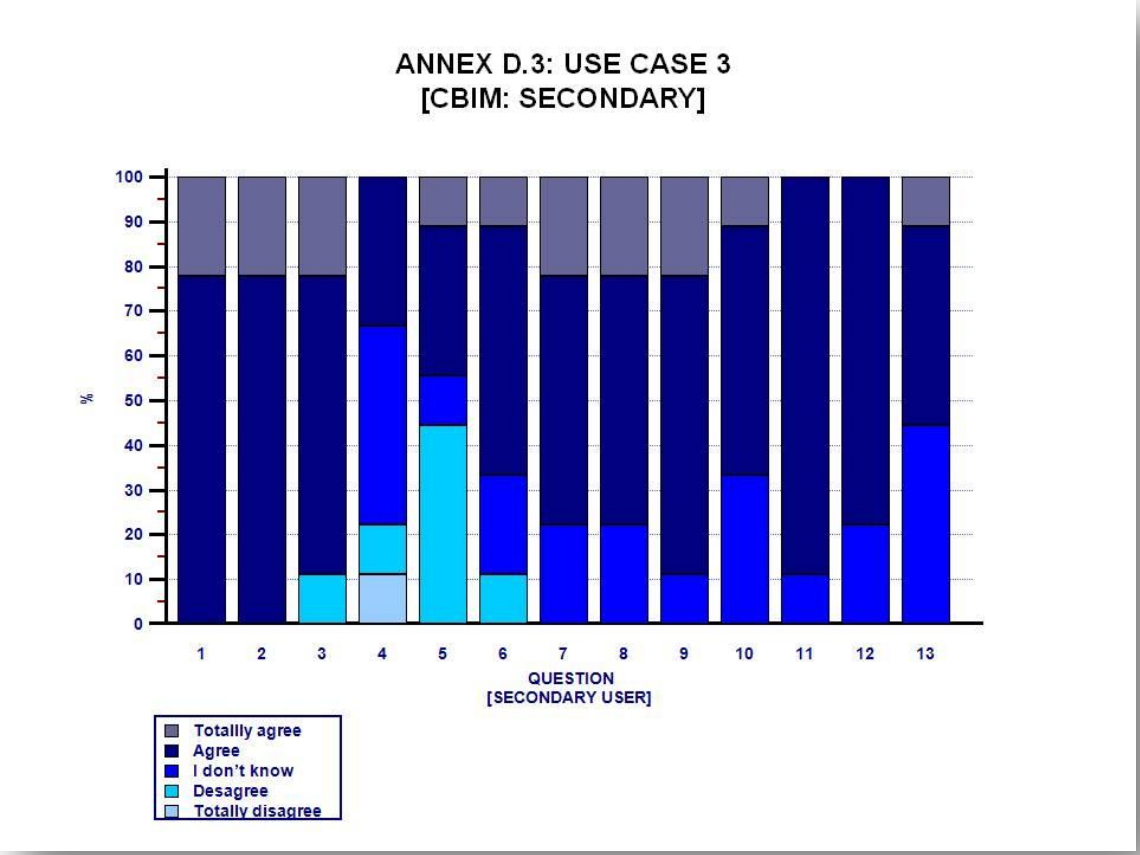


Figure 32 – response score frequency of secondary users in use case functionality *ad-hoc* questionnaire.

As depicted in the figures above, users report a consistent amount "Totally agree" (range about 10%-20%) and "Agree" (range about 30%-90%) responses. This result confirms the functionality of the use case.

6.3.2- Results of learning objectives test

The second part of the questionnaire reports 4 items measuring the learning objectives achievement. Users were asked to choose among three response alternatives, by selecting the right steps to do the use case task.

In the following graphics (Figure 33 and Figure 34) we analyzed the frequency of right and wrong responses reported by primary users (left) and secondary users (right).

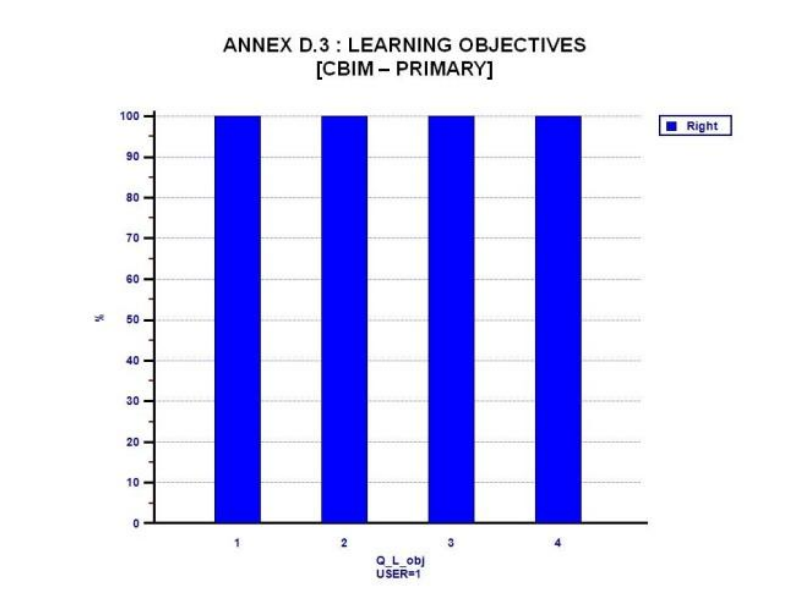


Figure 33 – Frequency of right and wrong responses of learning objectives *ad-hoc* questionnaire of primary users (upper) and secondary users (lower).

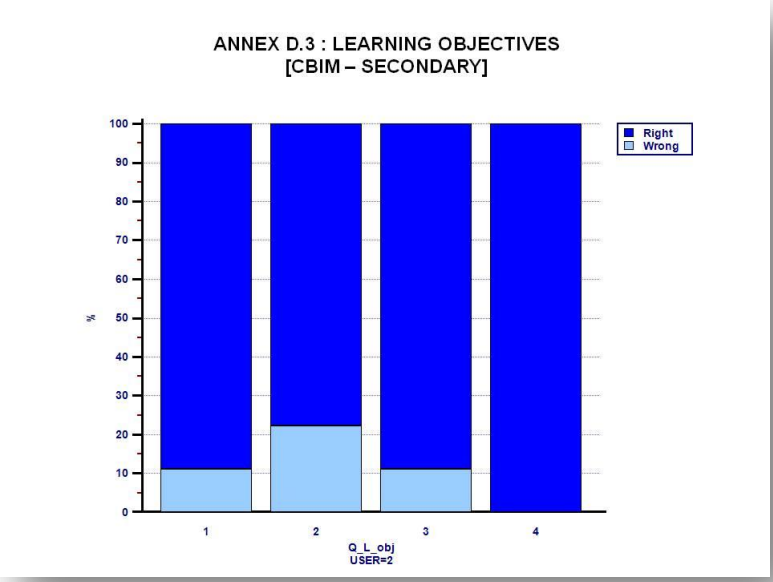


Figure 34 – Frequency of right and wrong responses of learning objectives *ad-hoc* questionnaire of primary users (upper) and secondary users (lower).

Besides analysis doesn't report them as significant, the questionnaire highlights a major amount of primary users right answers than secondary ones. Overall, we can say that both of users groups had a good performance in this task.

7- User experience results

The user's experience is assessed in order to obtain a measure of SeniorLudens usability, user's motivation, affective and psychological state in SeniorLudens usage.

7.1- Usability of SeniorLudens System

7.1.1- users from use case organization

In order to ensure that the platform and the game have a good level of usability, users are invited to fill System Usability Scale [1], consisting of 10 items on 5 points Likert scale (1= totally disagree, 2= little disagree, 3= neither agree neither disagree, 4= sufficiently agree, 5= strongly agree). Mean and standard deviation of primary users and secondary ones are analyzed irrespective of organization specific use case.

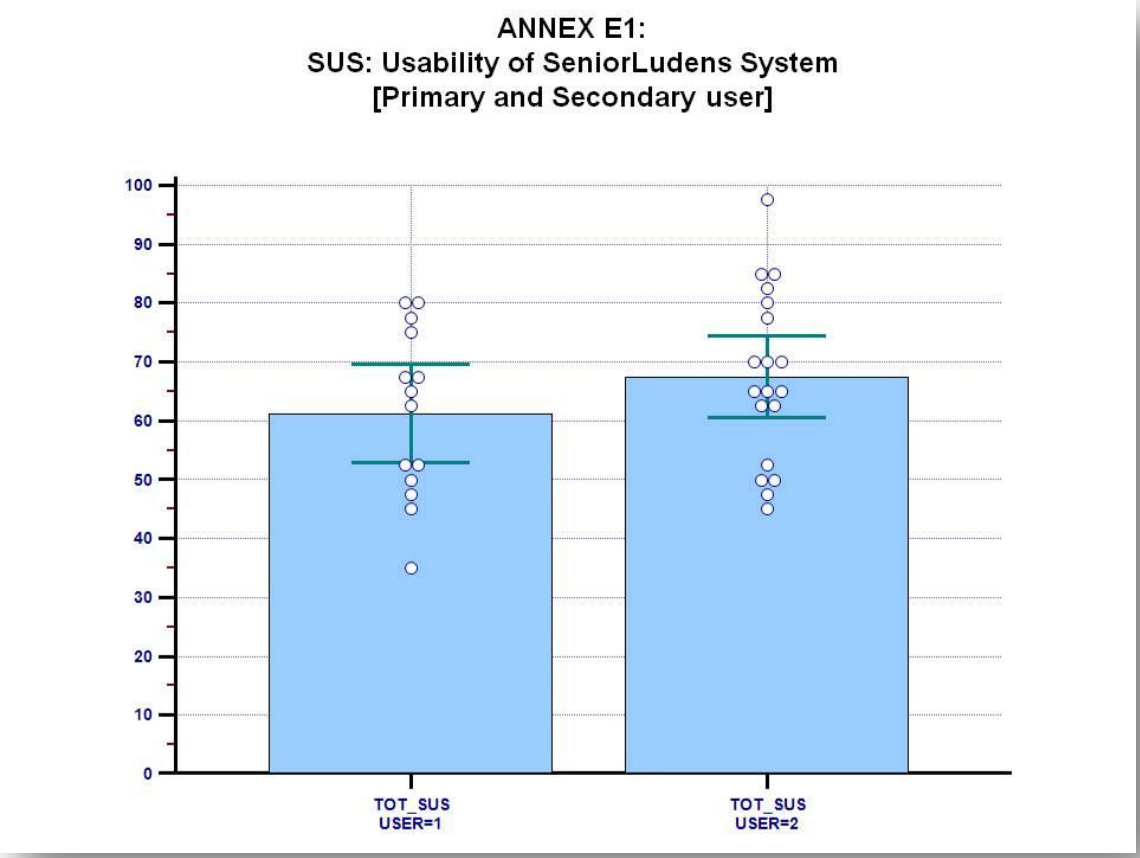


Figure 35 – Mean and standard deviation of SeniorLudens usability score estimated by primary users (on the left) and secondary users (on the right) regarding all use cases

The results don't show a significant difference between users groups in SeniorLudens platform and game usability. The product presents a usability mean score of 61.25 (SD±14.33) in the primary users group and a mean score of 67.50 (SD±14.57) in secondary users group.

7.1.2- Senior elderly advisors

The System Usability Scale was also used by the senior elderly advisors (N=8). Since this group exists of different kind of users than the use case test users, scores were calculated separately. As we also already saw in earlier parts of the test which was done by both groups of users, the senior elderly advisors seemed less satisfied with using the platform than the other groups. The usability mean score is 43.13 with an SD±16,02. Reasons may be again that this group didn't play a game, which makes harder for them to imagine in which case they should use SeniorLudens in the future.

7.2- Intrinsic motivation assessment

The participant's intrinsic motivation regarding SeniorLudens is examined through Intrinsic Motivation Inventory [2], by administration of 6 items of Interest/Enjoyment factor. The users are invited answering questions about whether SeniorLudens presents itself playful, interesting and enjoyable on a 3 points Likert scale (1=absolutely not, 2= a little, 3=much).

The results are analysed irrespective of the specific organization use case.

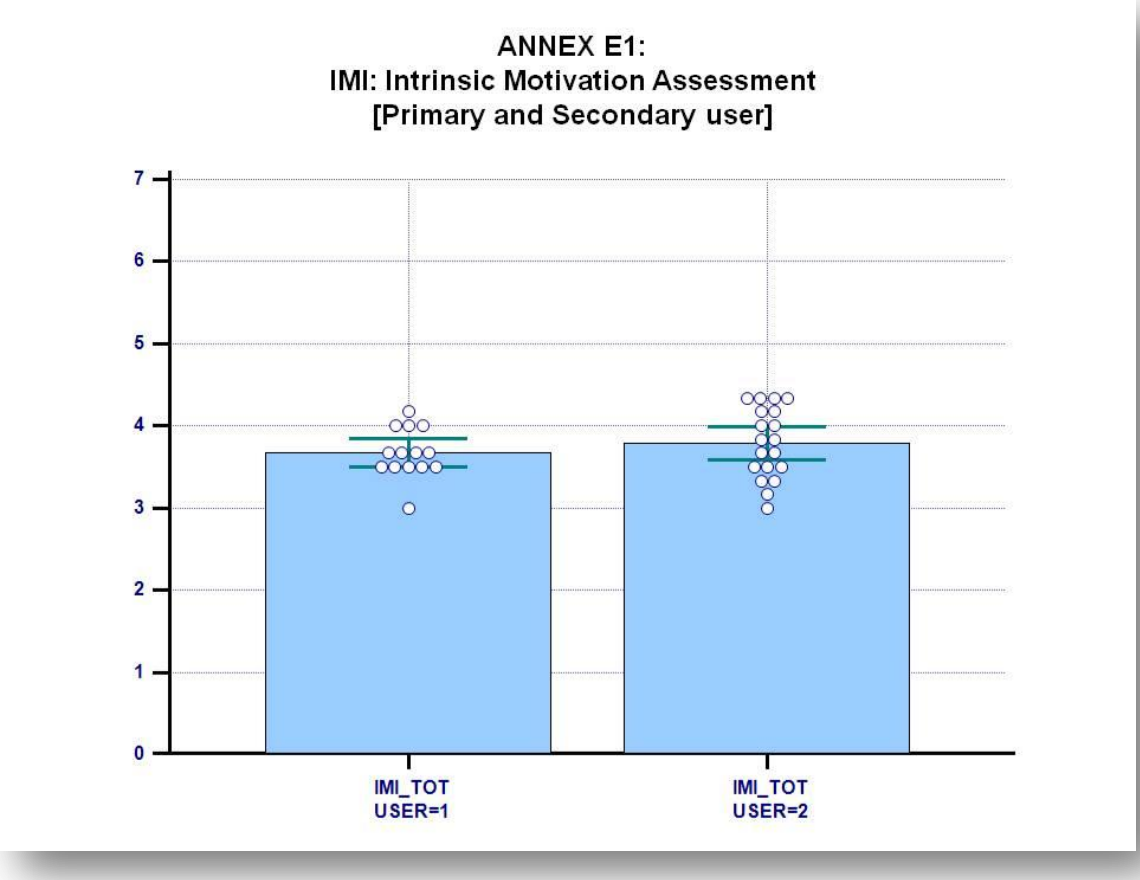


Figure 36 – Mean and standard deviation of Primary users (on the left) and secondary users (on the right) results of Intrinsic Motivation Inventory.

The analysis reports no significant differences in intrinsic motivation regarding SeniorLudens between primary and secondary users with a mean score of 3.67 (SD±0.33) in primary users group and a mean score of 3.79 (SD±0.42) in secondary users group.

7.3- Flow state assessment

To assess whether SeniorLudens offers to the user the optimal psychological state to carry out the activity, we administrated the Flow State Scale [3], a 36 items on 5 points Likert scale (1=Totally disagree, 2=little disagree, 3=neither agree neither disagree, 4=sufficiently agree, 5=strongly agree) that examines 7 domains (challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration on task at hand and sense of control) in order to ensure the difficulty level of an activity compared with user's skills.

The mean and standard deviation of primary users and secondary users group regarding each factor are depicted in the following figure (Figure 37).

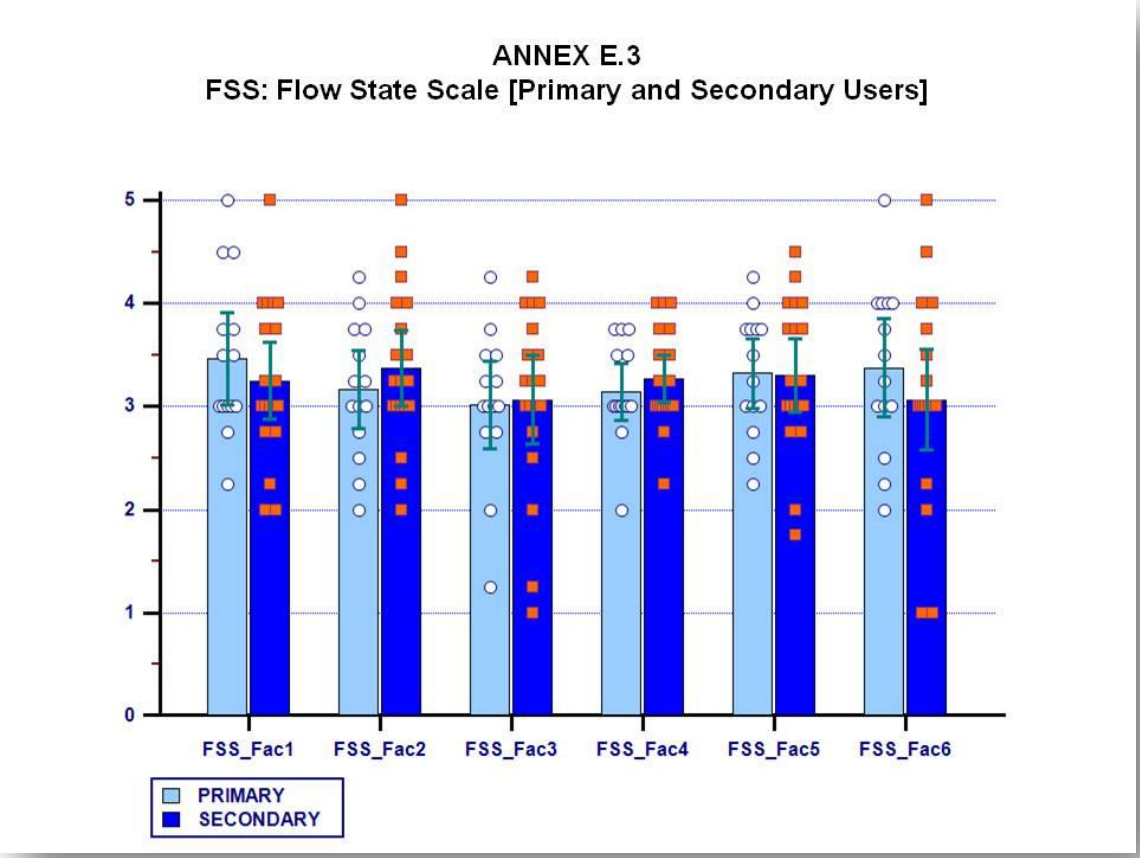


Figure 37 – Mean and standard deviation of Primary users (left) and secondary users (right) scores of each factor of Flow State Scale (respectively, Fac1=challenge-skill balance, Fac2=action-awareness merging, Fac3=clear goals, Fac4=unambiguous feedback, Fac5=concentration on task at hand, Fac6=sense of control).

As depicted in the graphic above, we didn't find any significant difference between primary and secondary users' score in each factor, nor between primary and secondary users among different factors score.

7.4- Affect assessment

In order to obtain an index of user's affective state after SeniorLudens experience, we administrate Positive Affect and Negative Affect Scale [4] two times into the validation session: the first time in the pre-game phase and the second one in the post-game phase.

We analyzed independently the user's positive affect index and the user's negative affect index before platform and game exploration and after that, achieving affective state information regarding primary and secondary users after validation session.

The following graph (Figure 38) shows the mean and standard deviation of Positive Affect (PA) scores of primary users (marked as 'circle') and secondary users (marked as 'square') in pre-game phase (on the left) and in post-game phase (on the right); the second one (Figure 39) shows the mean and standard deviation of Negative Affect (NA) scores of primary users (marked as 'circle') and secondary users (marked as 'square') in pre-game phase (on the left) and in post-game phase (on the right).

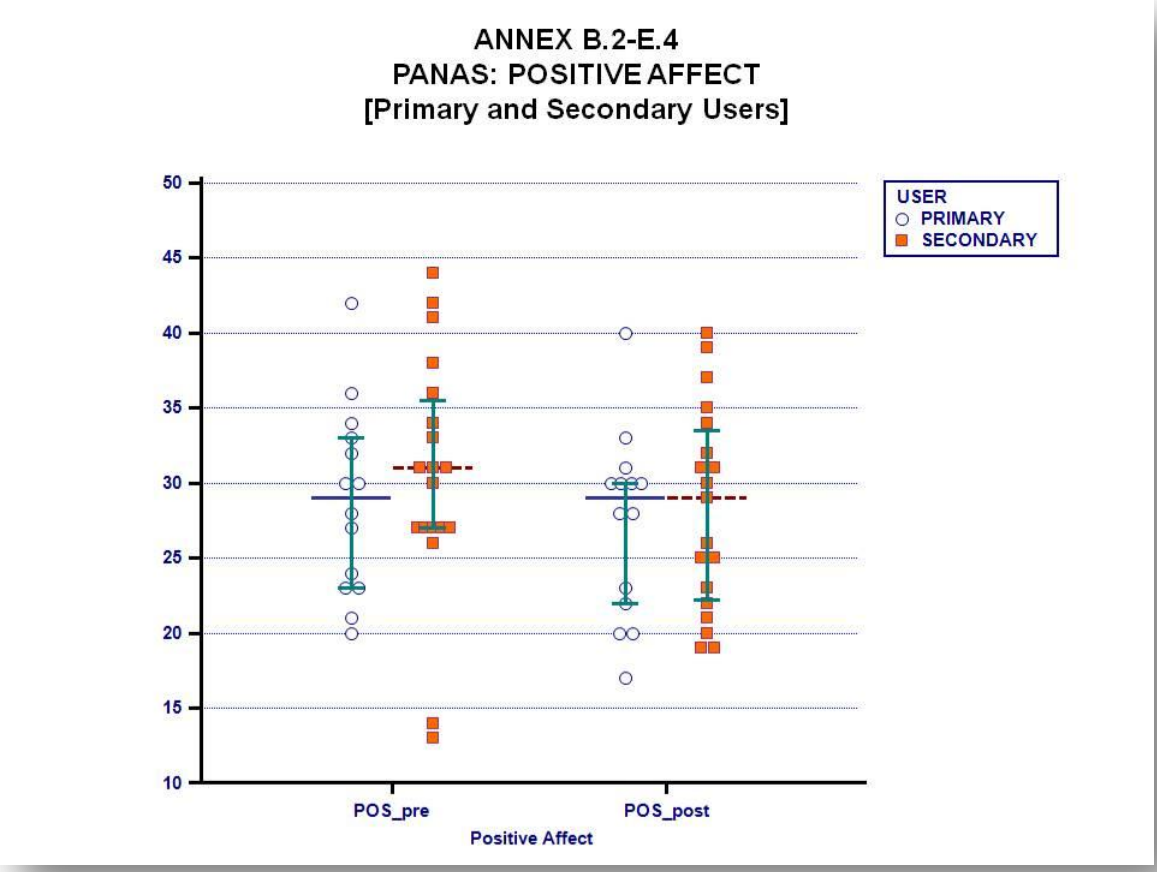


Figure 38 – Mean and standard deviation of primary users (whisker and box plot on the left) and secondary users (right) of PA index of PANAS in the pre-game phase (left) and post-game phase (right).

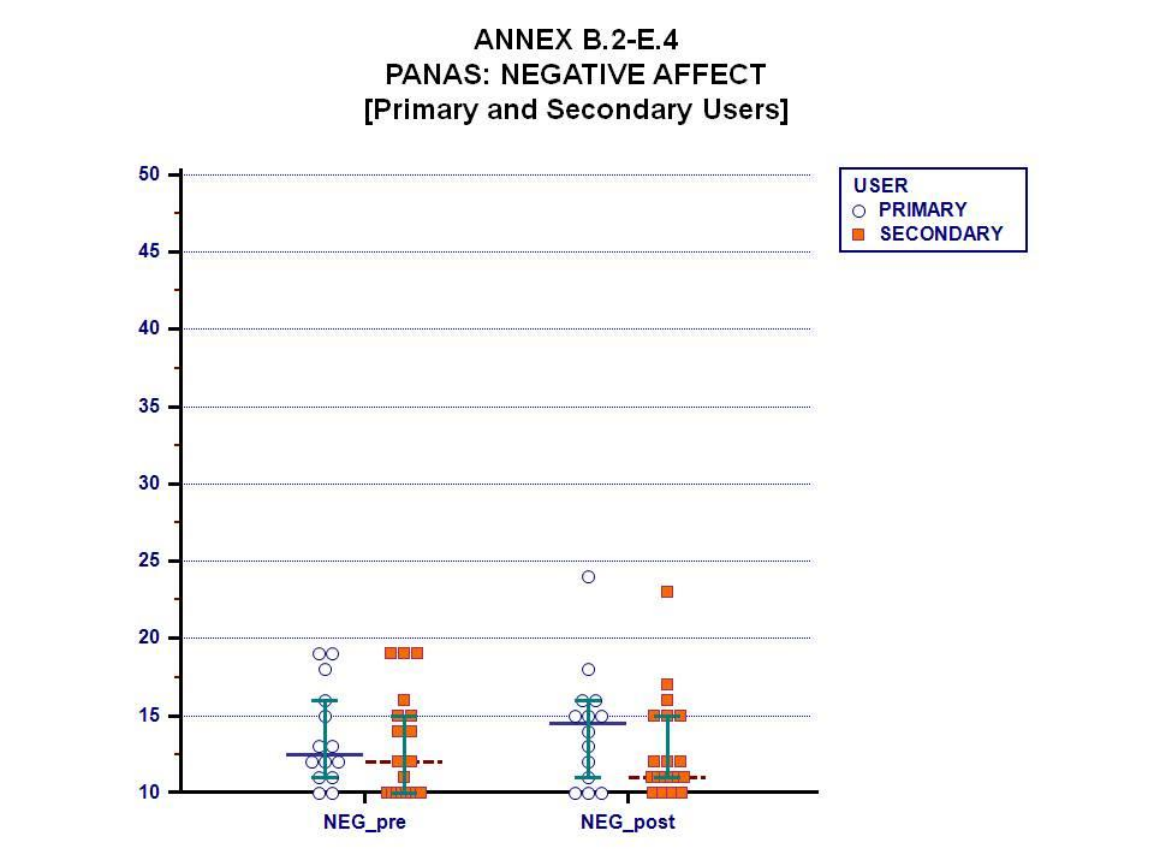


Figure 39 – Mean and standard deviation of primary users (left) and secondary users (right) of NA index of PANAS in the pre-game phase (left) and post-game phase (right).

As depicted in the figures, we can say that users show a low level of NA index and a good level of PA index. The PA index and the NA index don't show a significant difference between pre-game phase and post-game phase.

8- Conclusion

The first validation session has successfully ended. The functionality of SeniorLudens platform and use cases at this phase of implementation has been evaluated.

Notable results in this first validation sessions, were the differences between the use case test users and the senior elderly advisors who reviewed the platform only on general functionalities. In all different kind of groups the test users think the platform and games can attribute to their work performance, but the test users who were assigned to execute concrete tasks are clearly more positive about the system. A recommendation would be to let the general test users play a game as well in the next validation session. This will be more fun and – more important – will help them imagine what the system can be used for.

Furthermore, more specific conclusions and recommendations have been taken from the use cases. We will follow these results obtained from this evaluation session to structure the next implementations of SeniorLudens.

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10- Setting

Participants take part to the evaluation session in their Organization. They are tested individually by a SeniorLudens' expert (also "researcher") who has also the role of introducing them to the product.

Each session takes place in a quiet room studied for preserving participant's concentration in order not to not invalidate the evaluation session. In line with this purpose, the room offers the correct enlightenment's degree, a writing desk with a computer with a mouse device.

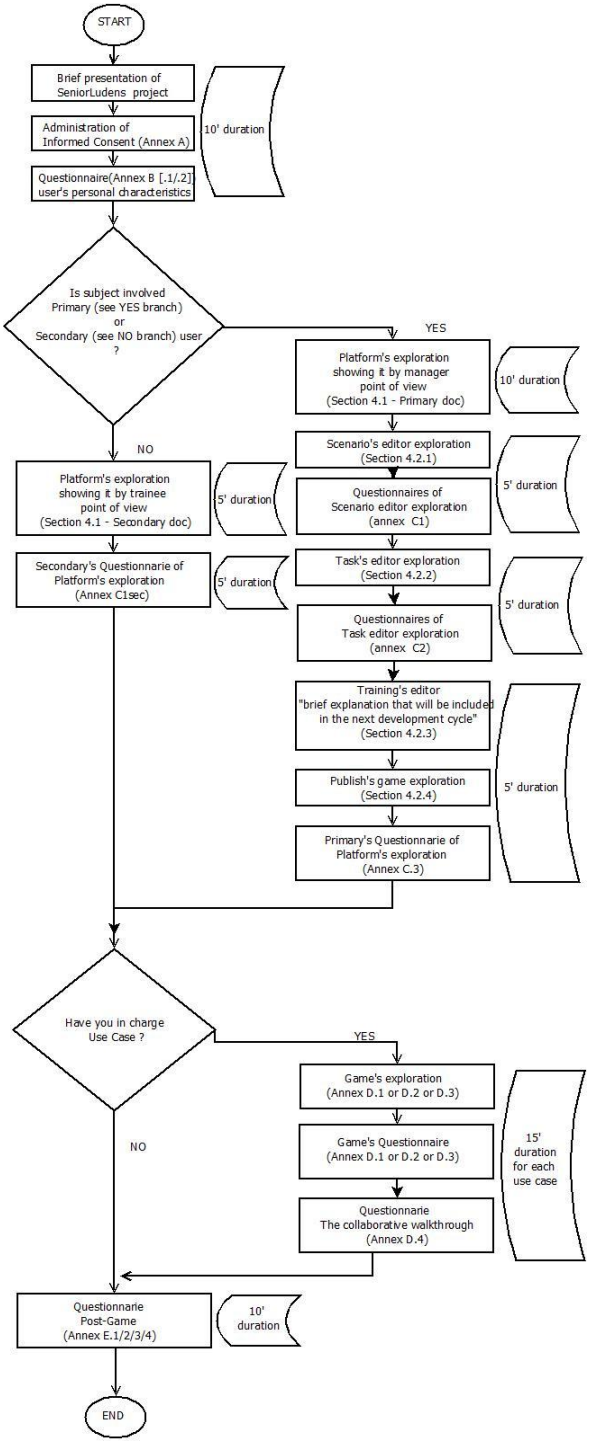
The user access the platform and the games in a Firefox or MSExplorer navigator (not Google Chrome).

During the validation session the researcher guides the user in the exploration of SeniorLudens Platform following the present document indications. At the same time, the user is free to explore the SeniorLudens Platform using the mouse device.

Each session lasts about 60 minutes and consists of three different phases: *pre-game, in-game and post-game*. The timing is the following:

Phase	Sub-phase	Paragraph	Annex	Timing
Pre-game	Introduction to the project	3.1		**10 min.**
	Informed Consent signature	3.2	A	
	Questionnaire personal characteristics	3.3	B.1	
	Affect Assessment questionnaire - PANAS		B.2	
In-game (platform)	Platform management script	4.1		**10 min.**
	Scenario editor script and questionnaire	4.2.1.3	C.1	**5 min.**
	Task editor script and questionnaire	4.2.2.2	C.2	**5 min.**
	Training's editor & publish game exploration	4.2.3; 4.2.4		**5 min.**
	Platform management questionnaire	4.3	C.3	
In-game (game)	Use-case script and questionnaire	5.1	D.1/D.2/D.3	**15 min**
	Collaborative walkthrough questionnaire	5.2	D.4	
Post-game	SUS		E.1	**10 min**
	IMI scale		E.2	
	FSS		E.3	
	Affect Assessment questionnaire - PANAS		E.4	

11- Testing Flow



12- Pre-game Phase

12.1- Introduction to the Senior Ludens project

The researcher introduces the user to the SeniorLudens project :

"Thanks for taking part in SeniorLudens project, your role is huge for the evaluation and implementation of a innovative emerging technology.

What's SeniorLudens? *SeniorLudens is a European AAL project and includes industrials partners, SMEs, research centers and end user organizations from 4 countries (Spain, Italy, Switzerland and Netherlands).*

The main goal underlying SeniorLudens is to create the first Serious Game development platform for the fast, easy and cheap creation of serious professional training games, which are suitable for use by older workforce in order to help senior professional figures in familiarizing with new technology and to enhance intergenerational transference of knowledge.

Your role in the project: *Today, you are in charge to test the pilot version of SeniorLudens platform and game in order to give us main indications about its functionality, effectiveness, usability and about the quality of your experience with it. You will be included in other two SeniorLudens evaluation session. Data we obtain form this evaluation will be useful for us to improve SeniorLudens among its implementation phases. Thanks for your time and availability."*

12.2- Informed consent

The user signs the Informed Consent (Annex A) provided by the researcher:

"In order to take part to this evaluation session, please sign the Informed Consent".

12.3- Pre-game questionnaires administration

The participant fills in a questionnaire recording participant's personal characteristics and aptitudes for technology usage (see Annex B.1) and an Affect Assessment questionnaire - PANAS (Annex B.2).

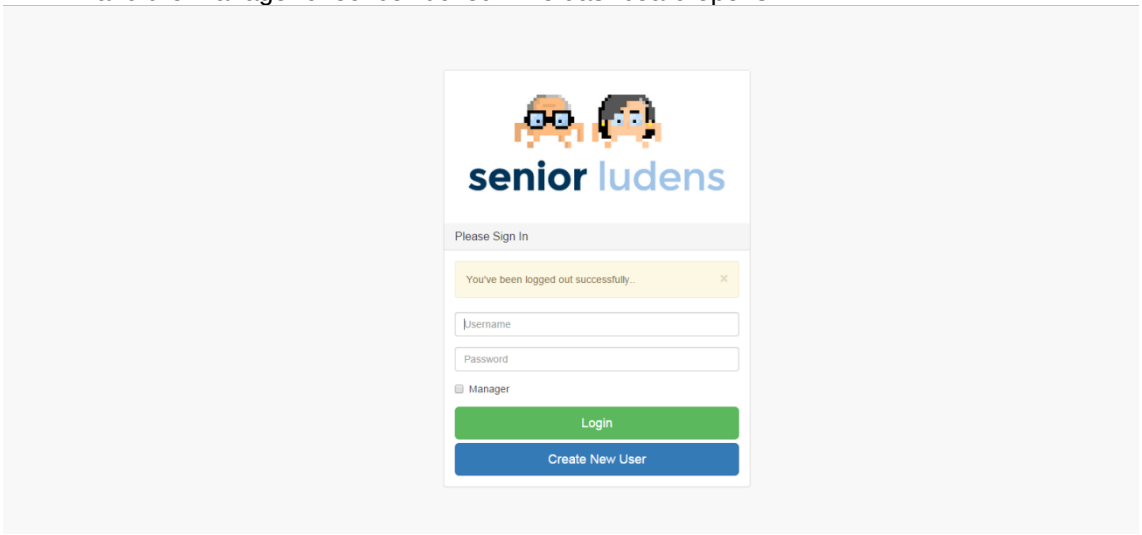
13- In-game Phase (Platform)

The SeniorLudens expert guides the user in the exploration of the platform showing it from a manager point of.

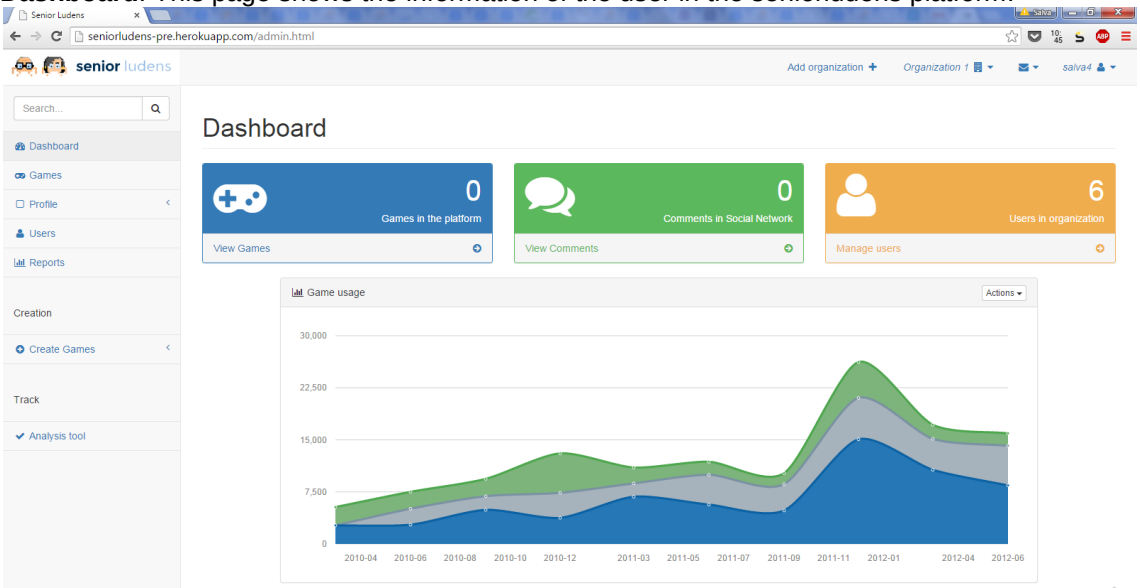
13.1- Platform management script

1. The researcher has the access to the platform located at:
   http://seniorludens-pre.herokuapp.com/login
   User registration: the researcher moves to create new user feature and shows the user the form. It is a common registration formulary so it is explained to the user.

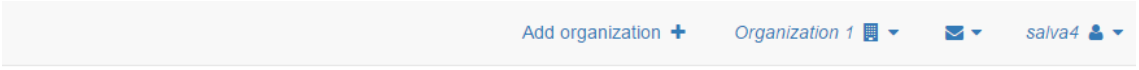
2. **User login:** the user validates with the test username (Username: testuser Pass: test) and the manager checkbox ticked. The dashboard opens.



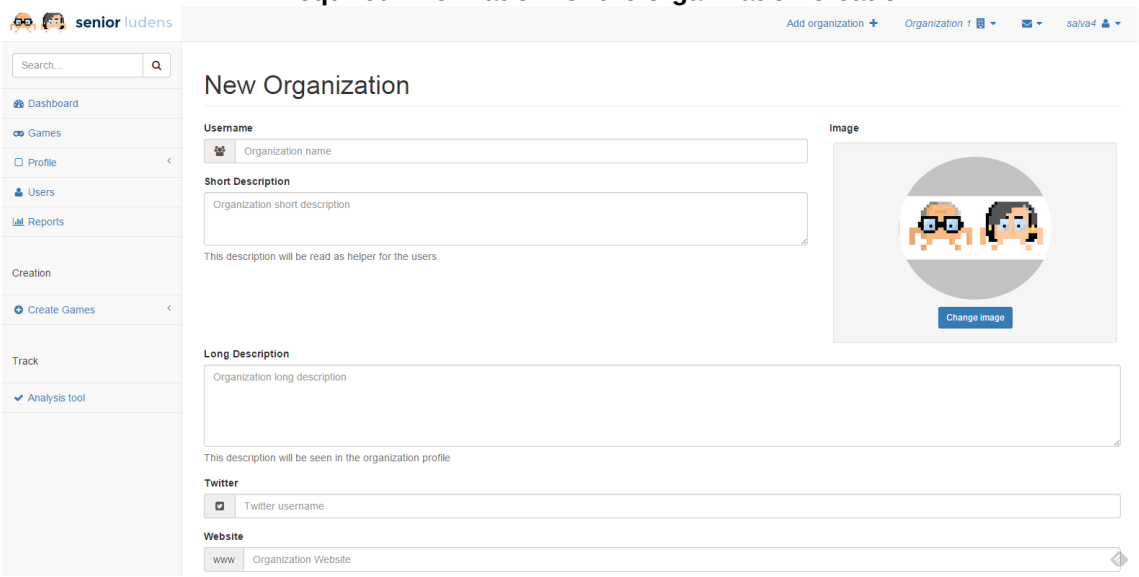
- **Dashboard**: This page shows the information of the user in the seniorludens platform.



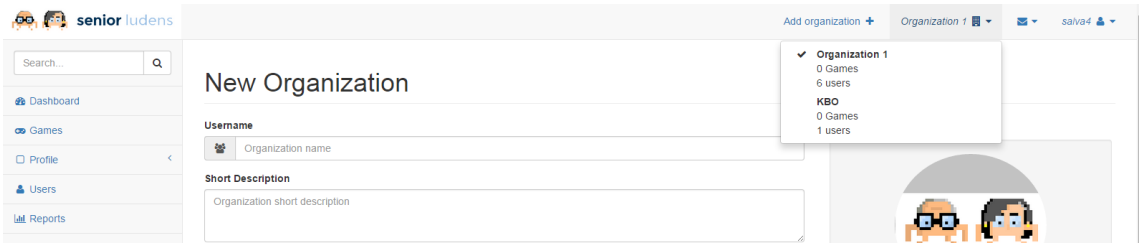
It has some menus in the top bar. **The researcher shows the menus to the user.**



a) **Add organization**: This button gives access to create new organization in the system.
   - **The researcher shows the formulary to the user showing him the required information for the organization creation.**

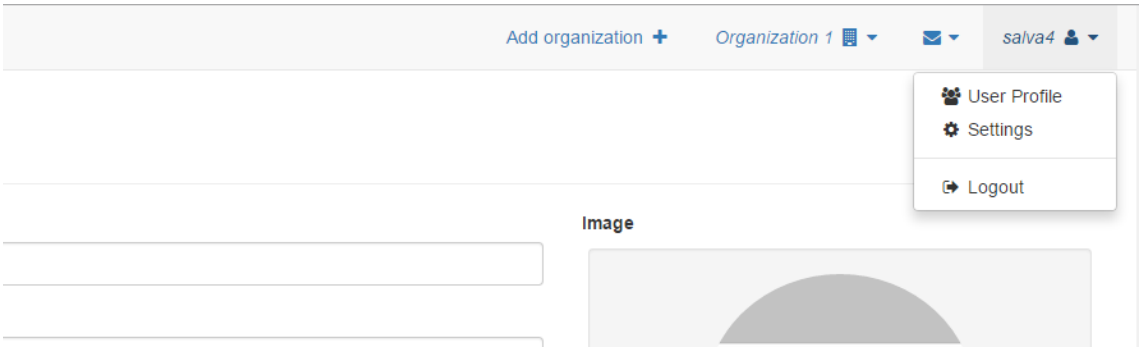


b) **Organization menu:** This slider menu shows the organizations where the user has been included. Clicking on the organization the user changes the dashboard to the selected organization, letting the user to administer the organization.
   - **The researcher comments this functionality to the user just to show him how to change between organizations when the user is included in some.**

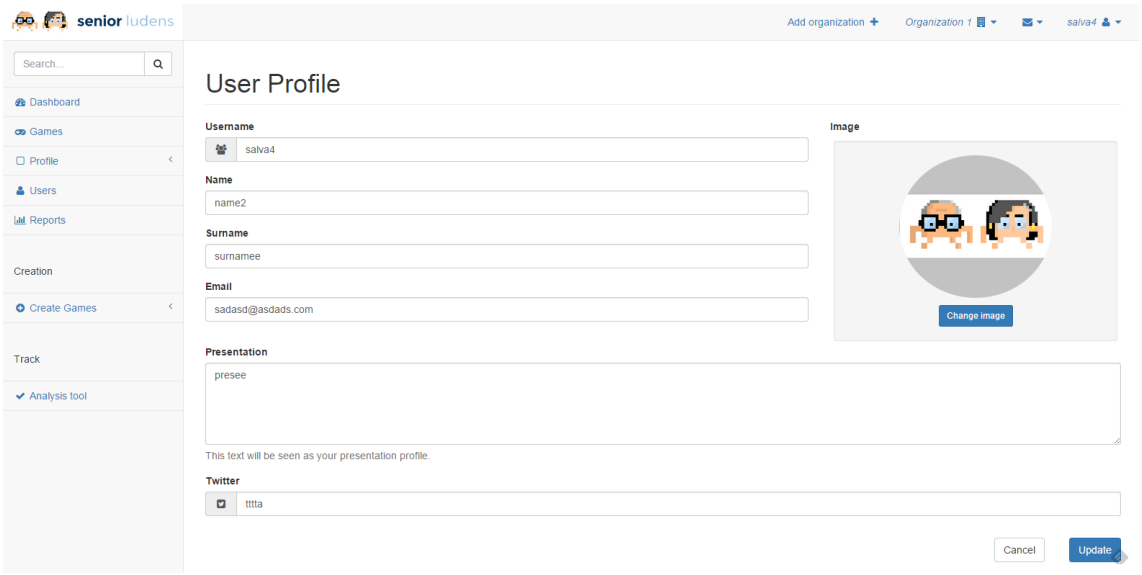


c) **[Messages menu**: It was not developed in this version. Will include the alert system used in the descriptors validation among the role chain.
   - The researcher passes through this menu without any explanation as it is not developed yet. If the user asks about this, the researcher will detail the expected functionality that will be included in the next development cycles.**]**

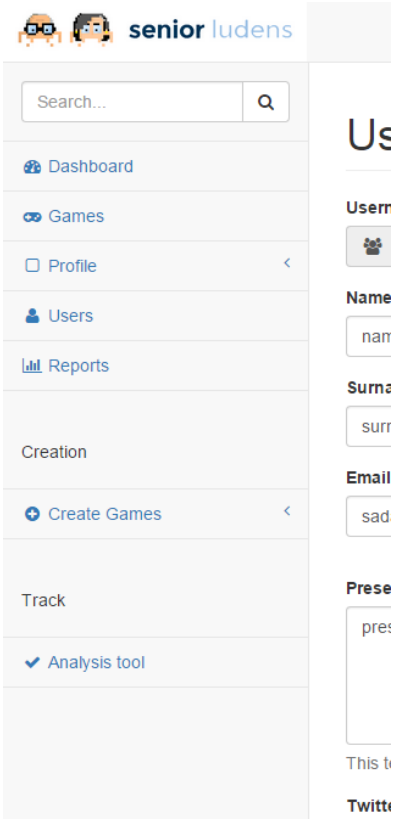
d) **User menu**: This sliding menu provides the user the access to manage the user profile, and logout the current session.



   - **The researcher shows the user how to update the user profile by clicking on the user profile button**.

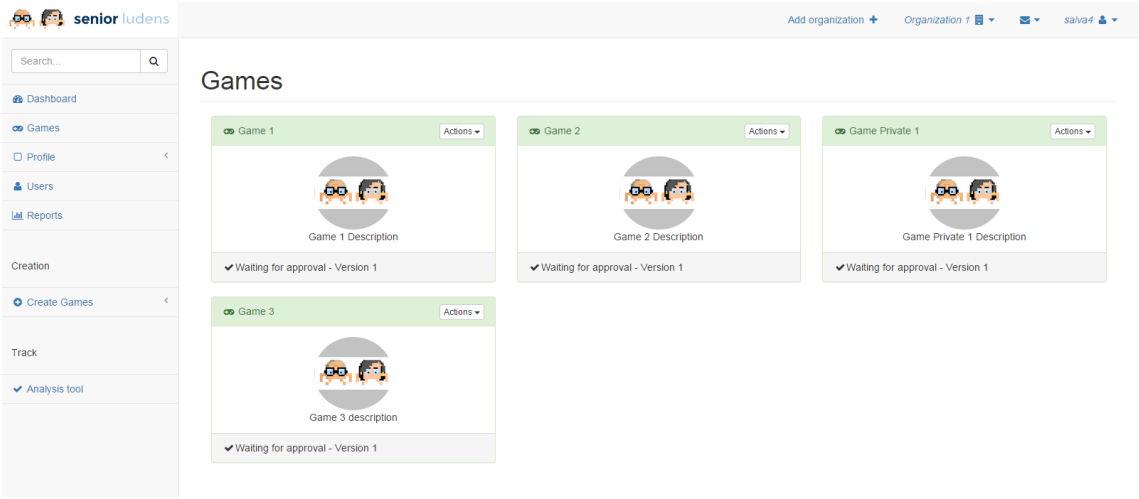


e) After these explanations on the ancillary top menu, **the researcher moves to the side menu** that gives access to the main functionality of game creation and organization administration in SeniorLudens platform.



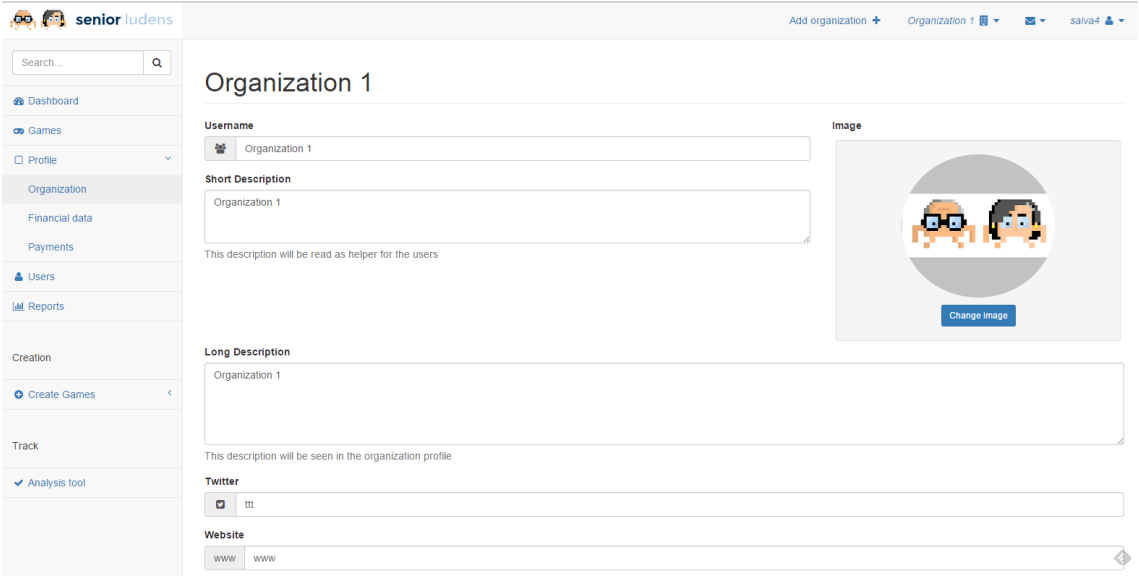
- **Side Menu**: This menu has four essential developed features:
  a) **Game Catalog:** This view is intended to manage the games published in the platform. Using the actions sliding menu on the top of each game, the user is able to modify the game, update the game details, publish and unpublish the game in the organization.

- **The researcher goes through this view detailing to the user the possibilities that are enabled over the deployed games**.



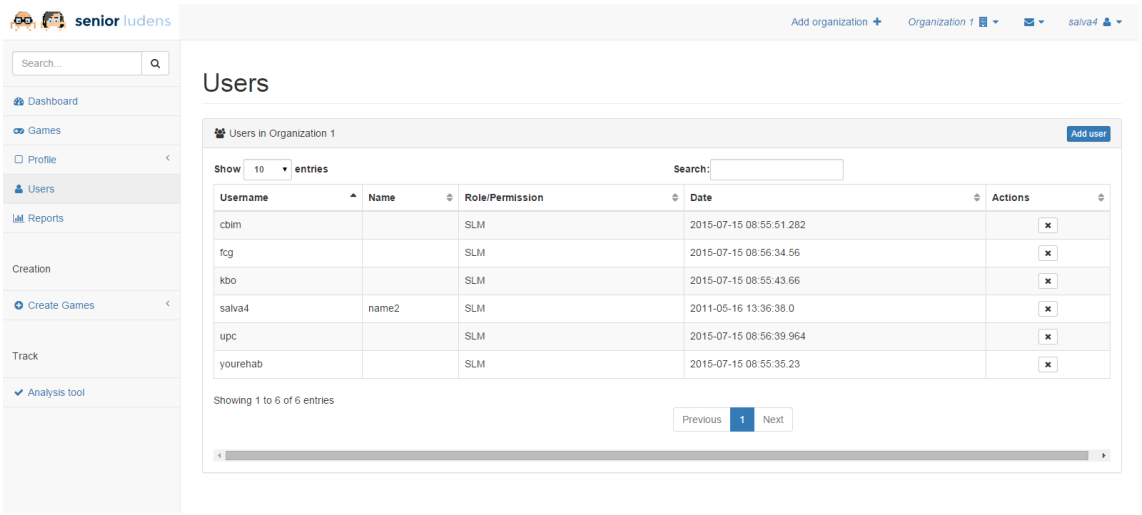
b) **Organization profile**: This view permits the user in charge of the selected organization to modify the information included into the organization profile.

- **The researcher shows briefly the functionality of the view to the user.**



c) **User's management in the organization**: This view is in charge of managing the users included in the organization. Using the add user button in the top right of the table the user is able to include new users to the current organization. Using the x button in the end of each row, the manager can also remove existing user roles from the organization in the platform.

- **The researcher goes into the functionalities of the view detailing them to the user.**


senior ludens
Add organization
Organization 1
salva4
Search...
Dashboard
Games
Profile
Users
Reports
Creation
Create Games
Track
Analysis tool
Users
Users in Organization 1
Add user
Show 10 entries
Search:
Username
Name
Role/Permission
Date
Actions
cbim SLM 2015-07-15 08:55:51.282
fcg SLM 2015-07-15 08:56:34.56
kbo SLM 2015-07-15 08:55:43.66
salva4 name2 SLM 2011-05-16 13:36:38.0
upc SLM 2015-07-15 08:56:39.964
yourehab SLM 2015-07-15 08:55:35.23
Showing 1 to 6 of 6 entries
Previous
1
Next

13.2- Game creation chain

- The game creation process is based on an incremental hierarchy built upon descriptor files that encompass the information of the specific scope where they are meant. This structure begins with the more general phase: world definition.
  - World Definition: The world is the 3d scenario where the designers define and create the 3d scenarios, objects and actions that shape the complete set of options and variants with which a game can be designed and created. It is divided into two separated parts: The game model in the 3d game engine made by 3d designers and the definition file that will be completed with the created 3d elements. This file separates the serious game creation from the 3d engine. This stage is the only one connected with the 3d modeling environments, easing the change with any third party 3d engine used. This stage is not covered in the present validation.
  - Scenario Definition: The scenario is built upon the world definition descriptor file, and generates a scenario descriptor file. This descriptor includes the elements (previously defined in the world) that will be used in our game. It includes the scenarios that we intend to use, the objects, as well as their positions in the game. It is created with the Scenario Editor included into SeniorLudens Platform. The creation is straightforward because it is made graphically using the 3d environment that includes the 3d elements that were defined in the world.
  - Task definition: After scenario definition, the game creation process continues with the task definition that will create another descriptor file named: task descriptor. Following the same lines, it is created with another tool called Task Editor that is integrated inside SeniorLudens platform. The task descriptor includes the information about the game rules that will be applied during the play, which cover all the actions and results that will be performed over the objects included in our serious game.
  - Training Plan definition: This represents the last step on the game creation process. It pursues to define the game difficulty and repetitions as it will be included in each level of our serious game. It is created with the Program Training Editor Tool, which is integrated in SeniorLudens platform (not yet in this validation). This tool lets the users to define the difficulty of the levels creating the Training Plan xml descriptor file.
  - After all these steps are completed, we have defined uniquely our Serious Game, and we can publish our game in the platform (through the administration portal), naming the game, defining a version, and selecting the built descriptor files. Once the game is created, the user responsible in the organization will accept and will publish the game publically or inside the specific organization.

- The researcher will go through the next steps to guide the users in the validation.
  - Scenario Editor: The demo to the user will go through the scenario editor script and questions
  - Task Editor: The demo will follow with the Task Editor script and questions
  - Training Plan Editor: Not developed yet. Can be explained to the user that will be included in the next development cycle.
  - Publish Game: This is the final step in the game creation chain because it is where the descriptors are connected and the game is included inside an organization.
  - After showing all these steps related with the descriptor management, the researcher shows the user how to create a new game, using the game publish form.

13.2.1- Scenario Editor script

The Scenario Editor is the SeniorLudens tool needed to create different scenario configurations. These configurations will allow repeating tasks in visually different scenarios, as far as the different configurations include the set of objects involved in the actions. They will also allow creating new tasks specific to each configuration. Variations introduced by scenario configurations are essential to avoid player's boredom and to promote adherence to the games.

Users that create scenario configurations are Trainers with the corresponding permissions. The Scenario Editor is implemented as a SeniorLudens game. Thus, it does not require programming skills.

There is one Scenario Editor Game for each SeniorLudens World. They all have the same structure and differ only on the set of objects that can be located in the scenario, because each set of objects is specific to a particular world. In this deliverable, we describe the first validation procedure for the Scenario Editor first prototype of the use case *Grow Your Project*. It could have been done with any of the existing worlds.

13.2.1.1- Scenario Edition Task

The Scenario Editor shows a configuration of a scenario. In a configuration, there are fixed structural objects that cannot be touched and objects that can be modified. Users of the Scenario Editor are able to modify these objects, add new ones and remove existing ones. The minimum required functionalities are:

1. Remove objects existing in the scenario. To do so, user should select the object by clicking on it in the scenario and select the *remove tool* by click on the corresponding tool in the tools menu. The object will disappear.
2. Modify the position of an object of the scenario. To do so, user should select the object by clicking on it in the scenario and select the *grab tool* by click on the corresponding tool in the tools menu. The object will be attached to the cursor and will be dropped at the new location on a user click on the target location.
3. Modify the orientation of an object. To do so, users should select the object by clicking on it in the scenario and select the *rotation tool* by click on the corresponding tool in the tools menu. It will be possible to make a y-axis (vertical) rotation of the object by moving the mouse. Other rotation may also be enabled if needed.
4. Change the current state of an object. To do so, users should select the object by clicking on it in the scenario and select the *change state* tool by click on the corresponding tool in the tools menu. A state menu will appear in the bottom menu from which users will be able to select the desired state. The object state will change in the scenario. For example, users will be able to change the initial state of the object egg from raw to cooked (fried). The visual appearance and the actions available on the objects depend on their state.
5. Change the current style of an object. To do so, users should select the object by clicking on it in the scenario and select the *change style* tool by click on the corresponding tool in the tools menu. A style menu will appear in the bottom menu from which users will be able to select the desired style. The object style will change in the scenario. The style of an object modifies only its visual appearance, not its functionality.
6. Change the attributes of an object. To do so, users should select the object by clicking on it in the scenario and select the *change attributes* tool by click on the corresponding tool in the tools menu. A menu with the object's attributes will be deployed where users

will be able to modify attribute values. For example, modify the initial current date on a calendar object or the initial temperature of a thermometer object.

7. Add a new object in the scenario. To do so, users will need to select an object from a menu that includes all objects of the world. The object be attached to the cursor and will be dropped at the desired location on a user click on the target location. Since a world can have many objects, the Scenario Editor should allow users to search objects through a hierarchy of objects categories and other search mechanisms. A particular category of objects is messages and 2D interfaces.
8. Save the new configuration and name it.

The current version of the Scenario Editor offers a view of most of these features, but does not provide an implementation of all of them. The purpose of the first validation is to discuss on this first version the location of the tools and menus needed for the edition procedure. Specifically, the current version allows only grabbing existing objects and creating and locating new objects.

13.2.1.2- Guided procedure

- User login: the user starts the game by opening the following url in a Firefox or MSExplorer navigator (not Google Chrome): http://movibio.lsi.upc.edu/seniorludens/dev/game/gyp/2?t=scenarioeditor&tp=1

- The Unity player will open. You may need to install it the first time you enter or authorize its running if it is the first time you launch it. You'll see the GrowYourProject basic scenario (see Figure 1)

Figure 40: The first view of the Scenario Editor Game for the GrowYourProject World

- The scenario is made of a countryside landscape with a farm, a barn and a plot divided into subplots. There is also a table and a set of pumkins. On the bottom side of the window you'll see a message asking you to edit the scenario, save it and close the game.

- It may be a good idea to work in fullscreen otherwise, it may happen that you unvonluntarily put the focus out of the graphical area without noticing it. In this case you will not be able to interact until you restititute the focus.
- First of all, navigate here and there in the environment:
  - To rotate the camera, move the mouse
  - To navigate click on the location you want to go.
- If you have already tested the game in the first use-cases validation, you already know how to do it. If you have tested specifically the GrowYourProject use case, you'll see that the scenario is slightly different. It corresponds to an upper version of the world.
- Try to focus at different points of the scene:
  - At the barn
  - At the farm
  - At the table
  - Far way in the landscape.
- Try to stop navigation by clicking the left button while navigation is on.

Figure 41: Navigation through the environment; a view of the surrounding landscape. It is not possible to go further since there are invisible walls that prevent users from exiting the boundaries of the farm neighbourhood.

- To deploy the Scenario Editor menu, press the right mouse button (RMB).

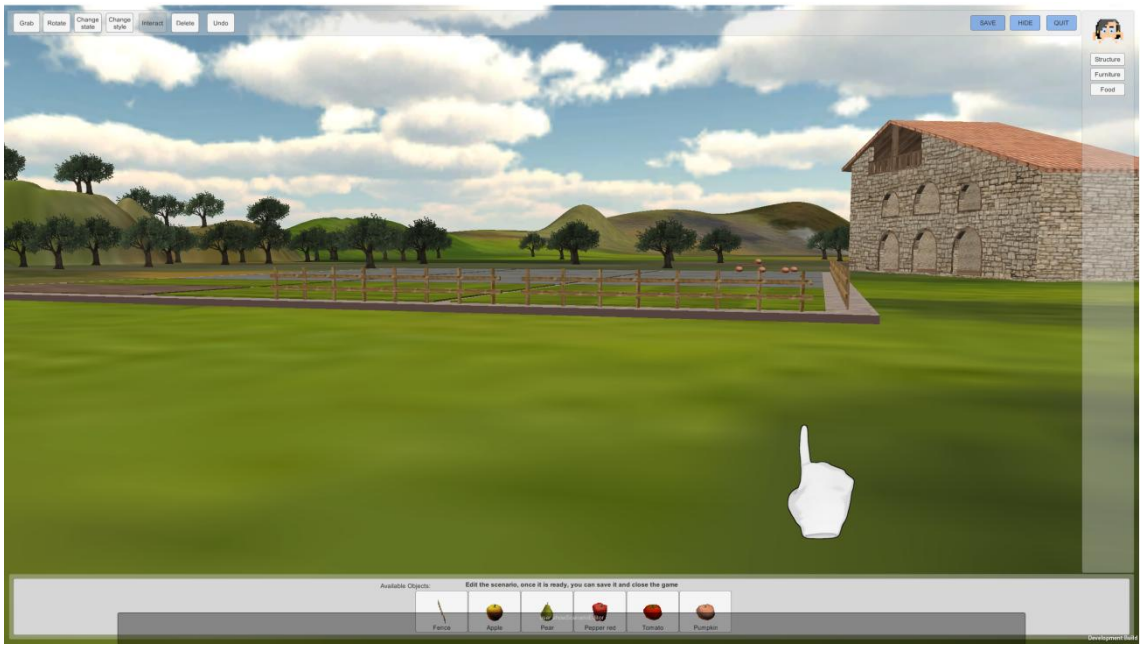


Figure 42: Deploy the menus by pressing the Right Mouse Button

You will see at right the list of world's object category. Currently, there are only three categories: *Structure, Furniture* and *Food*. According to the selected category different objects would appear in the bottom menu. This functionality is not working in the current version because there are only six different objects to be put in the scenario, specifically, *fences, apple, pears, red peppers* and *pumpkins*. Onecategory of objects will be 2D interfaces and messages.
In the top left of the window the tool menu allows you to select the action you want to do with an object: to *grab* it, to *rotate* it, to *change* its *state*, its *style*, to *remove* it and *undo*. Currently only the generic *interact action* is enabled.
The top right menu allows you to *hide* the menus, *save* the configuration and *quit*. Currently, you'll be able to test only the *hide* and the *quit* options.

- With the *interact option* on (you are not able to unselect it) try to pick a pumpkin in the plot with left mouse button. Try to drop it on the table near the plot by clicking on the table.
- Try to select the farm. See that it is not possible.
- Try to select the table, the objects on top and the fences. Move what you can.
- Empty the field of all pumpkins. Drop them wherever, but out of the field.
- In the bottom menu, select an apple and put it on the field. See that the menus disappear as soon as you have selected the apple and observe that the apple is now attached to the cursor. Remember that you just have to click the right button to deploy the menus, but you can do it only if there are no selected objects.
- Try with the other object: put one of each on the field.
- Try the hide button. Play at hiding and deploying the menu.
- Try the save option. Nothing will happen by now
- Finally, quit the game.

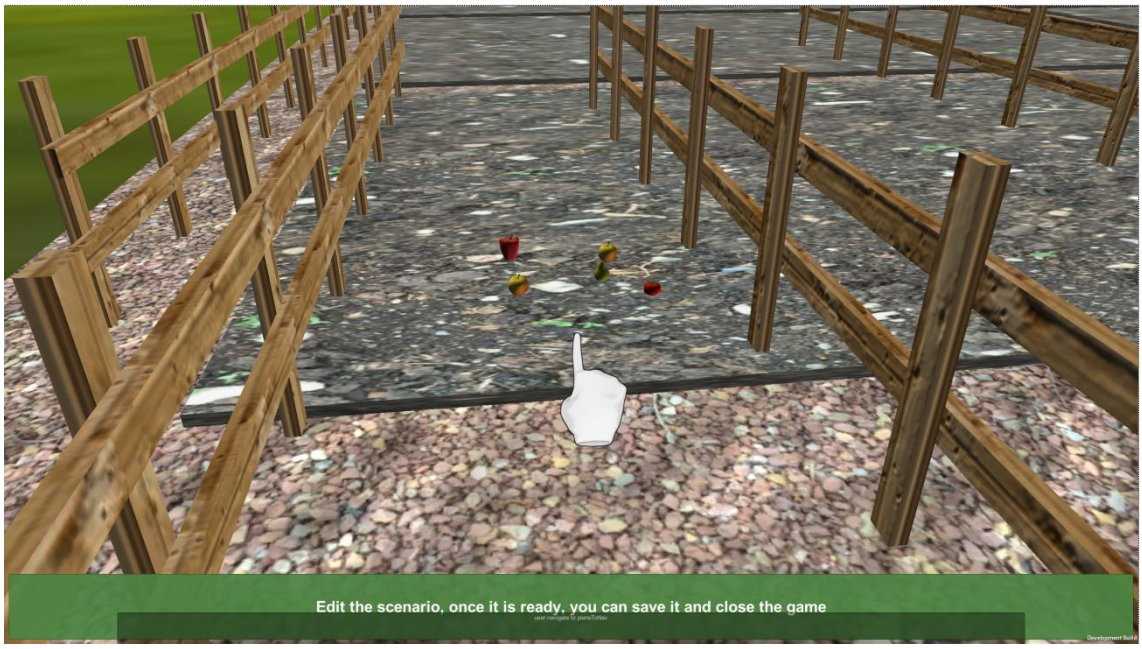


Figure 43 A view of the plot after moving the pumpkins off, adding fences, two apples, a pear and a red pepper.

13.2.1.3- Scenario Editor questionnaire

The researcher administrates the Scenario Editor questionnaire (ANNEX C1) to the user.

13.2.2- Task Editor script

The researcher introduces the user to the functionalities of the Task Editor.

“The task editor is the tool used by the trainer to design the reference task for the trainee and define the different roles of the characters.

Deploying the full state diagram of all possible user actions is very tedious and prone to errors. Therefore, the task editor tool will require trainers to define only the reference task, this is the correct way of doing things.

For the reason Task Editor tool makes use of Blockly as Visual Editor that allows users to write flows by plugging blocks together.

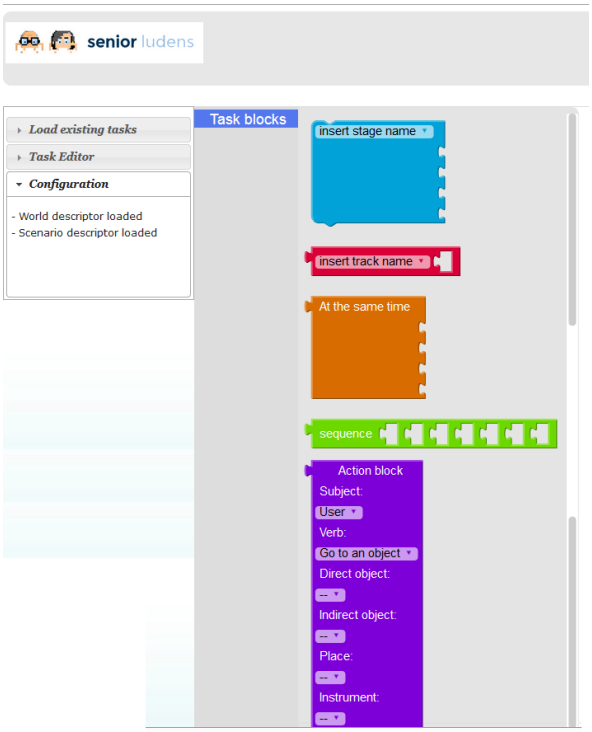
The reference task is defined in terms of actions structured as sequential or parallel compositions. Sequential compositions mean that the actions must be done one after the other, and parallel compositions mean that a subset of the actions of the bloc must be done no matter in which order. During the game play, all user interactions are interpreted as action queries. The action queries are evaluated in comparison to the reference task to know if they are correct or no. If they are correct, they are done. Otherwise, they can be done and evaluated as incorrect or forbidden to provide a free-of error learning process.”

13.2.2.1- Task Editor testing procedure

The researcher introduces the user to the possible actions of the Task Editor.

1. **INCLUDE NEW BLOCKS**

You can find the existing set of blocks in the toolbox (Task blocks) as follow:

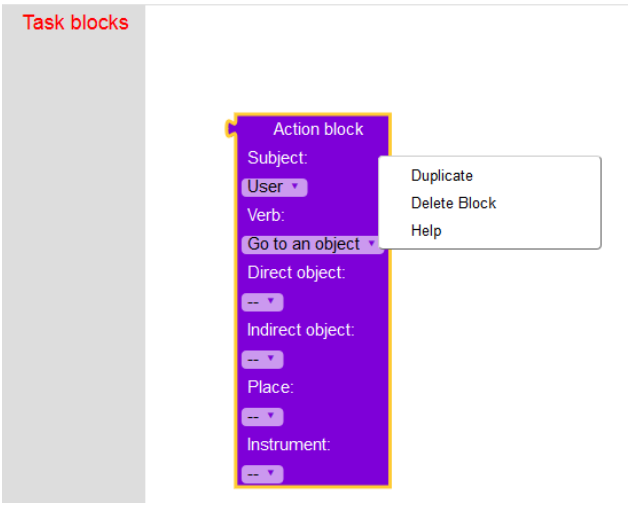


1. MODIFY ALL TYPE OF MODULE

For each block, you can manage the following modification:

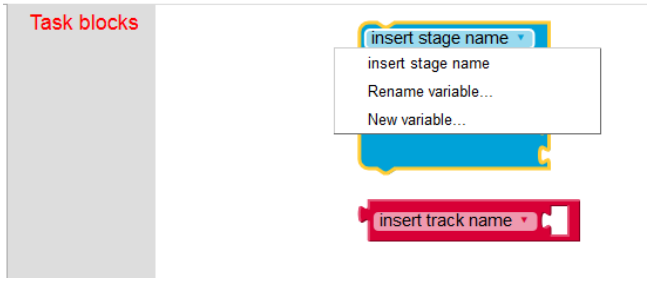
- Duplicate
- Delete
- Run a contextual description of blocks

For example, we can try to put into the workspace the Action Block and with right click of mouse on the block area, testing the functions as listed above:



Meanwhile, only for types Stage and Track, you can “rename” the title of the block.

For example, we can try to put into the workspace the Stage Block and with left click of mouse on the dropdown area, testing the function “New variable”:



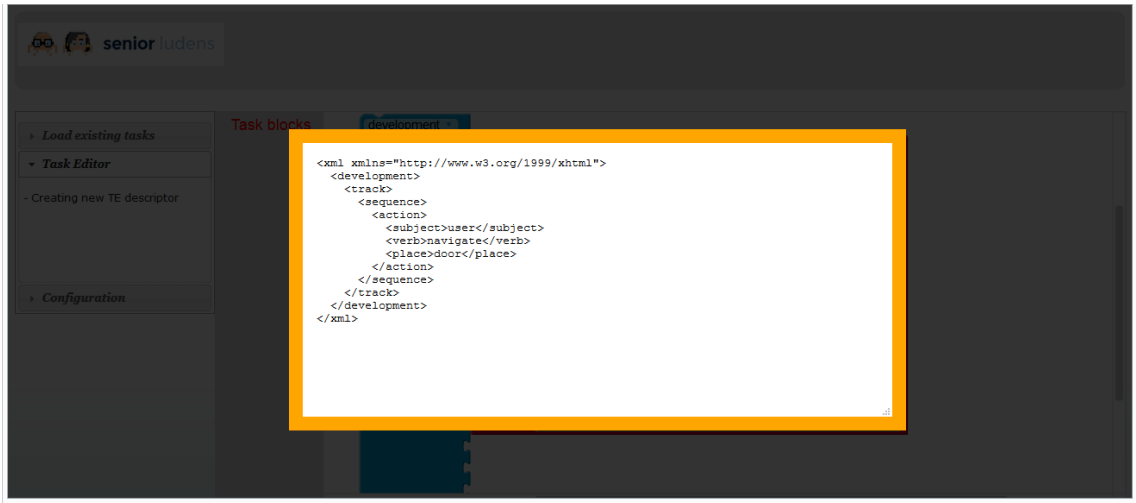
2. LOAD EXISTING TASK DESCRIPTORS

You can load an existing task by clicking on “go to an object” within left menu (Load existing tasks) as follow:

3. CREATE A NEW TASK DESCRIPTOR

For example, after inserting the existing task “Go to an object” (as described in the previous 2.3 point), you can create and show new task descriptor simply clicking “Creating the new TE descriptor” within the left menu (task editor) as follow:

Create new TE descriptor

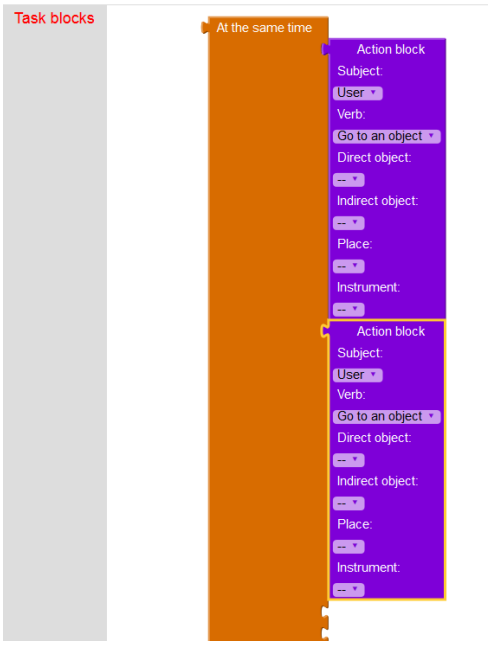


Show new TE descriptor just created

4. PUT ACTION MODULES IN PARALLEL

Task editor is able to manage the action block also in parallel to communicate to the Training Program Module how the action should be execute, at the same time or in sequence.

For example, we can try to put a parallel block into a clean workspace and insert two action block into this one as follow:



5. WE CREATE A NEW TASK

After locating to **http://selte.cbim.it/**, we are able to create new task.

For example, we want create a task to go to a door of the scenario:

6. WE MODIFY AN EXISTING TASK

To modify an existing task be enough to call back one and delete and/or add the needed blocks to achieve the new goal of the task

For example, we can call back the the task created in the previous point and then we modify it to go to a specific door you can use the door_1 identifier instead of the door identifier. As you can see in the following flow:

13.2.2.2- Task Editor questionnaire

The researcher administrates the Task Editor questionnaire (ANNEX C2) to the user.

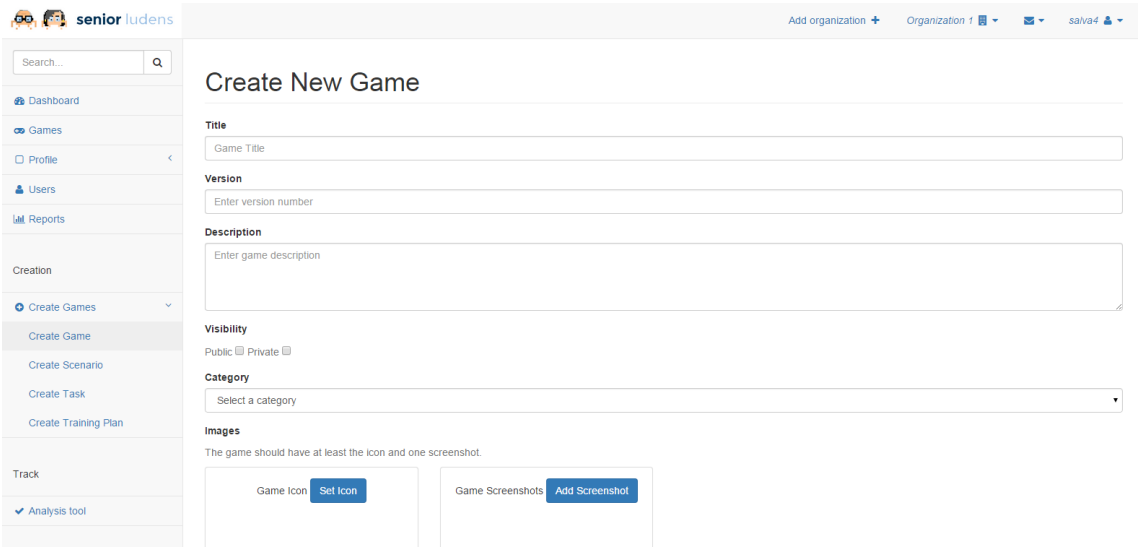
13.2.3- Training Plan Editor

Not developed yet. Can be explained to the user that will be included in the next development cycle.

13.2.4- Publish Game

This is the final step in the game creation chain because it is where the descriptors are connected and the game is included inside an organization.

After showing all these steps (4.2.1-4.2.4) related with the descriptor management, the researcher shows the user how to create a new game, using the game publish form.



13.3- Platform management questionnaires

The participant fills in a questionnaire about the exploration of the platform form a management point of view (Annex C.3).

14- In-game Phase (Use case Games)

14.1- Use case exploration script

According to the Organization profile, the researcher shows to the user the specific use case.

14.1.1- IT use case

The researcher shows to the user the use case following the relative script (ANNEX D.1). At the end of the exploration of the game the researcher administrates the **use-case questionnaire** to the user.

- **User login** (in a Firefox or MSExplorer navigator - not Google Chrome):
  http://movibio.lsi.upc.edu/SeniorLudens/dev/validation1/

14.1.2- Rehabilitation use Case

The researcher shows to the user the use case following the relative script (ANNEX D.2). At the end of the exploration of the game the researcher administrates the **use-case questionnaire** to the user.

- **User login** (in a Firefox or MSExplorer navigator - not Google Chrome):
  http://m14f0109.sui-inter.net/SL_Physio_UseCase_evaluation_1/
  SL_Physio_UseCase_evaluation_1.html

14.1.3- Traditional food production use Case

The researcher shows to the user the use case following the relative script (ANNEX D.3). At the end of the exploration of the game the researcher administrates the **use-case questionnaire** to the user.

- **User login** (in a Firefox or MSExplorer navigator - not Google Chrome):
  http://m14f0109.sui-inter.net/SL_Cheese_UseCase_evaluation_1_build_2/
  SL_Cheese_UseCase_evaluation_1.html

14.2- Use case evaluation

The user is provided with the collaborative walkthrough questionnaire (Annex D.4) about the functionalities of the game.

15- Post-game phase

This phase includes the administration of different questionnaires to assess the degree of game and platform usability, user's motivation to SeniorLudens usage and his/her quality of experience. Specifically, the administration includes:

- System Usability Scale (SUS) (Annex E.1),
- Intrinsic Motivation Inventory (IMI) (Annex E.2)
- Flow State Scale (FSS) (Annex E.3)
- Affect Assessment questionnaire - PANAS (Annex E.4)

Annex A: Informed consent

The present document is composed in two sections, information sheet and declaration. The information sheet explains the activities that are going to take place today, and the statement – if signed- is your consent to participate in these activities. We invite you to read the document carefully and, if you need to, to ask for clarifications before signing it.

Information sheet

The data collection will be carried out by the staff of [insert research institution name] and particularly by [insert researchers' names] today [insert date] at [insert place] for the SeniorLudens project.

The activity that constitutes this data collection is composed by:

- Small presentation of the project SeniorLudens
- Use of a serious-game assisted by a facilitator
- Filling a battery of questionnaire asking for your opinion about Serious Gaming.

During these activities you might be shot by a video camera.

The data gathered (questionnaire, informed consent and video) will be archived, protected and handled by Indra Software Labs in compliance with the present information sheet, and under the European Union regulation on data protection (Directive 95/46/EC e 2002/58/EC) [include another directives in terms of data protection of your country if needed]. To access to the anonymous data and to the videos will be possible exclusively to the member of the SeniorLudens project. The researchers commit to preserve your anonymity and the anonymity of other people or institutions to whom you might refer to during the data collection.

The research results will be made public through scientific papers, conferences and events with education purposes only.

The data collected will be used for research purposes and can be shared among the members of the SeniorLudens consortium.

If you are interested in the research result – at the end of the study- you are free to contact [insert person in charge for your trial site in SeniorLudens].

Declaration

Name _____ **Surname** _____

ID _____ **[Partner acronym + number starting at zero]**

Date of birth _____

☐ **female** ☐ **male**

The underwritten [insert participant's name] declares to have read and understood all the information written in this document and agrees to take part to the data gathering therein described on [insert date] operating at the best of his/her abilities and truthfully answering to all questions.

(The refusal to underwrite this specific agreement impedes the participation in the data collection).

Date ……

Participant's signature ……..

The underwritten [insert participant's name] accepts that his/her images extracted from the video-registrations are employed to illustrate the results of SeniorLudens (The refusal to underwrite this second specific agreement does not impede the participation in the data collection).

Date ……
……..

Participant's signature

Annex B.1 (pre-game): Personal characteristics and Aptitude for usage Questionnaire

User ID	
Date	

Profession	
Role in the Organization	
Years of working experience from the degree	

We kindly ask you to answer the following questions about your use of new technologies….

How often do you use the following technologies and/or tools?	**Always**	**Sometimes**	**Rarely**	**Never**
Smart phone				
Personal Computer				
Tablet				
Social Network				
Internet				
Video-games				
Which is your competence in the use of use the following technologies and/or tools?	**Expert**	**Competent**	**Beginner**	**No competence**
Smart phone				
Personal Computer				
Tablet				
Social Network				
Internet				
Video-games				

Annex B.2 (pre-game): Affect Assessment Questionnaire - PANAS

User ID	
Date	

Before starting the activity, we want to know how do you feel today.

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt like this in the past few hours. Use the following scale to record your answers.

	Very slightly or not at all	A little	moderately	Quite bit	extremely
Nervous	1	2	3	4	5
Attentive	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Interested	1	2	3	4	5
Determined	1	2	3	4	5
Alert	1	2	3	4	5
Upset	1	2	3	4	5
Ashemed	1	2	3	4	5
Afraid	1	2	3	4	5
Excited	1	2	3	4	5
Guilty	1	2	3	4	5
Jittery	1	2	3	4	5
Inspired	1	2	3	4	5
Irritable	1	2	3	4	5
Distressed	1	2	3	4	5
Hostile	1	2	3	4	5
Scared	1	2	3	4	5
Active	1	2	3	4	5
Strong	1	2	3	4	5

Annex C.1 (in-game): Scenario editor questionnaire

User ID	
Date	

Answer the questions below.

How would you review the following aspects of the platform?	Totally disagree	Desagree	I don't know	Agree	Totallly agree
General questions					
I understood the concept of scenario configuration and its purpose					
I was able to launch the scenario editor					
I understood that the environment represents a farm					
Rotating the camera was easy					
Moving the camera was easy					
I understood the instructions					
It was easy to pick a pumpkin from the plot.					
It was easy to pick a fruit from the table					
It was easy to pick a fence					
It was easy to drop an object where I wanted					
I understood where I was during all the session					
I could stop automatic navigation by clicking the left button while moving					
Substituting the cursor by the selected object is useful					
Scaling the selected objects when they act as cursor is weird					
The position of the menus is suitable					
The menus are easy to deploy					
The menus are easy to hide					
It is easy to pick an object from the objects menu					
I was able to move all pumpkins from the plot and put other fruits and vegetables instead.					
I was able to quit the game by selecting the corresponding option in the top right menu					
The quit button was easy to find					
I can imagine how will the Scenario Editor be when it will be finished					

Annex C.2 (in-game): Task editor questionnaire

User ID	
Date	

How would you review the following aspects of Task Editor?	Bad	Insufficient	Sufficient	Good	Excellent
Questions for Task Designer					
I am able to log in the Task Editor					
I am able to add new block					
I am able to modify each type of block					
I am able to load existing task					
I am able to create new task descriptor					
I am able to modules in parallel					
I am able to create new task flow					
I am able to modify an existing task flow					

Annex C.3 (in-game): Platform exploration questionnaire

User ID	
Date	

How would you review the following aspects of the platform?		Bad	Insufficient	Sufficient	Good	Excellent
PL_1	I am able to log in the Organization Platform Administration					
PL_2	How do you consider the dashboard?					
PL_3	I am able to visualize my user profile					
PL_4	I am able to update my user profile					
PL_5	I am able to change between my organizations					
PL_6	I am able to create new organizations					
PL_7	I am able to visualize the organization profile					
PL_8	I am able to modify the organization profile					
PL_9	I am able to visualize the game deployed in the organization					
PL_10	I am able to visualize the game details					
PL_11	I am able to publish a game into the organization					
PL_12	I am able to unpublish a game in the organization					
PL_13	How do you consider the difference between public and private games?					
PL_14	I am able to add new users to the organizations					
PL_15	I am able to remove users of the organizations					
PL_16	I am able to assign roles to the users of the organization					
PL_17	I am able to visualize all the					

	users included in the organization					
PL_18	The game creation process is understandable					
PL_19	I am able to select the different descriptors in the game creation					
PL_20	I am able to create a new game					

How would you review the following aspects of the platform?		Bad	Insufficient	Sufficient	Good	Excellent
	General questions					
PL_21	The platform does support the development of Serious Games					
PL_22	The platform does allow the deployment of Serious Games in its own infrastructure					
PL_23	The SeniorLudens Platform is usable					
PL_24	The platform is understandable					

Ask the user for additional comments and suggested modifications.

Comments & Suggestions:

_____

_____

_____

Would you change, add or delete something in SeniorLudens Platform:

_____

_____

_____

Annex D.1 (in-game): IT Use Case

Introduction

The use case GrowYourProject is aimed at providing formation on the management of projects in ICT companies such as Indra. Trainees will be current Senior Project Engineers that will design training tasks for newly arrived engineers. The training will encompass the three steps of development of a project: managing, planning and following.

The main challenge of the use case is to bring a metaphoric vision of Project Managing in order to offer a wider perspective of this work and make training more attractive and visually pleasant. Specifically, the game will happen in a virtual farm and Project managing concepts will be represented through farm tasks.

The Virtual Environment

The virtual environment reproduces a countryside landscape with a farm and plots where different types of seeds must be planted and grown to fulfill with the order of surrounding supermarkets (see Figure 1). By opposite to other use cases, here the view is isometric with the camera elevated, located at a large distance from the ground to provide a global view of the whole scenario. Future versions of the interface will provide zoom in and out on the scenario.

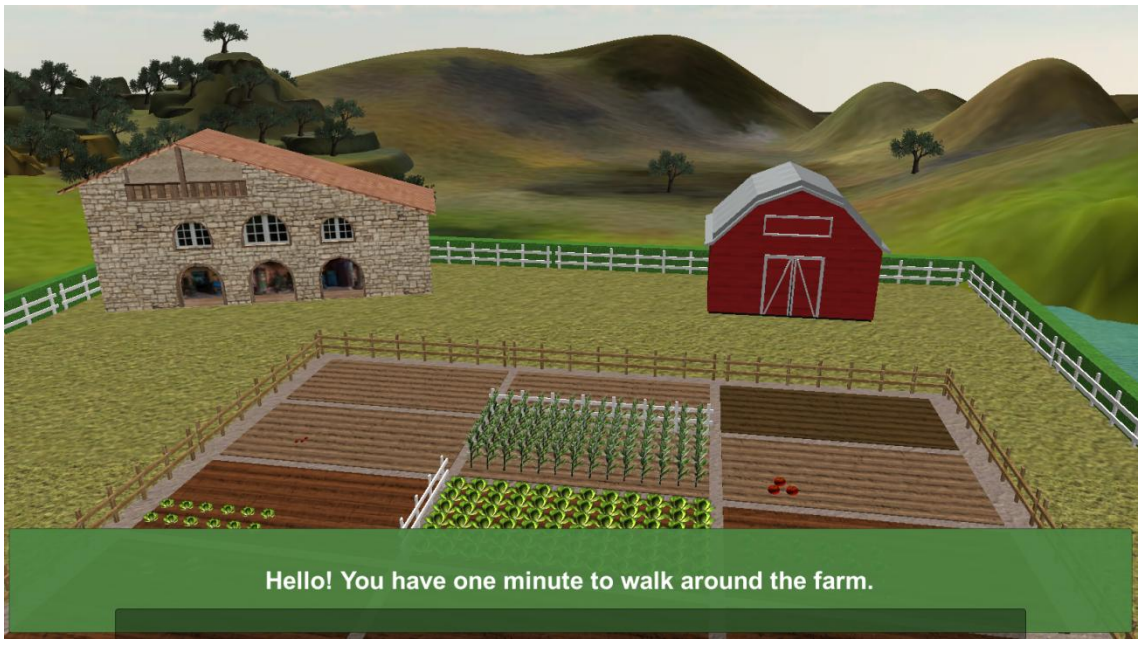


Figure 44: A frontal view of the virtual environment of GrowYourProject use case.

Validation task

The task used for the first validation is aimed at planning the resources and timing of a project to match the deadlines. Metaphorically, this is represented by the task described in Table 1. Given an order from a supermarket for a given due date and given different types of vegetables, each one with its time of growth, users must plant different plots a specific dates and, once the deadline has been reached, collect the vegetables. The goal is to collect all what was order and

not having grown anything else within the allotted time. Dates and times are expressed in days and are scale to the time dimension in the virtual world (approx. 1 day = 15s). The times of growth are not based on real plants timings. Currently, the task does not have neither levels of difficulty, nor validation of the final result.

The basic rules of the game are:

R1	The supermarket order is always visible in the bottom message panel
R2	An information panel is always visible in side panel showing the current date in days and the selected tool, if any.
R3	Trainees must press Right Mouse Button to deploy the tool menu.
R4	Trainees can exit the game at any time by pressing the exit button in the tool menu
R5	In order to plant, users need to select a vegetable in the tool menu and click on an empty plot
R6	A click on an already planted crop does not yield to any change in the environment
R7	Once a plot has been planted, it cannot be unplanted.
R8	It is only possible to proceed to the collecting stage if all required plots have been planted, no matter at which date
R9	To collect plants, users need only to do a click on the plot
R10	The game finishes by user exit, time over or achieved goal

Different types of errors can happen. Table 1 summarizes the visible consequences of the errors.

Error	Result
User clicks on non-active objects	No visible result.
User plants a non-due vegetable or fruit on an empty plot	The plot is occupied by the incorrect plant. The task cannot be completed.
User tries to plant an already planted plot	No visible result
User plants a correct vegetable or fruit in an empty plot later that the foreseen date	No visible result in the first stage. Currently, no error in the collection stage. In the next version, it will not be possible to collect the crop in the second stage (immature crop)
User plants a correct vegetable or fruit in an empty plot sooner that the foreseen date	No visible result in the first stage. Currently, no error in the collection stage. It will not be possible to collect the crop in the second stage (burnt crop)
User tries to collect an immature crop	Currently, they are able to collect it.
User tries to collect a burnt crop	Currently, they are able to collect it.

Guided procedure

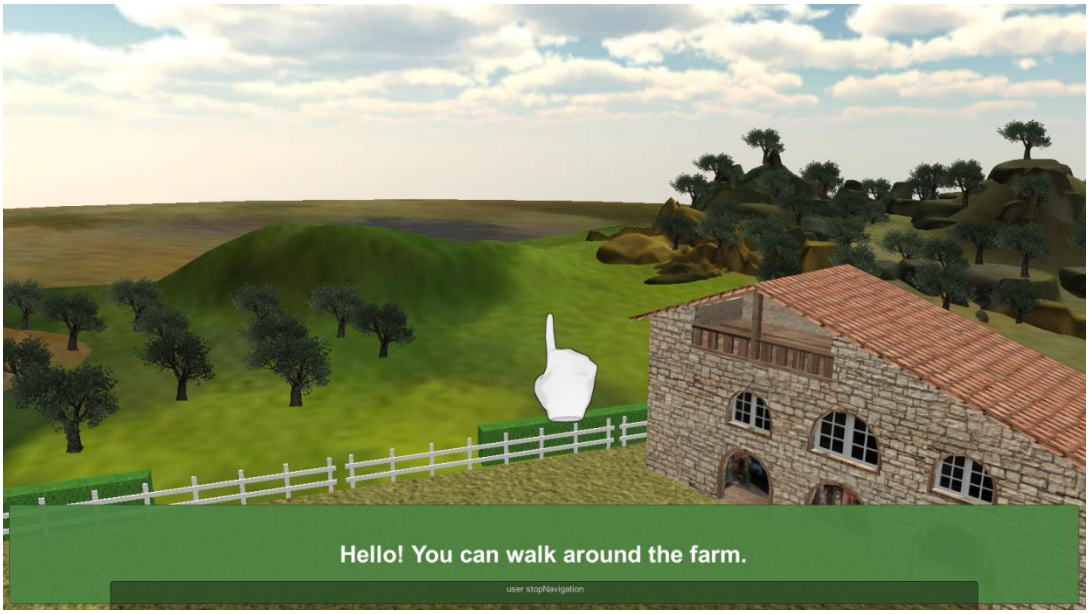
- User login: the user starts the game by opening the following url in a Firefox or MSExplorer navigator (not Google Chrome): http:/movibio.lsi.upc.edu/seniorludens/dev/validation1
- The Unity player will open. You may need to authorize its running if it is the first time you launch it.

- The countryside landscape appears. A message at the bottom indicates that you can navigate through the environment.

- Try to move the camera by moving the mouse. Try to focus on the red barn at right and then on the house at left. Look all around.

- Try to navigate. Click on a plot. You'll keep the camera at the same height but move nearer to the object

- Try to navigate far away. Click on a tree or on the ground far away the farm. You'll see that there is an invisible wall that prevents you to get out from the farm neighborhood



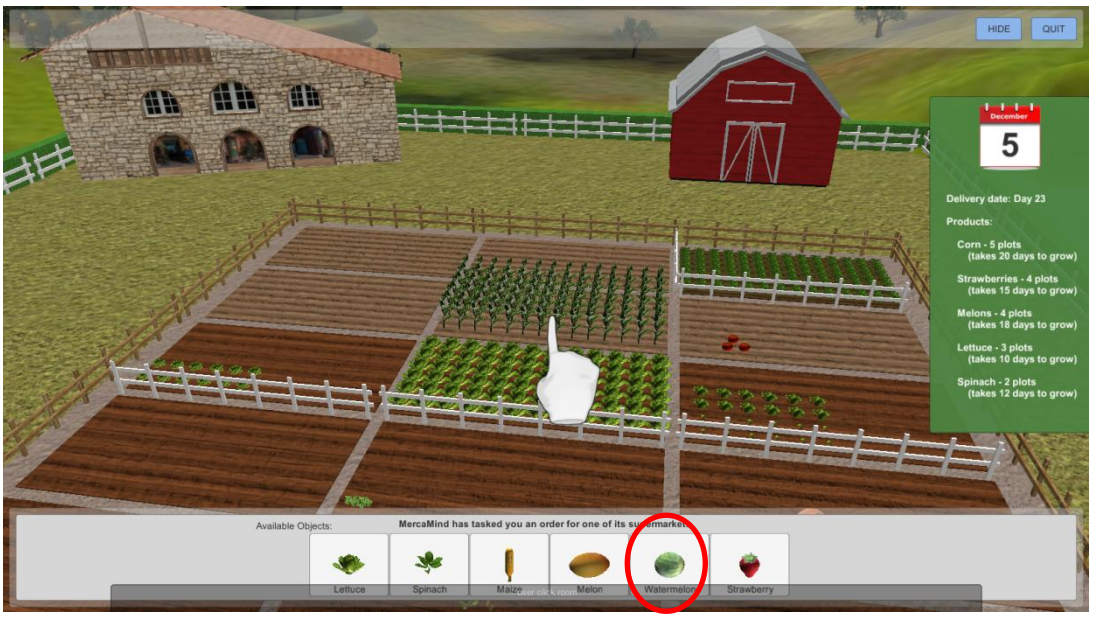
- Navigate freely through the environment until a new message appears

- A new message at the bottom of the screen indicates you that Supermarket Mercamind has a new order. The right panel shows the delivery date (day 23) and the required fruits and vegetables. For each fruit and vegetable, the number of days to mature is indicated together with the number of plots that are needed.

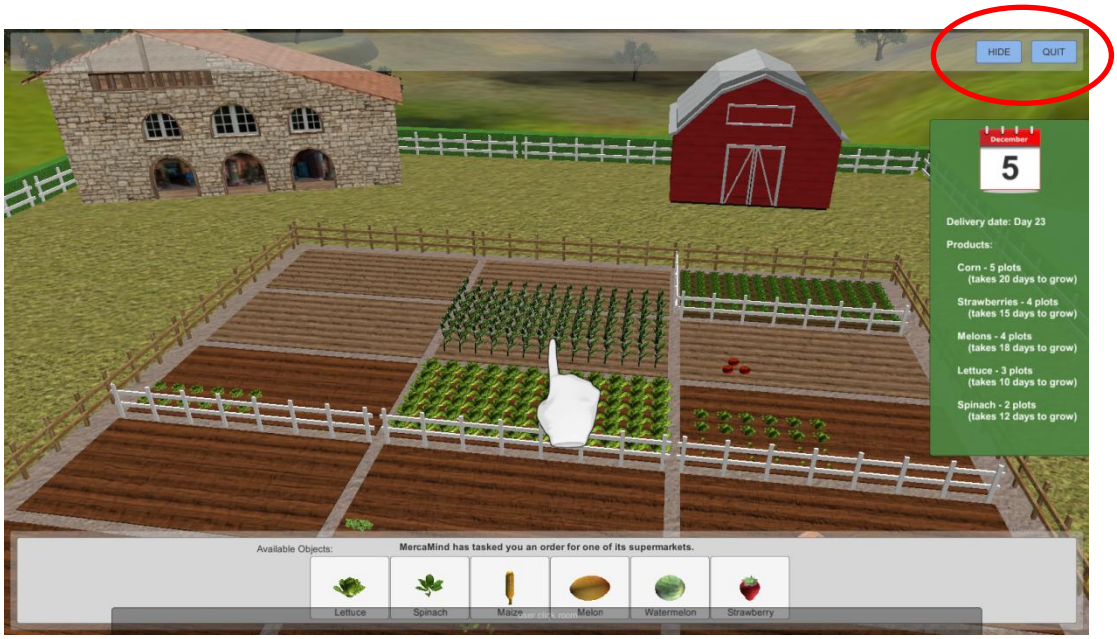
You must calculate the date at which you should plant each vegetable (fruit) in order to match the deadline. For instance, if the corn lasts 20 days to grow, you should plant it

on day 3 in order to be mature to be collected at day 23. Similarly, strawberries should be planted on day 8, because they need 15 days (15+8 = 23).

- Deploy the menu pressing the Right Mouse Button (RMB). You will see the different vegetables and fruits that you are able to plant. Observe that there is an intruder plant.



- At the same time, in the upper side of the screen, at right, you can see another panel with two options: hide and quit.



- At right there is the current day. Observe how it evolves through time. Ask yourself what is the current day.

- Select a suitable vegetable in the tool menu.
- Select a suitable plot. Observe what happens.

- Deploy the tool menu and hide it again.
- Select another plot and plant again

- Select a new vegetable. Try to plant an already planted plot. Observe what happens.
- Plant the new vegetable in another plot
- Proceed planting until you'll see the message to collect

- Pick on the plots to collect.
- Once you have collected all of them you'll see a final congratulation message

IT Use case Questionnaire

Answer the questions below.

How would you review the following aspects of the platform?	Totally disagree	Desagree	I don't know	Agree	Totallly agree
General questions					
I understood the scenario					
I was able to identify the barn, the house and the plots					
I found the environment visually attractive					
Rotating the camera was easy					
Moving the camera was easy					
I understood the instructions					
I was able to deploy and hide the menu					
It was easy to pick a tool from the menu					
It was easy to pick on the plot where I wanted to plant					
I was able to plant a plot					
I was able to understand what plant I was planting at any time					
I understood the time dimension and how it scales real time					
I was able to read the date of plantation of each plot					
I was able to know what was the date at anytime					
I was able to collect a crop					
I was able to quit the game					
There was enough time to plant					
There was enough time to collect					
The game fulfilled the described rules					

The following Table shows the main learning objectives that were implemented for the first evaluation of the use case and the correspondent criteria for their evaluation.

Id	Brief description	Metrics	Acceptance criteria
1	**Starting and organizing a project**		
1.1	Understand the following JIRA concepts and the relationships between them: Component, Version		
1.2	Be able to create the right	• Components should	

	Components for a given project	correspond to subsystems or functional blocks of the project	

	How would you review the following aspects of Use Case?	Answer DESCRIPTION	Answer (x)
1.1	Where did you plant the plants?	A. Crops area	
		B. House area	
		C. There was no area reserved to plant	
1.1	Which element delimitates your plantation?	A. nothing	
		B. a fence	
		C. a road	
1.2	How many plant species can you plant on each one of the reserved slots?	A. one	
		B. two	
		C. three	
1.2	Which is the last sequence of the actions you do?	A. Plant	
		B. Water the plants	
		C. Harvest the plantation	

Annex D.2 (in-game): Rehabilitation Use Case

Introduction

The use case takes place in the field of patients' motor and cognitive rehabilitation performed by physiotherapists in a hospital environment. It aims for:

- the familiarization of primary-users (Senior Physiotherapists, SPTs) with new technologies: primary users will translate task oriented rehabilitation protocols into standardized procedures to be adapted to technological solutions. They will accomplish managements roles in designing of the game. Some of them will also familiarize with the game itself as a trainee.
- the intergenerational transfer of the SPT's knowledge to young physiotherapists (YPTs, secondary users): The YPT will be virtually trained on appropriate rehabilitation procedures using the serious game developed by the SPTs, benefiting from this knowledge transfer. Some of them will also support the SPTs in the designing of the game.

The Virtual Environment

The virtual environment reproduces a rehabilitation room with a patient on a treadmill, his or her health record and the control for the treadmill.

Figure 45: A frontal view of the virtual environment of the Rehabilitation use case.

Validation task

The task used for the first validation is aimed at the basic functionality of reading the health record of the patient and operating the treadmill.

The basic rules of the game are:

R1	A click on the medical record on the table opens the medical record.
R2	A click on the open medical record closes it.
R3	Sliding the mouse pointer on the open medical up and down scrolls the content up and down
R4	Sliding the Speed slider up accelerates the treadmill
R5	Sliding the Speed slider down slows the treadmill down
R6	Sliding the Inclination slider up elevates the treadmill
R7	Sliding the Inclination slider down lowers the treadmill
R8	A right klick on the scene opens a window and allows full screen mode
R9	Pressing ESC in fullscreen mode closes the fullscreen mode
R10	The game finishes when the browser is closed

Different types of errors can happen. The following Table summarizes the visible consequences of the errors.

Error	Result
User clicks on non-active objects	No visible result.
Patient runs for a longer time on the treadmill	The patient starts to run in slopes

Guided procedure

- User login: the user starts the game by opening the following url in a Firefox or MS InternetExplorer (not Google Chrome):
- http://m14f0109.sui-inter.net/SL_Physio_UseCase_evaluation_1/ SL_Physio_UseCase_evaluation_1.html.
- The Unity player will open. You may need to authorize its running if it is the first time you launch it.

- The training room appears.
- Right click on the game scenario and choose Go Fullscreen
- Click on the medical record

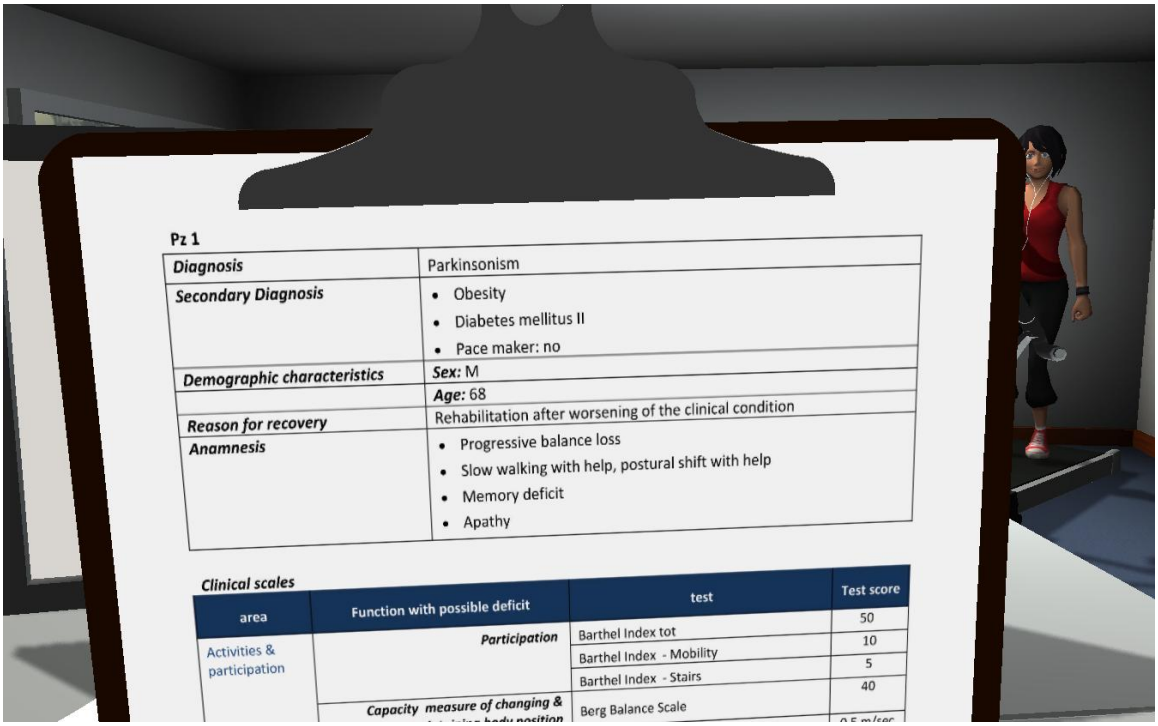
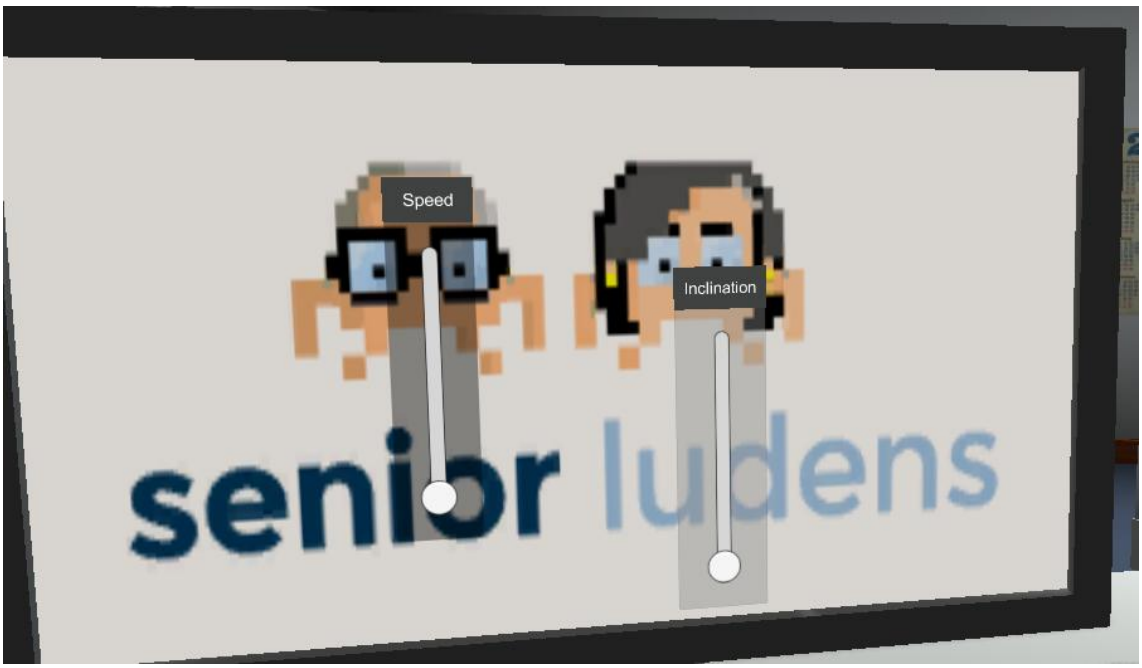


Figure 2: A frontal view of the virtual environment of the Rehabilitatoin use case.

- Move your mouse up and down on the medical record and read it carefully
- Press ESC to close the medical record



- Slide the Speed Slider up and down and watch the patient on the treadmill
- Slide the Inclination Slider up and down and watch the treadmill
- Refer back to your supervisor

Rehabilitation Use case Questionnaire

Answer the questions below.

How would you review the following aspects of the platform?	Totally disagree	Desagree	I don't know	Agree	Totallly agree
General questions					
I understood the scenario					
I was able to identify the medical record and the sliders to control the treadmill					
I understood the instructions					
I could not have navigated through the game without the instructions					
I will have to look for assistance often when I play the game					
The game has an attractive presentation					
Learning to use this game is easy					
The control of the game is intuitive					
It was generally easy to play the game					
The game fulfilled the described rules					

What was the most difficult part to understand?

_____

_____

_____

What did you like the most while playing the game?

_____

_____

The following Table shows the main learning objectives that were implemented for the first evaluation of the use case and the correspondent criteria for their evaluation.

Id	Brief description	Metrics	Acceptance criteria
1	To be able to read clinical charts		
1.1	To be able to extract from the clinical chart the relevant information for *motor* rehabilitation	Questionnarie	-
1.2	To be able to extract from the clinical chart the relevant information for *cognitive* rehabilitation	Questionnarie	-

	How would you review the following aspects of Use Case?	Answer DESCRIPTION	Answer (x)
1.1	Which scale was use to assess the capacity measure of functional mobility?	A. Barthel Index	
		B. Timed Up and Go	
		C. Heart rate at rest	
1.1	At the Barthel Index Mobility item the patient presented a Test score equal to 10. What does it mean?	A. wheelchair independent, including corners	
		B. immobile	
		C. walks with help of one person (verbal or physical)	
1.2	Which scale was use to assess the short term memory functions?	A. Token Test	
		B. Mini Mental State Examination	
		C. Digit Span forward	
1.2	At the Delay recall of Rey Figure the patient presented a Test equivalent score equal to 0. What does it mean?	A. Long term memory deficit	
		B. Long term memory normal functioning	
		C. Praxis deficit	

Annex D.3 (in-game): Traditional food production Use Case

Introduction

The main goals of the use-case traditional food production are 1) to preserve the cultural background and know-how of older workers at a cheese production. This requires the capture and transfer of knowledge and experience to younger employees. 2) Young employees need to learn the steps of traditional cheese production to keep the industrial competition of small artisanal companies.

The Virtual Environment

The virtual environment represents a typical production room of a small artisanal cheese factory. Within the room the different steps of the cheese production are organized from the left to the right. Future versions of the interface will provide zoom in and out on the scenario.

Figure 46: A overview of the chees production site of the Traditional Food Production use case.

Validation task

The task used for the first validation is aimed at putting the colander on the bucket, taking the basin with the milk and poor the milk through the colander into the bucket.

The basic rules of the game are:

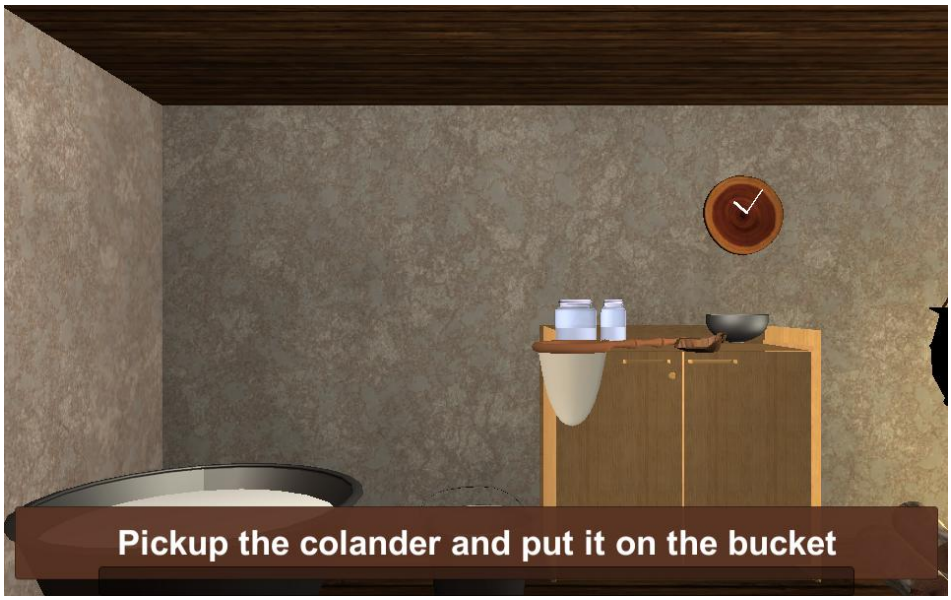
	The first click activates the game, the mouse pointer is changed to a hand and the view moves forward to the point clicked on. A second click stops the view moving forward
R1	The first click activates the game, the mouse pointer is changed to a hand and the view moves forward to the point clicked on. A second click stops the view moving forward.
R2	When the game is activated the view in the room can be changed by moving the mouse. Moving left/right moves the view to the left/right. Moving the mouse up/down moves the view up/down
R3	Clicking on an object activates the object and it can be moved and placed (drag and drop).
R4	The text in the text box at the bottom of the screen displays the next step of the game and informs about success.
R5	Pressing ESC interrupts the game and the mouse pointer is set back to an arrow.
R6	Pressing F5 reloads the game
R7	The game is finished when the message “Learning objective 1.3 completed” followed by “Very Good” is displayed

Different types of errors can happen. Table 1 summarizes the visible consequences of the errors.

Error	Result
User clicks on non-active objects	No visible result or forward move.
An action is executed wrong for several times	The object disappears.
An object is clicked while moving within the room.	No visible result. The move will be done until the point clicked on is reached.
Imprecise click on an active object.	The click is interpreted as a move command and the view moves to the clicked point.
The moves are not done in the correct order.	Object may disappear and the text is moving to the next step and the task cannot be fulfilled.
An object is clicked when not positioned correctly over another object.	The object is dropped on the floor and cannot be picked-up anymore (Game must be restarted).

Guided procedure

- User login: the user starts the game by opening the following url in a Firefox or MSExplorer navigator (not Google Chrome): http://m14f0109.sui-inter.net/SL_Cheese_UseCase_evaluation_1_build_2/SL_Cheese_UseCase_evaluation_1.html
- The Unity player will open. You may need to authorize its running if it is the first time you launch it.



- The corner of the room with all the objects need for the first training step appears and the text banner shows you what to do next.

- Click on the game to activate it and click again to stop the view going forward.

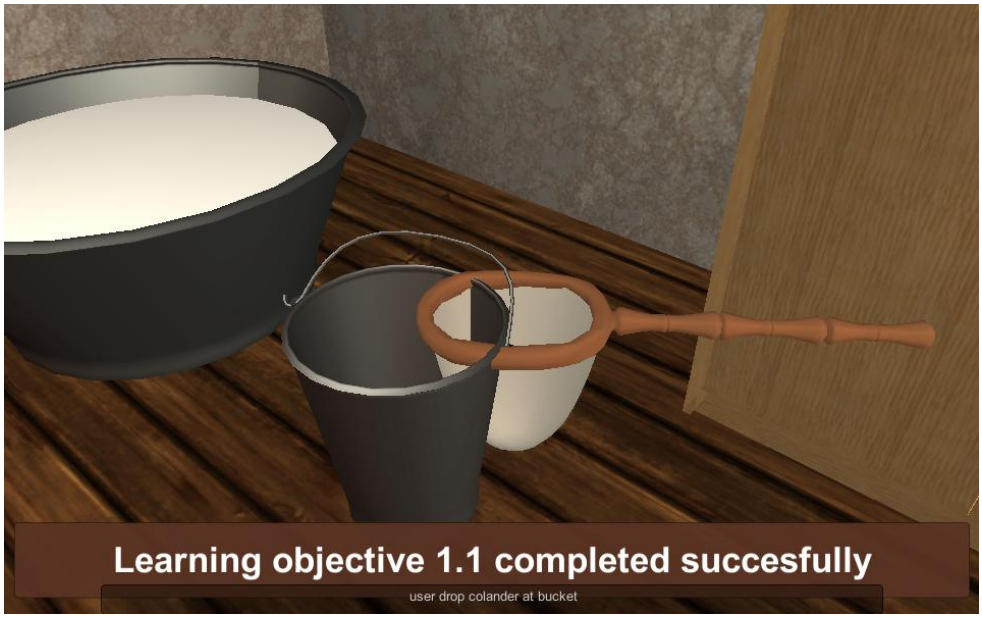
- Move your mouse to explore the room and get familiar with controlling the view in the room.

- Now move the view back to the corner where you have to fulfill your first tasks.

- Move closer to the colander and click on it to activate it.

- When you successfully click on the colander it changes its appearance.

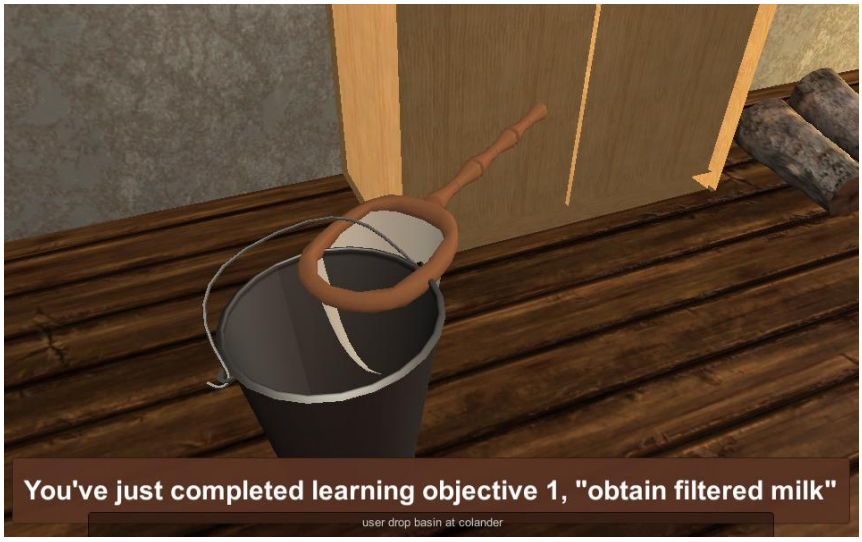
- Change the view by moving your mouse sideward until the colander is above the bucket.
- Click while the colander is above the bucket.



- The colander changes its appearance and attaches to the bucket and the message in the text banner shows that the first step was done successfully.

- The text-banner show you the next step to execute.

- Click on the basin with the raw milk.
- When the basin is activated it changes its appearance and the text-banner shows you what to do next.
- Bring the basin over the bucket and click.



- When the basin is placed correct while you click, it will disappear and the text-banner shows that the step was done successfully.

Traditional food production Use case Questionnaires

Answer the questions below.

How would you review the following aspects of the platform?	Totally disagree	Desagree	I don't know	Agree	Totallly agree
General questions					
I understood the scenario					
I was able to identify the colander, the bucket and the basin					
I found the environment visually attractive					
Rotating the camera was easy					
I understood the instructions					
I could not have navigated through the game without the instructions					
It was easy to pick an object					
It was easy to drop an object on its intended place					
The game has an attractive presentation					
Learning to use this game is easy					
The control of the game is intuitive					
It was generally easy to play the game					
The game fulfilled the described rules					

What was the most difficult part to understand?

_____

_____

_____

What did you like the most while playing the game?

_____

_____

_____

This use case is based on Bagolino's traditional cheese, a village in the province of Brescia(Italy).

This food product is seasoned between 6 and 12 months, with cylindrical form and smooth hard crust with yellow-orange colour or dark brown.

It's processed during aging with uncooked linseed oil; straw-yellow pasta in winter and dark yellow in summer, because the milk used is made by cows located in mountain pastures.

Pasta has a compact texture tending towards to granulose during the aging.

The principal *interactive object* of the first version of the game is to obtain the filtered milk (show in table 1).

Id	Brief description	Metrics	Acceptance criteria
1	Obtain filtered milk		
1.1	To be able to put the colander on the basin(empty) that will contain filtered milk	Colander's dimension must be bigger than basin one	
1.2	To be able to take the box with raw milk located near the main door		
1.3	To be able to pour raw milk into basin (to obtain filtered milk)		

Table 15 – Learning objectives Use case 3 for the first evaluation

After seeing the table 1 answer the questions below.
There are three different answers but the correct answer is one(X).

How would you review the following aspects of Use Case?	Answer DESCRIPTION	Answer (x)
Questions for Trainee		
1.1)Which is the first object that you use?		
	ANS 1: The colander	
	ANS 2: The basin	
	ANS 3: The table	
1.1)Where you place the colander?		
	ANS 1: On the table	
	ANS 2: On the basin	
	ANS 3: On the box	
1.2) What's in the box that is located near the front door?		
	ANS 1: The filtered milk	
	ANS 2: The raw milk	
	ANS 3: Nothing	
1.3) Which is the last sequence of the		

actions you do?		
	ANS 1: Mix up the raw milk	
	ANS 2: Pour raw milk into basin	
	ANS 3: Pour raw milk into box	

Annex D.4 (in-game): The collaborative walkthrough questionnaire

User ID	
Date	

After the researcher has shown you how to play the game, please, answer the following questions:

	Question	answer
1a	**What did you like most?**	
1b	**What did you like less?**	
2a	**What do you think it was most useful in the game?**	
2b	**What less?**	
3a	**What do you think is missing in the game?**	
3b	**What would you change in the game?**	

Annex E.1 (post-game): System Usability Scale [primary users]

User ID	
Date	

One of the aims of the platform you have just used is to support young workers in learning their job by means of technology.

Imagine to come back when you were not an expert in your work-field (physiotherapy/ IT/ food industry). Think how you felt when you were learning you job.

Taking into account this point of view, please, answer to the following questions about SeniorLudens.

		totally disagree	little disagree	Neither agree not disagree	sufficiently agree	Strongly agree
1	I think that I would like to use this system frequently.	1	2	3	4	5
2	I found the system unnecessarily complex.	1	2	3	4	5
3	I thought the system was easy to use.	1	2	3	4	5
4	I think that I would need the support of a technical person to be able to use this system.	1	2	3	4	5
5	I found the various functions in this system were well integrated.	1	2	3	4	5
6	I thought there was too much inconsistency in this system.	1	2	3	4	5
7	I would imagine that most people would learn to use this system very quickly.	1	2	3	4	5
8	I found the system very cumbersome to use.	1	2	3	4	5
9	I felt very confident using the system.	1	2	3	4	5
10	I needed to learn a lot of things before I could get going with this system.	1	2	3	4	5

Annex E.2 (post-game): Intrinsic Motivation Inventory (IMI) - short version (Interest/enjoyment factor items) [primary users]

User ID	
Date	

One of the aims of the platform you have just used is to support young workers in learning their job by means of technology.

Imagine to come back when you were not an expert in your work-field (physiotherapy/ IT/ food industry). Think how you felt when you were learning you job.

Taking into account this point of view, please, mark the point that is more in line with your agreement about the sentences:

		Absolutely not	A little	Much
1	**I enjoyed doing this activity very much**	1	2	3
2	**This activity was fun to do**	1	2	3
3	**I thought this was a boring activity**	1	2	3
4	**This activity did not hold my attention at all**	1	2	3
5	**I thought this activity was quite enjoyable**	1	2	3
6	**While I was doing this activity, I was thinking about how much I enjoyed it**	1	2	3

Annex E.3 (Post-game): Flow State Scale (FSS) [primary users]

User ID	
Date	

One of the aims of the platform you have just used is to support young workers in learning their job by means of technology.

Imagine to come back when you were not an expert in your work-field (physiotherapy/ IT/ food industry). Think how you felt when you were learning you job.

Taking into account this point of view, please use the rating scale to answer to the following questions in relation to your experience during the event you have just completed. These questions are related to the thought and feelings you may have experienced during the event. There are no right or wrong answers. Circle the number that best matches your experience from the options to the right of each question.

		totally disagree	little disagree	Neither agree not disagree	sufficiently agree	Strongly agree
Challenge-Skill Balance	I was challenged, but I believed my skills would allow me to meet the challenge	1	2	3	4	5
	My abilities matched the high challenge of the situation	1	2	3	4	5
	I felt I was competent enough to meet the high demands of the situation	1	2	3	4	5
	The challenge and my skills were at an equally high level	1	2	3	4	5
Action-Awareness Merging	I made the correct way without thinking about trying to do so	1	2	3	4	5
	All just seemed to be happening automatically	1	2	3	4	5
	I performed automatically	1	2	3	4	5
	I did things spontaneously and automatically without having to think	1	2	3	4	5
Clear Goals	I knew clearly what I wanted to do	1	2	3	4	5
	I had a strong sense of what I wanted to do	1	2	3	4	5

	I knew what I wanted to achieve	1	2	3	4	5
	My goals were clearly defined	1	2	3	4	5
		totally disagree	little disagree	Neither agree not disagree	sufficiently agree	Strongly agree
Unambiguous Feedback	It was really clear to me that I was doing well	1	2	3	4	5
	I was aware of how well I was performing	1	2	3	4	5
	I had a good idea while I was performing about how well I was doing	1	2	3	4	5
	I could tell by the way I was performing how well I was doing	1	2	3	4	5
Concentration on task at hand	My attention was focused entirely on what I was doing	1	2	3	4	5
	It was no effort to keep my mind on what was happening	1	2	3	4	5
	I had total concentration	1	2	3	4	5
	I was completely focused on the task at hand	1	2	3	4	5
Sense of control	I felt in total control of what I was doing	1	2	3	4	5
	I felt like I could control what I was doing	1	2	3	4	5
	I had a feeling of total control	1	2	3	4	5
	I felt in total control of myself	1	2	3	4	5

Annex E.4 (Post-game): Affect Assessment Questionnaire - PANAS

User ID	
Date	

And now, please, indicate how do you feel at the end of the activity.

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt like this in the past few hours. Use the following scale to record your answers.

	Very slightly or not at all	A little	moderately	Quite bit	extremely
Nervous	1	2	3	4	5
Attentive	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Interested	1	2	3	4	5
Determined	1	2	3	4	5
Alert	1	2	3	4	5
Upset	1	2	3	4	5
Ashemed	1	2	3	4	5
Afraid	1	2	3	4	5
Excited	1	2	3	4	5
Guilty	1	2	3	4	5
Jittery	1	2	3	4	5
Inspired	1	2	3	4	5
Irritable	1	2	3	4	5
Distressed	1	2	3	4	5
Hostile	1	2	3	4	5
Scared	1	2	3	4	5
Active	1	2	3	4	5
Strong	1	2	3	4	5

THANK YOU FOR YOUR COLLABORATION!

16- Annex II: Internal protocol to be used in first validation session [secondary users]

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17- Setting

Participants take part to the evaluation session in their Organization.
They are tested individually by a SeniorLudens' expert (also "Researcher") who has also the role of introducing them to the product.

Each session takes place in a quiet room studied for preserving participant's concentration in order not to not invalidate the evaluation session. In line with this purpose, the room offers the correct enlightenment's degree, a writing desk with a computer with a mouse device.

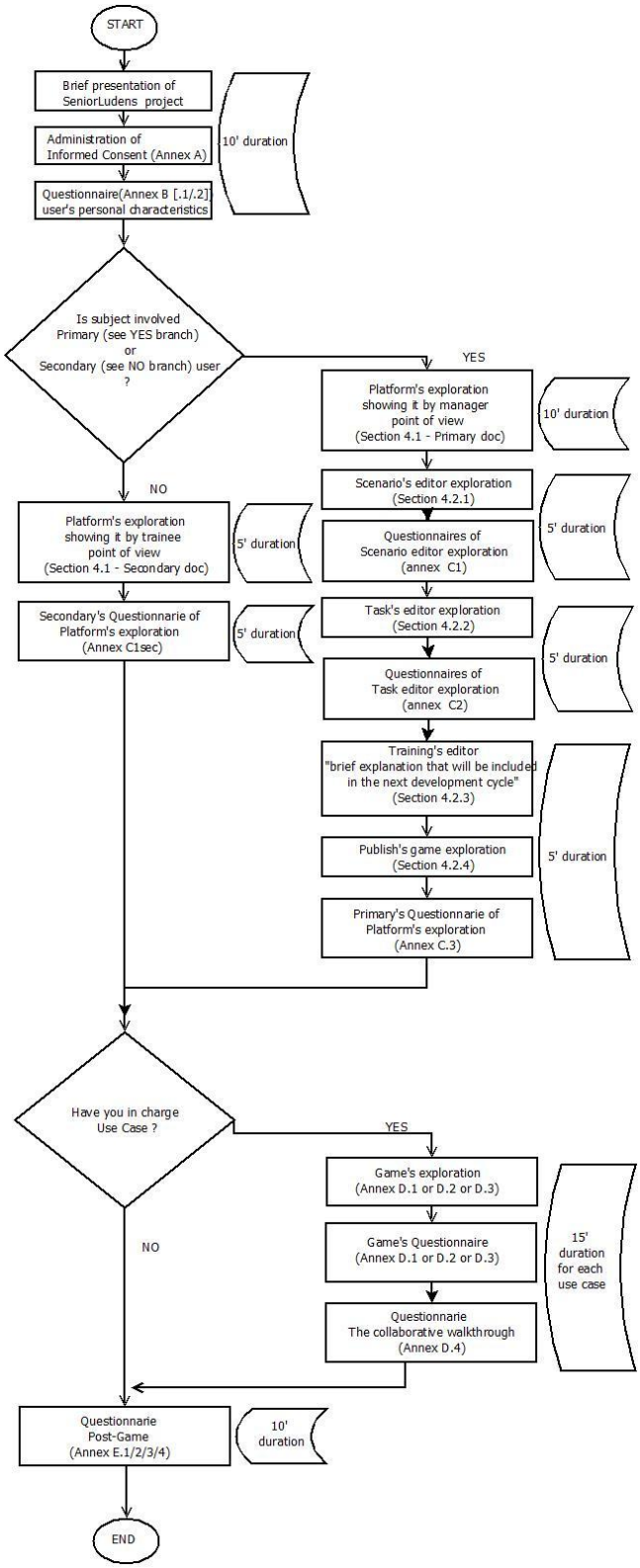
The user access the platform and the games in a Firefox or MSExplorer navigator (not Google Chrome).

During the validation session the researcher guides the user in the exploration of SeniorLudens Platform following the present document indications. At the same time, the user is free to explore the SeniorLudens Platform using the mouse device.

Each session lasts about 45 minutes and consists of three different phases: *pre-game, in-game and post-game*. The timing is the following:

Phase	Sub-phase	Paragraph	Annex	Timing
Pre-game	Introduction to the project	3.1		**10 min.**
	Informed Consent signature	3.2	A	
	Questionnaire personal characteristics	3.3	B.1	
	Affect Assessment questionnaire - PANAS		B.2	
In game (platform)	Platform trainee script	4.1		**5 min.**
	Platform trainee questionnaire	4.2	C.1sec	**5 min.**
In-game (game)	Use-case script and questionnaire	5.1	D.1/D.2/D.3	**15 min**
	Collaborative walkthrough questionnaire	5.2	D.4	
Post-game	SUS		E.1	**10 min**
	IMI scale		E.2	
	FSS		E.3	
	Affect Assessment questionnaire - PANAS		E.4	

18- Testing Flow



19- Pre-game Phase

19.1- Introduction to the Senior Ludens project

The researcher introduces the user to the SeniorLudens project :

"Thanks for taking part in SeniorLudens project, your role is huge for the evaluation and implementation of a innovative emerging technology.

What's SeniorLudens? *SeniorLudens is a European AAL project and includes industrials partners, SMEs, research centers and end user organizations from 4 countries (Spain, Italy, Switzerland and Netherlands).*

The main goal underlying SeniorLudens is to create the first Serious Game development platform for the fast, easy and cheap creation of serious professional training games, which are suitable for use by older workforce in order to help senior professional figures in familiarizing with new technology and to enhance intergenerational transference of knowledge.

Your role in the project: *Today, you are in charge to test the pilot version of SeniorLudens platform and game in order to give us main indications about its functionality, effectiveness, usability and about the quality of your experience with it. You will be included in other two SeniorLudens evaluation session. Data we obtain form this evaluation will be useful for us to improve SeniorLudens among its implementation phases. Thanks for your time and availability."*

19.2- Informed consent

The user signs the Informed Consent (Annex A) provided by the researcher:

"In order to take part to this evaluation session, please sign the Informed Consent".

19.3- Pre-game questionnaires administration

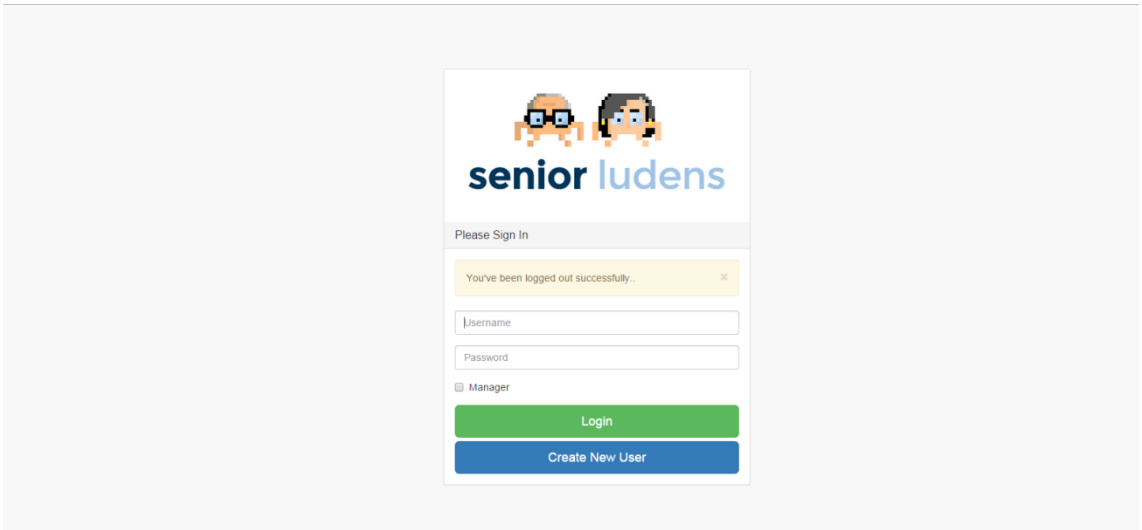
The participant fills in a questionnaire recording participant's personal characteristics and aptitudes for technology usage (see Annex B.1) and an Affect Assessment questionnaire - PANAS (Annex B.2).

20- In-game Phase (Platform)

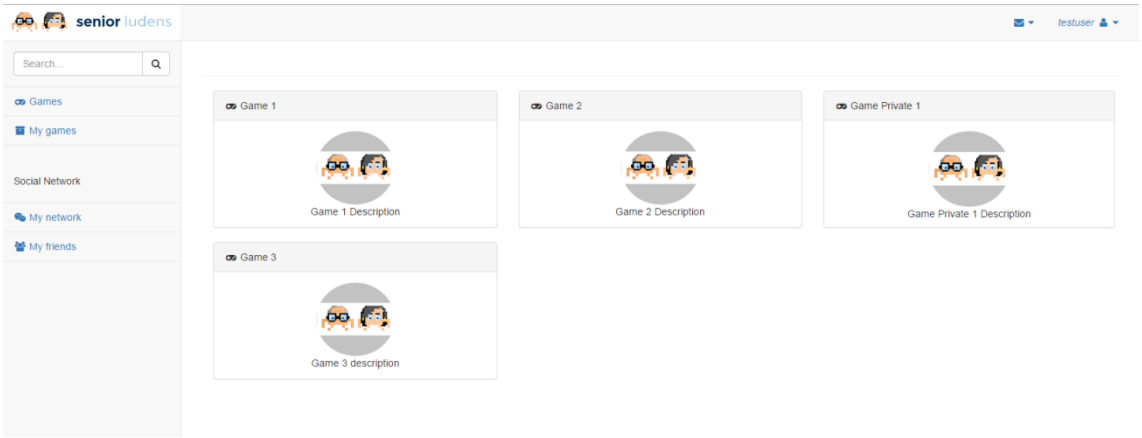
The SeniorLudens expert guides the user in the exploration of the platform showing it from a manager point of.

20.1- Platform trainee script

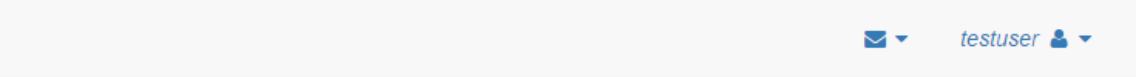
3. **User login:** the user validates with the test username (Username: testuser Pass: test) and without ticking the manager checkbox. The game catalog view is opened.



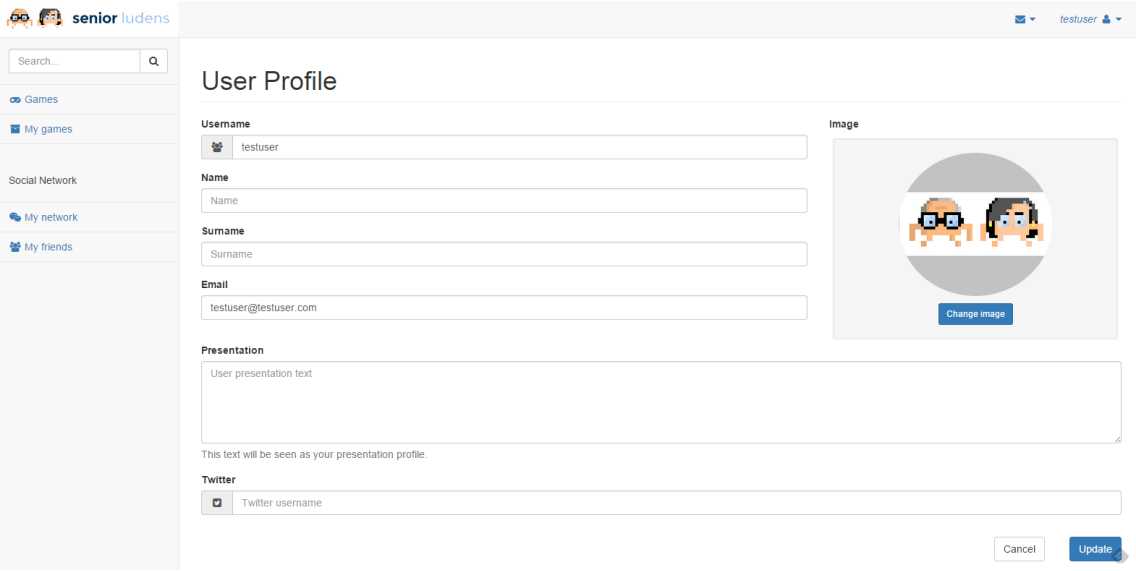
1. **Game Catalog:** This view shows the games deployed in the system to the user. Only the public games and those games deployed into the organizations where the user is included, are visualized.
    - **The researcher shows to the user the catalog explaining about the difference between the public and private games.**



This view includes a top menu used for user management and notifications purposes.



a) The notifications sliding menu has not been developed yet, but it will provide the communication channel between the trainee and the trainer during the training.
b) The User profile menu, gives access to modify the user profile data, and logout the current session.



- **The researcher shows the user profile form and explains the user how they can change their profile.**

The view also presents a side menu, that is still pending to be developed (second development phase) that will include the access to the user results in the games played, and to social network.

- **The researcher explains the future features of the side menu to the user.**

20.2- Platform trainee questionnaire

The participant fills in a questionnaire about the exploration of the platform form a management point of view (Annex C.1sec).

21- In-game Phase (Use case Games)

The SeniorLudens expert guides the user in the exploration of the platform showing it from a manager point of.

21.1- Use case exploration script

According to the Organization profile, the researcher shows to the user the specific use case.

21.1.1- IT use case

The researcher shows to the user the use case following the relative script (ANNEX D.1). At the end of the exploration of the game the researcher administrates the **use-case questionnaire** to the user.

- **User login** (in a Firefox or MSExplorer navigator - not Google Chrome):
  http://movibio.lsi.upc.edu/SeniorLudens/dev/validation1/

21.1.2- Rehabilitation use Case

The researcher shows to the user the use case following the relative script (ANNEX D.2). At the end of the exploration of the game the researcher administrates the **use-case questionnaire** to the user.

- **User login** (in a Firefox or MSExplorer navigator - not Google Chrome):
  http://m14f0109.sui-inter.net/SL_Physio_UseCase_evaluation_1/
  SL_Physio_UseCase_evaluation_1.html

21.1.3- Traditional food production use Case

The researcher shows to the user the use case following the relative script (ANNEX D.3). At the end of the exploration of the game the researcher administrates the **use-case questionnaire** to the user.

- **User login** (in a Firefox or MSExplorer navigator - not Google Chrome):
  http://m14f0109.sui-inter.net/SL_Cheese_UseCase_evaluation_1_build_2/
  SL_Cheese_UseCase_evaluation_1.html

21.2- Use case evaluation

The user is provided with the collaborative walkthrough questionnaire (Annex D.4) about the functionalities of the game.

22- Post-game phase

This phase includes the administration of different questionnaires to assess the degree of game and platform usability, user's motivation to SeniorLudens usage and his/her quality of experience. Specifically, the administration includes:

- System Usability Scale (SUS) (Annex E.1),
- Intrinsic Motivation Inventory (IMI) (Annex E.2)
- Flow State Scale (FSS) (Annex E.3)
- Affect Assessment questionnaire - PANAS (Annex E.4)

Annex A: Informed consent

The present document is composed in two sections, information sheet and declaration. The information sheet explains the activities that are going to take place today, and the statement – if signed- is your consent to participate in these activities. We invite you to read the document carefully and, if you need to, to ask for clarifications before signing it.

Information sheet

The data collection will be carried out by the staff of [insert research institution name] and particularly by [insert researchers' names] today [insert date] at [insert place] for the SeniorLudens project.

The activity that constitutes this data collection is composed by:

- Small presentation of the project SeniorLudens
- Use of a serious-game assisted by a facilitator
- Filling a battery of questionnaire asking for your opinion about Serious Gaming.

During these activities you might be shot by a video camera.

The data gathered (questionnaire, informed consent and video) will be archived, protected and handled by Indra Software Labs in compliance with the present information sheet, and under the European Union regulation on data protection (Directive 95/46/EC e 2002/58/EC) [include another directives in terms of data protection of your country if needed]. To access to the anonymous data and to the videos will be possible exclusively to the member of the SeniorLudens project. The researchers commit to preserve your anonymity and the anonymity of other people or institutions to whom you might refer to during the data collection.

The research results will be made public through scientific papers, conferences and events with education purposes only.

The data collected will be used for research purposes and can be shared among the members of the SeniorLudens consortium.

If you are interested in the research result – at the end of the study- you are free to contact [insert person in charge for your trial site in SeniorLudens].

Declaration

Name _____ **Surname** _____

ID _____ **[Partner acronym + number starting at zero]**

Date of birth _____

☐ **female** ☐ **male**

The underwritten [insert participant's name] declares to have read and understood all the information written in this document and agrees to take part to the data gathering therein described on [insert date] operating at the best of his/her abilities and truthfully answering to all questions.

(The refusal to underwrite this specific agreement impedes the participation in the data collection).

Date ……

Participant's signature ……..

The underwritten [insert participant's name] accepts that his/her images extracted from the video-registrations are employed to illustrate the results of SeniorLudens (The refusal to underwrite this second specific agreement does not impede the participation in the data collection).

Date ……

Participant's signature ……..

Annex B.1 (pre-game): Personal characteristics and Aptitude for usage Questionnaire

User ID	
Date	

Profession
Role in the Organization
Years of working experience from the degree

We kindly ask you to answer the following questions about your use of new technologies….

How often do you use the following technologies and/or tools?	**Always**	**Sometimes**	**Rarely**	**Never**
Smart phone				
Personal Computer				
Tablet				
Social Network				
Internet				
Video-games				

Which is your competence in the use of use the following technologies and/or tools?	**Expert**	**Competent**	**Beginner**	**No competence**
Smart phone				
Personal Computer				
Tablet				
Social Network				
Internet				
Video-games				

Annex B.2 (pre-game): Affect Assessment Questionnaire - PANAS

User ID	
Date	

Before starting the activity, we want to know how do you feel today.

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt like this in the past few hours. Use the following scale to record your answers.

	Very slightly or not at all	A little	moderately	Quite bit	extremely
Nervous	1	2	3	4	5
Attentive	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Interested	1	2	3	4	5
Determined	1	2	3	4	5
Alert	1	2	3	4	5
Upset	1	2	3	4	5
Ashemed	1	2	3	4	5
Afraid	1	2	3	4	5
Excited	1	2	3	4	5
Guilty	1	2	3	4	5
Jittery	1	2	3	4	5
Inspired	1	2	3	4	5
Irritable	1	2	3	4	5
Distressed	1	2	3	4	5
Hostile	1	2	3	4	5
Scared	1	2	3	4	5
Active	1	2	3	4	5
Strong	1	2	3	4	5

Annex C.1sec (in-game): Platform trainee questionnaire

User ID	
Date	

	How would you review the following aspects of the platform?	Bad	Insufficient	Sufficient	Good	Excellent
PL_sec1	I am able to log in the Trainee Portal					
PL_sec2	I am able to check the game catalog					
PL_sec3	I am able to visualize my user profile					
PL_sec4	I am able to update my user profile					
PL_sec5	I am able to visualize the game descriptions.					
PL_sec6	The catalog shows the list of all the public Serious Games in the SeniorLudens Platform, and does display the specific information of each one.					
PL_sec7	I see the Serious Games developed and published in this organization.					
PL_sec8	The SeniorLudens Platform is usable					
PL_sec9	The platform is understandable					

Ask the user for additional comments and suggested modifications.

Comments & Suggestions:

_____

_____

Would you change, add or delete something in SeniorLudens Platform:

_____

Annex D.1 (in-game): IT Use Case

Introduction

The use case GrowYourProject is aimed at providing formation on the management of projects in ICT companies such as Indra. Trainees will be current Senior Project Engineers that will design training tasks for newly arrived engineers. The training will encompass the three steps of development of a project: managing, planning and following.

The main challenge of the use case is to bring a metaphoric vision of Project Managing in order to offer a wider perspective of this work and make training more attractive and visually pleasant. Specifically, the game will happen in a virtual farm and Project managing concepts will be represented through farm tasks.

The Virtual Environment

The virtual environment reproduces a countryside landscape with a farm and plots where different types of seeds must be planted and grown to fulfill with the order of surrounding supermarkets (see Figure 1). By opposite to other use cases, here the view is isometric with the camera elevated, located at a large distance from the ground to provide a global view of the whole scenario. Future versions of the interface will provide zoom in and out on the scenario.

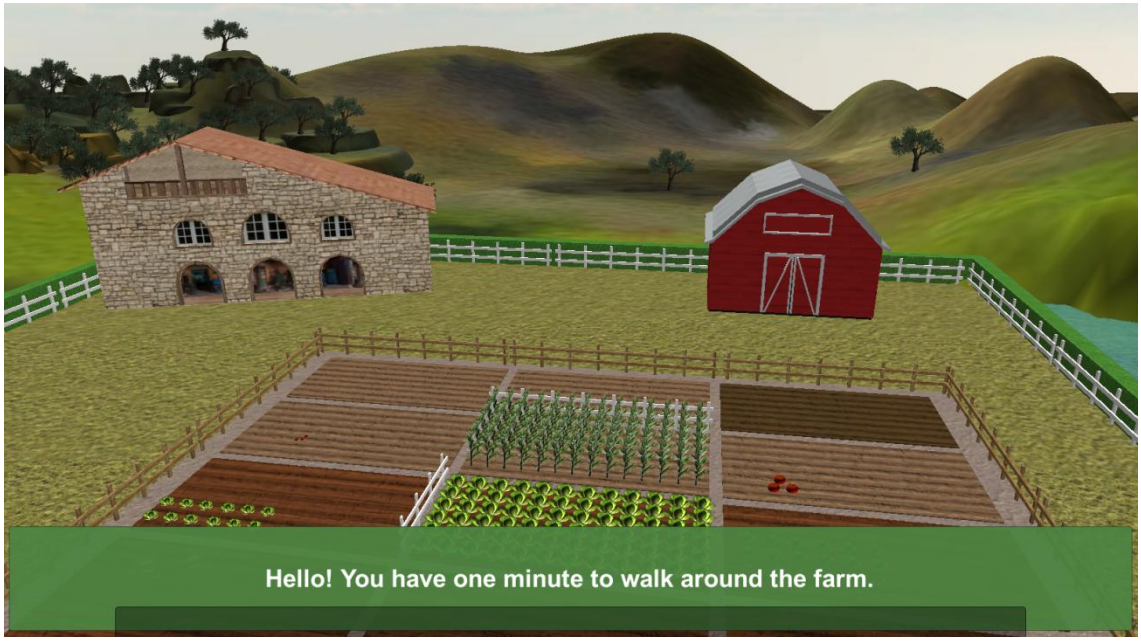


Figure 47: A frontal view of the virtual environment of GrowYourProject use case.

Validation task

The task used for the first validation is aimed at planning the resources and timing of a project to match the deadlines. Metaphorically, this is represented by the task described in Table 1. Given an order from a supermarket for a given due date and given different types of vegetables, each one with its time of growth, users must plant different plots a specific dates and, once the deadline has been reached, collect the vegetables. The goal is to collect all what was order and not having grown anything else within the allotted time. Dates and times are expressed in days

and are scale to the time dimension in the virtual world (approx. 1 day = 15s). The times of growth are not based on real plants timings. Currently, the task does not have neither levels of difficulty, nor validation of the final result.

The basic rules of the game are:

R1	The supermarket order is always visible in the bottom message panel
R2	An information panel is always visible in side panel showing the current date in days and the selected tool, if any.
R3	Trainees must press Right Mouse Button to deploy the tool menu.
R4	Trainees can exit the game at any time by pressing the exit button in the tool menu
R5	In order to plant, users need to select a vegetable in the tool menu and click on an empty plot
R6	A click on an already planted crop does not yield to any change in the environment
R7	Once a plot has been planted, it cannot be unplanted.
R8	It is only possible to proceed to the collecting stage if all required plots have been planted, no matter at which date
R9	To collect plants, users need only to do a click on the plot
R10	The game finishes by user exit, time over or achieved goal

Different types of errors can happen. Table 1 summarizes the visible consequences of the errors.

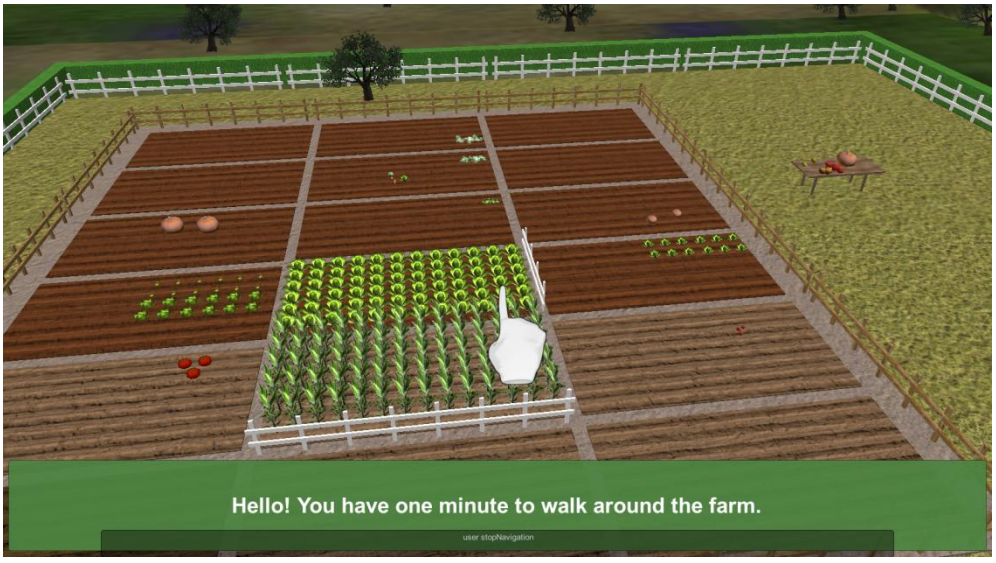
Error	Result
User clicks on non-active objects	No visible result.
User plants a non-due vegetable or fruit on an empty plot	The plot is occupied by the incorrect plant. The task cannot be completed.
User tries to plant an already planted plot	No visible result
User plants a correct vegetable or fruit in an empty plot later that the foreseen date	No visible result in the first stage. Currently, no error in the collection stage. In the next version, it will not be possible to collect the crop in the second stage (immature crop)
User plants a correct vegetable or fruit in an empty plot sooner that the foreseen date	No visible result in the first stage. Currently, no error in the collection stage. It will not be possible to collect the crop in the second stage (burnt crop)
User tries to collect an immature crop	Currently, they are able to collect it.
User tries to collect a burnt crop	Currently, they are able to collect it.

Guided procedure

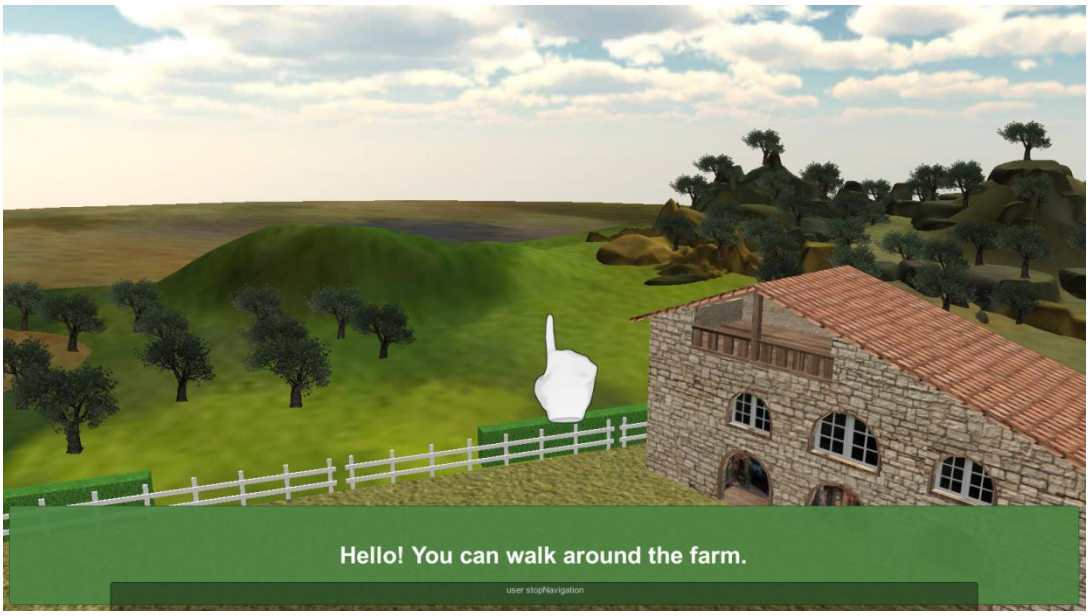
- User login: the user starts the game by opening the following url in a Firefox or MSExplorer navigator (not Google Chrome): http:/movibio.lsi.upc.edu/seniorludens/dev/validation1
- The Unity player will open. You may need to authorize its running if it is the first time you launch it.

- The countryside landscape appears. A message at the bottom indicates that you can navigate through the environment.

- Try to move the camera by moving the mouse. Try to focus on the red barn at right and then on the house at left. Look all around.



- Try to navigate. Click on a plot. You'll keep the camera at the same height but move nearer to the object
- Try to navigate far away. Click on a tree or on the ground far away the farm. You'll see that there is an invisible wall that prevents you to get out from the farm neighborhood

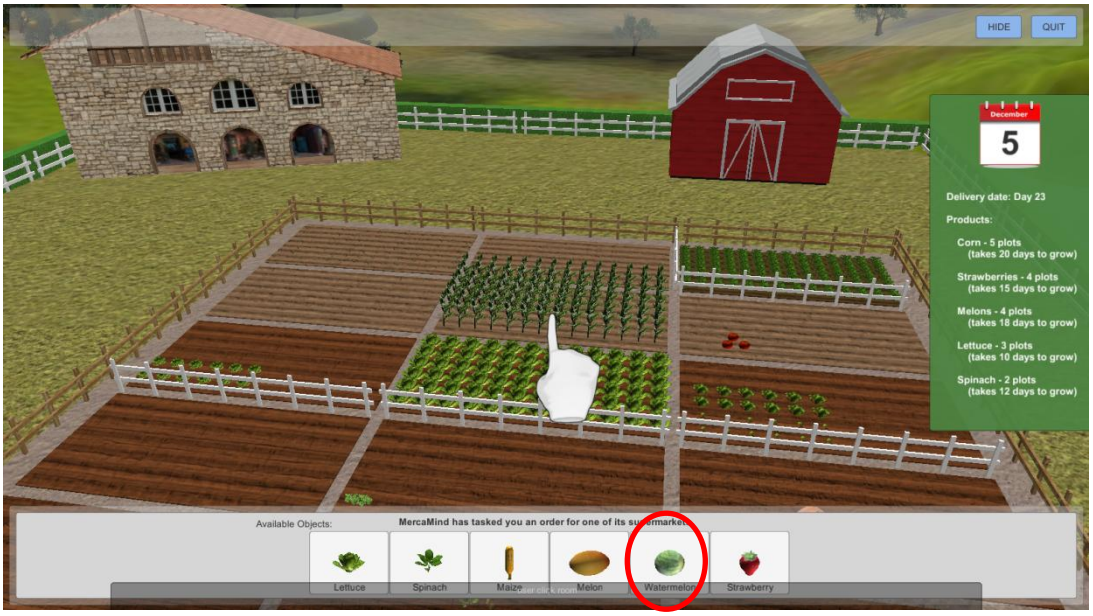


- Navigate freely through the environment until a new message appears

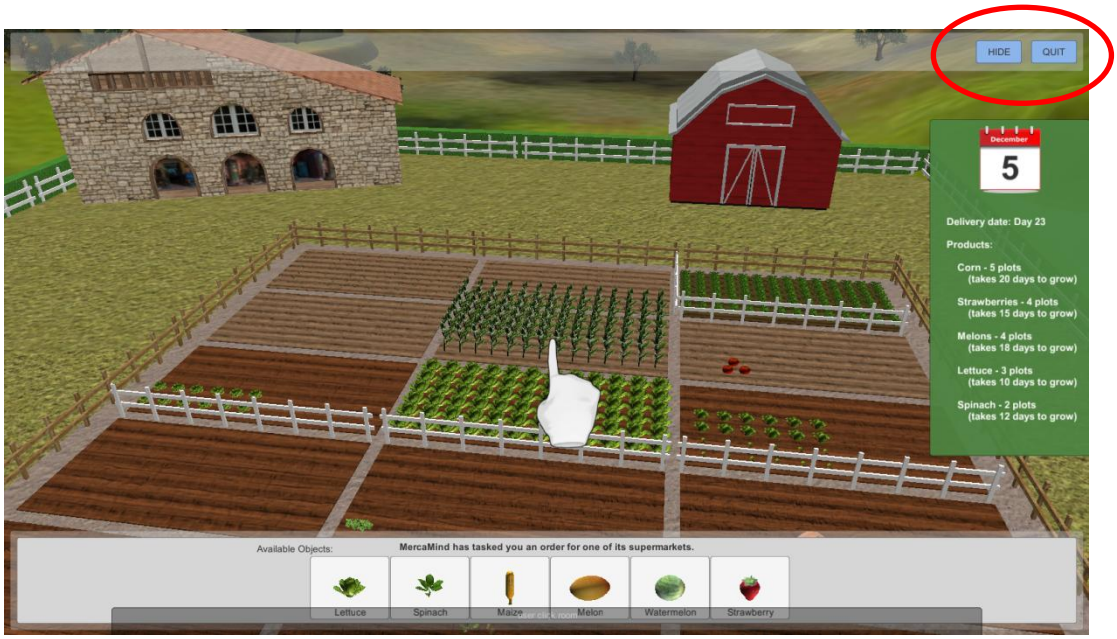
- A new message at the bottom of the screen indicates you that Supermarket Mercamind has a new order. The right panel shows the delivery date (day 23) and the required fruits and vegetables. For each fruit and vegetable, the number of days to mature is indicated together with the number of plots that are needed.

You must calculate the date at which you should plant each vegetable (fruit) in order to match the deadline. For instance, if the corn lasts 20 days to grow, you should plant it on day 3 in order to be mature to be collected at day 23. Similarly, strawberries should be planted on day 8, because they need 15 days (15+8 = 23).

- Deploy the menu pressing the Right Mouse Button (RMB). You will see the different vegetables and fruits that you are able to plant. Observe that there is an intruder plant.



- At the same time, in the upper side of the screen, at right, you can see another panel with two options: hide and quit.



- At right there is the current day. Observe how it evolves through time. Ask yourself what is the current day.

- Select a suitable vegetable in the tool menu.
- Select a suitable plot. Observe what happens.

- Deploy the tool menu and hide it again.
- Select another plot and plant again
- Select a new vegetable. Try to plant an already planted plot. Observe what happens.

- Plant the new vegetable in another plot
- Proceed planting until you'll see the message to collect

- Pick on the plots to collect.
- Once you have collected all of them you'll see a final congratulation message

IT Use case Questionnaire

Answer the questions below.

How would you review the following aspects of the platform?	Totally disagree	Desagree	I don't know	Agree	Totallly agree
General questions					
I understood the scenario					
I was able to identify the barn, the house and the plots					
I found the environment visually attractive					
Rotating the camera was easy					
Moving the camera was easy					
I understood the instructions					
I was able to deploy and hide the menu					
It was easy to pick a tool from the menu					
It was easy to pick on the plot where I wanted to plant					
I was able to plant a plot					
I was able to understand what plant I was planting at any time					
I understood the time dimension and how it scales real time					
I was able to read the date of plantation of each plot					
I was able to know what was the date at anytime					
I was able to collect a crop					
I was able to quit the game					
There was enough time to plant					
There was enough time to collect					
The game fulfilled the described rules					

The following Table shows the main learning objectives that were implemented for the first evaluation of the use case and the correspondent criteria for their evaluation.

Id	Brief description	Metrics	Acceptance criteria
1	**Starting and organizing a project**		
1.1	Understand the following JIRA concepts and the relationships between them: Component, Version		

1.2	Be able to create the right Components for a given project	• Components should correspond to subsystems or functional blocks of the project	

	How would you review the following aspects of Use Case?	Answer DESCRIPTION	Answer (x)
1.1	Where did you plant the plants?	A. Crops area	
		B. House area	
		C. There was no area reserved to plant	
1.1	Which element delimitates your plantation?	A. nothing	
		B. a fence	
		C. a road	
1.2	How many plant species can you plant on each one of the reserved slots?	A. one	
		B. two	
		C. three	
1.2	Which is the last sequence of the actions you do?	A. Plant	
		B. Water the plants	
		C. Harvest the plantation	

Annex D.2 (in-game): Rehabilitation Use Case

Introduction

The use case takes place in the field of patients' motor and cognitive rehabilitation performed by physiotherapists in a hospital environment. It aims for:

- the familiarization of primary-users (Senior Physiotherapists, SPTs) with new technologies: primary users will translate task oriented rehabilitation protocols into standardized procedures to be adapted to technological solutions. They will accomplish managements roles in designing of the game. Some of them will also familiarize with the game itself as a trainee.
- the intergenerational transfer of the SPT's knowledge to young physiotherapists (YPTs, secondary users): The YPT will be virtually trained on appropriate rehabilitation procedures using the serious game developed by the SPTs, benefiting from this knowledge transfer. Some of them will also support the SPTs in the designing of the game.

The Virtual Environment

The virtual environment reproduces a rehabilitation room with a patient on a treadmill, his or her health record and the control for the treadmill.

Figure 48: A frontal view of the virtual environment of the Rehabilitation use case.

Validation task

The task used for the first validation is aimed at the basic functionality of reading the health record of the patient and operating the treadmill.

The basic rules of the game are:

R1	A click on the medical record on the table opens the medical record.
R2	A click on the open medical record closes it.
R3	Sliding the mouse pointer on the open medical up and down scrolls the content up and down
R4	Sliding the Speed slider up accelerates the treadmill
R5	Sliding the Speed slider down slows the treadmill down
R6	Sliding the Inclination slider up elevates the treadmill
R7	Sliding the Inclination slider down lowers the treadmill
R8	A right klick on the scene opens a window and allows full screen mode
R9	Pressing ESC in fullscreen mode closes the fullscreen mode
R10	The game finishes when the browser is closed

Different types of errors can happen. The following Table summarizes the visible consequences of the errors.

Error	Result
User clicks on non-active objects	No visible result.
Patient runs for a longer time on the treadmill	The patient starts to run in slopes

Guided procedure

- User login: the user starts the game by opening the following url in a Firefox or MS InternetExplorer (not Google Chrome):
- http://m14f0109.sui-inter.net/SL_Physio_UseCase_evaluation_1/ SL_Physio_UseCase_evaluation_1.html.
- The Unity player will open. You may need to authorize its running if it is the first time you launch it.

- The training room appears.
- Right click on the game scenario and choose Go Fullscreen
- Click on the medical record

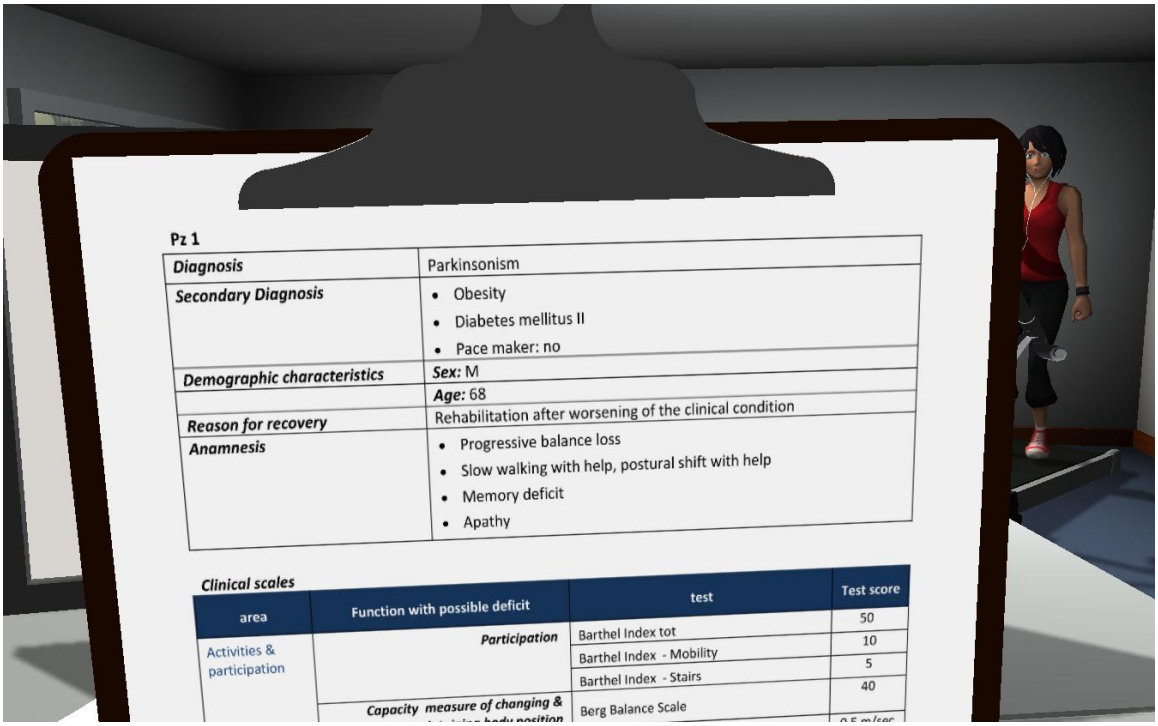
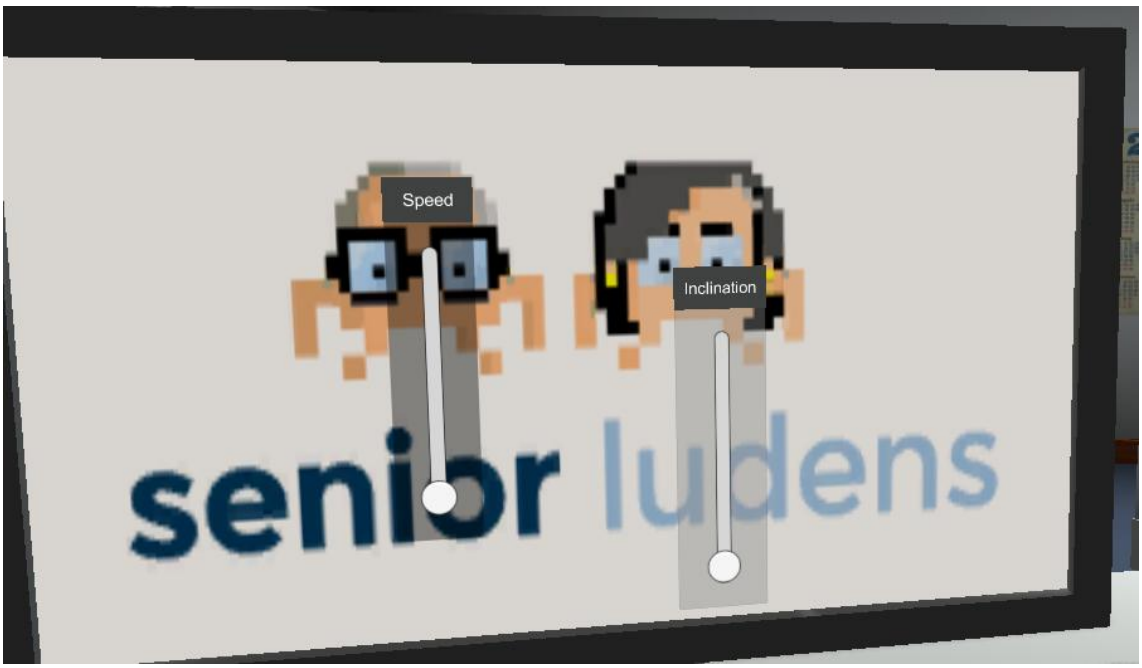


Figure 2: A frontal view of the virtual environment of the Rehabilitatoin use case.

- Move your mouse up and down on the medical record and read it carefully
- Press ESC to close the medical record



- Slide the Speed Slider up and down and watch the patient on the treadmill
- Slide the Inclination Slider up and down and watch the treadmill
- Refer back to your supervisor

Rehabilitation Use case Questionnaire

Answer the questions below.

How would you review the following aspects of the platform?	Totally disagree	Desagree	I don't know	Agree	Totallly agree
General questions					
I understood the scenario					
I was able to identify the medical record and the sliders to control the treadmill					
I understood the instructions					
I could not have navigated through the game without the instructions					
I will have to look for assistance often when I play the game					
The game has an attractive presentation					
Learning to use this game is easy					
The control of the game is intuitive					
It was generally easy to play the game					
The game fulfilled the described rules					

What was the most difficult part to understand?

_____

_____

_____

What did you like the most while playing the game?

_____

_____

The following Table shows the main learning objectives that were implemented for the first evaluation of the use case and the correspondent criteria for their evaluation.

Id	Brief description	Metrics	Acceptance criteria
1	To be able to read clinical charts		
1.1	To be able to extract from the clinical chart the relevant information for *motor* rehabilitation	Questionnarie	-
1.2	To be able to extract from the clinical chart the relevant information for *cognitive* rehabilitation	Questionnarie	-

	How would you review the following aspects of Use Case?	Answer DESCRIPTION	Answer (x)
1.1	Which scale was use to assess the capacity measure of functional mobility?	A. Barthel Index	
		B. Timed Up and Go	
		C. Heart rate at rest	
1.1	At the Barthel Index Mobility item the patient presented a Test score equal to 10. What does it mean?	A. wheelchair independent, including corners	
		B. immobile	
		C. walks with help of one person (verbal or physical)	
1.2	Which scale was use to assess the short term memory functions?	A. Token Test	
		B. Mini Mental State Examination	
		C. Digit Span forward	
1.2	At the Delay recall of Rey Figure the patient presented a Test equivalent score equal to 0. What does it mean?	A. Long term memory deficit	
		B. Long term memory normal functioning	
		C. Praxis deficit	

Annex D.3 (in-game): Traditional food production Use Case

Introduction

The main goals of the use-case traditional food production are 1) to preserve the cultural background and know-how of older workers at a chees production. This requires the capture and transfer of knowledge and experience to younger employees. 2) Young employees need to learn the steps of traditional chees production to keep the industrial competition of small artisanal companies.

The Virtual Environment

The virtual environment represents a typical production room of a small artisanal cheese factory. Within the room the different steps of the cheese production are organized from the left to the right. Future versions of the interface will provide zoom in and out on the scenario.

Figure 49: A overview of the chees production site of the Traditional Food Production use case.

Validation task

The task used for the first validation is aimed at putting the colander on the bucket, taking the basin with the milk and poor the milk through the colander into the bucket.

The basic rules of the game are:

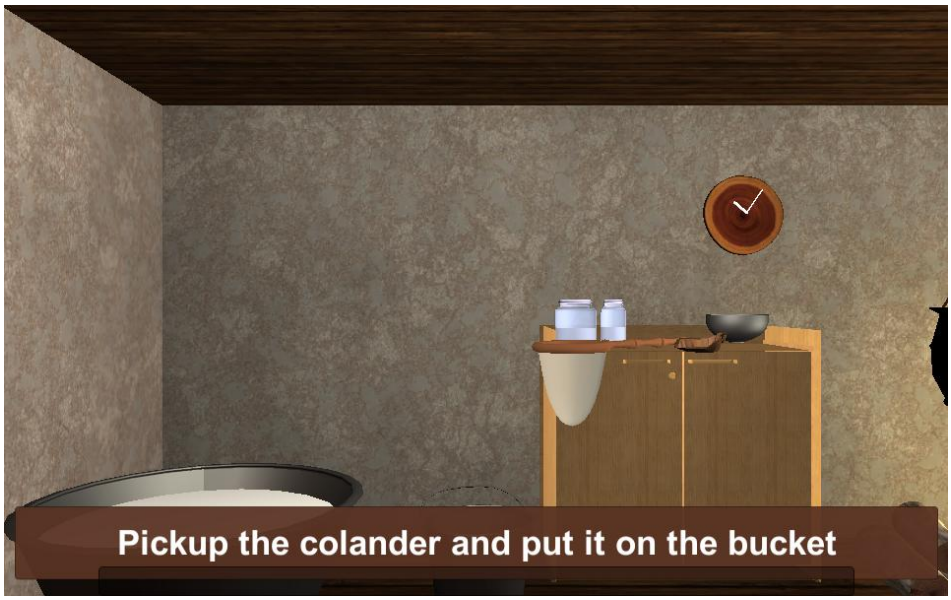
	The first click activates the game, the mouse pointer is changed to a hand and the view moves forward to the point clicked on. A second click stops the view moving forward
R1	The first click activates the game, the mouse pointer is changed to a hand and the view moves forward to the point clicked on. A second click stops the view moving forward.
R2	When the game is activated the view in the room can be changed by moving the mouse. Moving left/right moves the view to the left/right. Moving the mouse up/down moves the view up/down
R3	Clicking on an object activates the object and it can be moved and placed (drag and drop).
R4	The text in the text box at the bottom of the screen displays the next step of the game and informs about success.
R5	Pressing ESC interrupts the game and the mouse pointer is set back to an arrow.
R6	Pressing F5 reloads the game
R7	The game is finished when the message “Learning objective 1.3 completed” followed by “Very Good” is displayed

Different types of errors can happen. Table 1 summarizes the visible consequences of the errors.

Error	Result
User clicks on non-active objects	No visible result or forward move.
An action is executed wrong for several times	The object disappears.
An object is clicked while moving within the room.	No visible result. The move will be done until the point clicked on is reached.
Imprecise click on an active object.	The click is interpreted as a move command and the view moves to the clicked point.
The moves are not done in the correct order.	Object may disappear and the text is moving to the next step and the task cannot be fulfilled.
An object is clicked when not positioned correctly over another object.	The object is dropped on the floor and cannot be picked-up anymore (Game must be restarted).

Guided procedure

- User login: the user starts the game by opening the following url in a Firefox or MSExplorer navigator (not Google Chrome): http://m14f0109.sui-inter.net/SL_Cheese_UseCase_evaluation_1_build_2/SL_Cheese_UseCase_evaluation_1.html
- The Unity player will open. You may need to authorize its running if it is the first time you launch it.



- The corner of the room with all the objects need for the first training step appears and the text banner shows you what to do next.

- Click on the game to activate it and click again to stop the view going forward.

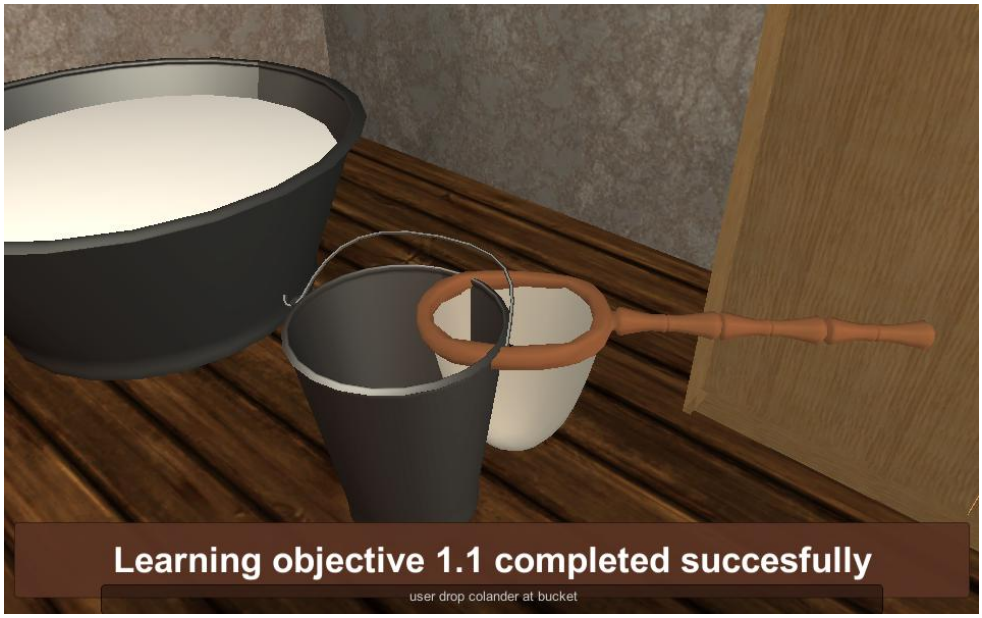
- Move your mouse to explore the room and get familiar with controlling the view in the room.

- Now move the view back to the corner where you have to fulfill your first tasks.

- Move closer to the colander and click on it to activate it.

- When you successfully click on the colander it changes its appearance.

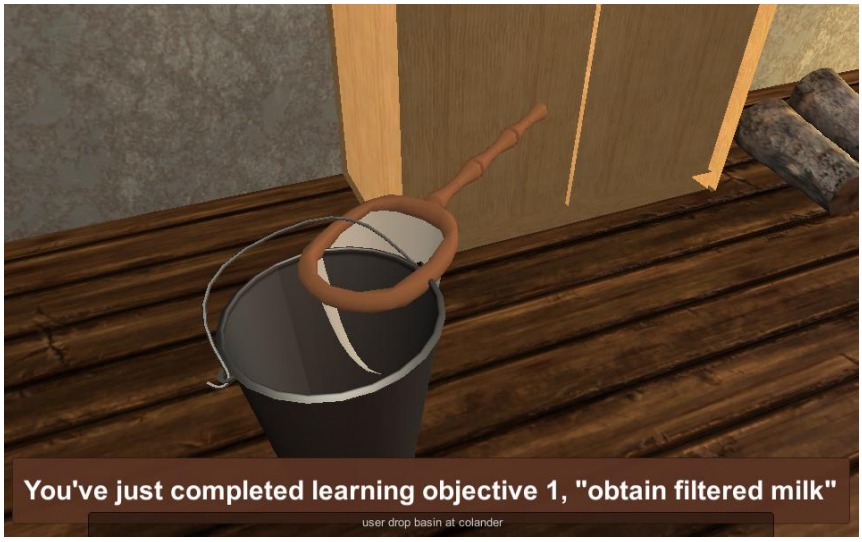
- Change the view by moving your mouse sideward until the colander is above the bucket.
- Click while the colander is above the bucket.



- The colander changes its appearance and attaches to the bucket and the message in the text banner shows that the first step was done successfully.

- The text-banner show you the next step to execute.

- Click on the basin with the raw milk.
- When the basin is activated it changes its appearance and the text-banner shows you what to do next.
- Bring the basin over the bucket and click.



- When the basin is placed correct while you click, it will disappear and the text-banner shows that the step was done successfully.

Traditional food production Use case Questionnaires

Answer the questions below.

How would you review the following aspects of the platform?	Totally disagree	Desagree	I don't know	Agree	Totallly agree
General questions					
I understood the scenario					
I was able to identify the colander, the bucket and the basin					
I found the environment visually attractive					
Rotating the camera was easy					
I understood the instructions					
I could not have navigated through the game without the instructions					
It was easy to pick an object					
It was easy to drop an object on its intended place					
The game has an attractive presentation					
Learning to use this game is easy					
The control of the game is intuitive					
It was generally easy to play the game					
The game fulfilled the described rules					

What was the most difficult part to understand?

_____

_____

_____

What did you like the most while playing the game?

_____

_____

_____

This use case is based on Bagolino's traditional cheese, a village in the province of Brescia(Italy).

This food product is seasoned between 6 and 12 months, with cylindrical form and smooth hard crust with yellow-orange colour or dark brown.

It's processed during aging with uncooked linseed oil; straw-yellow pasta in winter and dark yellow in summer, because the milk used is made by cows located in mountain pastures.

Pasta has a compact texture tending towards to granulose during the aging.

The principal *interactive object* of the first version of the game is to obtain the filtered milk (show in table 1).

Id	Brief description	Metrics	Acceptance criteria
1	Obtain filtered milk		
1.1	To be able to put the colander on the basin(empty) that will contain filtered milk	Colander's dimension must be bigger than basin one	
1.2	To be able to take the box with raw milk located near the main door		
1.3	To be able to pour raw milk into basin (to obtain filtered milk)		

Table 16 – Learning objectives Use case 3 for the first evaluation

After seeing the table 1 answer the questions below.
There are three different answers but the correct answer is one(X).

How would you review the following aspects of Use Case?	Answer DESCRIPTION	Answer (x)
Questions for Trainee		
1.1)Which is the first object that you use?		
	ANS 1: The colander	
	ANS 2: The basin	
	ANS 3: The table	
1.1)Where you place the colander?		
	ANS 1: On the table	
	ANS 2: On the basin	
	ANS 3: On the box	
1.2) What's in the box that is located near the front door?		
	ANS 1: The filtered milk	
	ANS 2: The raw milk	
	ANS 3: Nothing	
1.3) Which is the last sequence of the		

actions you do?		
	ANS 1: Mix up the raw milk	
	ANS 2: Pour raw milk into basin	
	ANS 3: Pour raw milk into box	

Annex D.4 (in-game): The collaborative walkthrough questionnaire

User ID	
Date	

After the researcher has shown you how to play the game, please, answer the following questions:

	Question	answer
1a	**What did you like most?**	
1b	**What did you like less?**	
2a	**What do you think it was most useful in the game?**	
2b	**What less?**	
3a	**What do you think is missing in the game?**	
3b	**What would you change in the game?**	

Annex E.1 (post-game): System Usability Scale [secondary users]

User ID	
Date	

We kindly ask you to answer the following questions about the usability of Senior Ludens….

		totally disagree	little disagree	Neither agree not disagree	sufficiently agree	Strongly agree
1	I think that I would like to use this system frequently.	1	2	3	4	5
2	I found the system unnecessarily complex.	1	2	3	4	5
3	I thought the system was easy to use.	1	2	3	4	5
4	I think that I would need the support of a technical person to be able to use this system.	1	2	3	4	5
5	I found the various functions in this system were well integrated.	1	2	3	4	5
6	I thought there was too much inconsistency in this system.	1	2	3	4	5
7	I would imagine that most people would learn to use this system very quickly.	1	2	3	4	5
8	I found the system very cumbersome to use.	1	2	3	4	5
9	I felt very confident using the system.	1	2	3	4	5
10	I needed to learn a lot of things before I could get going with this system.	1	2	3	4	5

Annex E.2 (post-game): Intrinsic Motivation Inventory (IMI) - short version (Interest/enjoyment factor items) [secondary users]

User ID	
Date	

We kindly ask you to answer the following questions about your use of SeniorLudens. Mark the point that is more in line with your agreement about the sentences:

		Absolutely not	A little	Much
1	**I enjoyed doing this activity very much**	1	2	3
2	**This activity was fun to do**	1	2	3
3	**I thought this was a boring activity**	1	2	3
4	**This activity did not hold my attention at all**	1	2	3
5	**I thought this activity was quite enjoyable**	1	2	3
6	**While I was doing this activity, I was thinking about how much I enjoyed it**	1	2	3

Annex E.3 (Post-game): Flow State Scale (FSS) [primary users]

User ID	
Date	

Please, use the rating scale to answer to the following questions in relation to your experience during the event you have just completed. These questions are related to the thought and feelings you may have experienced during the event. There are no right or wrong answers. Circle the number that best matches your experience from the options to the right of each question.

		Too much easy	Easy	Balanced	Appropriate	Difficult
Challenge-Skill Balance	**I was challenged, but I believed my skills would allow me to meet the challenge**	1	2	3	4	5
	My abilities matched the high challenge of the situation	1	2	3	4	5
	I felt I was competent enough to meet the high demands of the situation	1	2	3	4	5
	The challenge and my skills were at an equally high level	1	2	3	4	5
Action-Awareness Merging	**I made the correct way without thinking about trying to do so**	1	2	3	4	5
	All just seemed to be happening automatically	1	2	3	4	5
	I performed automatically	1	2	3	4	5
	I did things spontaneously and automatically without having to think	1	2	3	4	5
Clear Goals	**.I knew clearly what I wanted to do**	1	2	3	4	5
	I had a strong sense of what I wanted to do	1	2	3	4	5
	I knew what I wanted to achieve	1	2	3	4	5
	My goals were clearly defined	1	2	3	4	5
Unambiguous Feedback	**It was really clear to me that I was doing well**	1	2	3	4	5
	I was aware of how well I was performing	1	2	3	4	5

	I had a good idea while I was performing about how well I was doing	1	2	3	4	5
	I could tell by the way I was performing how well I was doing	1	2	3	4	5
Concentration on task at hand	**My attention was focused entirely on what I was doing**	1	2	3	4	5
	It was no effort to keep my mind on what was happening	1	2	3	4	5
	I had total concentration	1	2	3	4	5
	I was completely focused on the task at hand	1	2	3	4	5
Sense of control	**I felt in total control of what I was doing**	1	2	3	4	5
	I felt like I could control what I was doing	1	2	3	4	5
	I had a feeling of total control	1	2	3	4	5
	I felt in total control of myself	1	2	3	4	5

Annex E.4 (Post-game): Affect Assessment Questionnaire - PANAS

User ID	
Date	

And now, please, indicate how do you feel at the end of the activity.

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt like this in the past few hours. Use the following scale to record your answers.

	Very slightly or not at all	A little	moderately	Quite bit	extremely
Nervous	1	2	3	4	5
Attentive	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Interested	1	2	3	4	5
Determined	1	2	3	4	5
Alert	1	2	3	4	5
Upset	1	2	3	4	5
Ashemed	1	2	3	4	5
Afraid	1	2	3	4	5
Excited	1	2	3	4	5
Guilty	1	2	3	4	5
Jittery	1	2	3	4	5
Inspired	1	2	3	4	5
Irritable	1	2	3	4	5
Distressed	1	2	3	4	5
Hostile	1	2	3	4	5
Scared	1	2	3	4	5
Active	1	2	3	4	5
Strong	1	2	3	4	5

THANK YOU FOR YOUR COLLABORATION!