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SeniorLudens

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

D4.2B

Pilots evaluation results

M21

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Table of Contents

ABSTRACT	4
INTRODUCTION	5
1- PLATFORM AND GAMES IMPLEMENTATION AT SECOND EVALUATION	6
PLATFORM	6
USE CASE 1: IT COMPANIES	7
<i>Implementation of Use case 1 at first evaluation</i>	<i>7</i>
<i>Methodology to test use case 1 learning objectives achievement.....</i>	<i>13</i>
USE CASE 2: HOSPITAL/CLINICAL AND HOME CARING	17
<i>Implementation of Use case 2 at second evaluation</i>	<i>17</i>
<i>Methodology to test use case 2 learning objectives achievement.....</i>	<i>18</i>
USE CASE 3: TRADITIONAL FOOD PRODUCTION	21
<i>Implementation of Use case 3 at second evaluation</i>	<i>21</i>
<i>Methodology to test use case 3 learning objectives achievement.....</i>	<i>22</i>
USE CASE 4: SAFETY AT HOME.....	25
<i>Implementation of Use case 4 at second evaluation</i>	<i>25</i>
<i>Methodology to test use case 4 learning objectives achievement.....</i>	<i>25</i>
2- TESTING METHODOLOGY	26
PROCEDURE AND INTERNAL PROTOCOLS	26
<i>Evaluation session and tools.....</i>	<i>26</i>
<i>Internal protocol : primary users.....</i>	<i>28</i>
Setting	28
Pre-game Phase	29
In-game Phase (Platform)	29
In-game Phase (Use case Games)	49
Post-game phase	50
<i>Internal protocols : secondary users</i>	<i>51</i>
Setting	51
Pre-game Phase	52
In-game Phase (Platform)	52
In-game Phase (Use case Games)	57
Post-game phase	57
<i>Extra evaluation of elders group</i>	<i>58</i>
User requirements session.....	58
Internal protocol for elders users	59
3- PARTICIPANTS.....	61
4- PLATFORM: RESULTS	64
PRIMARY USERS: MANAGER	64
<i>Results For TASK EDITOR.....</i>	<i>64</i>
<i>Results for web frontend (administration portal)</i>	<i>65</i>
SECONDARY USERS: TRAINEE	67
<i>Results for web frontend (trainees portal)</i>	<i>67</i>
5- USE CASES: RESULTS	68
USE CASE 1: IT COMPANIES	68
<i>Functionality results.....</i>	<i>68</i>
<i>Results of learning objectives test.....</i>	<i>72</i>
USE CASE 2: HOSPITAL/CLINICAL AND HOME CARING	73
<i>Functionality results.....</i>	<i>73</i>
<i>Results of learning objectives test.....</i>	<i>74</i>
USE CASE 3: TRADITIONAL FOOD PRODUCTION	76

<i>Functionality results</i>	76
<i>Results of learning objectives test</i>	77
USE CASE 4: HOME SAFETY	79
<i>Results of learning objectives</i>	79
6- USER EXPERIENCE RESULTS	81
USABILITY OF SENIORLUDENS SYSTEM	81
INTRINSIC MOTIVATION ASSESSMENT	81
FLOW STATE ASSESSMENT.....	82
AFFECT ASSESSMENT.....	83
7- RESULTS OF THE EXTRA SESSION OF ELDERLY SAMPLE	86
8- DISCUSSION AND CONCLUSION.....	92
FIGURES AND TABLES	94
REFERENCES.....	96
ANNEX A: INFORMED CONSENT	97
ANNEX B.1 PRE-GAME: PERSONAL CHARACTERISTICS AND APTITUDE FOR USAGE QUESTIONNAIRE.....	99
ANNEX B.2 PRE-GAME: AFFECT ASSESSMENT QUESTIONNAIRE - PANAS	100
ANNEX C.2 IN-GAME: TASK EDITOR QUESTIONNAIRE.....	101
ANNEX C.3 IN-GAME: PLATFORM EXPLORATION QUESTIONNAIRE	102
ANNEX D.4 IN-GAME: HOME SAFETY USE CASE SCRIPT.....	144
ANNEX D.5 IN-GAME: THE COLLABORATIVE WALKTHROUGH QUESTIONNAIRE	154
ANNEX E.1 POST-GAME: SYSTEM USABILITY SCALE	155
ANNEX E.2 POST-GAME: INTRINSIC MOTIVATION INVENTORY (IMI) - SHORT VERSION (INTEREST/ENJOYMENT FACTOR ITEMS).....	156
ANNEX E.3 POST-GAME: FLOW STATE SCALE (FSS)	157
ANNEX E.4 POST-GAME: AFFECT ASSESSMENT QUESTIONNAIRE - PANAS	159
ANNEX F: USER REQUIREMENTS SAFETY AT HOME	160

Abstract

The goal of this document is to report the results of the second phase of validation of SeniorLudens system.

The session has predicted the same test methodology adopted in the first validation session and described deeply in the deliverable 4.1.

The first part of the document describes the level of implementation reached at second implementation phase of each module integrated in the platform and each use case. Also a brief explanation of the main characteristics and the state of implementation of new modules and serious games developed are reported.

The second part includes the results extracted by the second evaluation session in terms of usability and functionality of the platform and user requirements together with learning objectives reached in the serious games.

According with the purpose of the project, the results of this second evaluation have been compared with the first validation session ones. This comparison aims to verify whether the implementation of the new functionalities of the system fits with the recommendations obtained by the last evaluation and whether the level of usability and functionality of the system is in line with the user requirements.

Also, conclusions extracted by the results of this second implementation phase will consist of an informative feedback able to be used to structure the next implementation phase in line with the user centric approach predicted by the onset of the project.

Introduction

In the previous part of SeniorLudens project, we tested the first pilot version of the design and implementation of the platform in relation to the user requirements.

In accordance with the user centric development methodology of the project, we planned to test the platform implementation along the whole validation phase two times more, specifically at M22 and M30.

The user's feedback extracted by the first evaluation session of the system has constituted some informative guidelines followed by all consortium during the whole second implementation phase in order to make the system more tailored to the users requirements.

In line with the first validation session, all modules integrated in the platform were tested in terms of functionality, usability and user's requirements. Serious games were assessed also in terms of learning objectives.

The present document reports the implementation status of each module of the platform developed and the results obtained by the users second evaluation session in which functionality of the platform and effectiveness in reaching learning objectives of serious games were tested.

The results of this second pilot evaluation (M21) will structure the third and last implementation phase, in order to obtain a definitive version of the system the most adequate to the user's needs and expectations.

These several steps of implementation and testing phases of the system will lead to the definitive version of SeniorLudens that will be assessed in all its functionality at M30, in which is predicted the third validation session.

Date	D4.2 – Pilots evaluation results (M21)	Page 5
26/02/2016	WP4 – Pilot evaluation	

1- Platform and games implementation at second evaluation

Platform

SeniorLudens Platform has structured the basis for the overall system, because it centralizes the access for all users: managers and trainees. This common access produces important benefits for the project as: it unifies the security layer for all the tools included in the variety defined in SeniorLudens architecture; it simplifies the access to the system, because the users has only one entrance point to all features integrated in the solution; it set the bases for interconnection among the different components, and it structures the access under a unique user role system.

All these benefits are basic for the general objective projected for the platform, which is by definition, the creation of 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.

In this validation, the platform has extended the scheme used in the first validation, considering the main blocks in the platform architecture: Storage Server and Web Platform. In this assessment the integration of the different tools mainly comprised inside the SeniorLudens Game Engine has been empowered, with the objective of providing a complete meaning and execution in a the integrated prototype.

In this direction, we have extended the status presented in the first evaluation with the following components:

- **Storage Server:** This component has been improved to extend its range not only for descriptors, but also for game executables and any other content needed for the correct execution of the platform and the different tools coming from SeniorLudens Game Engine. The storage of the different descriptors included in the Serious Game creation chain has been extended by expanding the scope to include different versions of the descriptors coexisting inside the organizations.
 - **Managers:** The connection between the Storage Server and the platform has been improved by the integration of descriptors Managers. These managers are visualizations of the Storage Server contents for each one of the descriptors involved in the game creation. It is dependant of the specific organization, so each organization has only access to the owned descriptors. This fact ensures the data protection among different entities.
- **Web Platform:** The evolution of the platform resides in the integration of the different tools involved in the Game Creation chain, originating from SeniorLudens Game Engine. In addition, it has been integrated and improved tools used for Game management and provided the feedback mechanisms to users.
 - **SeniorLudens Game Engine Tools Integration:** The current release has integrated the tools validated in the first assessment : Scenario Editor and Task Editor, and now they are accessible through the normal workflow. In addition

Date	D4.2 – Pilots evaluation results (M21)	Page 6
26/02/2016	WP4 – Pilot evaluation	

- the Training Program Editor has been developed but it was not fully integrated with the rest of the ecosystem.
- **Games Executables integration:** The game catalog has been improved in both portals (Management and Trainee) to support the game executables inside the Web Platform environment.
 - **Extended Game Management:** The Game Management system has been extended to consider the new abstraction named Activity, which is considered as the univocal relation with a Serious Game. This change motivates to restructure slightly the concept of Game inside the platform, which has been remodeled to be considered as set of different Activities.
 - **Results Analysis:** The current integration has included the connection with the results management in both portals: Management and Trainee. The first to permit the Trainers of the organization to analyze the collected data and act consequently, and the latter to provide feedback about the learning obtained by the Trainees during the playing process.

The underlying objective in the second validation is the assessment of the new features offered, extending those components tested in first evaluation. Thus, the intention is to base this validation on the integration of the tools to obtain a measure on the user's satisfaction when they interact transparently with all set of tools and features included in SeniorLudens, even though they belong to different subsystems. In order to maintain a time control over the trials, these sessions are intended to comprise the new elements included in the development, not going into specific details on those components already tested on first iteration. However, most of them are inherently re validated in the normal workflow of the current validation.

Use case 1: IT companies

The overall goal of the *Grow your Project* serious game is to provide training on the process of Project managing in *Indra* with *Jira*. The training will encompass the steps of organization, planning, and follow up of the project. The game will help to understand the different stages of Project managing through the use of a metaphor: a farm.

The main partial goals of the use-case IT for the second validation stage are:

- Organization of a project: concepts of version and component
- Planning of a project: creation of subtasks, assignment of resources in terms of hours and persons.

Implementation of Use case 1 at first evaluation

ENVIRONMENT: The virtual environment has two parts:

- The three dimensional world that represents a farm
- The 2D interface at the bottom that shows the tools and objects

THE 3D ENVIRONMENT: it is an open-air scenario that represents a farm, with a plot area and decorative elements such as a farm, a barn, some people and animals (hens). The perspective is isometric.

Date	D4.2 – Pilots evaluation results (M21)	Page 7
26/02/2016	WP4 – Pilot evaluation	



Figure 1 - A overview of the farm of the IT use case

- Control Panel

At the bottom part of the screen, there is a 2D panel that includes all the tools needed to interact with the environment. The panel is divided into several parts.



Figure 2 – The environment with the control panels of the IT use case

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 8
	WP4 – Pilot evaluation	

- **Information area:** it is located at the left part of the menu. It included the calendar, the clock and the weather buttons. In the current version, these buttons are not active yet.



Figure 3 – Information Area IT Use Case

- **Common tools area:** it is located in the central part of the panel. Each tool has an identifier icon and a descriptive text. These tools are always visible during the game.

CONCEPTS	
Icon	
Text	Concepts
Usage	It shows the list of equivalent concepts between Jira and the farm. It is always available as a manual.

ORDER	
Icon	
Text	Order
Usage	It shows the order of the supermarkets in a 2D panel overlaid on the 3D scenario.

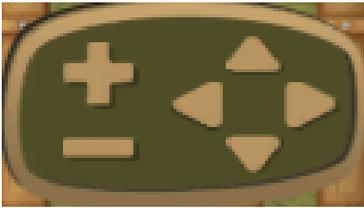
- Task dependent tools:

CROP SELECTION	
Icons	
Texts	Cereals / Fruits / Vegetables
Cursor	<p>Icon of the type of crop selected</p> 
Usage	Click on it to select the crop.

DELIVERY SELECTION	
Icon	
Text	Delivery 1 / Delivery 2 / Delivery 3
Cursor	
Usage	Click on it to create the equivalent to versions.

- **Navigation tools:** + to zoom out – to zoom in, and the arrows to go right, left, up and down.

NAVIGATION TOOLS

Icon	
Text	Zoom in / zoom out / right / left / up / down
Usage	The sign + to zoom out, the sign - to zoom in, and the arrows to go right, left, up and down.

OBJECTS: For the second evaluation version of the IT use case some more objects were implemented:

Id	Name	Function	Appearance	Parameters	Number instances	Thumb
0	Sign of crop type	To identify the area for a particular type of crop	wood	The crop type	3	
1	Delivery sign	To identify the area for a particular delivery	wood	The delivery	3	
2	Wooden box	Decorative object	wood	-	3	

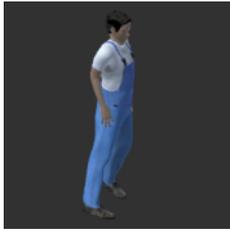
3	Water tank	Decorative object	metallic	-	1	
4	Straw ball	Decorative object	straw	-	22	
5	Farmer	Decorative object	human	An animation loop	3	
6	Chicken	Decorative object	animal	An animation loop	3	
7	Rooster	Decorative object	animal	An animation loop	1	

Table 1- Objects implemented in Use Case 1 at the second implementation phase

Methodology to test use case 1 learning objectives achievement

The table below shows the main learning objectives that were implemented for the second evaluation of the use case and the correspondent criteria for their evaluation.

Id	Brief description	Metrics
1	Analyze the customer's order	
1.1	Understand the requirements of a project	
1.2	Know how many components should be created	To be able to answer that there are three plantation areas of types of crops
1.3	Know how many versions should be created	To be able to answer that there are three plantation areas assigned to delivery dates
2	Create the components of the project	
2.1	Know that you have to create the components	Having created three plantation areas of types of crops
2.2	Identify the components in terms of types of crops	To be able to answer that the Jira's components are equivalent to the types of crops
3	Create the versions of the project	
3.1	Know that you have to create the versions	Having created three plantation areas assigned to delivery dates
3.2	Identify the version in terms of delivery	To be able to answer that the Jira's versions are equivalent to the different deliveries
4	Identify and estimate the tasks	
4.1	Know that you have to divide a project into tasks	Having created the tasks of all deliveries
4.2	Know that you have to divide the tasks into subtasks	Having created the subtasks of all deliveries
4.3	Know the maximum recommended size for a subtask (in hours)	Having answered 60 hours
4.4	Know the number of persons recommended to assign a subtask	Having answered one
4.5	Know the minimum essential data to create a subtask	Having answered the assigned person, the estimation of the effort, the planned dates of the start and the end, and the version.

Table 2- Learning objectives for Use Case IT in second evaluation

The game used for the second validation is divided into 3 levels composed respectively of 1, 3 and 1 tasks. All the tasks are defined below by describing all the steps required in the game. The tables also inform about the states of the game in each interaction.

- The following table describes the game procedure the trainee goes through in order to answer to the learning objectives of the game.

Id	Name	Description	Task	Learning	Space
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Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 13
	WP4 – Pilot evaluation	

				objectives	
1	Level 0 Task 1	A video showing the environment and a tutorial of the navigation tools.	Use the navigation tools.	-	Virtual farm
2	Level 1 Task 1	Analyze the customer's order.	Look at the order and answer three questions.	1.1, 1.2, 1.3	Virtual farm
3	Level 1 Task 2	Create the components of the project.	Select the three types of crops and assign them to a particular zone in the cultivation area.	2.1, 2.2	Forms
4	Level 1 Task 3	Create the versions of the project.	Select the three deliveries and assign them to a particular zone in the cultivation area.	3.1, 3.2	Virtual farm
5	Level 2 Task 1	Identify and estimate the tasks.	Subdivide the three orders in tasks and subtasks.	4.1, 4.2, 4.3, 4.4, 4.5	Forms

Table 3- Procedures of Use case 1 for the second evaluation

- **Level 0 Task 1**

R1	All interactions are disabled. The game shows a welcome message.
R2	The game enters in video mode, with all interactions disabled. A fly through the environment is displayed.
R3	Still in video mode, with all interactions disabled the isometric view of the environment is shown.
R4	Still in video mode, with all interactions disabled and in the isometric view, a demo of how to do zoom and panning is performed.
R5	Zoom and panning interactions allowed, the user can use the controls in the bottom panel, the arrow keys of the keyboard and the mouse to explore the environment. There is no limit of time.
R6	Pressing the "Exit" button, the user exits the game.
R7	The game shows a goodbye message that remains some seconds. The game ends automatically.

Table 4- Procedures IT Use Case in Level 0 for Task 1

There is no possible source of errors in this familiarization task, because it is predominantly a guided process.

- **Level 1 Task 1**

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 14
	WP4 – Pilot evaluation	

R1	The game shows an instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R2	The game shows a second instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R3	The game shows a form with the order of three supermarkets. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R4	The game shows a third instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R5	The game display successively three questions about the order. The user must click on the selected answer to proceed.
R6	The game shows a fourth instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R7	The game shows the <i>Plantation Planner</i> form with the answers previously given by the user. The user click on the <i>next</i> button to proceed. No other interactions are allowed
R8	The game shows a summary of concepts message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R9	The game shows a congratulation message that remains some seconds. The game ends automatically.

Table 5- Procedures IT Use Case in Level 1 for Task 1

Because of the current release development status it is not considered the presence of errors in this level.

- Level 1 Task 2

R1	The game shows an instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R2	The game shows a second instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R3	The user must select a type of crop in the bottom panel. There are three possible types of crop: vegetables, cereals and fruits. When selecting a type of crop, an image of it is attached to the cursor. The user must click on the corresponding plot area. If the plantation is incorrect, the game will not let him/her drop the crop. If it is correct, the crop area color changes, a crop sign panel appears and the selected crop disappears from the cursor. This procedure is repeated for the three types of crops. There is no time limit. In parallel, the user can display the order form and the concepts form clicking on the corresponding button of the tools panel. The user can also do the zoom and the panning.
R4	Pressing the " <i>Exit</i> " button, the user exits the game.
R5	The game shows a summary of concepts message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.

Table 6- Procedures IT Use Case in Level 1 for Task 2

Because of the current release development status it is not considered the presence of errors in this level.

- Level 1 Task 3

R1	The game shows an instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R2	The game shows a second instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R3	The user must select a delivery in the bottom panel. There are three deliveries of three different supermarkets: MM Spain, MM Italy, MM France. When selecting a delivery, an image of it is attached to the cursor. The user must click on the corresponding plot area. At the first click the plantation area becomes visible. At the second click, if the plantation is incorrect, the game will not let him/her drop the delivery. If it is correct, the cultivation area for this delivery is fenced and a delivery sign panel appears. The selected delivery disappears from the cursor. This procedure is repeated for the three deliveries. There is no time limit. In parallel, the user can display the order form and the concepts form clicking on the corresponding button of the tools panel. The user can also do the zoom and the panning.
R4	Pressing the “ <i>Exit</i> ” button, the user exits the game.
R5	The game shows a summary of concepts message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.

Table 7- Procedures IT Use Case in Level 1 for Task 3

Because of the current release development status it is not considered the presence of errors in this level.

- Level 2 Task 1

R1	The game shows an instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R2	The game shows a second instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R3	The game shows the <i>Plantation Planner</i> form with the different deliveries. The user must create the tasks of each delivery clicking on the corresponding button.
R4	The game shows a concept message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R5	The game shows the <i>Plantation Planner</i> form with the different tasks to do for the selected delivery. The user must click on the button bellow to create the subtasks of this delivery.
R6	The game shows the <i>Plantation Planner</i> form with the different subtasks to do for the selected delivery. The user must click on the button bellow to proceed.
R7	The R3, R4, R5 and R6 steps are repeated for each delivery.
R8	The game shows an instruction message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.

R9	The game display successively three questions about the task identification. The user must check the answer and click on the <i>next</i> button to proceed.
R7	The game shows a summary of concepts message. The user click on the <i>next</i> button to proceed. No other interactions are allowed.
R8	The game shows a goodbye message that remains some seconds. The game ends automatically.

Table 8- Procedures IT Use Case in Level 2 for Task 1

Because of the current release development status it is not considered the presence of errors in this level.

The error management in the different tasks will be covered in the last evaluation, in which the Training Plan Editor will be fully integrated. It will give support for the difficulty level adaptation.

The *ad-hoc* questionnaire measuring the learning objectives achievement is reported in Annex D.1.

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 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.

Implementation of Use case 2 at second evaluation

The second 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 of the patient. On the other side of the room is the treadmill, where the patients will work out.

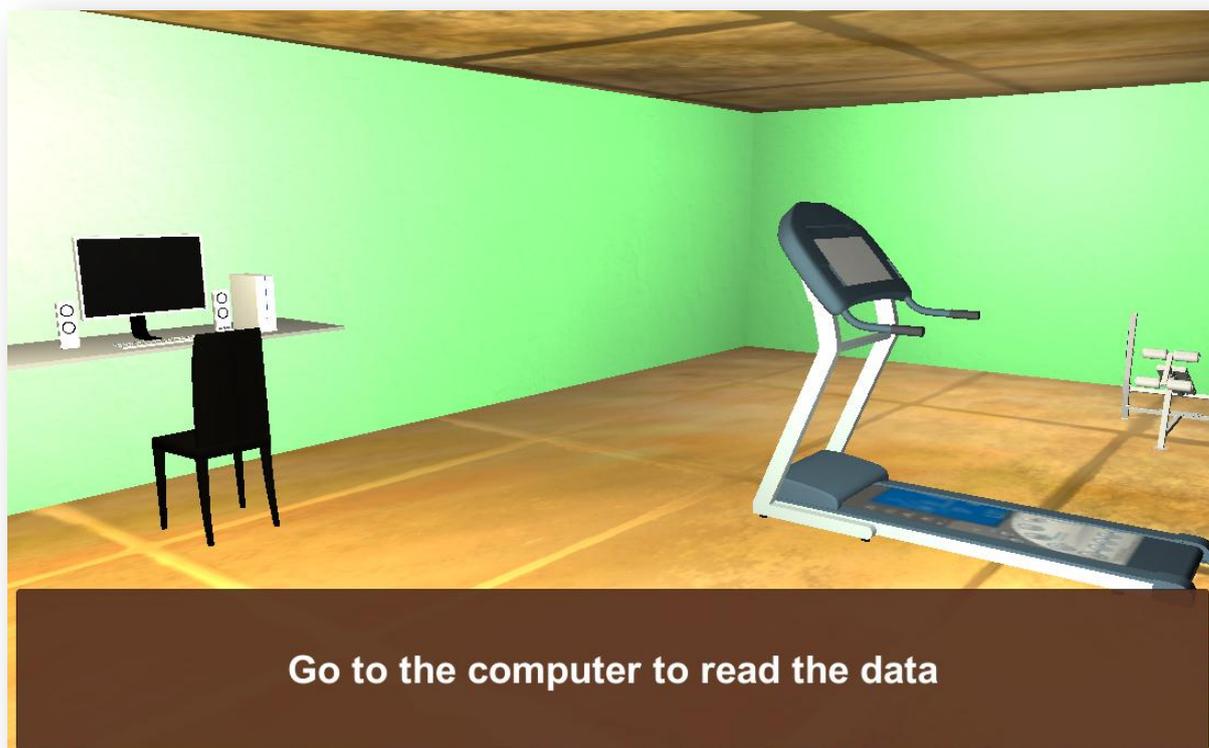


Figure 4: A view of the virtual environment of the Rehabilitation use case.

In this second version of the game the goal consists of selecting the type of motor rehabilitation exercises that are appropriate for the patient after reading the clinical chart 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.

After the clinical chart has been read, a series of forms with questions relevant for the motor rehabilitation training will be shown. The physiotherapists, by flagging the right alternatives of the lists, are able to organize and offer the correct motor rehabilitation protocol to the specific patient. Specifically, physiotherapists have to flag the right motor and cognitive areas that need to be rehabilitated.

In line with the first version of the game there is one clinical chart that is shown. In this second pilot version of the use case 2 the answers on motor and cognitive rehabilitation for this patient will be evaluated.

Methodology to test use case 2 learning objectives achievement

The Table 9 shows the main learning objectives that were implemented for the second evaluation of the use case and the correspondent criteria for their evaluation. The definitive list of learning objectives underlying different tasks of the serious game will be described and presented in the next deliverable, after the third and last implementation phase concluded (D4.2C, evaluation sessions at M30).

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 18
	WP4 – Pilot 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 <i>motor</i> rehabilitation	-	-
1.2	To be able to extract from the clinical chart the relevant information for <i>cognitive</i> rehabilitation		
2	Definition of the <i>motor</i> rehabilitation procedure		
2.1	To be able to identify the areas (use of handrail, type of walk, position of head and usage of arm) to be rehabilitated with motor exercises	Selection of areas to be rehabilitated with motor exercises	Right match with the selection previously set by the SPT
3	Definition of the <i>cognitive</i> rehabilitation procedure		
3.1	To be able to identify the areas to be rehabilitated with cognitive exercises	Selection of areas to be rehabilitated with <i>cognitive</i> exercises	Right match with the selection previously set by the SPT

Table 9- Learning objectives Use case 2 for the second evaluation

The following table (Table 10) 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.		-	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

4	Definition of motor areas for rehabilitation	A list of motor areas is presented to the trainee. The trainee is asked to select the areas for patient's rehabilitation.	Flag the right voices of a lists of different motor areas	2.1	Forms
5	Definition of cognitive areas for rehabilitation	A list of cognitive areas is presented to the trainee. The trainee is asked to select the areas for patient's rehabilitation.	Flag the right voices of a lists of different cognitive areas	3.1	Forms

Table 10- Procedures of Use case 2 for the first evaluation

The *ad-hoc* questionnaire measuring the learning objectives achievement is reported in Annex D.2.

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.

Implementation of Use case 3 at second evaluation

The second 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 racebred locally fed with hay in Bagolino's area located in province of Brescia (Italy).

This cheese is produced - all year long - in 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.

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.

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

For the second evaluation the following learning objectives have been added:

- Obtain skimmed milk
- Milk coagulation
- Obtain the correct consistency of the curd

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 21
	WP4 – Pilot evaluation	

Methodology to test use case 3 learning objectives achievement

Table 3 shows the main learning objectives that were implemented for the second evaluation of the use case and the correspondent criteria for their evaluation. Additional learning objectives will be provided and presented in the next deliverable (D4.2, evaluation session at M30).

Id	Brief description	Metrics
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)	
2	Obtain skimmed milk	
2.1	To be able to wait milk emergencies in the basin	Time (between 12 and 36 hours)
2.2	To be able to take away the cream from the basin	Using skimmer (spannarola)
3	Coagulate milk	
3.1	To be able to transfer skimmed milk into boiler	
3.2	To be able to maintain the fire under the boiler	Using firewood
3.3	To be able to heat up the milk in the boiler	Temperature between 36°C and 40°C
3.4	To be able to add the rennet into boiler	Fixed quantity
3.5	To be able to wait milk coagulation	Time between 30 and 70 minutes
4	Obtain the correct consistency of the curd	
4.1	To be able to remove the boiler from fire	
4.2	To be able to break the unpolished curd	Using sword
4.3	Pause of the curd into boiler	Time between 10 and 40 minutes
4.4	To be able to add the saffron into curd	Fixed quantity
4.5	To be able to break the curd	Using "spino"
4.6	To be able to put the boiler on the fire	
4.7	To be able to heat up the curd into boiler	Temperature between 48°C and 53°C
4.8	To be able to remove the boiler from fire	
4.9	Pause of the curd into boiler	Time between 15 and 40 minutes

Table 11- learning objectives Use case 3 for the first and second evaluation

The following table (Table 12) 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	
3	Boiler	To warm up milk	Copper	Quantity of milk Temperature	1	
4	Skimmer (Spannarola)	To take away cream	Wood or Inox		1	
5	Pitcher	To contain rennet	Glass	Fixed quantity	1	

6	Sword	Curd-breaker	Wood or inox		1	
7	Box	To contain saffron	Glass	Fixed quantity	1	
8	Fireplace	To warm	Not defined		1	
9	Basin	Curd-mining	Wood		1	

Table 12- Procedures of Use case 3 for the second evaluation

The Game's Questionnaire presented to the users is reported in Annex D3.

Use Case 4: Safety at Home

This use case is based on the job of the elderly advisors Safety at Home from UnieKBO. These advisors are elderly people who visit other (vulnerable) elderly persons who live independently to give them advice about their safety. These advices may, for instance, concern prevention of burglary/chat tricks, fall prevention or fire prevention. This use case focuses primary on the most visual side of Safety at Home. It teaches the player where to place things so that they won't be dangerous for the resident. It teaches the player about the proper use of preventive interventions (such as a smoke detector) but also about the proper place of daily objects (such as cables of electronic devices)

Implementation of Use case 4 at second evaluation

ENVIRONMENT: The kitchen scenario is a rectangular room with a cooking island in the middle and a table with chairs at a side. The window and the door of the room can be opened and closed with one click. The fixed furniture consist of cupboards and drawers. They can be opened and closed with one click as well.

The kitchen contains most of the conventional food products and utensil objects. The main actions available on food products and utensils, are to pick and drop them. Some food products can be manipulated with utensils, for instance, cans can be opened with a can-opener, fruits and vegetables can be peeled or chopped with knives.

The island has a burner that can be turned on and off. Some cooking actions exist: burners transmit their temperature to pans and pots and the food they contain. After enough time at a certain temperature, some of the food products changes their aspect (cooked or burnt).

Some cleaning toxic bottles of product can also be put on the environment.

The scenario can have spilled water and a mop to wipe water on the floor with a simple click.

Finally, we can also add some anomalous conditions such as bad electrical appliances, cables, toys in the middle of the room in order to support tasks like:

- find all the unsafe (or unsafely located) objects in the room
- cook something in unsafe conditions (telephone is ringing, you drop some water on the floor...)

Methodology to test use case 4 learning objectives achievement

Table 13 shows the main learning objectives that were implemented in the use case and the correspondent criteria for their evaluation.

Id	Brief description	Metrics
1	Learning about Burglary prevention	
1.1	Not showing valuable possessions	Detect money on a unsafe place
2	Physical safety. Risk factors.	
2.1	Stumbling	Detect loose carpet, slipper under carpet, iron table in middle of the room, loose wires
2.3	Intoxication of (grand)children crawling around	Dangerous toxic substances in open cabinets
3	Fire prevention	
3.1	Knowing where to place the smoke detector	Detect smoke detector on unsafe place
3.2	Knowing what not to place close to the stove	Detect paper towel close to stove

Table 13- Learning objectives Use case 4

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 25
	WP4 – Pilot evaluation	

2- Testing Methodology

The second evaluation session predicted a testing methodology in line with the first evaluation one in order to ensure a continuum between two different steps of SeniorLudens implementation among the development of the system. In addition to the evaluation protocol pertinent to the first phase of validation, more *ad-hoc* questionnaires were administered

Since the need to spend and validate additional functionalities of the serious game creation phase, the time reserved to the platform exploration was reduced in favor of the time reserved to the game creation phase. This supplemental timing allows primary users to have enough time to study and verify whether the game they've just created satisfies themselves and to provide modifications in line with our suggestions. A new use case, whose topic is *home safety*, was implemented (to a deeper description, see paragraph 1.5). This new use case aims to provide a serious game to be evaluated by the elderly sample, who tested only the platform in the first evaluation session, in order to verify the usability of the system in its whole complexity, and not only its interface, by the point of view of elderly people.

Procedure and internal protocols

Evaluation session and tools

Participants took part to 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 65 minutes for primary users and 50 minutes for secondary users. It took place in a quiet room studied for preserving participant's concentration in order to do 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 SeniorLudens Platform following the indications reported in "Internal protocol to be used in second validation session" (see paragraph below "Internal protocol: primary users" and "Internal protocol secondary users"). Each participant was asked to read and sign the informed consent approved by Local Ethical Committee.

As in the first evaluation session, the second one consisted of three different phases: **pre-game, in-game and post-game**. The **pre-game** phase predicted 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 platform modules functionality. Finally, the **post-game** phase included the administration of different scales to assess the user experience in interacting with the system.

Figure 3 "testing flow" describes the phases and tools of the evaluation procedures. All questionnaires and scales are fully reported in Annexes (see Annexes A -E.4)

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 26
	WP4 – Pilot evaluation	

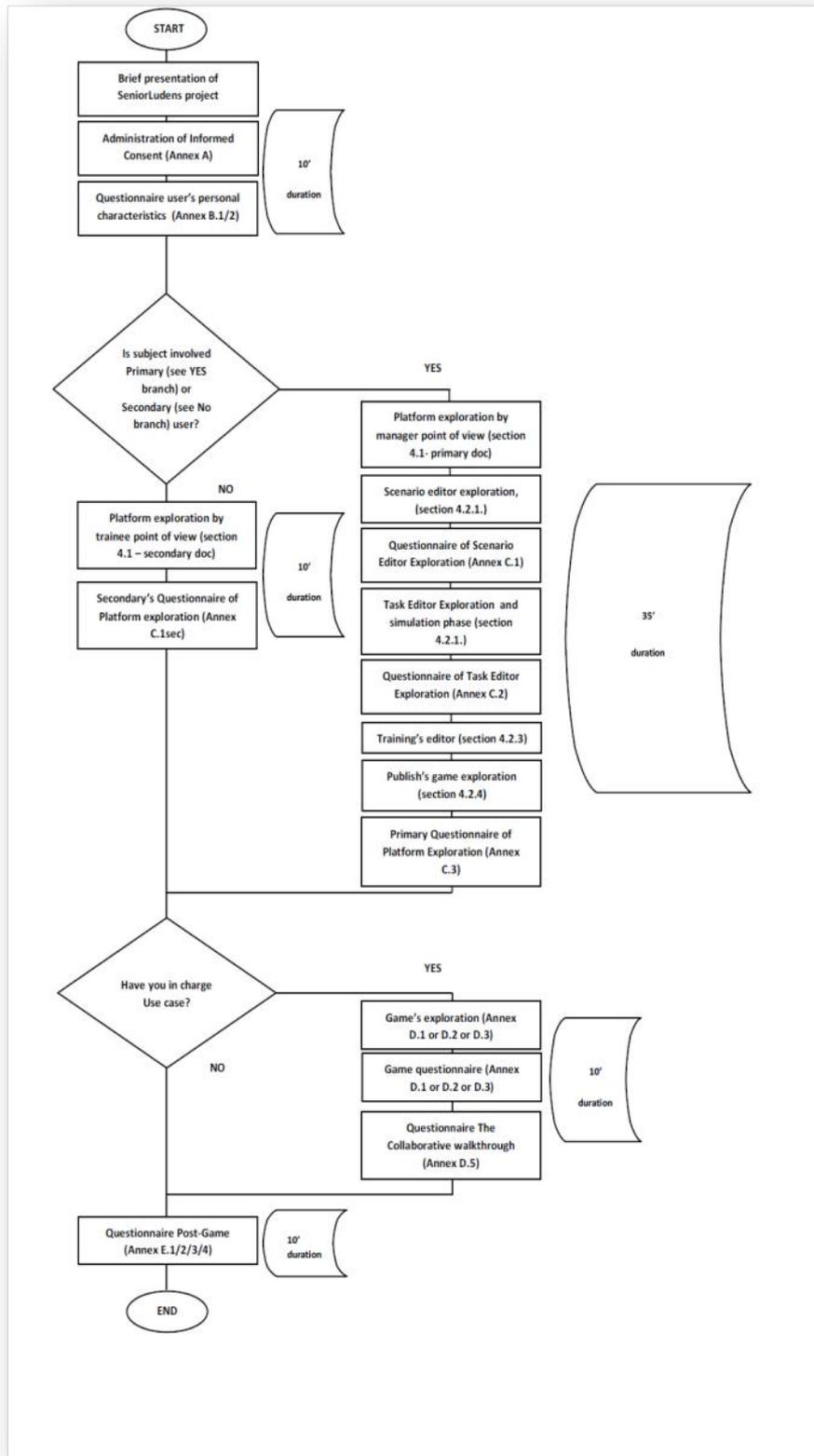


Figure 1- Validation session testing flow

Internal protocol: primary users

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 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:

	Sub-phase	Annex	Timing	SGS
Pre-game	Introduction to the project		10 min	1-2-3-4
	Informed Consent signature	A		1-2-3-4
	Questionnaire personal characteristics	B.1		1-2-3-4
	Affect Assessment questionnaire - PANAS	B.2		1-2-3-4
In-game (platform)	Platform management script		35 min	1-2-3-4
	Task editor and simulation phase	C.2		
	Platform management questionnaire Collaborative walkthrough questionnaire	C.3 D.5		
In-game (game)	Use case script and questionnaire	D.1 or D.2 or D.3 or D.4	10 min	1-2-3
	Collaborative walkthrough questionnaire	D.5		
Post-game	SUS	E.1	10 min	1-2-3-4
	IMI scale	E.2		1-2-3-4
	FSS	E.3		1-2-3-4
	PANAS questionnaire	E.4		1-2-3-4

Table- 14. Second evaluation session schedule

Pre-game Phase

Introduction to the SeniorLudens 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.”*

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”.

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 (see **Annex B.2**).

In-game Phase (Platform)

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

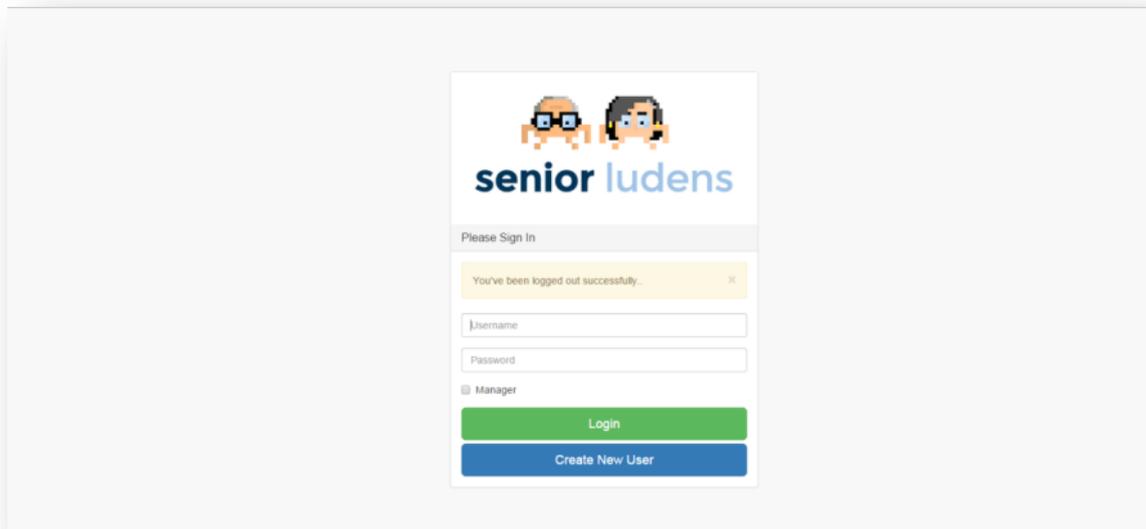
Platform management script

1. The researcher has the access to the platform located at:
<http://demos-innovation-labs.com/sl>
2. **User login:** the user validates with the test username and the manager checkbox ticked. The dashboard opens.

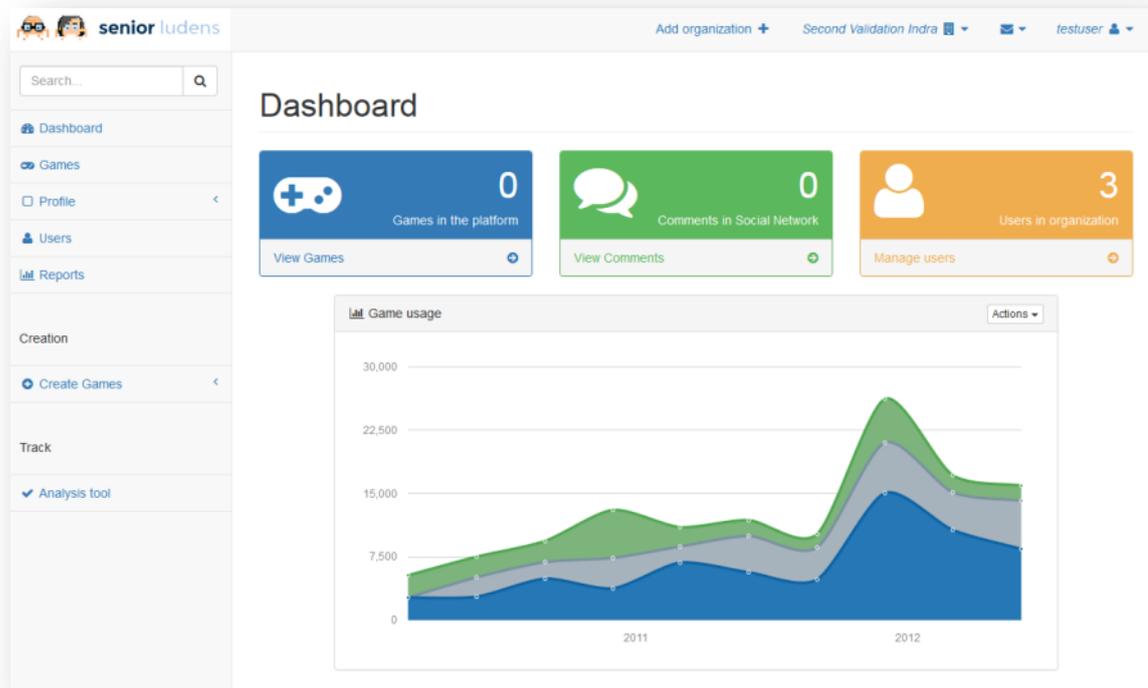
Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 29
	WP4 – Pilot evaluation	

The user and password by organization corresponds with the following table (username/pass):

Partner	Organization	Manager User	Trainee User
Indra	Second Validation Indra	testindra/test	playindra/play
CBIM	Second Validation CBIM	testcbim/test	playcbim/play
FCG	Second Validation FCG	testfcg/test	playfcg/play
KBO	Second Validation KBO	testkbo/test	playkbo/play

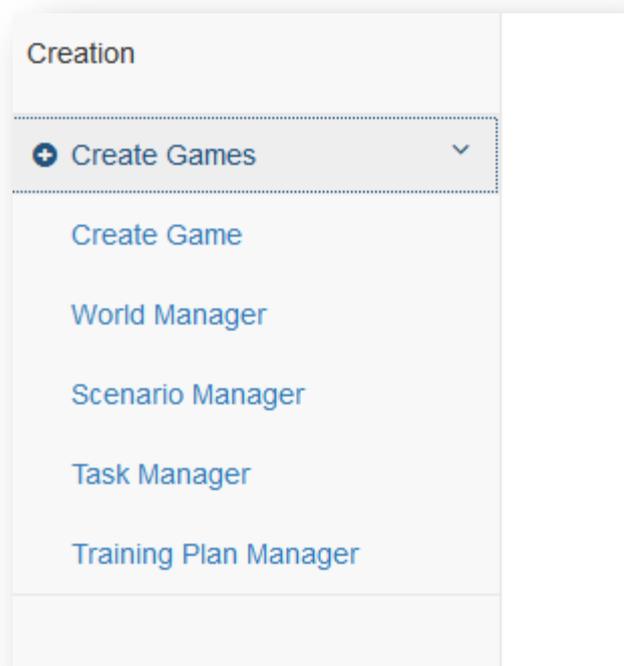


- **Dashboard:** This page shows the information of the organization in the SeniorLudens platform.



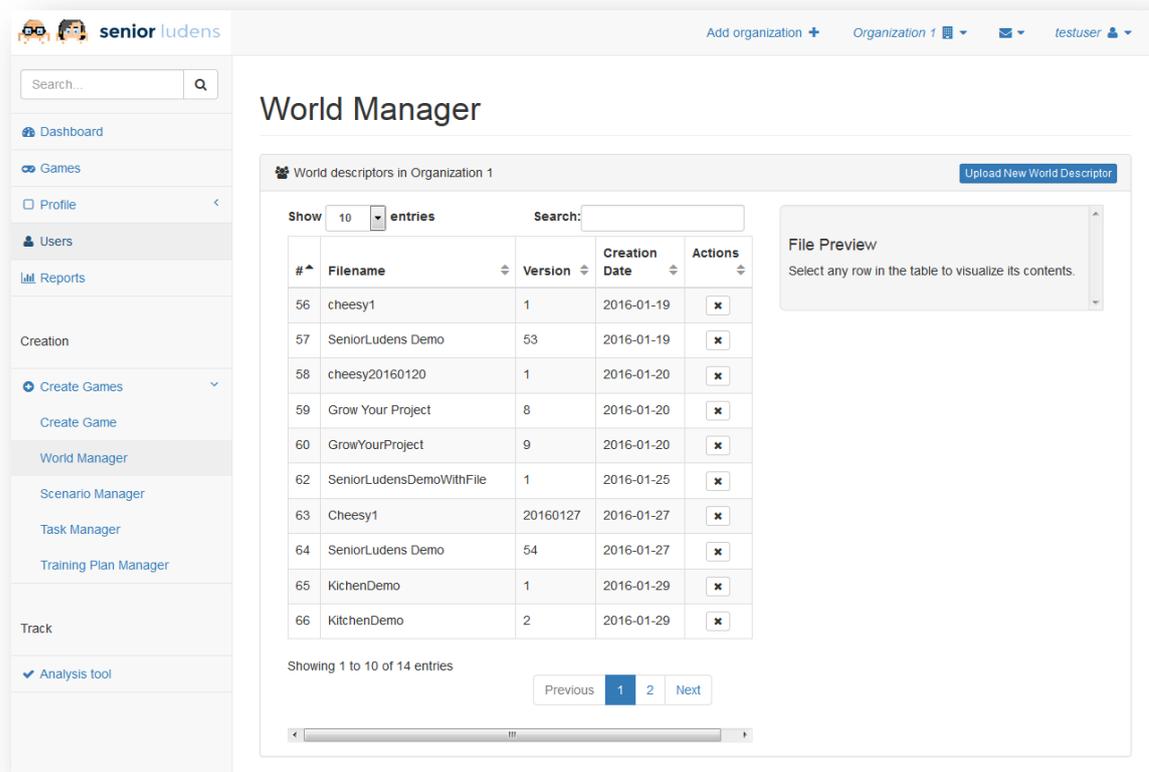
It has some menus in the top bar and side bar. The researcher explains the functionality of each menu if the user requires it. It is not needed to go into detail of all menus because they were validated in first release. Top menu is oriented to manage the organization and user profile. The side menu aims to help the users to administer the users, the games and the creation of them.

Going into detail of the create games menu in the side menu, we will validate mainly the functions included in this menu. By clicking on it, it is unfold a set of tools used in game creation.



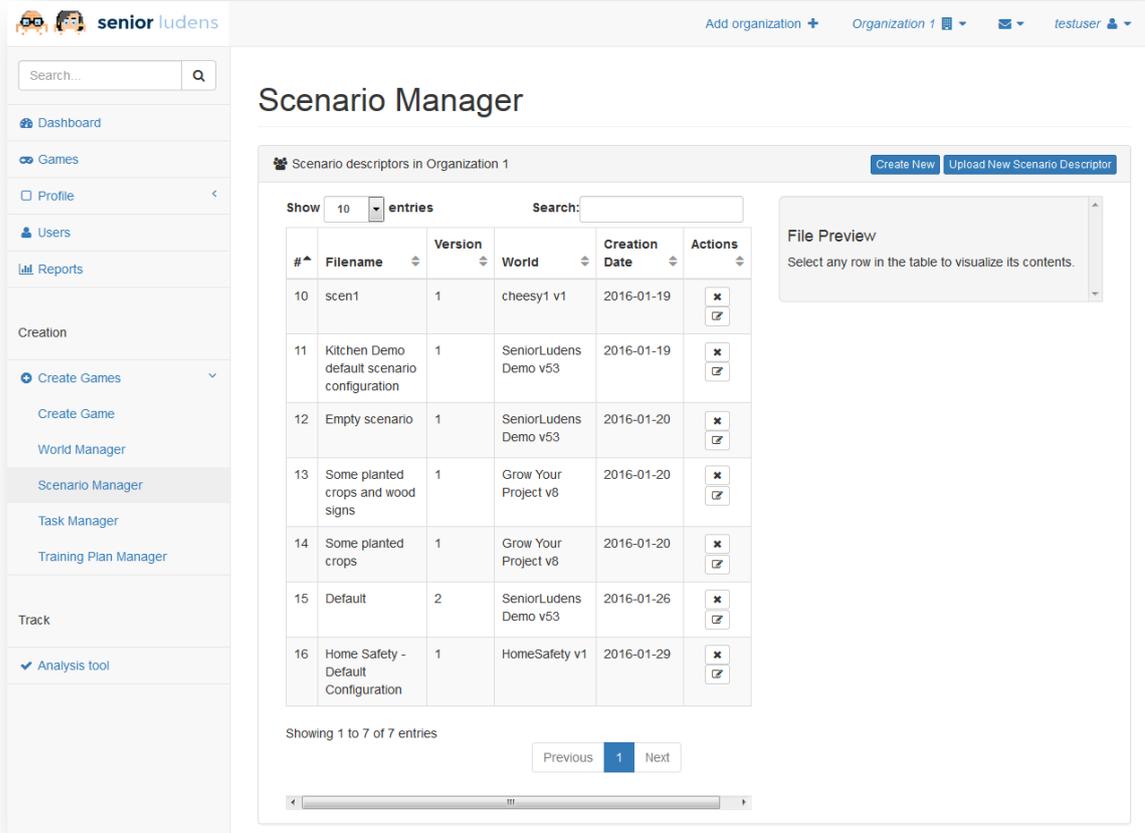
The researcher will go very briefly through the different functions included in this menu.

- a) **World Manager:** This manager view provides access to the existing world descriptors in the current organization. The world descriptor is explained below in the section Game Creation Chain. In the view, the different descriptors can be organized by version, filename, and creation date. The function of uploading new descriptors is also available in the view.



The researcher does not go into detail in this feature, as the data needed for the validation has been deployed previously by the SeniorLudens' Team.

- b) **Scenario Manager:** The view shows the scenario descriptors in the system in the selected organization. The view also permits to Game Designers uploading existing descriptors from their computers or create new scenarios by using the Scenario Editor Tool. If the designers want to create a new scenario descriptor, a modal view is shown in which the user must choose the existing world over which will be created the new scenario descriptor. Consequently the Scenario Editor Tool will be visualized with this world.



Scenario descriptors in Organization 1

Create New Upload New Scenario Descriptor

Show 10 entries Search:

#	Filename	Version	World	Creation Date	Actions
10	scen1	1	cheesy1 v1	2016-01-19	[x] [check]
11	Kitchen Demo default scenario configuration	1	SeniorLudens Demo v53	2016-01-19	[x] [check]
12	Empty scenario	1	SeniorLudens Demo v53	2016-01-20	[x] [check]
13	Some planted crops and wood signs	1	Grow Your Project v8	2016-01-20	[x] [check]
14	Some planted crops	1	Grow Your Project v8	2016-01-20	[x] [check]
15	Default	2	SeniorLudens Demo v53	2016-01-26	[x] [check]
16	Home Safety - Default Configuration	1	HomeSafety v1	2016-01-29	[x] [check]

Showing 1 to 7 of 7 entries

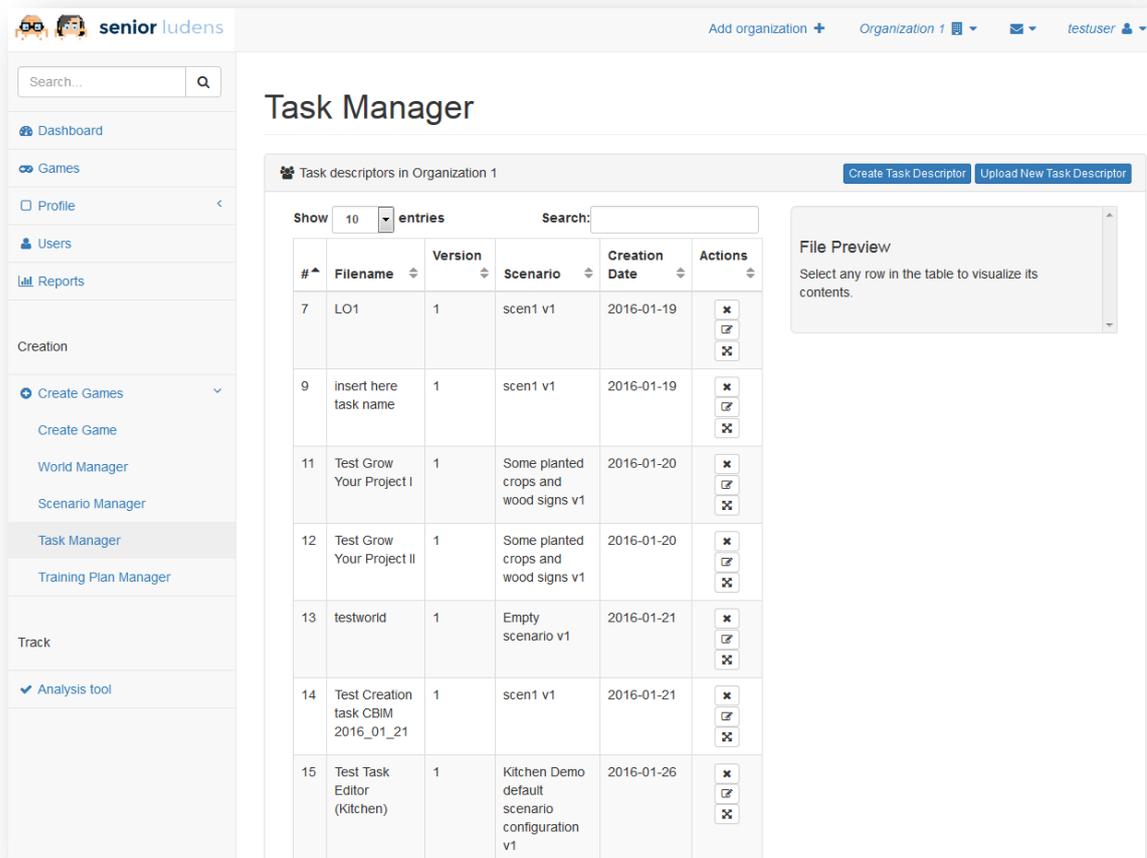
Previous 1 Next

File Preview
Select any row in the table to visualize its contents.

The Scenario Manager also permits to edit the existing scenario descriptors by clicking in the row button actions.

The Researcher will show the possibilities of Scenario Manager to the users.

- c) **Task Manager:** This view permits the users to access the task descriptors available in the selected organization. It provides access to Task Editor Tool. In the same way as Scenario Manager does, it permits to Game Designers to upload existing descriptors and create new by choosing the scenario descriptor in which the new task descriptor is going to be based. Besides it is possible to edit existing task descriptors by clicking the action button in each row of the table. In addition it is possible to simulate the existing task by clicking on the expand button of each row. This last action will fire the Simulator that will show to the users how is working the selected task.



Task Manager

Task descriptors in Organization 1

Create Task Descriptor Upload New Task Descriptor

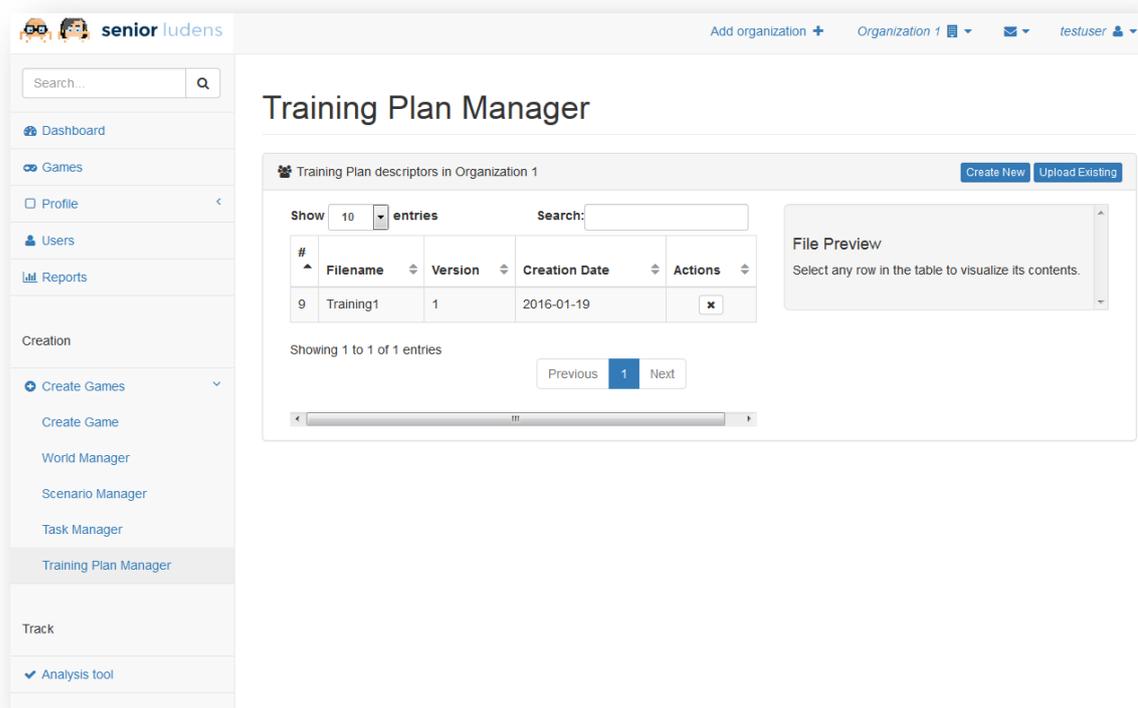
Show 10 entries Search:

#	Filename	Version	Scenario	Creation Date	Actions
7	LO1	1	scen1 v1	2016-01-19	[x] [edit] [delete]
9	insert here task name	1	scen1 v1	2016-01-19	[x] [edit] [delete]
11	Test Grow Your Project I	1	Some planted crops and wood signs v1	2016-01-20	[x] [edit] [delete]
12	Test Grow Your Project II	1	Some planted crops and wood signs v1	2016-01-20	[x] [edit] [delete]
13	testworld	1	Empty scenario v1	2016-01-21	[x] [edit] [delete]
14	Test Creation task CBIM 2016_01_21	1	scen1 v1	2016-01-21	[x] [edit] [delete]
15	Test Task Editor (Kitchen)	1	Kitchen Demo default scenario configuration v1	2016-01-26	[x] [edit] [delete]

File Preview
Select any row in the table to visualize its contents.

The researcher will review briefly the possibilities of the task manager.

- d) **Training Plan Manager:** This view follows the same pattern of the previous ones, but in this case it manages the existing training plan descriptors in the system. It permits the upload of any existing descriptor in the users' computers and the creation of new descriptors by using the Training Program Editor Tool. The tool has been developed and is fully functional by clicking the "create new" button, but it is not fully integrated with the storage server yet.



The researcher shows briefly to the user this view. However, this view is outside the second validation because it is not fully integrated with the game creation process workflow.

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 accessed through the World Manager.
 - 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. This stage is accessed through the Scenario Manager.
 - 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. This stage is accessed through the Task Manager.

- 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 by joining tasks defined in task descriptors. It is created with the Program Training Editor Tool, which is integrated in SeniorLudens platform (not fully integrated yet in this validation). This tool lets the users to define the difficulty of the levels creating the Training Plan xml descriptor file. This stage is accessed through the Training Plan Manager. However it will not be covered in the validation session.

- After all these steps are completed, we can go back to the game creation process in the platform. A game in SeniorLudens is composed by a Game with several activities that corresponds with the individual Serious Games that shapes the Game.

- Thus we can define uniquely our Serious Game, and we can publish them as activities into a game in the platform (through the administration portal), naming the game, defining a version, and selecting the built descriptor files. Once the activity is created, the user responsible in the organization will accept and will publish the activity 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. **The researcher will access the Scenario editor by using the Scenario Manager View explained before.**
 - **Task Editor:** The demo will follow with the Task Editor script and questions. **The researcher will access the Task Editor by using the Task Editor View explained before.**
 - **Training Plan Editor:** **This function has been developed, but it is not fully integrated. Because of this the researcher will explain to the users that will be covered in the next validation and development cycle.**
 - **Create Game:** This is the step in the game creation chain in which we create a game in the organization. This Game can be considered as a container of different Activities which will be considered as the Serious Games that are playable in SeniorLudens System. This step is explained after the Scenario Editor and Task Editor scripts and questionnaires.
 - **Create Activity:** When the game is created, the activities can be deployed inside it. These activities are considered as the Serious Games generated in the system by the conjunction of the descriptors explained above. These descriptors define uniquely the Serious Game in the system. This step is explained after the Scenario Editor and Task Editor scripts and questionnaires.

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.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 37
	WP4 – Pilot evaluation	

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.

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.”

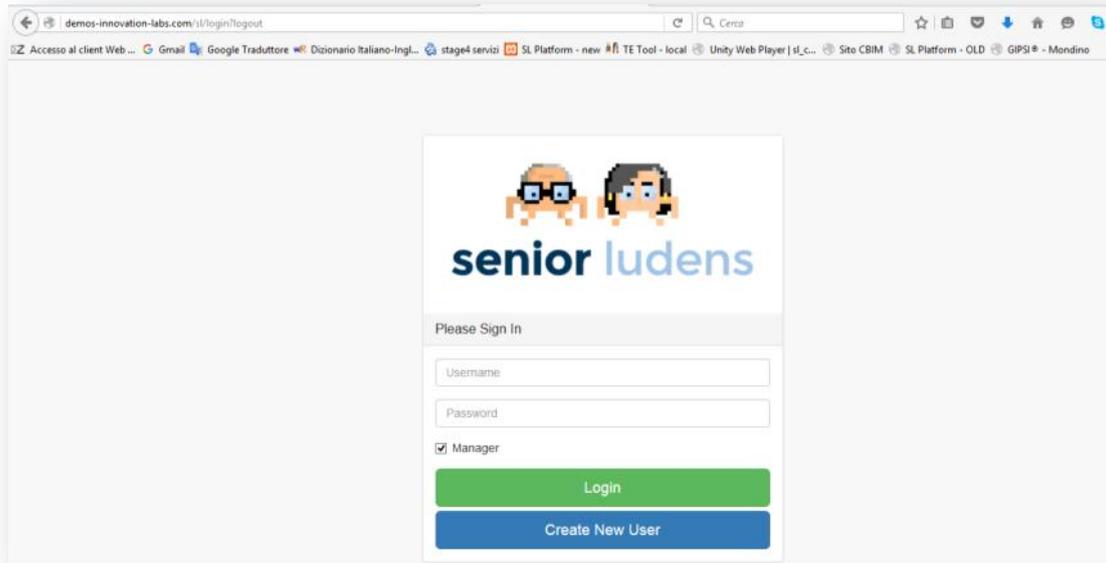
Task Editor testing procedure

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

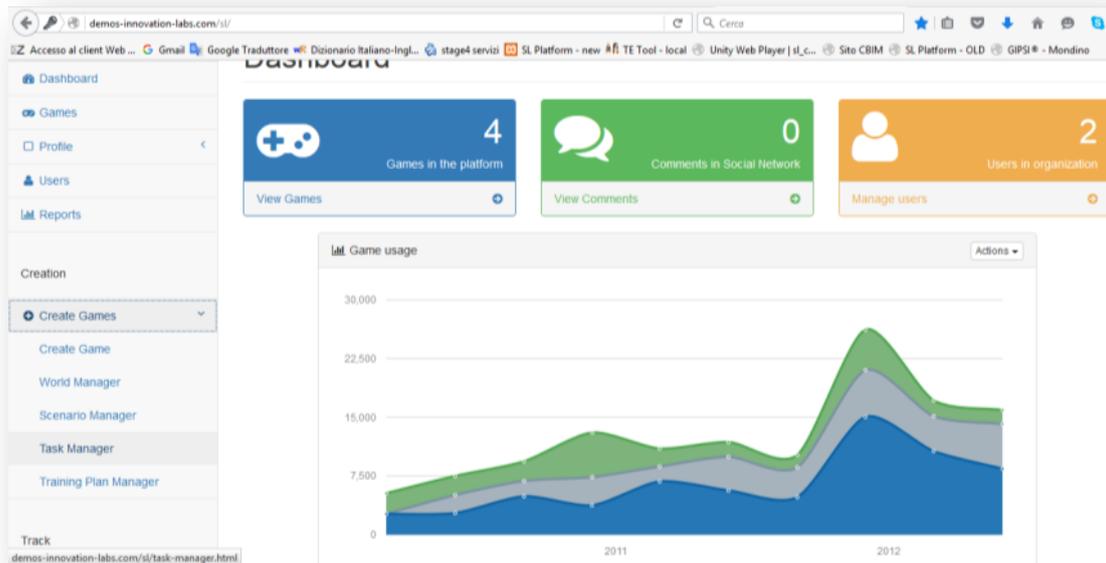
1. HOW TO LAUNCH TASK EDITOR TOOL

After SL Platform (demos-innovation-labs.com/sl) authentication enabling check Manager:

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 38
	WP4 – Pilot evaluation	

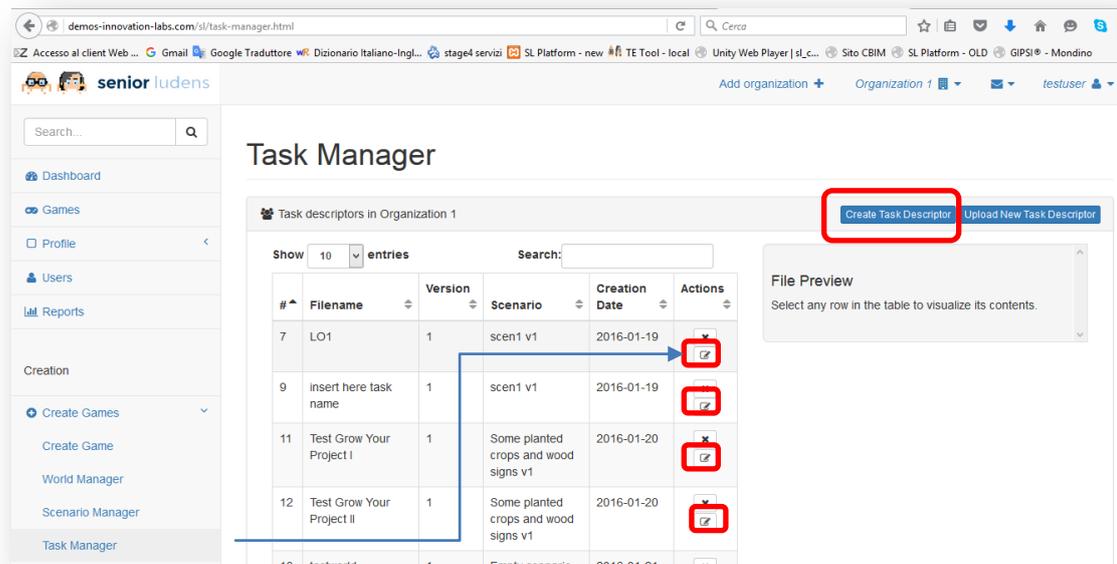


you should browse left menu (Create Game/Task Manager) as follow:



Clicking Task Manager left link menu, you can see relative page as follow:

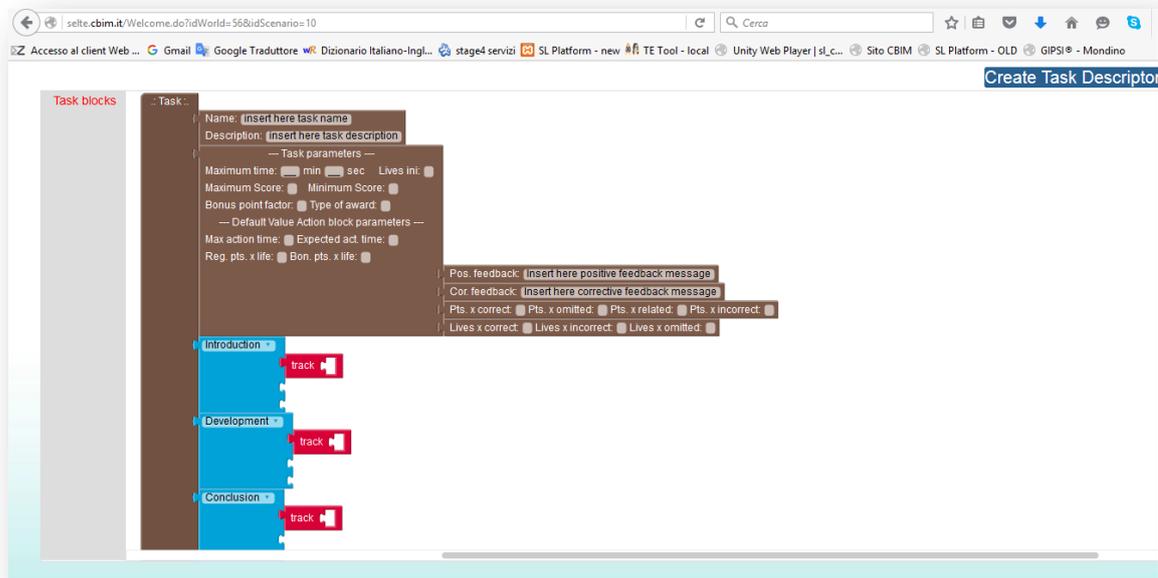
Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 39
	WP4 – Pilot evaluation	



After clicking:

- Modify button , you could launch TE tool able to modify the selected existing task
- Create Task Descriptor button, you could launch TE tool able to create new task

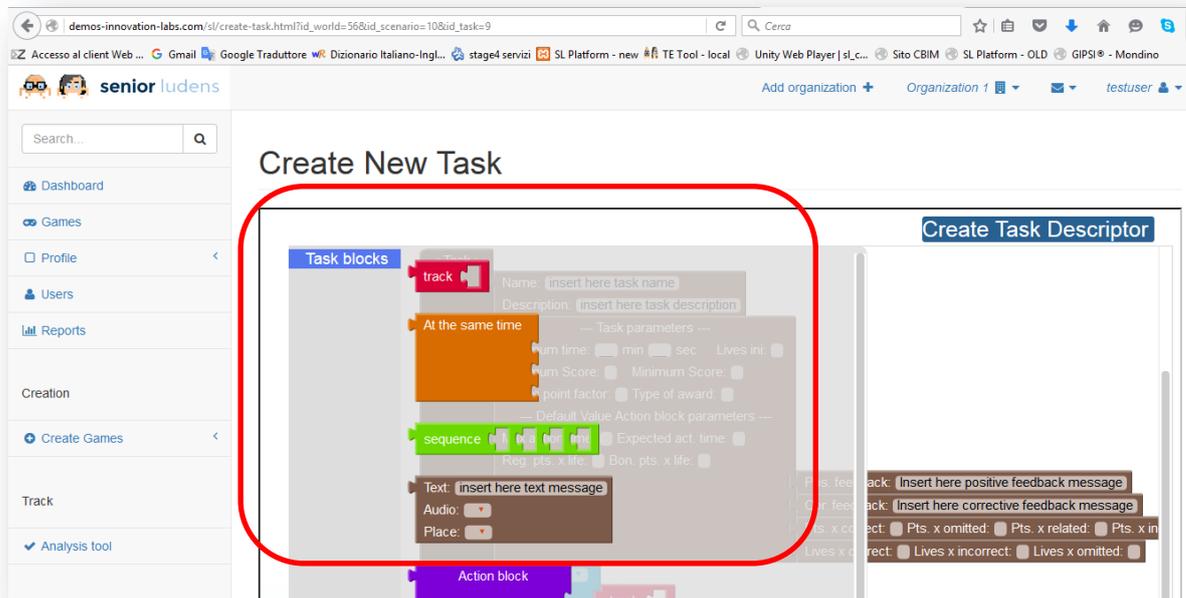
An important precondition is that when we going to open TE tool to create a new task, there are some mandatory blocks included into workspace yet, as following:



So, we aren't able to remove them, but we have only the permissions to add new ones included into Task Block Bar.

2. INCLUDE NEW BLOCKS

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



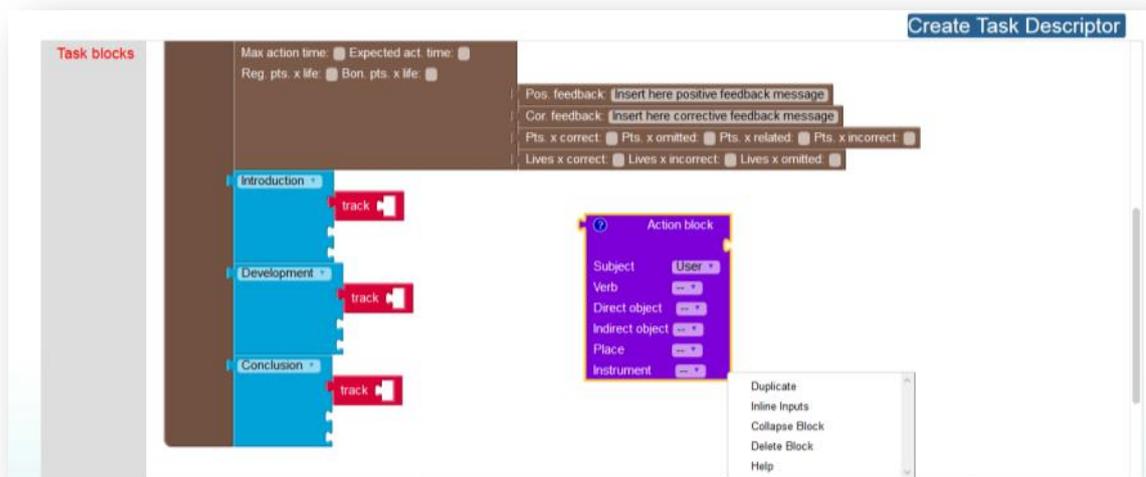
1. MODIFY ALL TYPE OF MODULE

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:

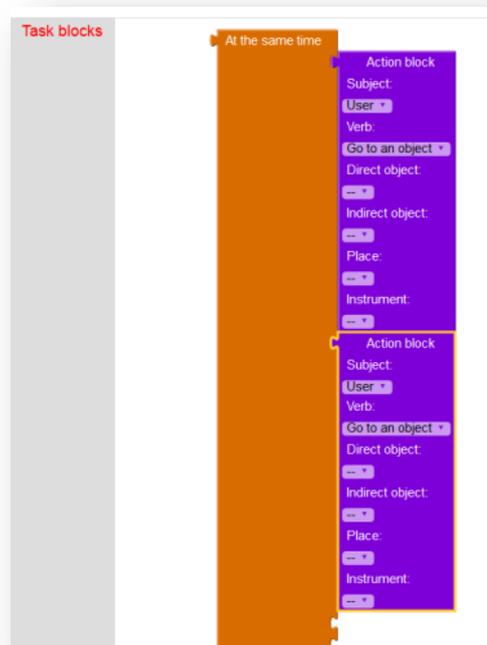
Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 41
	WP4 – Pilot evaluation	



2. 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 executed, 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 blocks into this one as follows:

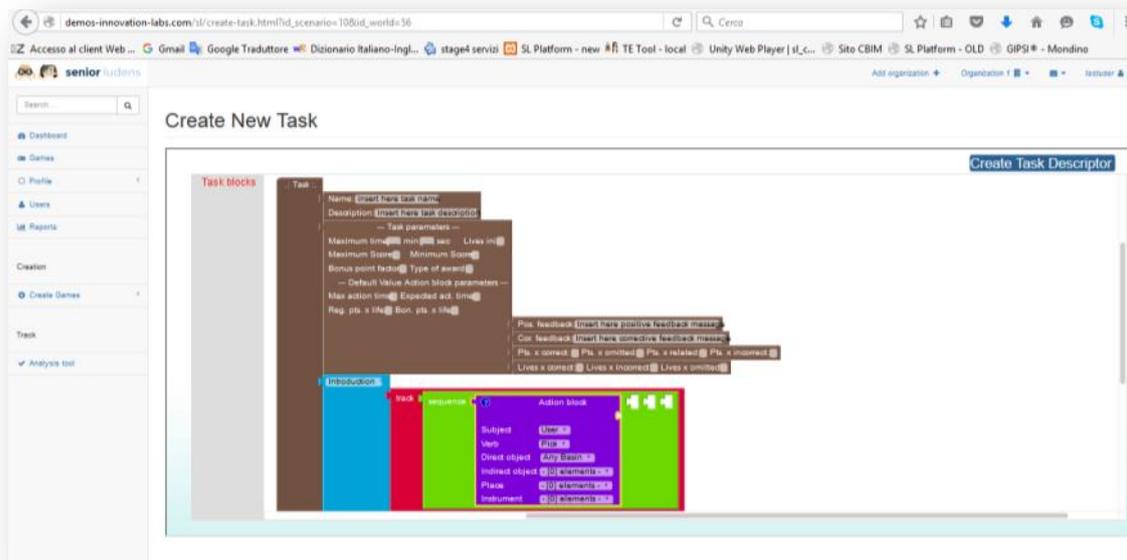


3. WE CREATE A NEW TASK

After execution of the steps listed in 2.1 (Launch Task Editor), we should:

1. click “Create Task descriptor” button
2. select relative scenario
3. launch TE tool in creation phase.

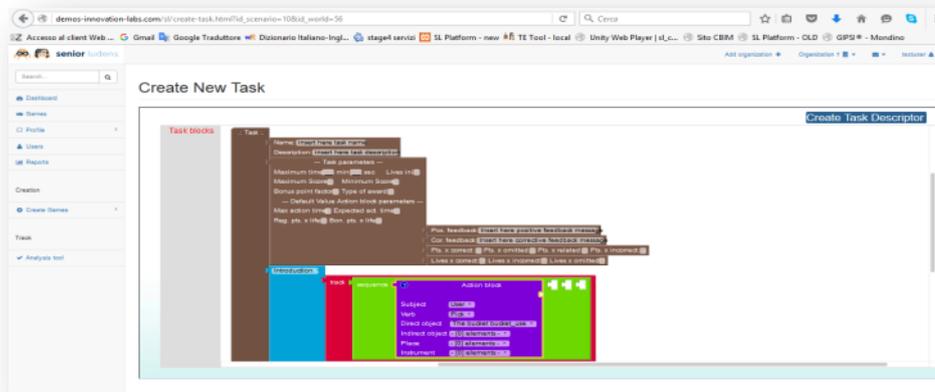
For instance, we want create a task to pick a basin of the scenario:



4. 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 instance, we can call back the task created in the previous point and then we modify it to pick to a specific bucket identifier instead of the basin identifier. As you can see in the following flow:

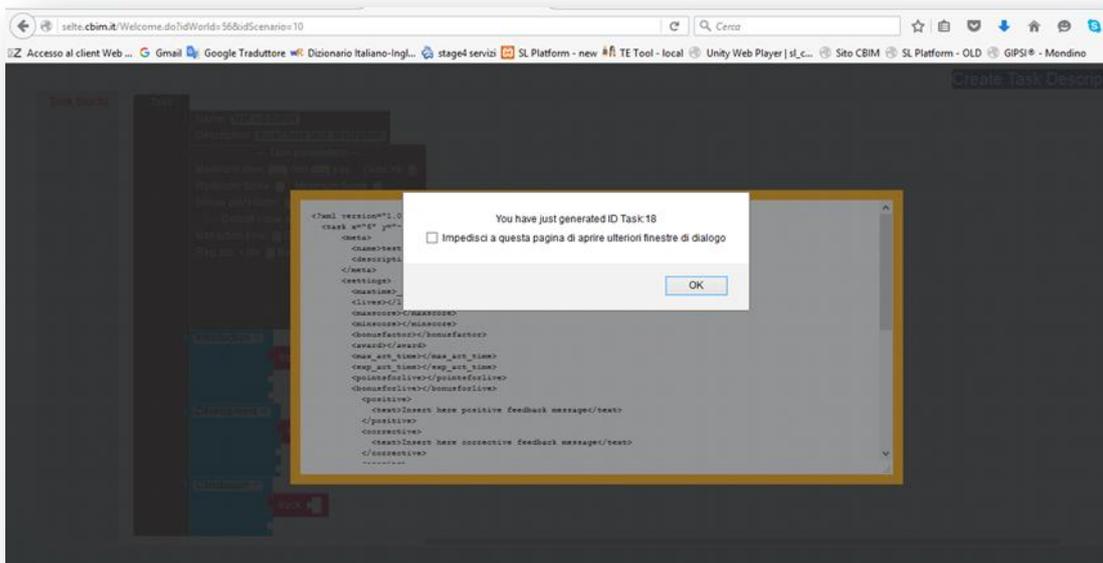


Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 43
	WP4 – Pilot evaluation	

5. WE SAVE THE NEW TASK

To save the new task just created, we should click simply “Create task descriptor” button.
The results of this operation are:

1. Generation of the Task descriptor
2. Update of this task descriptor into Storage server
3. Visualization of the relative task id associated to this task just saved

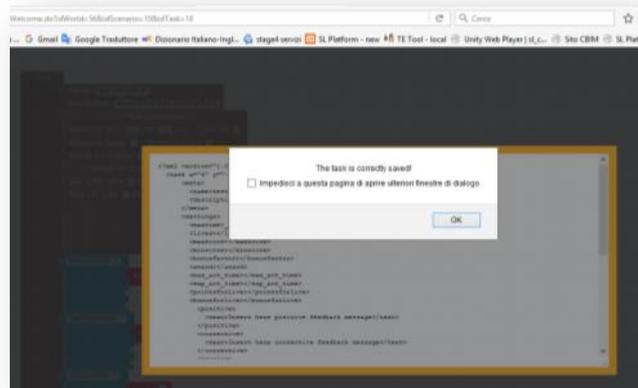


6. WE SAVE AN EXISTING TASK

To save an existing task just modified, we should click simply “Modify task descriptor” button.
The results of this operation are:

1. Update of the existing Task descriptor
2. Visualization of the storage server updating operation result

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 44
	WP4 – Pilot evaluation	



Task Editor Questionnaire

The researcher administrates the Task Editor questionnaire (see **ANNEX C.2**) to the user.

Training Plan Editor

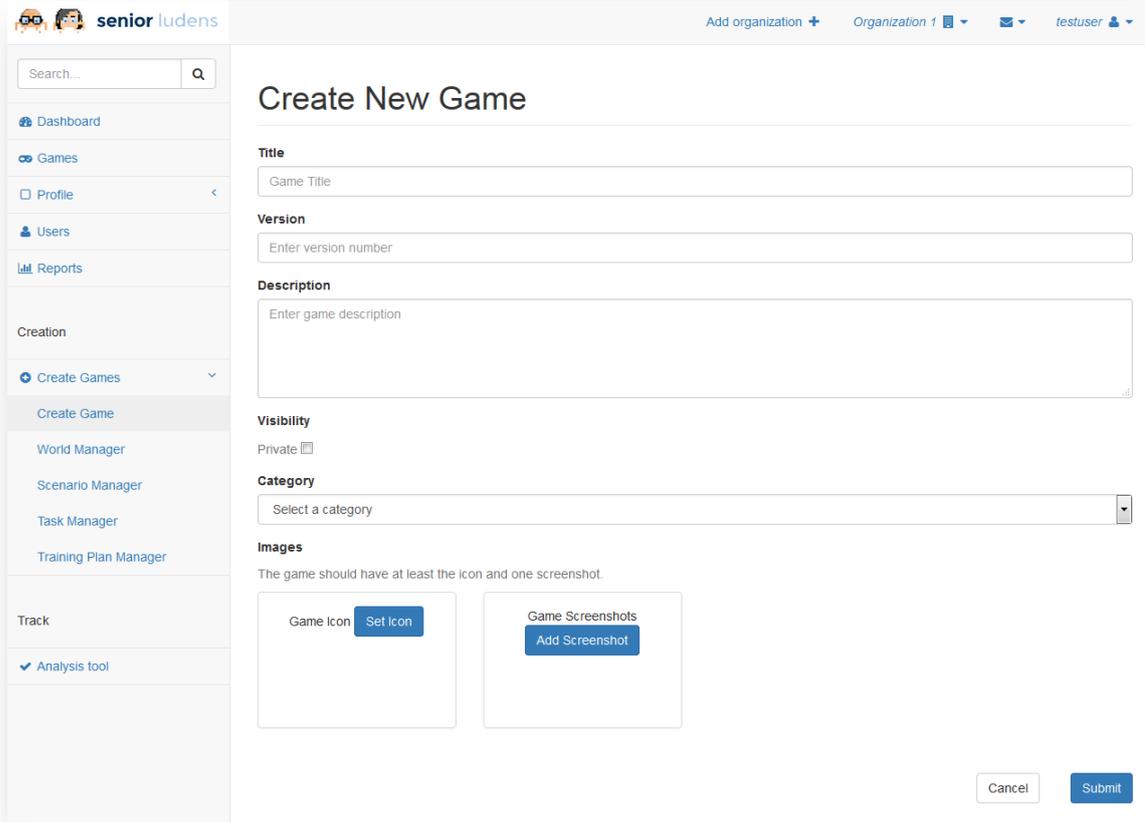
It has been developed but is not fully integrated. The researcher can explain to the user that will be validated in the next assessment.

Create Game

This step is very relevant in the game creation chain, as it creates a new game and includes it in the game catalog of the selected organization. This game agglutinates the general information that will be visible to the trainee users. In addition, this game provides access to the multiple Activities that are meant as the playable Serious Games. The Game itself will be accessible through the game catalog.

It is accessed by the selecting Create Game option in Create Games side menu.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 45
	WP4 – Pilot evaluation	

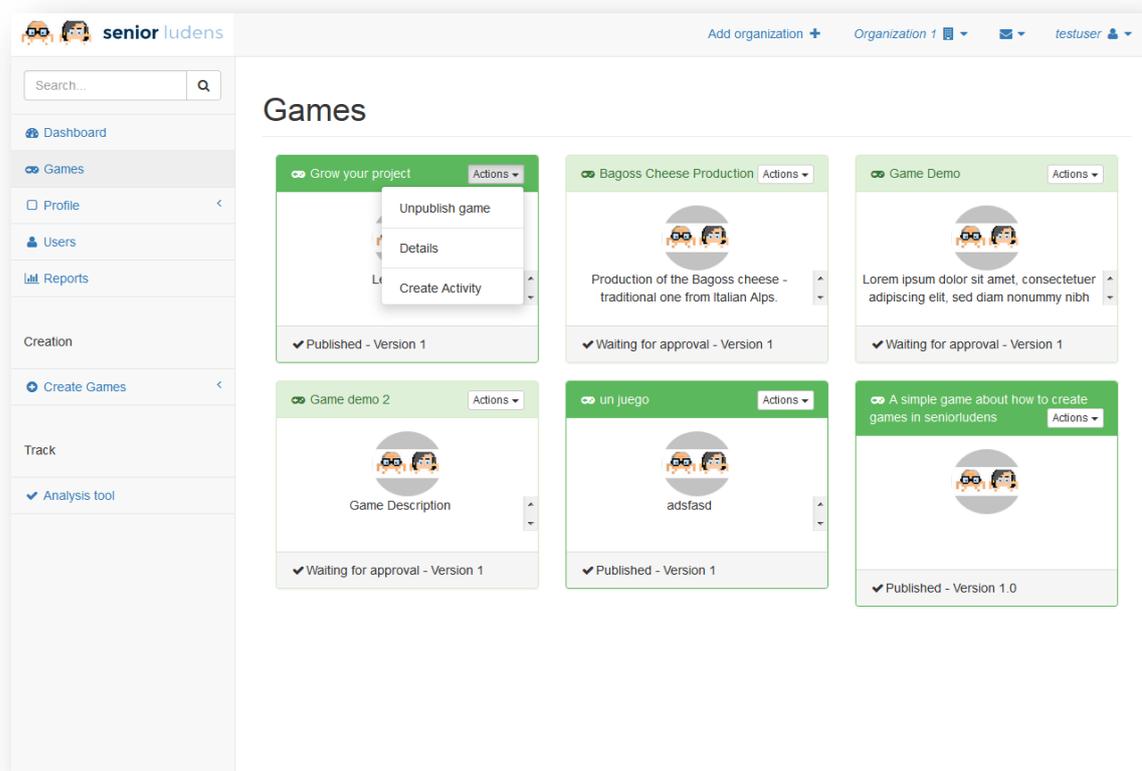


The screenshot shows the 'Create New Game' interface. On the left is a navigation sidebar with options like Dashboard, Games, Profile, Users, Reports, and Analysis tool. The main area contains the form with the following sections: 'Title' (text input), 'Version' (text input), 'Description' (text area), 'Visibility' (checkbox for 'Private'), 'Category' (dropdown menu), and 'Images' (two boxes for 'Game Icon' and 'Game Screenshots' with 'Set Icon' and 'Add Screenshot' buttons). At the bottom right are 'Cancel' and 'Submit' buttons.

The researcher will go through the view, filling the example Game fields with the user. The researcher explains to the user that the private checkbox enable the game to be only visible to those users who belong to the owner organization in which the game is being published. The game images and screenshots are not supported in this version and will be validated in the next assessment.

After doing this, the game will be visible in the game catalog.

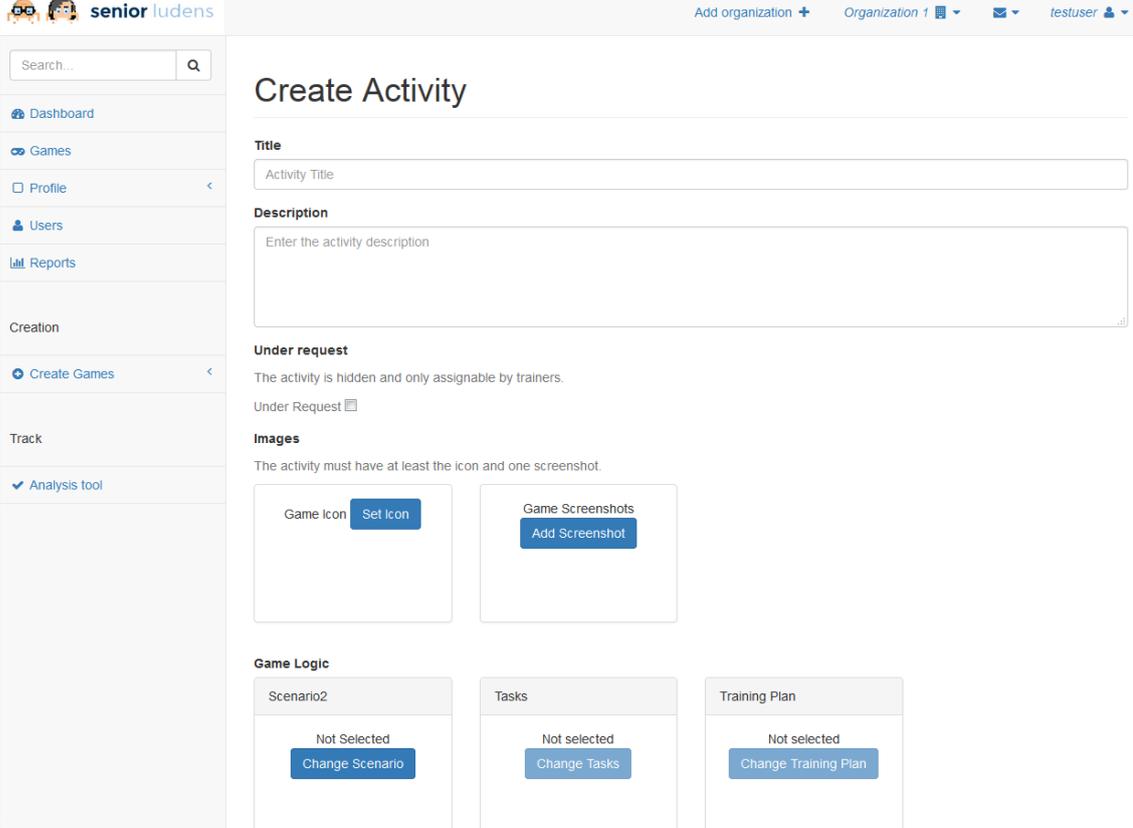
- a) **Game Catalog:** This view is intended to manage the games published in the platform. Using the actions folded menu on the top of each game, the user is able to modify the game, update the game details, publish and unpublish the game in the organization.
 - **The researcher goes through this view detailing to the user the possibilities that are enabled over the deployed games.**
 - **The researcher indicates the user to accept the game.** By doing it the game will be published into the catalog and will be visible for the trainees.



b) **Create Activity:** By clicking on the create Activity action in the actions of the game, we can add Serious Games developed by the platform inside the Game that was created in the SeniorLudens system. This activity is meant as a playable Serious Game.

The view requests all the data needed to identify the Serious Game in the system, specially the descriptors that identify the game uniquely. This is the connection with the managers reviewed in the first part of the validation session.

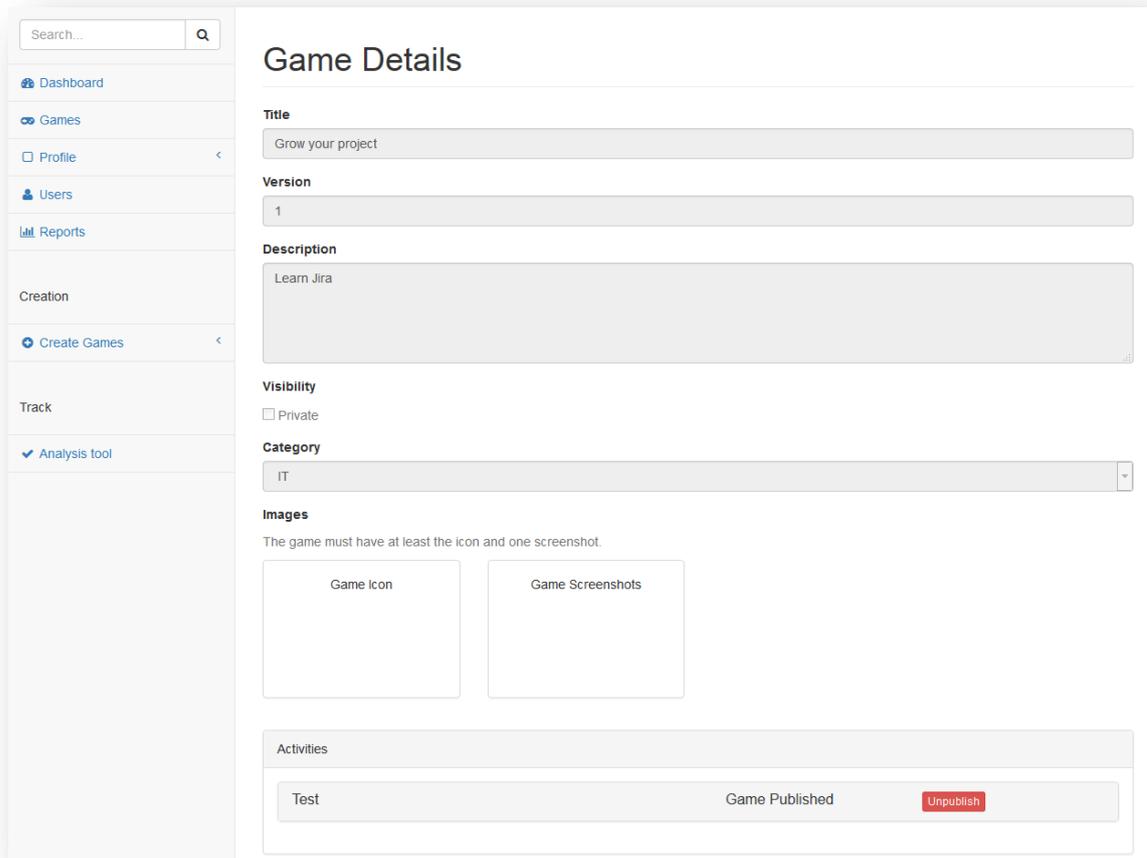
- **The researcher shows briefly the functionality of the view to the user. In particular, shows how to choose the game logic by selecting the descriptors starting by the scenario, the task, and finally the training plan. By selecting these three, the simulate button is visible and the game can be tested before creating the activity.**
- **The images, icons and screenshots are not covered in this release, but will be included in the next validation.**



The screenshot shows the 'Create Activity' interface. On the left is a navigation sidebar with options like Dashboard, Games, Profile, Users, Reports, and Analysis tool. The main area contains the following sections:

- Title:** A text input field containing 'Activity Title'.
- Description:** A large text area with the placeholder 'Enter the activity description'.
- Under request:** A section with the text 'The activity is hidden and only assignable by trainers.' and a checkbox labeled 'Under Request'.
- Images:** A section with the text 'The activity must have at least the icon and one screenshot.' It contains two boxes: 'Game Icon' with a 'Set Icon' button, and 'Game Screenshots' with an 'Add Screenshot' button.
- Game Logic:** Three separate boxes for 'Scenario2', 'Tasks', and 'Training Plan'. Each box shows 'Not Selected' and a corresponding 'Change' button (e.g., 'Change Scenario', 'Change Tasks', 'Change Training Plan').

- c) **Game Details:** After creating the Activity, the view is redirected to the game details. It can be accessed as well using the game catalog and clicking on game details option. The view shows the game information, and also includes the list of all the activities included in the game. By clicking on the activity name, the information is unfolded showing three fields: the game information, the descriptors and the images. The images are not included in the current validation. The user with proper role is able to accept the activity if it is a new activity or reject it.
- **The researcher guides the user in the view, finally accepting the activity.**
 - **Once the Activity is accepted, the SeriousGame associated is deployed and is accessible by the trainees with permissions in the organization.**
 - **The researcher logs out and logs in with the player user in the trainee portal without ticking in the manager checkbox (see secondary script for details). The researcher shows the game to the user by clicking on the activity of the game.**



Game Details

Title
Grow your project

Version
1

Description
Learn Jira

Visibility
 Private

Category
IT

Images
The game must have at least the icon and one screenshot.

Game Icon Game Screenshots

Activities

Test Game Published Unpublish

Platform management questionnaires

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

In-game Phase (Use case Games)

Use case exploration script

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

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 MS Explorer navigator - not Google Chrome):
<http://demos-innovation-labs.com/sl/>
username/password: testindra/test with **manager** clicked

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 49
	WP4 – Pilot evaluation	

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 MS Explorer navigator - not Google Chrome):
<http://demos-innovation-labs.com/sl/>
username/password: testfcg/test with **manager** clicked

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 MS Explorer navigator - not Google Chrome):
<http://demos-innovation-labs.com/sl/>
username/password: testcbim/test with **manager** clicked

Home safety use Case

The researcher shows to the user the use case following the relative script (**ANNEX D.4**). 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 MS Explorer navigator - not Google Chrome):
<http://demos-innovation-labs.com/sl/>
username/password: testkbo/test with **manager** clicked

Use case evaluation

The user is provided with the collaborative walkthrough questionnaire (**Annex D.5**) about the functionalities of the game.

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**)

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 50
	WP4 – Pilot evaluation	

Internal protocols : secondary users

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 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 MS Explorer 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	Annex	Timing	SGS
Pre-game	Introduction to the project		10 min.	1-2-3-4
	Informed Consent signature	A		1-2-3-4
	Questionnaire personal characteristics	B.1		1-2-3-4
	Affect Assessment questionnaire - PANAS	B.2		1-2-3-4
In game (platform)	Platform trainee script Platform trainee questionnaire	C.1sec	10 min.	1-2-3-4
	In-game (game)	Use-case script and questionnaire	20 min.	1-2-3
Collaborative walkthrough questionnaire		D.5		1-2-3-4
Post-game	SUS	E.1	10 min.	1-2-3-4
	IMI scale	E.2		1-2-3-4
	FSS	E.3		1-2-3-4
	Affect Assessment questionnaire - PANAS	E.4		1-2-3-4

Table 15. Second evaluation session schedule

Pre-game Phase

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.”*

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”.

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 (see **Annex B.2**).

In-game Phase (Platform)

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

Platform trainee script

3. **User login:** the user validates with the test username without ticking the manager checkbox. The game catalog view is opened.

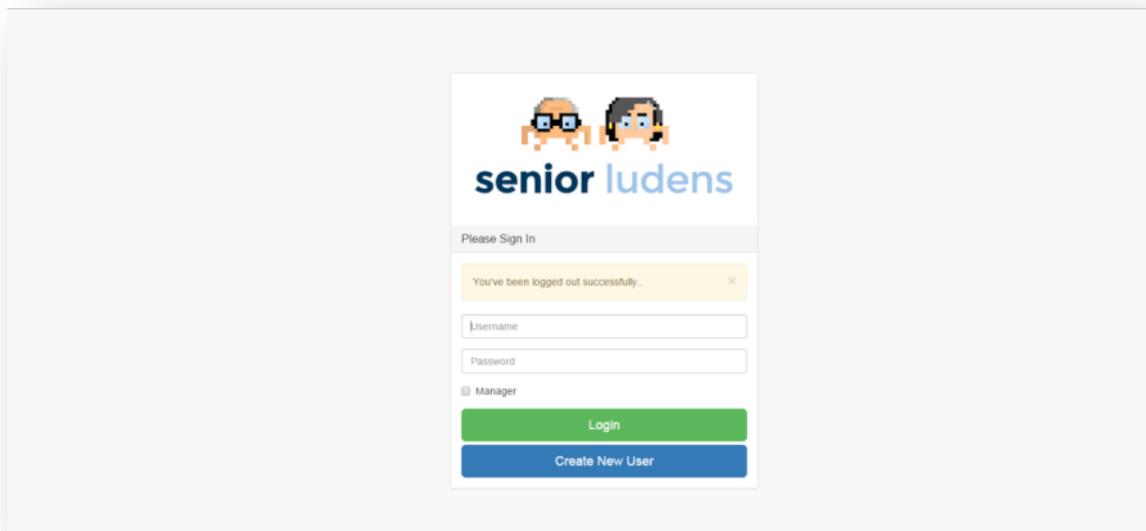
The researcher has the access to the platform located at:

<http://demos-innovation-labs.com/sl>

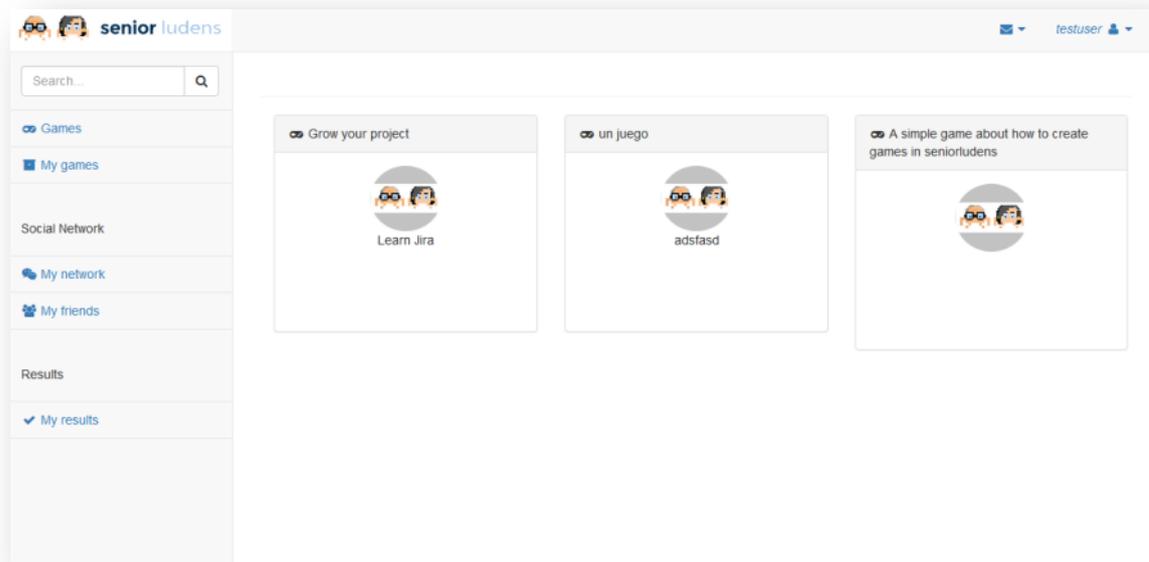
The user and password by organization corresponds with the following table (username/pass):

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 52
	WP4 – Pilot evaluation	

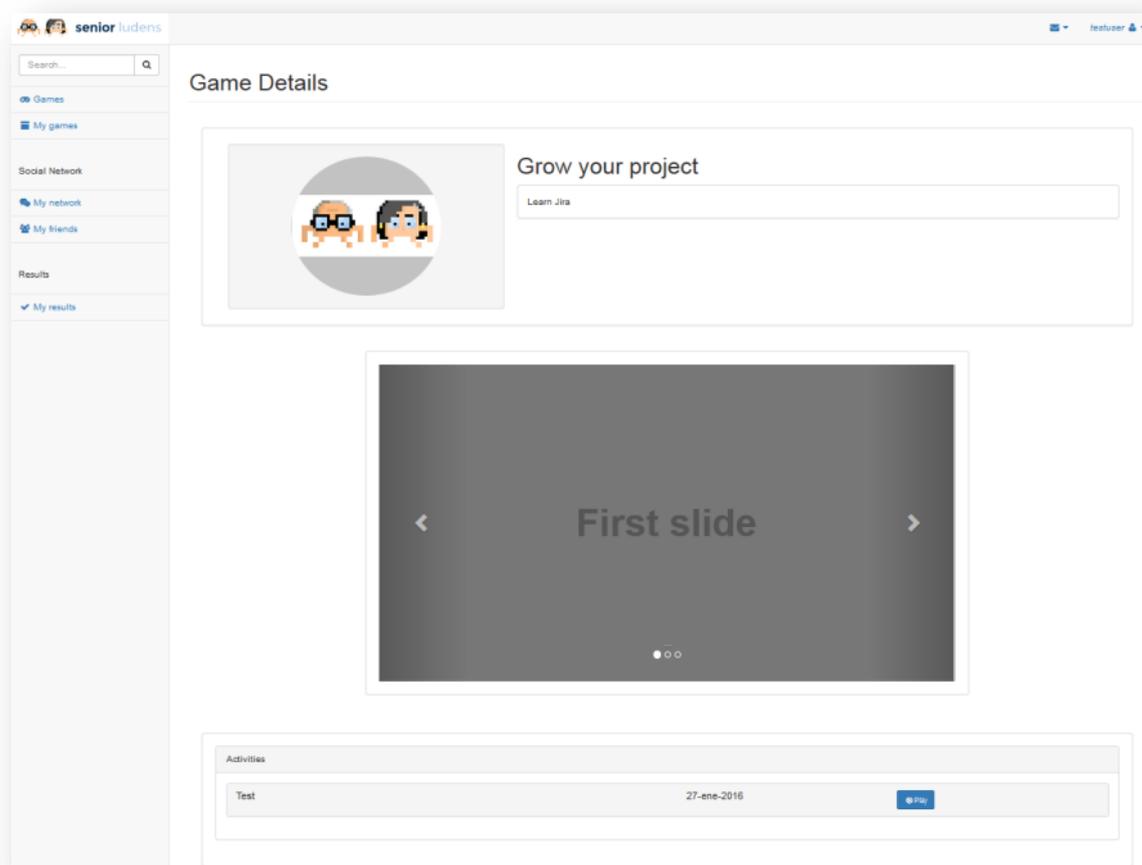
Partner	Organization	Manager User	Trainee User
Indra	Second Validation Indra	testindra/test	playindra/play
CBIM	Second Validation CBIM	testcbim/test	playcbim/play
FCG	Second Validation FCG	testfcg/test	playfcg/play
KBO	Second Validation KBO	testkbo/test	playkbo/play



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.**
 - **After this, the researcher clicks on a game of the catalog (the game should be the one under assessment depending of the consortium partner) and the view is redirected to the details of the selected game.**

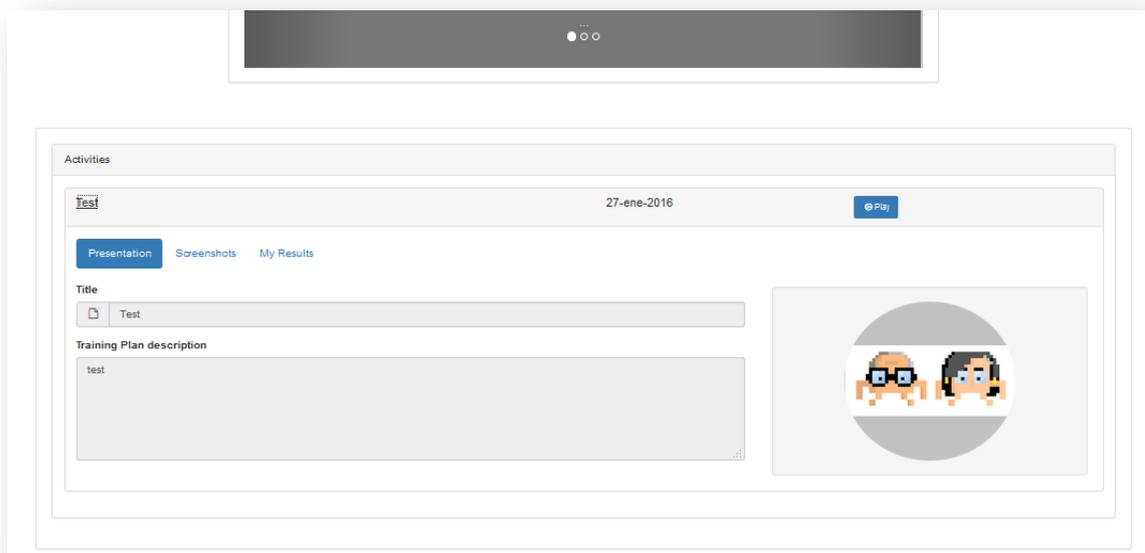


2. **Game details:** After clicking on a game of the catalog, the details view is loaded. In it can be seen the details of the game and all the activities deployed inside the game. The activities are considered as the SeriousGames developed with SeniorLudens System.
- **The researcher explains to the user that the images and screenshots are not validated in this phase, but will be covered in the next assessment.**

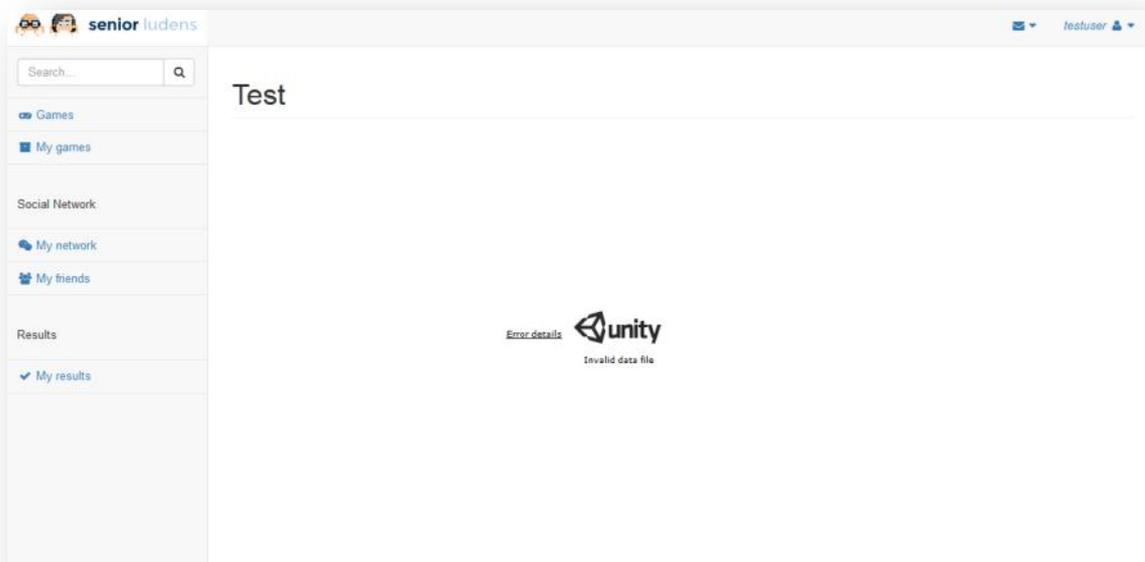


Activity details: When the user clicks on the name of an activity in the details view, the information of this Activity is unfolded. This information includes the title, description, the screenshots and the results of the user if the game was played before.

- **The researcher explains this information to the user**
- **The screenshots and results are not covered in this evaluation. However the results are integrated as well in the side menu through the ‘My results’ function. Nonetheless this functionality is not covered in the current assessment.**



3. **Play game:** By clicking on the play button on each activity, the selected activity is launched to be played by the user. The new view loads the unity executable and the game is visualized asking for the user interactions.
 - **The researcher guides the user to play the game from the game details view.**



Platform trainee questionnaire

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

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 56
	WP4 – Pilot evaluation	

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 view.

Use case exploration script

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

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 MS Explorer navigator - not Google Chrome):
- Login into SeniorLudens platform: <http://demos-innovation-labs.com/sl/login/>
username/password: playindra/play

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 MS Explorer navigator - not Google Chrome):
- Login into SeniorLudens platform: <http://demos-innovation-labs.com/sl/login/>
username/password: playfcg/play

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 MS Explorer navigator - not Google Chrome):
- Login into SeniorLudens platform: <http://demos-innovation-labs.com/sl/login/>
username/password: playcbim/play

Use case evaluation

The user is provided with the collaborative walkthrough questionnaire (**Annex D.5**) about the functionalities of the game.

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**)

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 57
	WP4 – Pilot evaluation	

Extra evaluation of elders group

In the first validation session, a very basic version of the platform was shown to the elderly. It appeared to be hard for this group of test-users to test the platform and to imagine where the platform could be used for. Therefore, in the second stage, the functionality and usability of the platform was also tested by asking elderly users to create a game. For this purpose, for this second evaluation session the extra use-case scenario 'Safety at Home' was defined, fitting in the domain of elderly volunteers of UniekBO..

There were several multiple reasons to organize this additional validation:

- In the protocolled sessions, the test-users had restricted time and a strict script. We assumed that if the elderly test-users have more time, more own ideas could be executed.
- The aim of this session was not to test whether the platform is functional within the time, but to explore the multiple possibilities when seniors get the chance to explore the possibilities their selves. Many elderly people are insecure to use new technology. They may be negative about the system when they get stuck. Working together, they could figure out difficulties together and help each other.
- During this session we could collect more qualitative information about how the testers experienced the system. We did observations, listened to conversations and asked (and answered) in depth questions. This was hard to put in a protocol or to compare with other sessions, so the protocolled test sessions were still necessary, but this session provided a lot of valuable extra information.
- Next to verbal information, we could collect visual material (photo's, video). Of course with permission of the participants. We can analyze these visuals, but also use it for promotional purposes. UniekBO for instance will make a report in the magazine.

This extra validation took place in two steps. First the end-users were involved in the creation of the environment (World) to guarantee the suitability of the scenario's and tasks for this new use-case. This was done in a user requirements session which is described below. Second, the generated toolkit was tested on usability.

User requirements session

In order to define the user requirements of the new use case for elders, a focus group took place in UniekBO.

The group session - attended by 12 elderly volunteers safety at home - started with an introduction of the project SeniorLudens, serious gaming and the role of the seniors as end-users. Aim of this session was to gather basic user requirements for the game concerning Safety at Home. During this session the safety elements in the whole house were discussed step by step, starting outside, getting into the house at the ground floor and eventually upstairs. The first prototype would focus on the kitchen, but since these elderly advisors had a lot of experience, knowledge and ideas, this session had a broader scope.

According to the attendees, safety at home was (mainly) about prevention of burglary; chat-tricks; physical safety of the elderly and digital safety. Especially (physical) house related issues were discussed, since these elements are most easy to visualize, and therefore more suitable to integrate in a game. The list with results/gathered elements served as input for UPC to create a World with the right elements available. The results of the user requirements group session can be found in Annex F.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 58
	WP4 – Pilot evaluation	

Internal protocol for elders users

Test session

Once the World was created, based on the input from the user requirements session, the elderly test-users tested the platform on usability on creating – in a group - a task concerning Safety at Home (their own ‘game’). This session took a half afternoon (2 hours).

In this session, 8 end-users were distributed among three groups. All of them were elderly advisors safety at home in the Netherlands. Seven of them also participated in the brainstorming focus group session to collect the requirements and all of them participated in the morning in the protocolled validation sessions as described in paragraph 2.1. So they had least basic experience with the platform. An extra benefit is that among these test-users already baseline information is collected, which makes it easier to analyze the data.

All groups got a laptop to work on and worked in the same room. A script was provided in Dutch (translated version of D4.2) to guide the participants through the session and provide them translations on paper of frequently used items. But next to the script, the elderly were free to experiment with the platform. They got the free assignment to ‘create a task to promote/educate safety at home’ to their colleague elderly advisors, with an example as provided by UPC. Since they already followed the morning validation session, they basically know how to start. The test-users were allowed (even stimulated!) to discuss within the group and to ask questions to the facilitators. This could be either technical questions or questions about the process/assignment. So we could easily find out which pitfalls were and what the elderly advisors find either motivating or difficult in using the program.

Different than in the regular validation session, no extensive questionnaires were taken before or after the session about the task creating process. Feedback was collected only by qualitative methods: observations, making notes of asked questions and a plenary feedback moment afterwards.

After the task was created, the participants were asked to test a task that one of the other groups created.

	Sub-phase	Annex	Timing
Pre-game	Introduction to the program		10 min
	Informed Consent signature	A	
In-game	Free time to create a game in the group	D4.2	90 min
In-between	Groups will test each other games as secondary users		15 min
Post-game	Plenary wrap-up/feedback session with all participants to collect general experiences.		20 min

Table 16- Planning of the activities scheduled for the extra session of the elderly sample

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 59
	WP4 – Pilot evaluation	

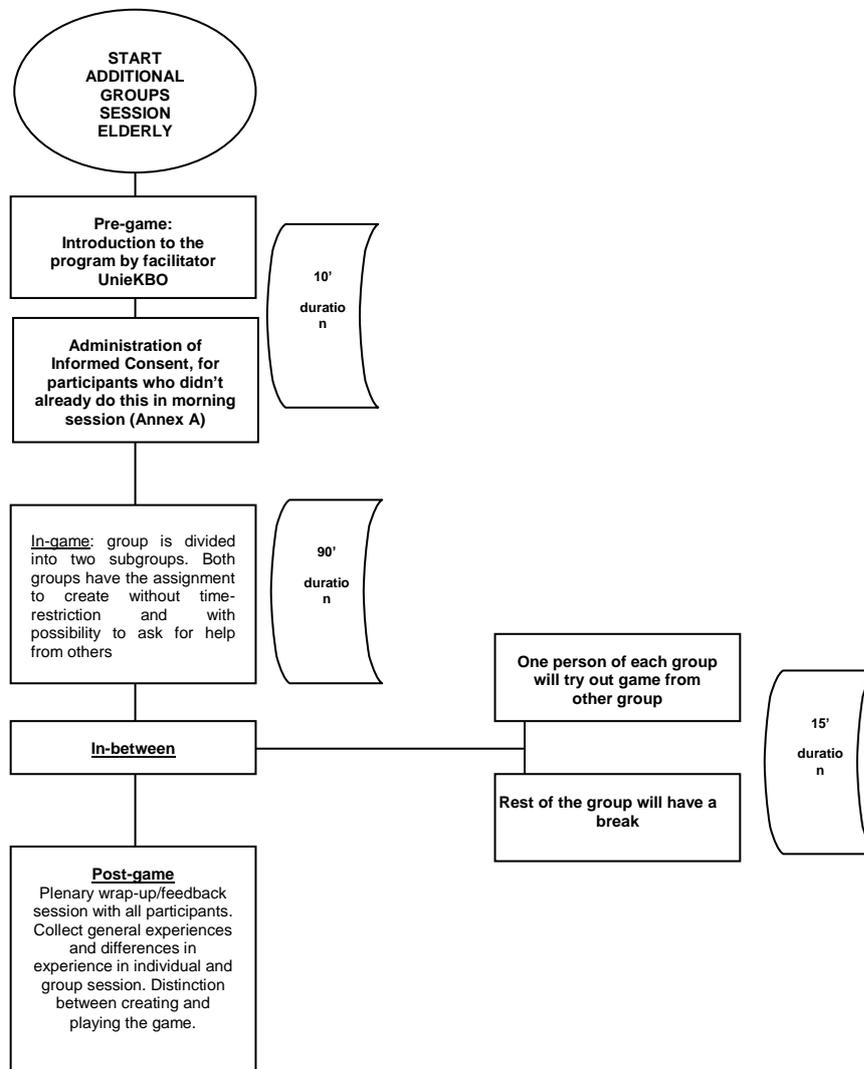


Figure 2- validation elders session flow

3- Participants

Each organization involved in the recruitment of the subjects –INDRA, FCG, CBIM and UniKBO- provided to increase the number of the participants, in order to allow to have more data to validate the system.

The following tables (17 and 18) report demographic data of primary and secondary users recruited for the second evaluation of the SeniorLudens system.

Responsible	Primary Users			Work experience
	Name [Country]	[Professional Figure]	[N]	
INDRA [Spain]	Engineer Technical figures Manager figures	7	R&D consulting (2) Product Manager (2) Innovation Manager (2) Software Engineer (1)	22.43±4.24
FCG [Italy]	Physiotherapists	8	senior clinical PT (6) senior PT researcher (2)	28.63±6.59
CBIM [Italy]	Engineer Office worker Manager	6	Project manager (3) management employee (1) secretary (1) management consultant (1)	27.33±5.47
UniekBO [The Netherlands]	Merchant Volunteer Manager Retired	8	owner (1) elderly advisors (6) manager (1)	43.33±13.35
Total		29		

Table 17- Sub-set of user's participants to the second evaluation

Responsible	Secondary Users			Work experience
Name [Country]	[Professional Figure]	[N]	[Role in Organization;(N)]	[Years; mean±SD]
INDRA [Spain]	R&D consulting Innovation Manager Engineer	7	Technical (1) Software Engineer (5) Manager (1)	10.29 ±8.52
FCG [Italy]	PT Phd Student	20	interns (7) researcher (13)	0.49±0.38
CBIM [Italy]	Student Graduate Employee	21	young researcher (6) interns (12) technical (3)	2.68±1.82
UnieKBO [The Netherlands]	Merchant Volunteer Manager Retired	8	owner (1) elderly advisor (6) manager (1)	43.33±13.35
Total		56		

Table 18- Sub-set of secondary users participants to the second evaluation

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 5 and 6) show the frequency of each response point by primary and secondary user.

On the basis of the analyses, we can ensure that:

Despite secondary users report a major aptitude for technology than primary users, both groups show the same trend: the use of Internet, PC and Smartphone is more frequent respect of other new technologies such as Social Network, Tablet and Videogames (see Figure 5). Specifically, 60% of primary users and about 35% of secondary ones have never used Videogames.

Primary users report to feel themselves competent in using Internet, PC and generally Smartphone, whereas they define themselves less competent in using Tablet, Social Network and 55 % of users report to feel no competent in using VideoGames (see Fig.6).

Also Secondary users report to perceive themselves more competent in using Internet, PC and Smartphone respect of Social Network, Tablet and VideoGames. Specifically, about 35% of the users described themselves as no competent in using VideoGames (see Fig.6).

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

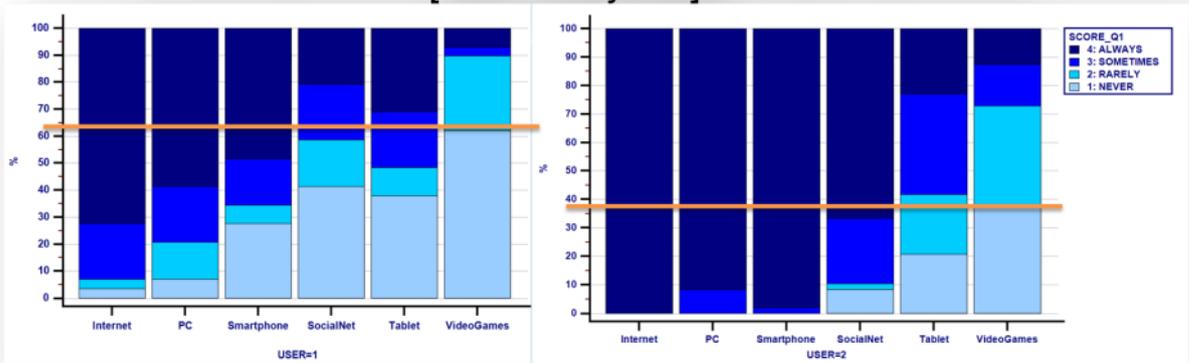


Figure 3- Primary users (left) and secondary users (right) baseline regarding habitual use of technology

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

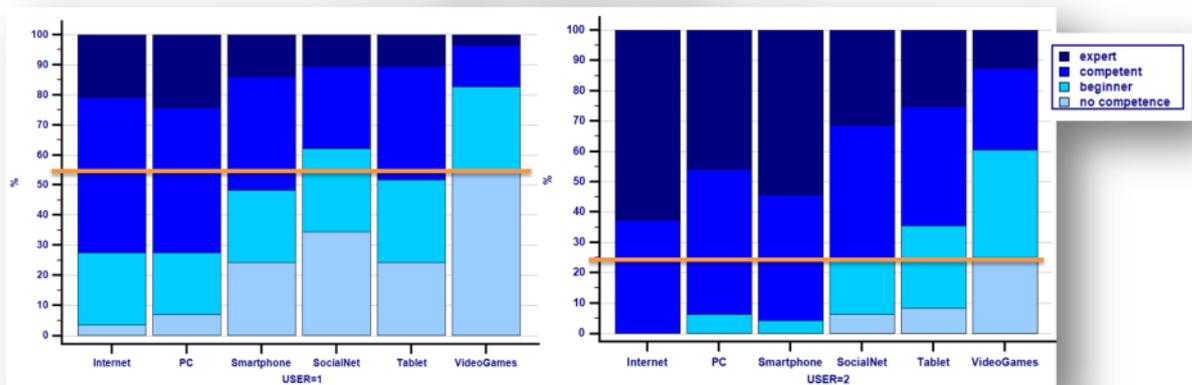


Figure 4- Primary users (left) and secondary users (right) baseline about competence in using new technologies

4- Platform: Results

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 world manager, task manager, training plan manager, game creation 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.

Results For TASK EDITOR

In this phase of SeniorLudens implementation, during task editor exploration, primary users are asked to experience the available functionalities as launching the tools, including new blocks, modifying all types of modules, putting actions modules in parallel, creating a new task, saving a new task, modifying an existing tasks and saving an existing task. The evaluation areas that are included in the task editor questionnaire in this specific second 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 9 items measuring the user's ability to understand and use the Task Editor.

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

According to the results of *ad-hoc* questionnaire we can report that about 70% of users evaluate the tool consisting of functionality (see Figure 7 for details).

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 64
	WP4 – Pilot evaluation	

ANNEX C2: TASK EDITOR
“I am able to ...”
[ALL- PRIMARY]

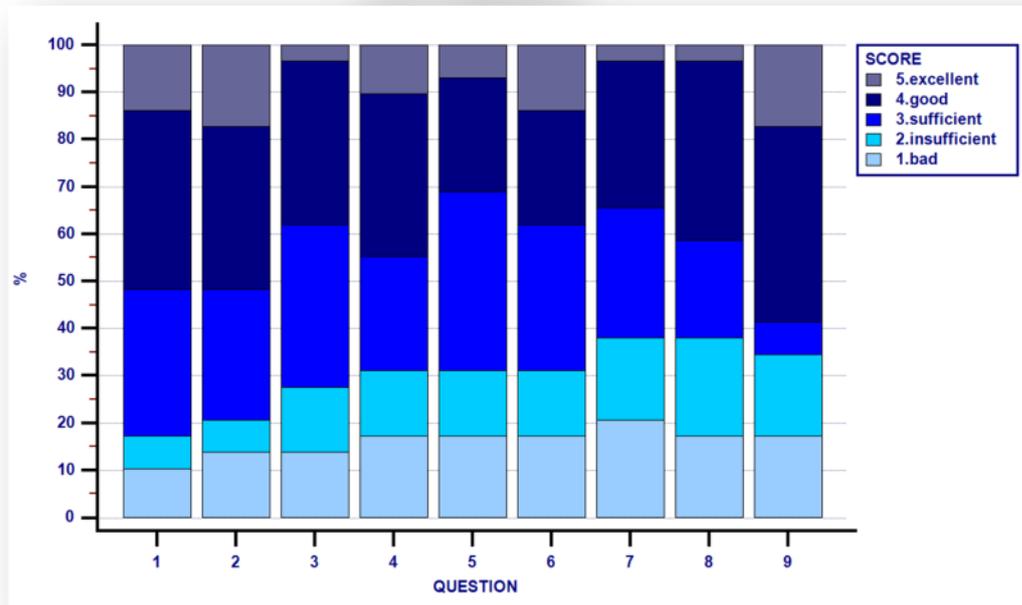


Figure 5- Response score frequency of primary users in Task Editor ad-hoc questionnaire

Results for web frontend (administration portal)

In order to verify whether platform fits the functionality requirements, primary users are asked to answer to 24 *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. Figure 8 reports the response frequency of items 1-20, that are focused on the functionality of the tool. Figure 9 depicts the answers frequency of items 21-24, that are general questions regarding the usability and understandability of the Platform. Also two qualitative questions are analyzed in order to collect constructive comments and remarks about what is needed to be improve and how.

According with the results, we can declare that. a) about 60% of primary users evaluate the platform as sufficiently functional; b) primary users evaluate the platform as understandable in the 40% of cases; c) about 50% of primary users evaluate the platform as usable. (see figure 9)

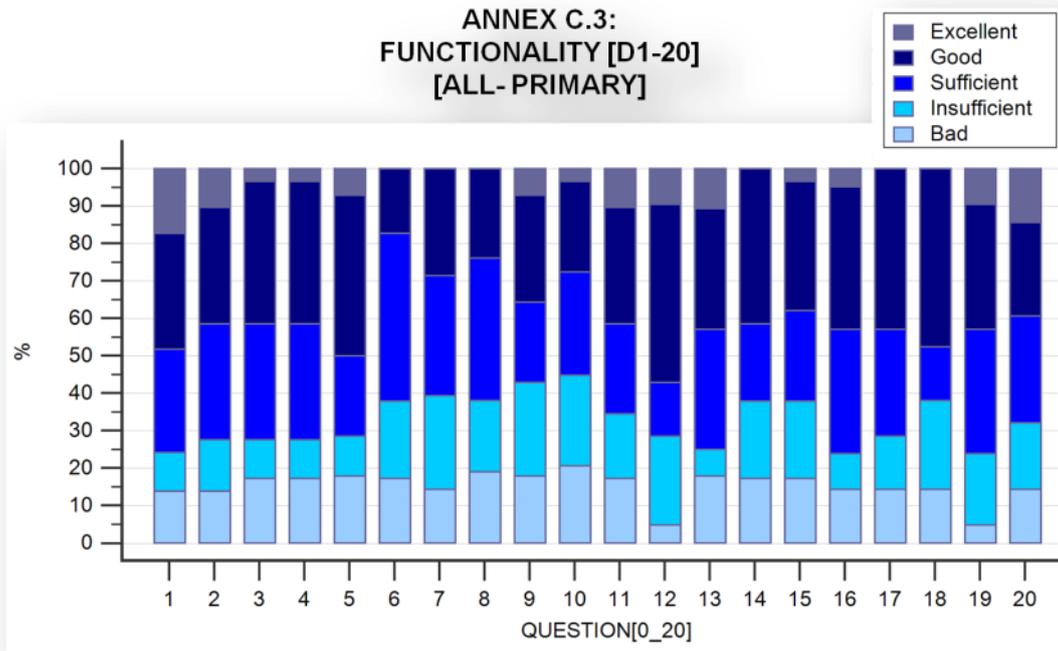


Figure 6- Response score frequency of primary users in the ad-hoc questionnaire about Platform functionality (item 1-20)

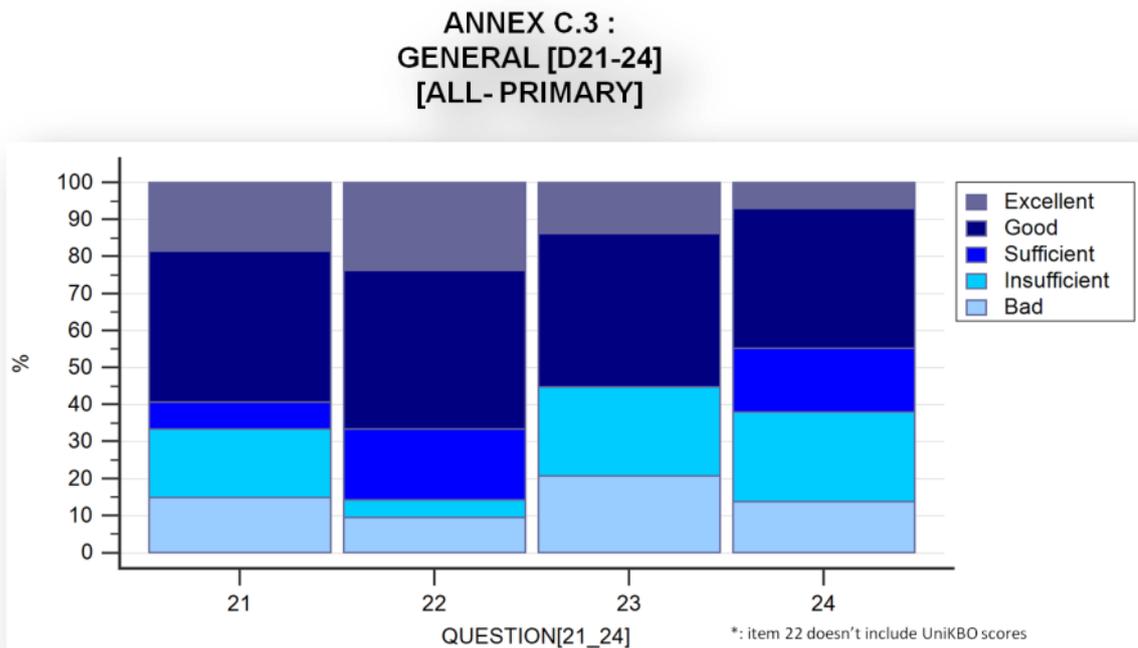


Figure 7- Response score frequency of primary users in Platform ad-hoc questionnaire (21-24)

The qualitative data have allowed to collect constructive comments regarding what have to be added during the next implementation phase in order to make the platform more usable and

understandable. On the basis of the qualitative responses, we can report that: a) in order to let the platform more understandable primary users required instructions about what is a descriptor and text content translated in their language; b) in order to let the platform more intuitive, primary users required that game catalog could be organized differently, activities more visible and that tools could predicted the full screen.

SECONDARY USERS: TRAINEE

As secondary users, by interacting with platform by a trainee point of view, they are asked to answer to Platform *ad-hoc* questionnaire that differs by primary users one. They are asked to evaluate the platform functionality relative to modules they have experienced.

Results for web frontend (trainees portal)

The Platform *ad-hoc* questionnaire is composed by 11 items and shows 4 different response points (1=bad, 2= insufficient, 3= good, 4= excellent). Also the *ad-hoc* questionnaire includes 2 open questions in order to collect qualitative data. On the basis of the results, we can report that secondary users evaluate the platform functionality as good. Specifically, more than 70% of users answer “Good” or “Excellent” to generally all items of the questionnaire.

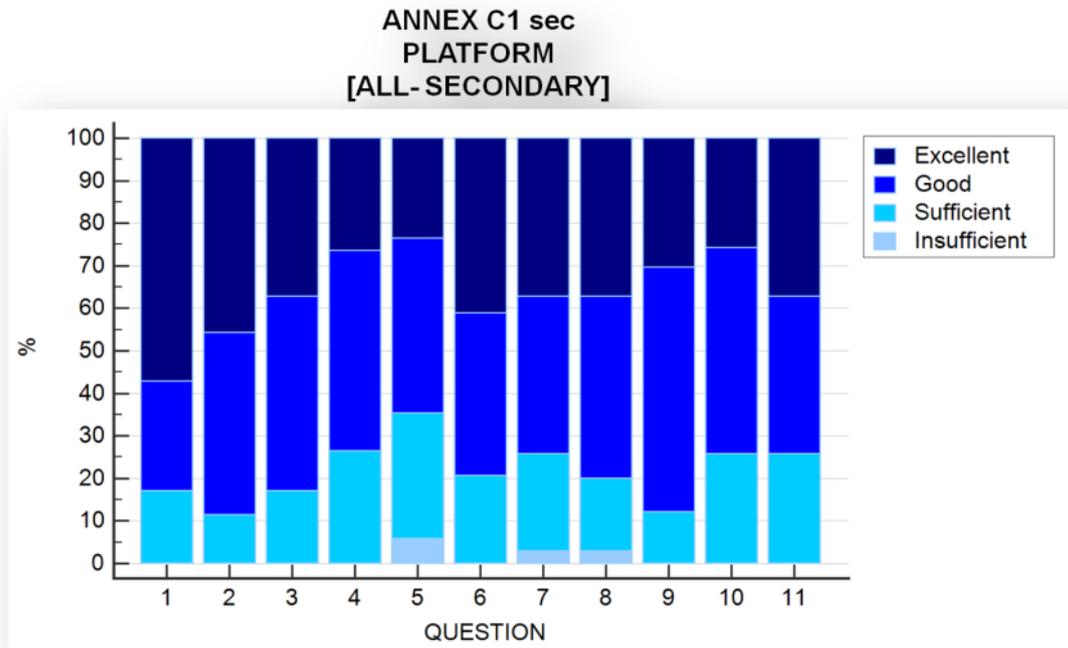


Figure 8- Response score frequency of secondary users in platform *ad-hoc* questionnaire

The qualitative data have allowed to collect constructive comments regarding what have to be added during the next implementation phase in order to make the platform more usable and understandable. On the basis of the qualitative responses, we can report that: a) in order to let the platform more attractive secondary users suggest different solutions such as adding videos and instruction about how to explore the platform integrated in the platform itself and also adding music; b) in order to let the platform more intuitive secondary users suggest to make more visible the possibility to access to the Game Catalog by clicking on icons of the specific games. They also report that the activities section has to be more visible and its graphic has to be more eye-catching.

5- Use cases: results

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

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.

Functionality results

The items of the first part of the ad-hoc questionnaire about use-case functionality (item 1-37) 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 following graphics report the answers of the users regarding the general functionality of the game (see Figure 11 and 12), the functionality of the task 1 in level 0 (see Figure 13), the functionality of the task 1 in level 1 (see Figure 14), the functionality of the task 2 in level 1 (see Figure 15), the functionality of task 3 in level 1 (see Figure 16), the functionality of task 1 in level 2 (see Figure 17).

The results show that primary and secondary users evaluate the Use Case 1 as provided with a good level of functionality for all tasks in each level (see figure 11-17)

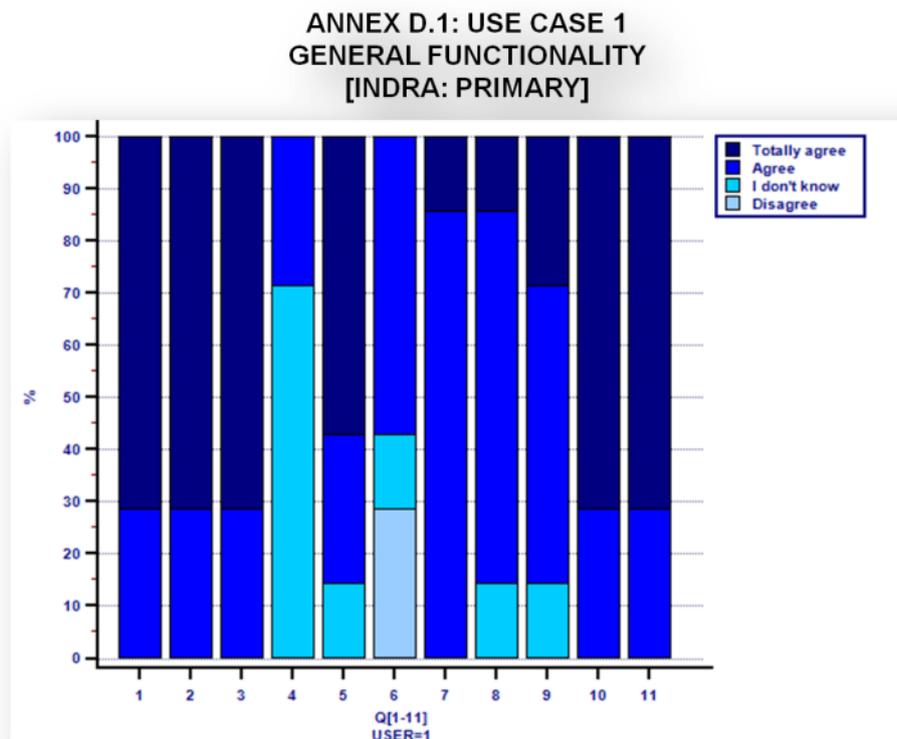


Figure 9- response score frequency of primary users in use case 1 ad-hoc questionnaire.

**ANNEX D.1: USE CASE 1
GENERAL FUNCTIONALITY
[INDRA: SECONDARY]**

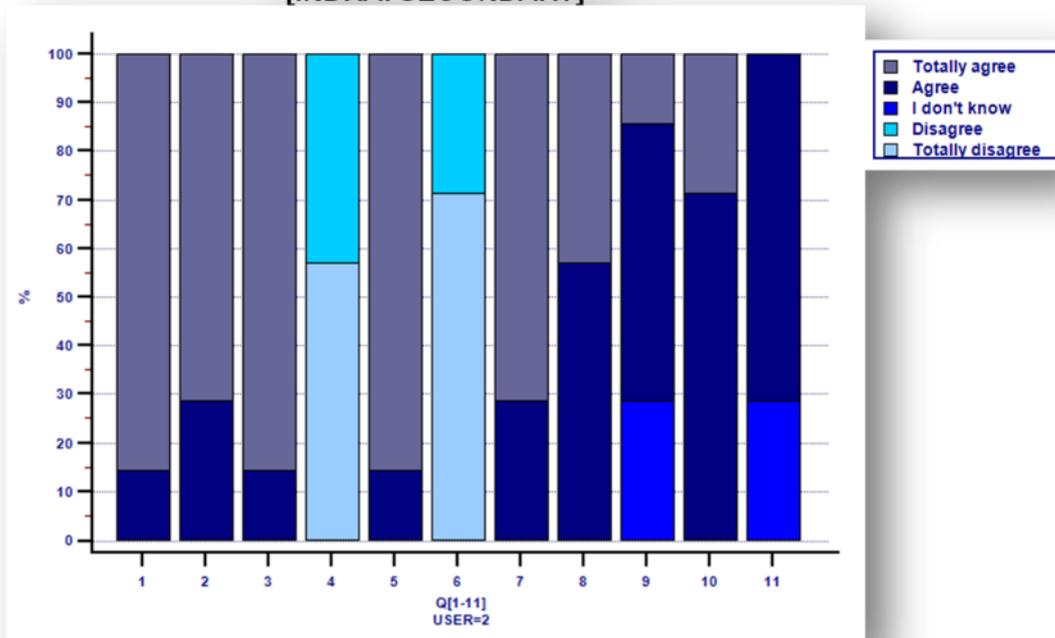


Figure 10- response score frequency of secondary users in use case 1 ad-hoc questionnaire.

**ANNEX D.1: USE CASE 1
FUNCTIONALITY_level0_TASK1
[INDRA: ALL]**

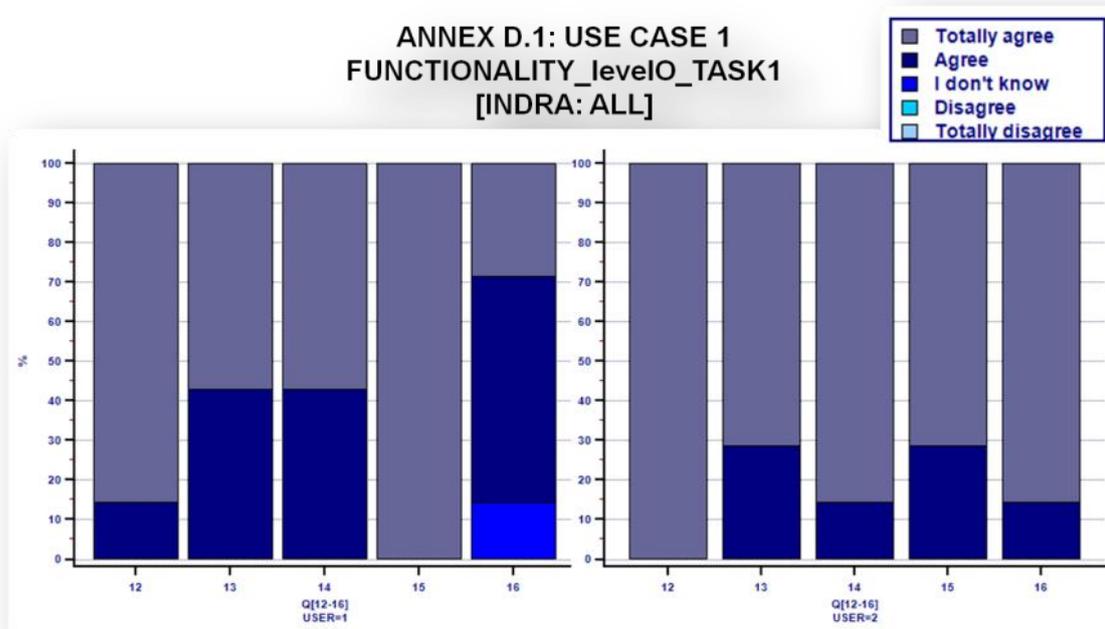


Figure 11- response score frequency of primary users (left) and secondary (right) in use case 1 ad-hoc questionnaire regarding task1 in level 0.

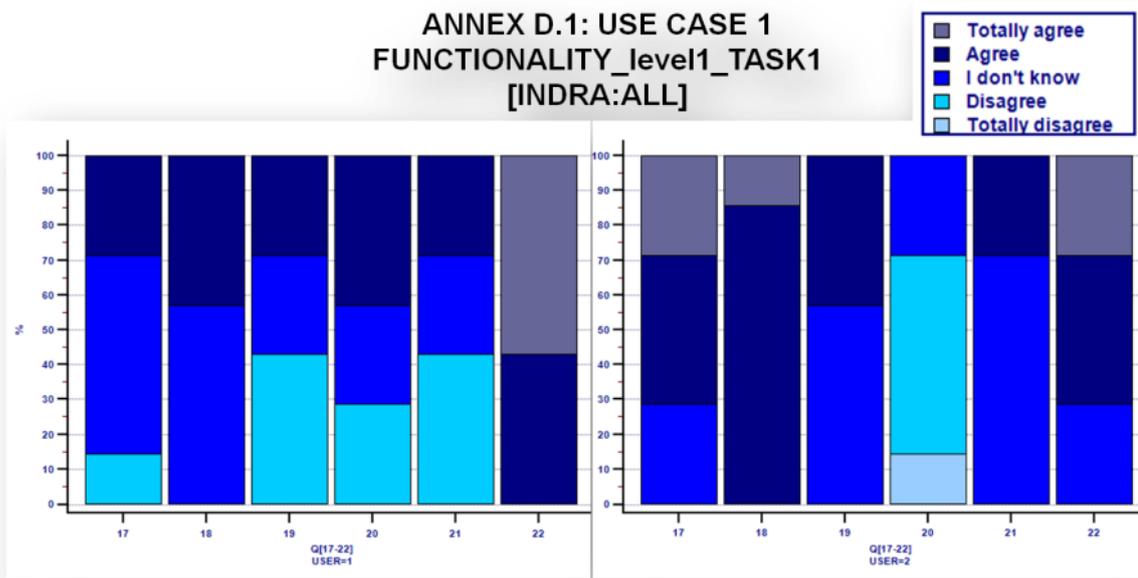


Figure 12- response score frequency of primary users (left) and secondary users (right) in use case 1 ad-hoc questionnaire regarding task 1 in level 1.

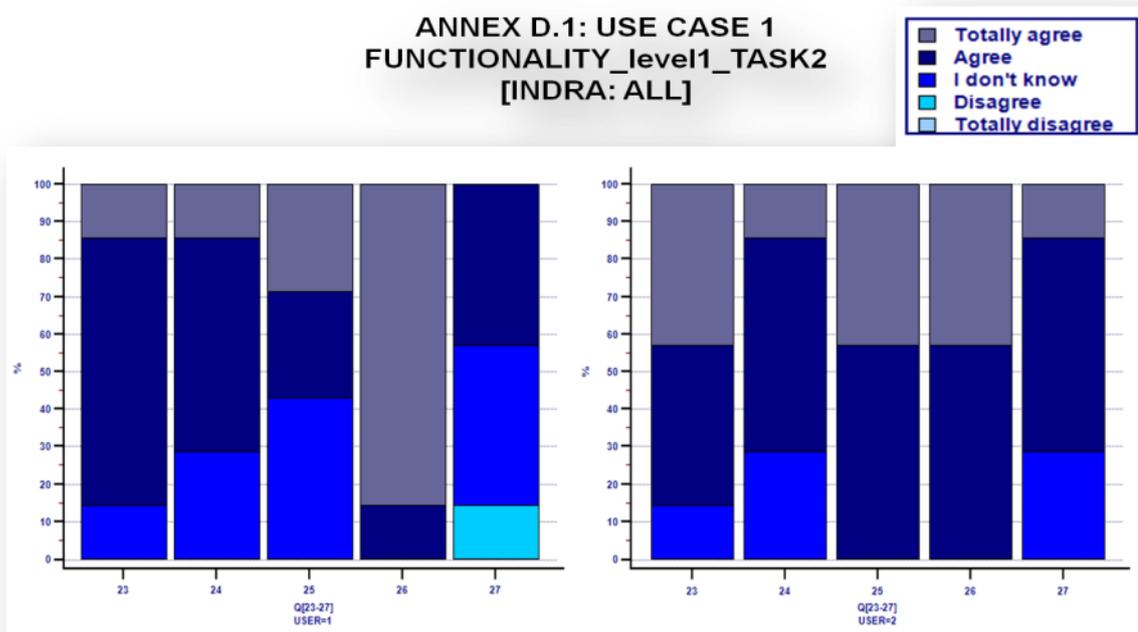


Figure 13- response score frequency of primary users (left) and secondary users (right) in use case 1 ad-hoc questionnaire regarding task 2 in level 1.

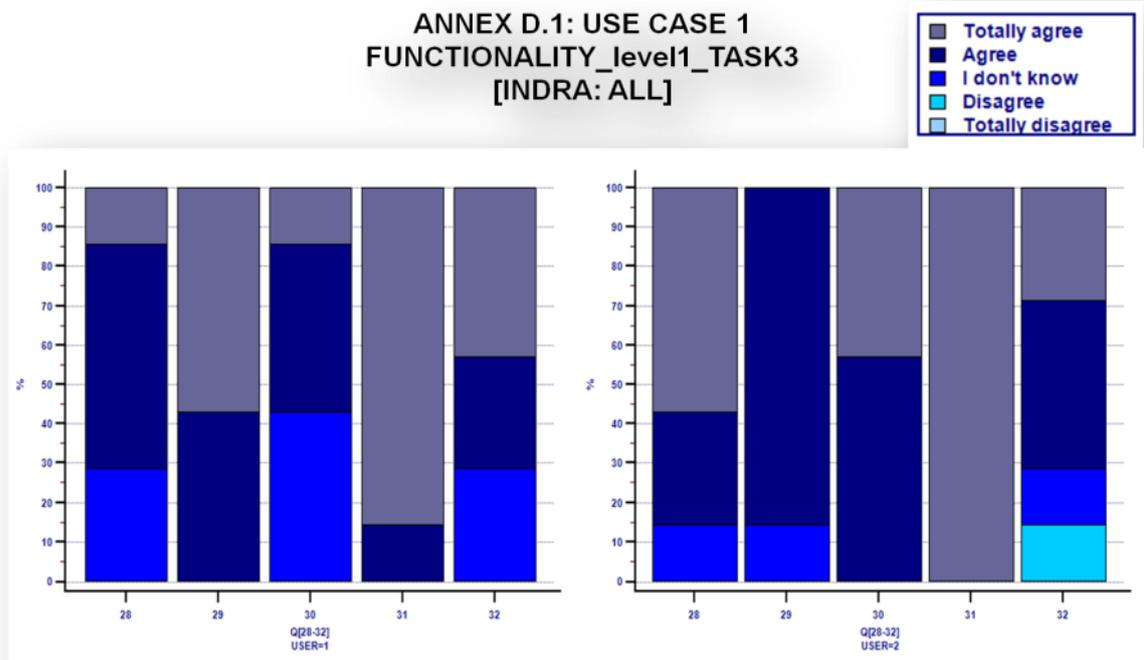


Figure 14- response score frequency of primary users (left) and secondary users (right) in use case 1 ad-hoc questionnaire regarding task 3 in level 1.

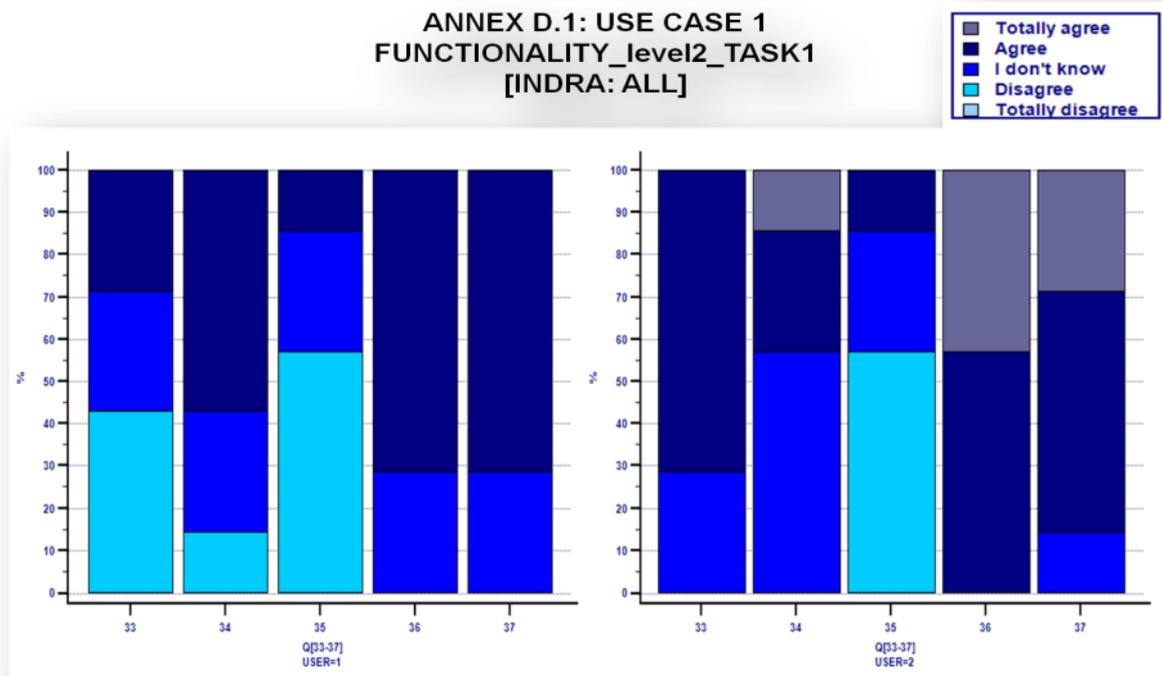


Figure 15- response score frequency of primary users (left) and secondary users (right) in use case 1 ad-hoc questionnaire regarding task 1 in level 2.

Results of learning objectives test

The second part of the questionnaire reports 10 items measuring the learning objectives achievement. Users were asked to choose among three response alternatives, by selecting the right answer. In the following graphic (Figure 18) we analyzed the frequency of right and wrong responses reported by secondary users

Secondary users present a consistent competence in UC1 learning objectives: the mean of correct responses is around 85%

ANNEX D.1 : LEARNING OBJECTIVES [INDRA – SECONDARY]

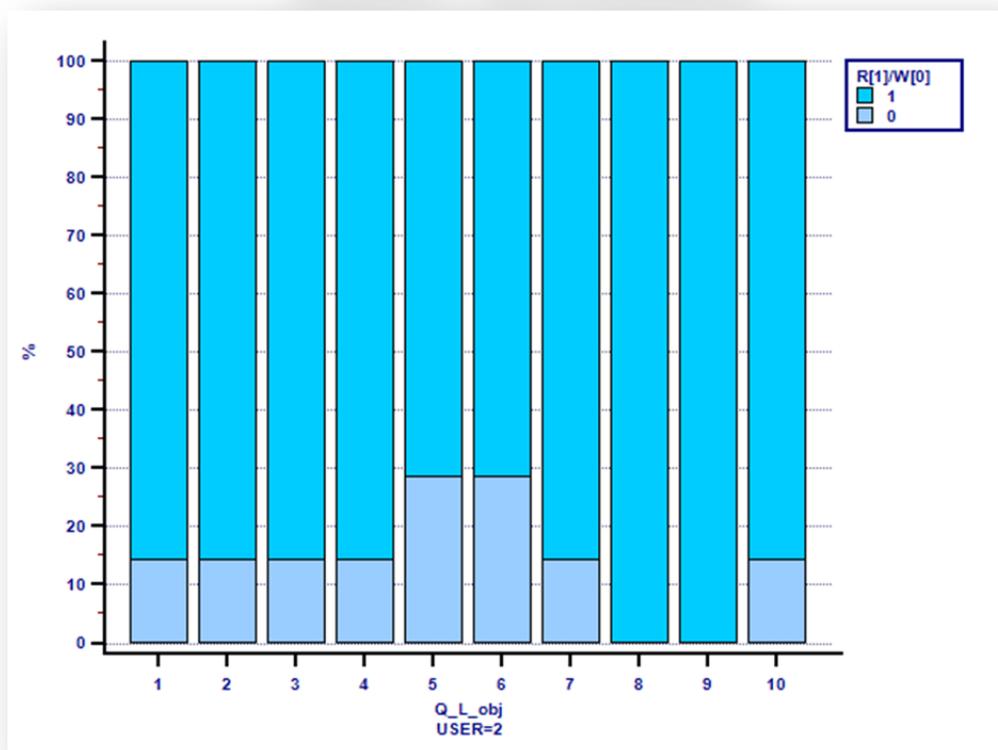


Figure 16- Frequency of right and wrong responses of learning objectives ad-hoc questionnaire of secondary users

Use case 2: Hospital/clinical and home caring

The use case 2 aims at train users to be able to extract from health report the relevant information for motor and cognitive rehabilitation and to identify the motor area and the cognitive areas to be rehabilitated.

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). In the following graphics (Figure 19, Figure 20) are depicted the frequency of each response score of each first 10 items chosen by primary users and secondary users.

On the basis of the results, we can report that both primary (see Figure 19) and secondary users (see Figure 20) evaluate Use Case 2 functionality as good or excellent. Only items 4 and 5 – respectively, “I could not have navigated through the game without the instructions “ and “I will have to look for assistance often when I play the game”- reports a consistent percentage of answers “Disagree” and “Totally disagree”.

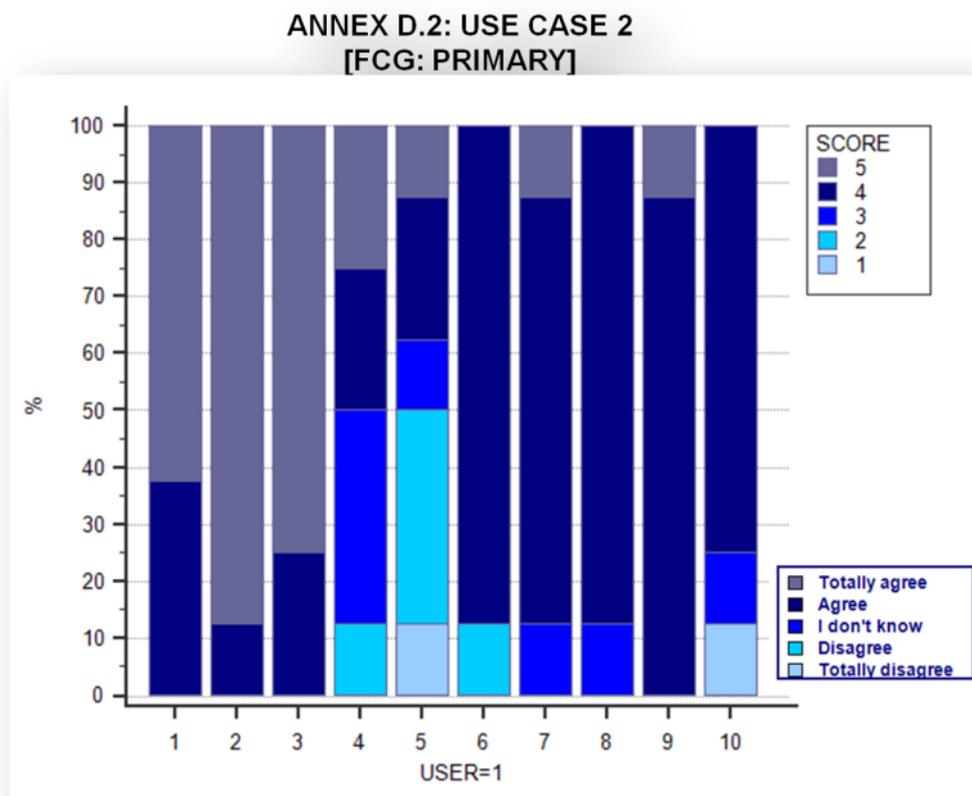


Figure 17-Response score frequency of primary users in Use Case 2 ad-hoc questionnaire

**ANNEX D.2: USE CASE 2
[FCG: SECONDARY]**

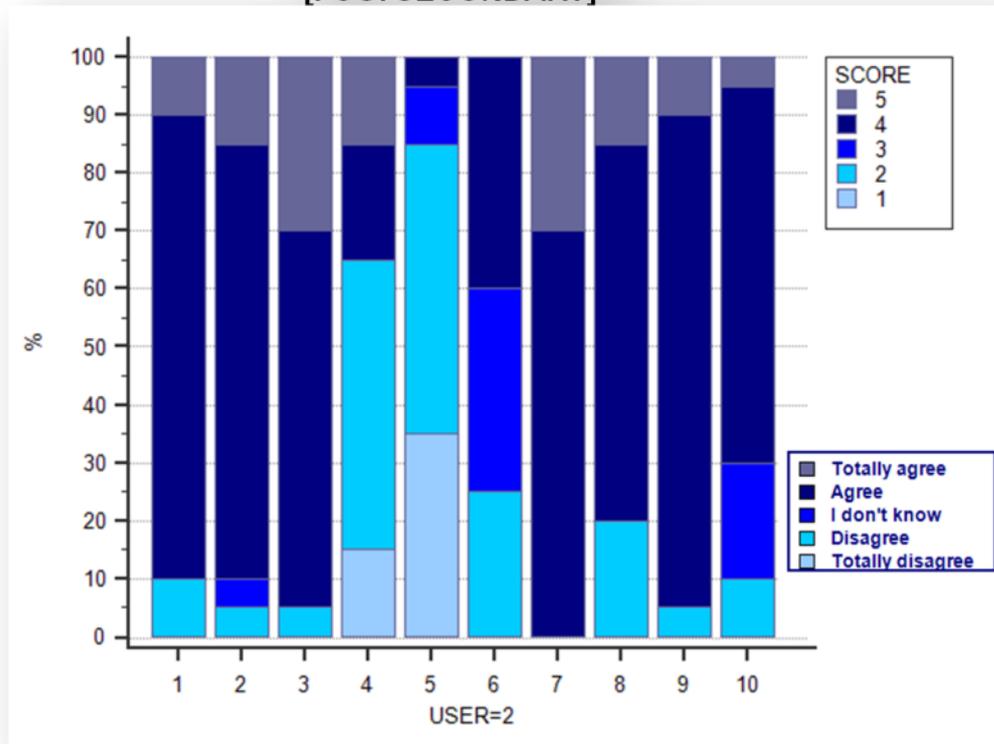


Figure 18- Response score frequency of secondary users in Use Case 2 *ad-hoc* questionnaire

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 graphic (Figure 21) we analyzed the frequency of right and wrong responses reported by secondary users. The results report: a) a general need to improve in UC2 learning objectives skills ; b) a major competence of secondary users in motor rehabilitation field (item 1 and 3) than in cognitive one (item 2 and 4)

ANNEX D.2 : LEARNING OBJECTIVES [FCG – SECONDARY]

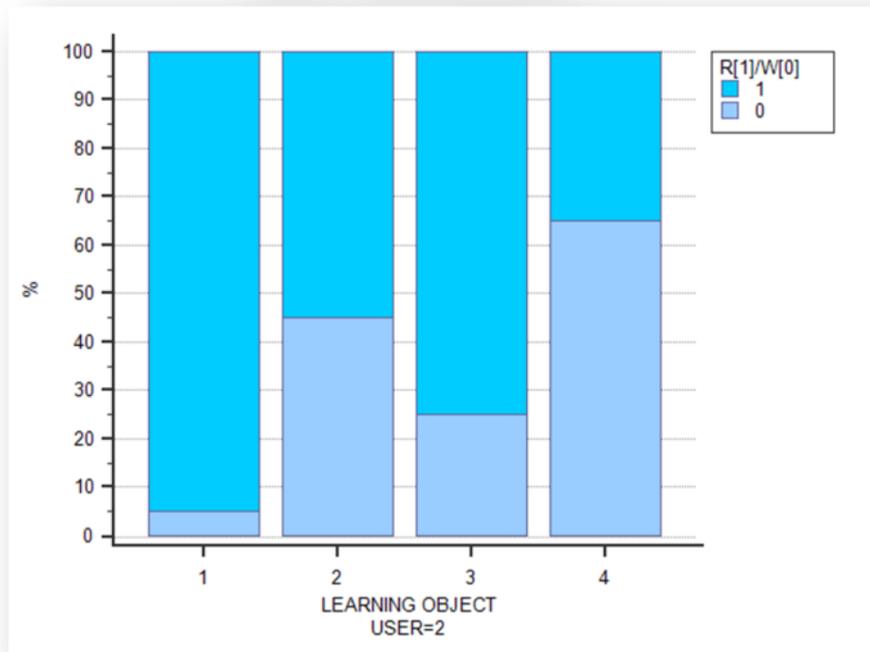


Figure 19- Frequency of right and wrong responses of learning objectives *ad-hoc* questionnaire of secondary users

Use case 3: Traditional Food Production

Functionality results

The items of the first part of the ad-hoc questionnaire about use-case functionality (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). In the following graphics (Figure 22, Figure 23) are depicted the frequency of each response score of each first 10 items chosen by primary users and secondary users

The results show that both primary and secondary users assess Use Case 3 as functional (

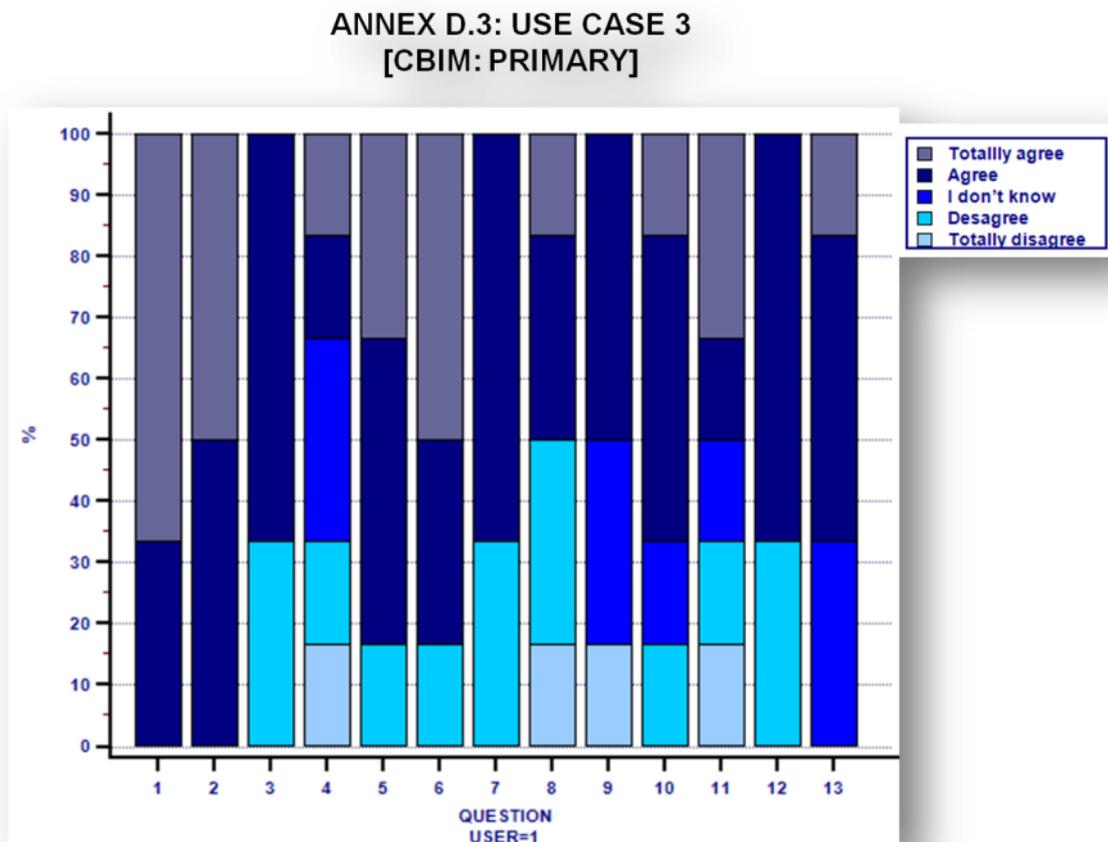


Figure 20- response score frequency of primary users in use case functionality ad-hoc questionnaire

ANNEX D.3: USE CASE 3 [CBIM: SECONDARY]

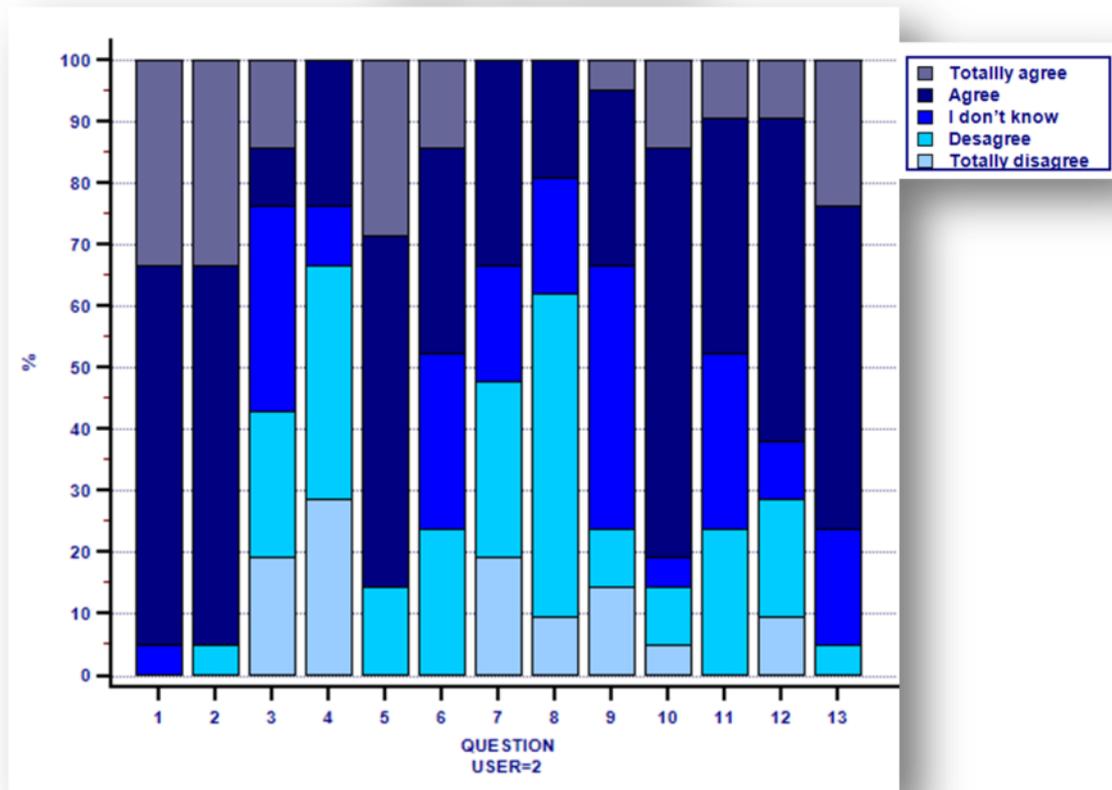


Figure 21- response score frequency of secondary users in use case functionality ad-hoc questionnaire

Results of learning objectives test

The second part of the questionnaire reports 10 items measuring the learning objectives achievement. Users were asked to choose among three response alternatives, by selecting the right answer.

In the following graphic (Figure 24) we analyzed the frequency of right and wrong responses reported by secondary users.

The results show that: a) secondary users report different scores among items (from all wrong answers to all correct answers); b) the score of item 1 and 10 demonstrates secondary users need to improve in UC3 learning objectives.

ANNEX D.3 : LEARNING OBJECTIVES [CBIM – SECONDARY]

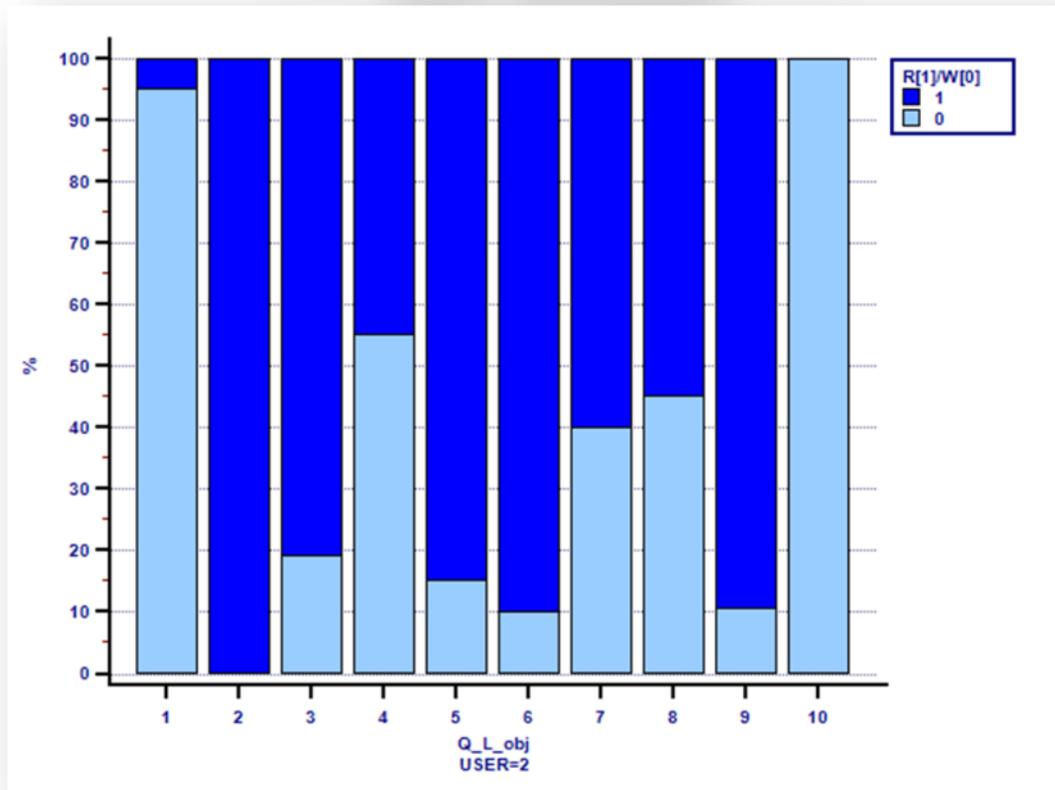


Figure 22- Frequency of right and wrong responses of learning objectives ad-hoc questionnaire of secondary users.

Use case 4: Home safety

Results of learning objectives

The game regarding Home Safety aimed to teach equip new elderly advisors Home Safety. Therefore the learning objectives of this use case, contained both elements concerning the job of elderly advisor and elements of content concerning Home Safety.

In order to check whether a game created in the SeniorLudens Platform is suitable for the elderly advisors to achieve the learning objectives, a questionnaire of 19 questions was conducted. According to the planned methodology, this questions would be asked to the elderly test-users about the game colleague test-users would made during the elderly afternoon session as described in chapter 5. However, after the task-creation in the afternoon, the system didn't work well enough to run all the created tasks. Only one of the three was able to be opened, but this particular one was still so simple that the questionnaire didn't apply so well anymore to this task. Instead of taking the (quantitative) questionnaires, a (qualitative) group discussion took place about whether a SeniorLudens game is suitable to teach new elderly advisors Home Safety or not. The 19 elements came across as sub elements in this discussion. Since the tasks that were created by the elderly test-users weren't suitable to answer all the questions about, the group conversation also elaborated on the example game that was made by UPC.

The job of the elderly advisor

Example game

The participants all agree that the example game quite good would work to teach about the job of elderly advisor, but it should definitely be in Dutch. In the game many elements come across, varying from burglary and physical safety to fire prevention. This gives a clear overview of what the job could contain: teaching about several categories and learn the elderly you visit about safety and unsafety placing of objects.

However, it is less clear if the shown elements include everything related to Home Safety. Some elements looked dangerous but were not included in the game, what made it difficult to learn whether this was insecure or not. One of the participants responded: *'When we found five insecure objects, the game was finished. I thought I had seen more insecure elements, but the game closed and I couldn't go back anymore. It would have been better if I would have the possibility to find all insecure elements.'* Next to the restricted amount of elements included in the game, the game doesn't teach which rooms are important to visit neither did it teach anything about closing of the doors or windows.

The next question was whether the game learned the player *how* to advise concerning Home Safety. The participants think the assignment to destroy the insecure objects is a little confusing. One of them said: *'Not all of the insecure objects should be destroyed necessarily. Most of them are not as dangerous, but simply not on the right place'* They found it hard to understand that destroying in the game not necessarily means that these objects should be destroyed in real life as well, but that it is to proof that you detected the objects. A solution might be not to destroy objects but move or replace them.

Game made by colleague elderly advisors

Although the participants think a game from the SeniorLudens platform can definitely help to teach new elderly advisors, they don't think a game made by the elderly their selves will be suitable for this – at least in this stage. One of the respondents said: *'We weren't able to make*

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 79
	WP4 – Pilot evaluation	

the task complete, which led to a confusing game. When the test-user clicked an unsafe object we didn't include yet, he got the message: 'not good, that's a pity', but actually he did a right job.'

It is important to check a game which was made by the elderly, before they really will use it to teach colleagues.

A next reason why the elderly advisors don't think an own created game will be suitable to teach new advisors, is that it would lead to many different variations of teaching material. Some elderly advisors would include other objects than others since they find certain elements more important than others. The participants think it is important that the UnieKBO will at least provide a standard to assure every elderly advisor is taught in a similar way.

Fire prevention

The example game does learn, according to the participants, a few examples of how to prevent fire. They agree these elements are also quite easy to be included by the elderly advisors themselves. However, there are only a few examples. Next to that, the insecure objects all have only one 'risk' mentioned. For instance, the loose wires are a risk for falling but could also cause short circuit. This is not mentioned in the game.

Physical safety

The participants like the elements concerning physical safety the most. For instance the challenge that the carpet is insecure in more than one way (loose and slipper). However, the loose wires in the corner were not so clear, since it wouldn't be a logical place to walk. The toxic substances in open cabinets were also considered as very original and interesting.

Burglary prevention

The elderly advisors also liked the money close to the door. However, they recommended to give the possibility to close the door or window, which is, according to them, the most important way to prevent burglary. The element of opening the door in a safe way when someone rings the bell was also mentioned to be learning full, but that would require an entire new scenario.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 80
	WP4 – Pilot evaluation	

6- 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.

Usability of SeniorLudens System

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.

The results show that: a) primary users (see Figure 21, left) report SUS median score of 55 (cutoff score >68); b) secondary users (see Figure 21, right) report SUS median score of 76.25.; c) Median of SUS score in primary users and secondary ones reports a significant statistically difference, $p < .001$. Specifically, secondary users evaluate platform and use cases as more usable than primary users.

ANNEX E1:
SUS: Usability of SeniorLudens System
[Primary and Secondary user]

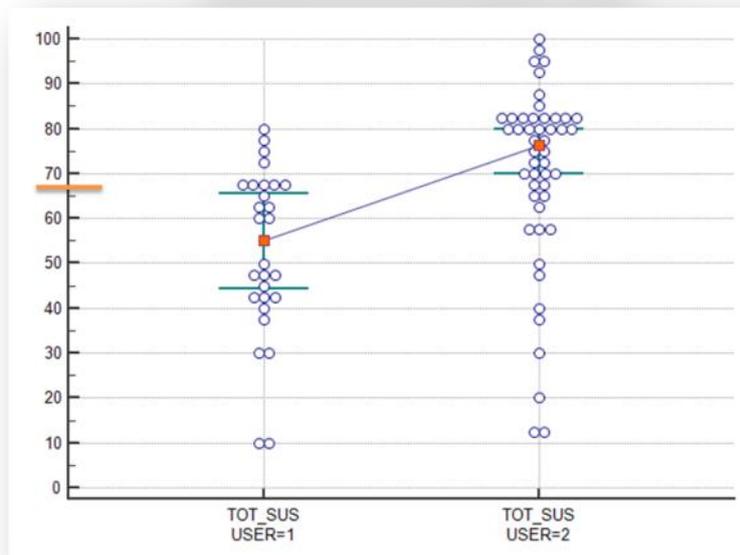


Figure 23-Mean and standard deviation of SeniorLudens usability score estimated by primary users (on the left) and secondary users (on the right). The orange line highlights the cut-off score.

Intrinsic motivation assessment

The participants intrinsic motivation regarding SeniorLudens has been examined through Intrinsic Motivation Inventory [2], by administration of 7 items of Interest/Enjoyment factor. The users are invited answering questions about whether SeniorLudens presents itself playful, interesting and enjoyable on a 7 points Likert scale (1=absolutely not, 7=absolutely yes).

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 81
	WP4 – Pilot evaluation	

The results show that : a) both primary and secondary users report an high score of Intrinsic Motivation Index;b)even if Intrinsic Motivation indexes of primary and secondary users don't report a statistically significant difference, primary users intrinsic motivation index results major than secondary users one.

**ANNEX E1:
IMI: Intrinsic Motivation Assessment
[Primary and Secondary user]**

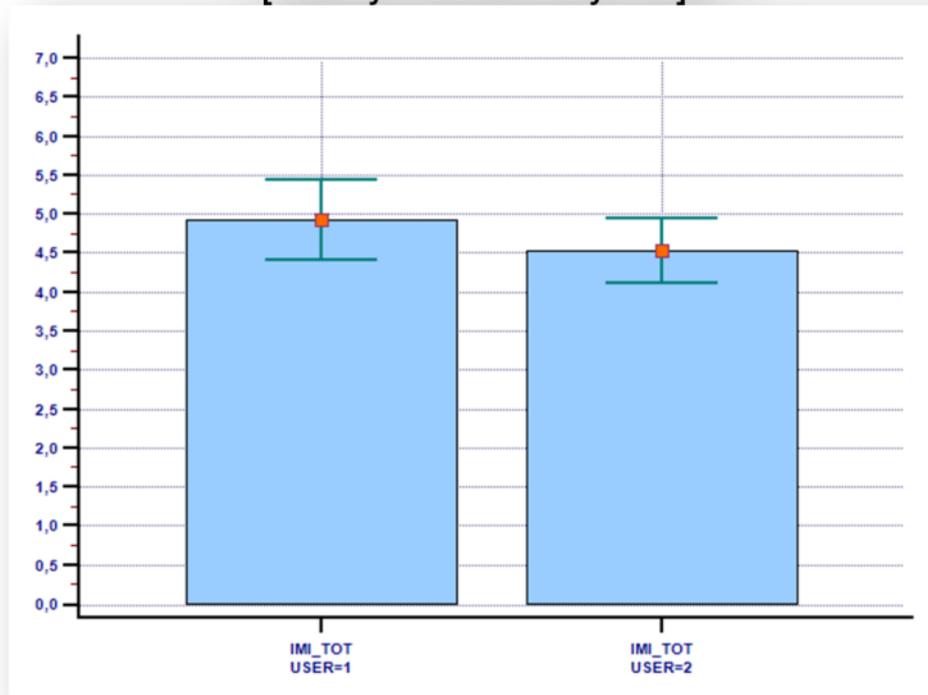


Figure 24- Mean and standard deviation of Primary users (on the left) and secondary users (on the right) results of Intrinsic Motivation Inventory.

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 6 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 user's and secondary user's group regarding each factor are depicted in the following figure (Figure 27).

The results show that:

Primary users report:

- I. Challenge skill balance mean score of 3.37 ± 0.94
- II. Action awareness merging mean score of 3.20 ± 0.87
- III. Clear goals mean score of 3.29 ± 1.07

- IV. Unambiguous feedback mean score of 3.05 ± 1.05
- V. Concentration on task at hand mean score of 3.76 ± 0.95
- VI. Sense of control mean score of 3.73 ± 1.08 ;

Secondary users report:

- I. Challenge skill balance mean score of 3.31 ± 0.94
- II. Action awareness merging mean score of 3.39 ± 0.87
- III. Clear goals mean score of 3.30 ± 1.03
- IV. Unambiguous feedback mean score of 3.12 ± 0.99
- V. Concentration on task at hand mean score of 3.55 ± 1.03
- VI. Sense of control mean score of 3.66 ± 1.00 ;

Both primary and secondary users show high scores in each domain of the scale;

Secondary users report a statistically significant major score in the factor 2, Action awareness merging, $p < .001$.

ANNEX E.3
FSS: Flow State Scale [Primary and Secondary Users]

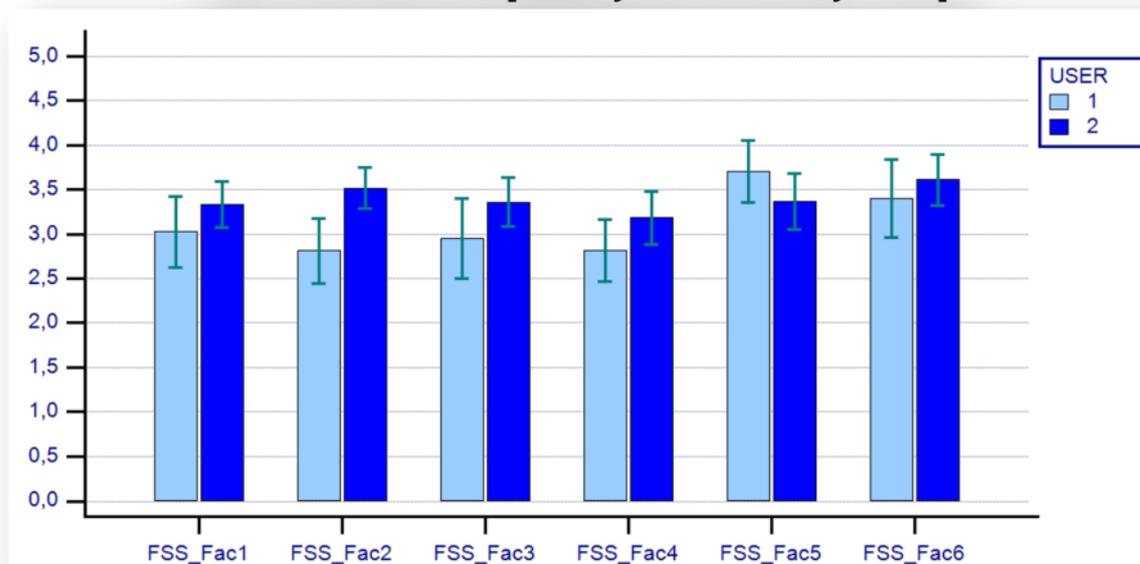


Figure 25- Mean and standard deviation of Primary users (left) and secondary users (right) scores of each factor of Flow State Scale (respectively, Fac1=challenge-skill balance, Fac2=action-awareness merging, Fac3=clear goals, Fac4=unambiguous feedback, Fac5= concentration on task at hand and sense of control)

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, in order to achieve affective state information regarding primary and secondary users after validation session.

The results show that:a) both primary and secondary users' positive affective state doesn't increase after SeniorLudens platform and game experience;b) both primary and secondary users' negative affective state statistically significantly decrease after SeniorLudens platform and game experience (ANOVA 2x2 Within –subjects effect Factor $p=0.007$).

ANNEX B.2-E.4 PANAS: POSITIVE AFFECT [Primary and Secondary Users]

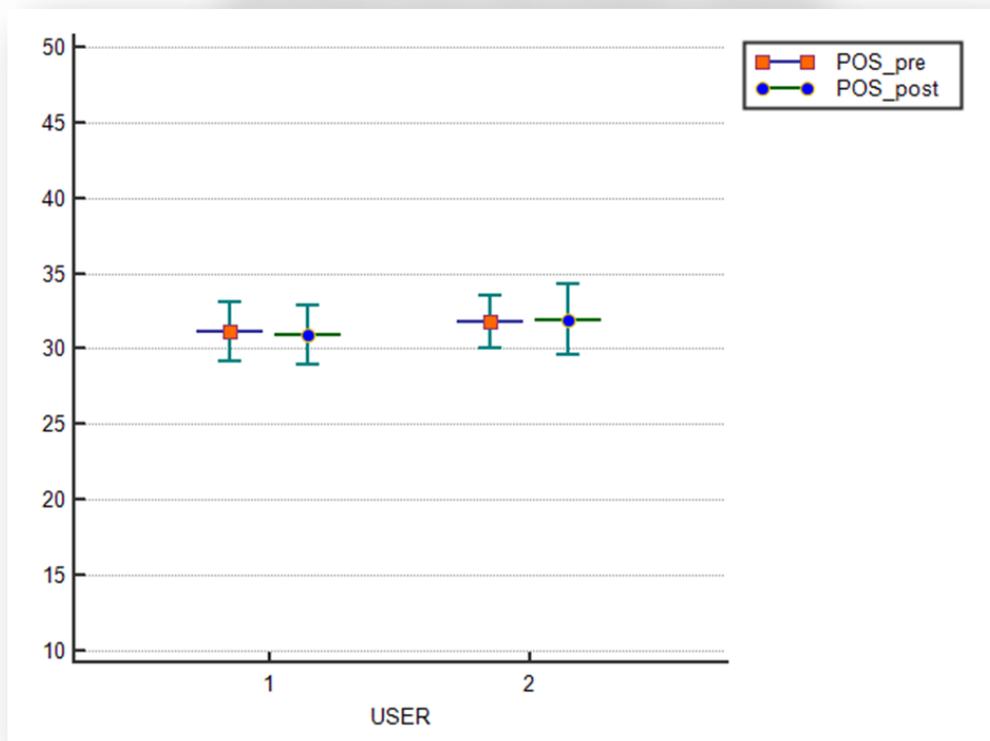


Figure 26- Mean and standard deviation of primary users (whisker and box plot on the left) and secondary users (right) of PA index of PANAS in the pre-game phase (left) and post-game phase (right).

ANNEX B.2-E.4
PANAS: NEGATIVE AFFECT
[Primary and Secondary Users]

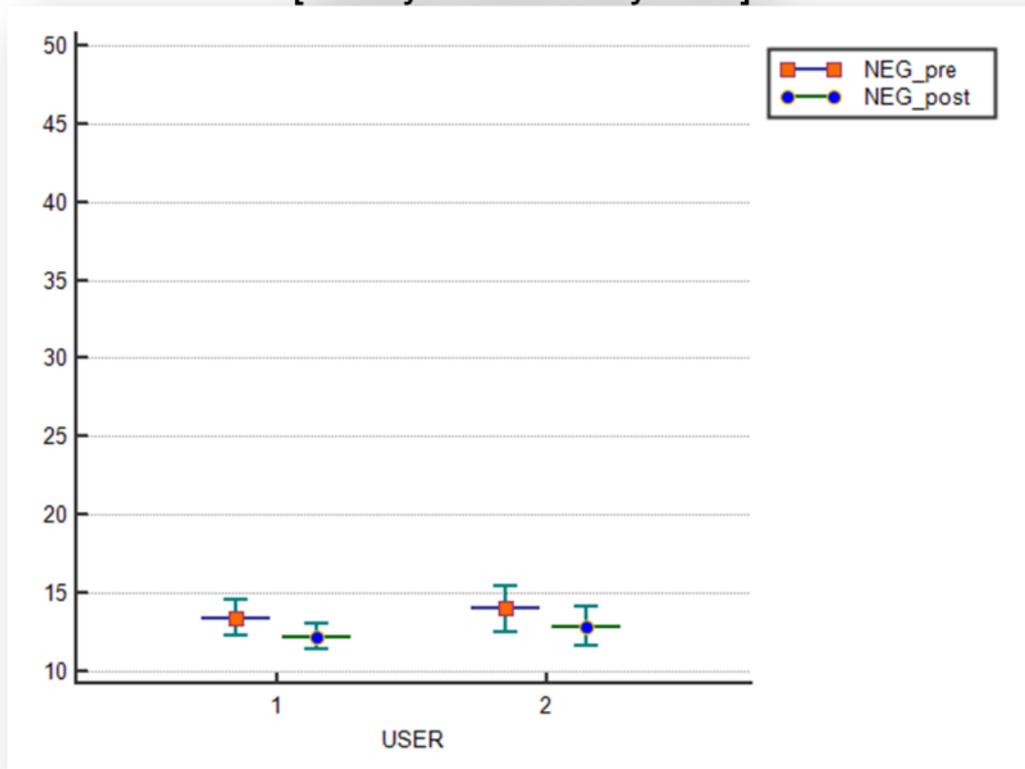


Figure 27- Mean and standard deviation of primary users (left) and secondary users (right) of NA index of PANAS in the pre-game phase (left) and post-game phase (right).

7- Results of the extra session of elderly sample

The same elders' sample who experience the platform during the evaluation session has been invited to take part to a additional session.

In the protocol, several reasons were mentioned for doing this extra session. Summarizing, this session was mainly organized to check whether the elderly would be able to work with the SeniorLudens platform without a strict script, without time-pressure and with the possibility to ask help from each other and the facilitators from UnieKBO.

Aim was to test whether the elderly advisors were able to make a simple game, inspired by the example game and to investigate the user experience of this assignment/using the platform to create a game.

The test-users split up into three groups and worked for 2 hours on the creation of a game. During this game-creation process, notes were made about their reactions on this job. After the session, a group discussion took place in which the participants shared their experiences. The groups got a step-by-step script to guide them through the process.



Figure 28- Elderly users during extra session

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 86
	WP4 – Pilot evaluation	



Figure 29- Elderly users during the extra session

Primary user experiences

Overview of the platform

Since the test-users were already introduced to the platform in the morning session, most of them explored their selves where to start. The participants indicate that they understand sufficiently where to find the different elements of the platform and how these relate to each other. When they sometimes got lost on the platform, most of them easily could come back to the task editor to continue their assignment. However, sometimes they say to be distracted by all the different technical English terms:

' We thought we were going to make a game, so we thought we should go to 'game creation' . However, we were working on a task. The difference between task, game and scenario was clear when it was explained, but hard to remember when we were really working with it'

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 87
	WP4 – Pilot evaluation	

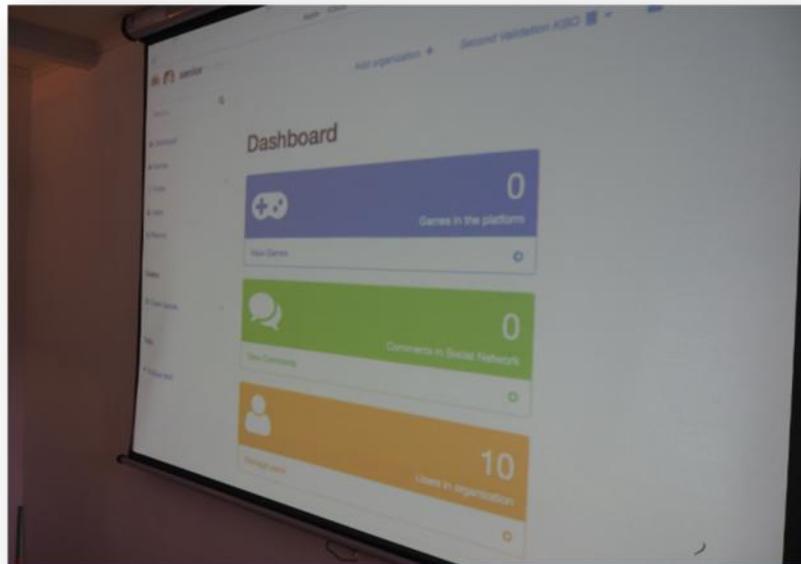


Figure 30- Maxi screen used during the session

Experiences in designing the task

The groups understood the assignment and knew more or less in which order they should do the steps. However, there were some things that were difficult during the task design:

- The elderly persons found it difficult to understand why some puzzle blocks clicked in each other and others did not.
- For some reason, sometimes (in all groups) the 40 elements didn't appear after the action in the action block: user – destroy an object - .. Even when we checked the persons used the right scenario, the user etc. It frustrated them since it was not clear if it was their own mistake or a system error.
- The elderly persons found it very difficult to work on the game while they didn't see it happen. It was hard for them to visualize in their mind. One of them asked several times after he put an action block whether the action already was executed. '*Was the iron table already destroyed?*' It was hard for them to understand that he didn't play a game but creating it.
- In general the test-users had fun in building the blocks, filling in their own text messages

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 88
	WP4 – Pilot evaluation	



Figure 31- Elders experience Task Editor tool

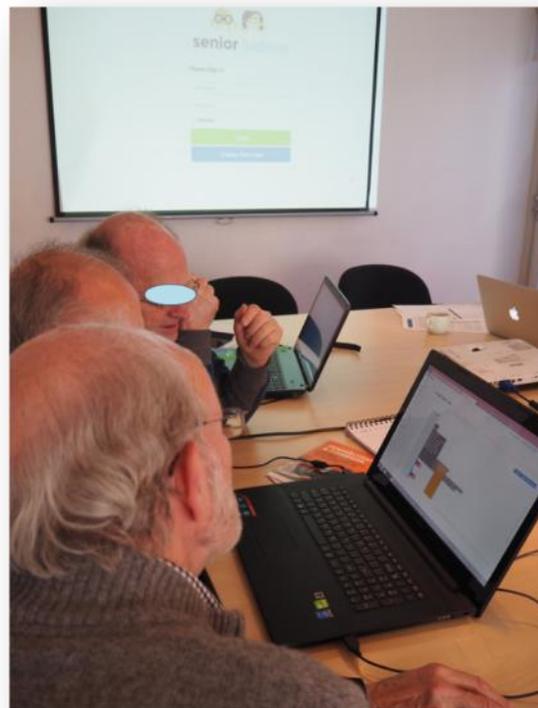


Figure 32- Elders experience Task Editor tool

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 89
	WP4 – Pilot evaluation	

Experiences with the working of the system

- The horizontal and vertical scroll bars were not working so well, so the test-users every time loosed blocks on their way to the 'puzzle'. That was probably caused by the pc's, but it bothered them a lot.
- The system appeared to be very heavy. Half of the office of the UnieKBO was kicked from the Internet and the pc's were loading and making noises a lot. This made it sometimes quite exciting, since we didn't know if everything would load properly (several times it didn't).
- There was a help/question mark button in some places. When the seniors didn't understand something, they were tended to click on this, which opened a whole new screen. They didn't know how to handle this and clicked everything off, which made them lost things several times.
- To use the system, you need the program webplayer. It took a lot of time to download and install everything the day before, but still not everything was working.
- When everything was saved, it didn't work to open the tasks again. So unfortunately we only could play one of the designed tasks, and that task only contained an introduction. that was a disappointing for the participants.



Figure 33- Elders experience the system

General experiences

- The participants had a nice and learning full day, but they see it only as a start. Only one day is not enough to learn everything of the system. It requires a lot of practicing, preferably guided.
- In the current situation, the UnieKBO provides presentations for the advisors to use. The advisors see some problems if every advisor would create it's own game. *'It is important that there is a standard and all advisors present the same message'*, according to the elderly persons.
- Although the system is able to provide a suitable game, the participants don't think elderly users will be able to create such a game. They like to learn new things by playing a game, but creating one is too high level – at least at this moment.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 90
	WP4 – Pilot evaluation	

- The participants see possible applications for SeniorLudens in their job as elderly advisor, but they see it rather as a way to teach elderly in their own house than to educate new elderly advisors.



Figure 34- Elders in filling in questionnaires

8- Discussion and conclusion

At this second evaluation session the level of functionality and usability reached in each tool integrated in the SeniorLudens platform has been evaluated. Also the use cases have been assessed in terms of level of functionality and learning objectives achievement.

So far, the SeniorLudens system consists of the integration of each tool in the platform and of an advanced use cases implementation status relative to the first phase of the games.

As expected, primary users recruited report a low familiarity relative to some new ICT technologies. They declared a low frequency of use and competence toward Social Network, Tablet and, most of all, Videogames. In accordance with literature [5], the lack of aptitude toward this new technologies could have been raised an obstacle for primary users. On the other hand, all users frequently use Internet and PC.

In general, primary users demonstrated a minor aptitude regarding new technology than secondary ones. This data highlights the potentiality of the project goal – to familiarize with technology from part of primary users.

The platform has been evaluated as functional in about 60% of cases by the point of view of primary users and as consisting of a good functionality by the point of view of secondary users. The evaluation of the primary users could be linked to the low familiarity with the technology.

The Task Editor tool has been evaluated as functional in the majority of cases. We are going to expect more positive evaluations in the third phase of implementation according with a more complex functionality reached.

All use cases result to have reached a good level of functionality, only use case 3 *ad-hoc* questionnaire report more heterogeneous evaluations.

Learning objectives scores of use case 1 have reported a good competence of secondary users in the field of the game.

Learning objectives scores of use case 2 have demonstrated a potentiality to increase practical skills of secondary users in the field of physiotherapy. Also learning objectives scores of use case 3 suggested a potentiality to increase practical skills of secondary users in the field of traditional food production. Also the presence of different professional figures in the sample could have affected learning objectives results of use case 3. The data of use case 2 and 3 support the potentiality of SeniorLudens in learning of practical skills using a motivating way (one of the main goals of the project).

The System Usability Scale scores revealed results statistically significantly different between user groups. Primary users reported a mean score under cut-off (mean score <68), beside secondary users show a mean score of usability within the normal range. This difference could be affected by the low familiarity of primary users relative to technology and also support the potentiality of SeniorLudens in familiarizing with technology. Interestingly, users reported a high score in Intrinsic Motivation Index, by demonstrating users are intrinsically motivated in using SeniorLudens system. The fact that primary users reported a major index than secondary ones could be affected by the low experience they have regarding technologies and the curiosity related opportunity to experience something new.

Moreover, the high scores users reported in each factor of Flow State Scale demonstrate that the system offers to the user the optimal psychological state to carry out the activity. Also, we observed a score significantly statistically different ($p < 0.001$) between user-group in the factor 2:

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 92
	WP4 – Pilot evaluation	

action-awareness merging. Specifically, secondary users reported a higher score than primary ones. This data suggests that involvement of secondary users in SeniorLudens activity has been deeper than primary users till it became completely automatic and spontaneous [3].

According with the analysis of the user's positive and negative affect between and after experiencing SeniorLudens system, we note that, despite positive affect hasn't increased after platform and game experience, the negative affect significantly statistically decreased after experiencing SeniorLudens in both user's groups. We expect to observe an increase also of the positive affect in the third evaluation of the definitive prototype of the system. This data could be in accordance with some contributions in literature that report a high positive relationship between flow state scale score and positive affect.[6]

In line with the primary users low aptitude in using technology, also in the extra session for elderly users we observed that the performance results affected by the inexperience toward technology:

- The elderly test-users like it to practice with the system SeniorLudens. Especially in a guided setting and working together with other elderly advisors. It was a nice day, with a good lunch and meeting colleagues. This setting made it comfortable to practice.
- However, use SeniorLudens the way they were supposed to: creating a game (task) for new colleagues, is still too hard for this target group and needs more time. At least there is willingness among the elderly advisors to invest in this.
- The elderly advisors rather prefer to play a game than making one their selves. Maybe the employees of UniekBO should be in charge of the game creation to teach these advisors.
- The system is quite heavy for a normal computer. Most of the elderly advisors don't have a fancy computer at home and when the system is down every time, it doesn't really motivate to continue. The system should be even more simple.
- This target group has really need for guidance. Realtime in their own language. For instance hints during the creation of the task in Dutch when the system notices that the user is searching or thinking longer than regular.

In conclusion, platform and game functionality have reached a good level of functionality. In accordance with their minor aptitude with technologies, primary users, together with elderly users, reported lower scores in evaluating usability and functionality of the system. On the other hand, primary users high score in intrinsic motivation index and flow state scale, confirm their interest in experiencing the system. Overall, the second evaluation session successfully ended by reporting a good functionality of all the system and by highlighting the potentialities of the goals of the project: a familiarization with the ICT technologies for senior users and to reach practical skills from older workforce through an innovative and motivating way such as serious games.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 93
	WP4 – Pilot evaluation	

Figures and tables

Figure 3- Validation session testing flow	27
Figure 4- validation elders session flow	60
Figure 5- Primary users (left) and secondary users (right) baseline regarding habitual use of technology	63
Figure 6- Primary users (left) and secondary users (right) baseline about competence in using new technologies	63
Figure 7- Response score frequency of primary users in Task Editor ad-hoc questionnaire	65
Figure 8- Response score frequency of primary users in the ad-hoc questionnaire about Platform functionality (item 1-20).....	66
Figure 9- Response score frequency of primary users in Platform <i>ad-hoc</i> questionnaire (21-24)	66
Figure 10- Response score frequency of secondary users in platform <i>ad-hoc</i> questionnaire....	67
Figure 11- response score frequency of primary users in use case 1 ad-hoc questionnaire.	68
Figure 12- response score frequency of secondary users in use case 1 ad-hoc questionnaire. 69	
Figure 13- response score frequency of primary users (left) and secondary (right) in use case 1 ad-hoc questionnaire regarding task1 in level 0.....	69
Figure 14- response score frequency of primary users (left) and secondary users (right) in use case 1 ad-hoc questionnaire regarding task 1 in level 1.....	70
Figure 15- response score frequency of primary users (left) and secondary users (right) in use case 1 ad-hoc questionnaire regarding task 2 in level 1.....	70
Figure 16- response score frequency of primary users (left) and secondary users (right) in use case 1 ad-hoc questionnaire regarding task 3 in level 1.....	71
Figure 17- response score frequency of primary users (left) and secondary users (right) in use case 1 ad-hoc questionnaire regarding task 1 in level 2.....	71
Figure 18- Frequency of right and wrong responses of learning objectives ad-hoc questionnaire of secondary users	72
Figure 19-Response score frequency of primary users in Use Case 2 <i>ad-hoc</i> questionnaire ...	73
Figure 20- Response score frequency of secondary users in Use Case 2 <i>ad-hoc</i> questionnaire	74
Figure 21- Frequency of right and wrong responses of learning objectives <i>ad-hoc</i> questionnaire of secondary users	75
Figure 22- response score frequency of primary users in use case functionality ad-hoc questionnaire	76
Figure 23- response score frequency of secondary users in use case functionality ad-hoc questionnaire	77
Figure 24- Frequency of right and wrong responses of learning objectives ad-hoc questionnaire of secondary users.	78
Figure 25-Mean and standard deviation of SeniorLudens usability score estimated by primary users (on the left) and secondary users (on the right). The orange line highlights the cut-off score.....	81
Figure 26- Mean and standard deviation of Primary users (on the left) and secondary users (on the right) results of Intrinsic Motivation Inventory.....	82
Figure 27- 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 and sense of control)	83

Figure 28- 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).	84
Figure 29- 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).....	85
Figure 30- Elderly users during extra session.....	86
Figure 31- Elderly users during the extra session.....	87
Figure 32- Maxi screen used during the session	88
Figure 33- Elders experience Task Editor tool	89
Figure 34- Elders experience Task Editor tool	89
Figure 35- Elders experience the system.....	90
Figure 36- Elders in filling in questionnaires	91
Figure 37. A frontal view of the virtual environment of the Rehabilitation use cas	133
Figure- 38. Visible money near the door	150
Figure- 39. Ironing table in the middle and accessible blue detergent.....	151
Figure- 40. Accessible bleach bottle and misplaced roll of paper	151
Figure- 41. Cables	152
Figure 42. Loose carpet and slipper out of place	153
Table 1- Objects implemented in Use Case 1 at the second implementation phase	12
Table 2- Learning objectives for Use Case IT in second evaluation	13
Table 3- Procedures of Use case 1 for the second evaluation	14
Table 4- Procedures IT USe Case in Level 0 for Task 1	14
Table 5- Procedures IT USe Case in Level 1 for Task 1	15
Table 6- Procedures IT Use Case in Level 1 for Task 2	15
Table 7- Procedures IT Use Case in Level 1 for Task 3	16
Table 8- Procedures IT Use Case in Level 2 for Task 1	17
Table 9- Learning objectives Use case 2 for the second evaluation	19
Table 10- Procedures of Use case 2 for the first evaluation	20
Table 11- learning objectives Use case 3 for the first and second evaluation	22
Table 12- Procedures of Use case 3 for the second evaluation	24
Table 13- Learning objectives Use case 4	25
Table- 21. Second evaluation session schedule	28
Table 26. Second evaluation session schedule	51
Table 16- Planning of the activities scheduled for the extra session of the elderly sample	59
Table 17- Sub-set of user's participants to the second evaluation	61
Table 18- Sub-set of secondary users participants to the second evaluation	62
Table- 19. Learning objectives IT use case for the second evaluation	129
Table- 20. Learning objectives Use case 3 for the second evaluation	141

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Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 96
	WP4 – Pilot evaluation	

Annex A: Informed consent

“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 to be used 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 one SeniorLudens evaluation session. Data we obtain from this evaluation will be useful for us to improve SeniorLudens among its implementation phases. Thanks for your time and availability.”*

The user signs the Informed Consent provided by the researcher:

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

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.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 97
	WP4 – Pilot evaluation	

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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal Computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tablet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social Network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video-games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Which is your competence in the use of use the following technologies and/or tools?	Expert	Competent	Beginner	No competence
Smart phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal Computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tablet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social Network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video-games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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.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 through SL Platform	<input type="checkbox"/>				
I am able to add new block	<input type="checkbox"/>				
I am able to modify each type of block	<input type="checkbox"/>				
I am able to load existing task	<input type="checkbox"/>				
I am able to create new task descriptor	<input type="checkbox"/>				
I am able to modules in parallel	<input type="checkbox"/>				
I am able to create new task flow	<input type="checkbox"/>				
I am able to modify an existing task flow	<input type="checkbox"/>				
I am able to save task descriptor	<input type="checkbox"/>				

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
Questions for managers					
I am able to log in the Organization Platform Administration	<input type="checkbox"/>				
I am able to identify in which organization I am?	<input type="checkbox"/>				
How do you consider the world manager?	<input type="checkbox"/>				
How do you consider the scenario manager?	<input type="checkbox"/>				
How do you consider the task manager?	<input type="checkbox"/>				
I understand how the different descriptors work.	<input type="checkbox"/>				
I understand the function of the different descriptors.	<input type="checkbox"/>				
I am able to create a new scenario descriptor.	<input type="checkbox"/>				
I am able to create a new task descriptor.	<input type="checkbox"/>				
I am able to launch the simulator to check the task descriptor.	<input type="checkbox"/>				
I understand how to create a game.	<input type="checkbox"/>				
I understand how to create an activity.	<input type="checkbox"/>				
I am able to publish a game into the game catalogue.	<input type="checkbox"/>				
I am able to manage the games with the game catalogue.	<input type="checkbox"/>				
I am able to create a new game.	<input type="checkbox"/>				
I am able to create a new activity.	<input type="checkbox"/>				
I am able to select the different descriptors in the activity creation	<input type="checkbox"/>				
I am able to publish an activity in a game.	<input type="checkbox"/>				
I understand the game details view.	<input type="checkbox"/>				
The game creation process is understandable	<input type="checkbox"/>				

How would you review the following aspects of the platform?	Bad	Insufficient	Sufficient	Good	Excellent
General questions					
The platform does support the development of Serious Games	<input type="checkbox"/>				
The platform does allow the deployment of Serious Games in its own infrastructure	<input type="checkbox"/>				
The SeniorLudens Platform is usable	<input type="checkbox"/>				
The platform is understandable	<input type="checkbox"/>				

Ask the user for additional comments and suggested modifications.

Comments & Suggestions:

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

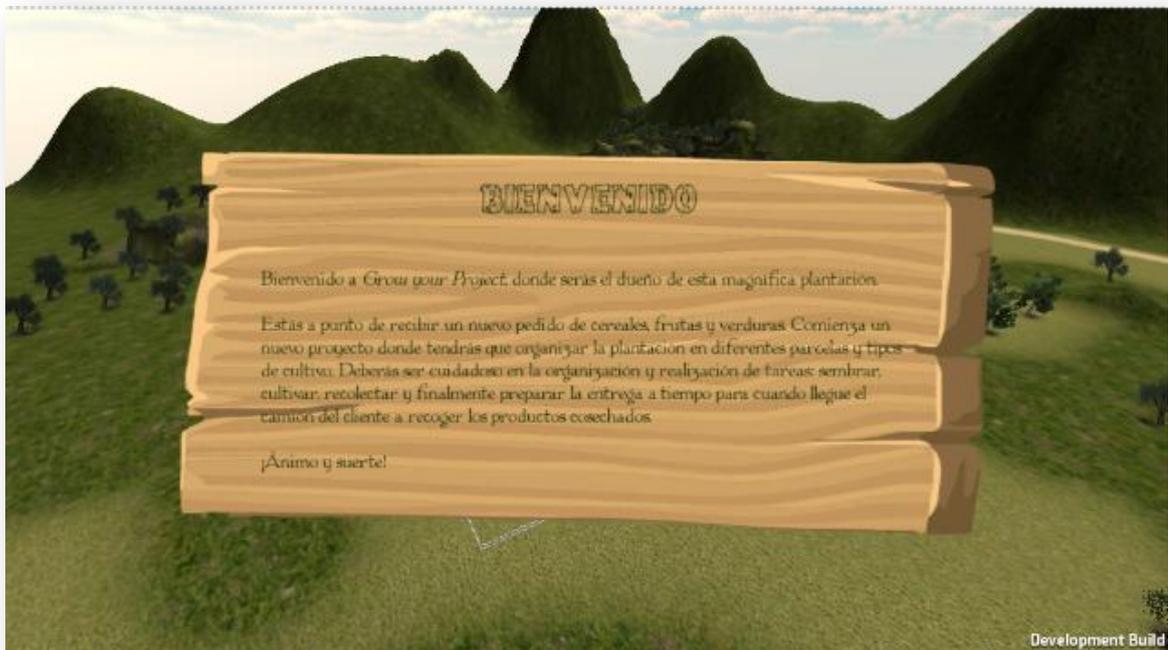
Annex D.1. : IT Use Case

Guided procedure IT Use Case

- User login: the user starts the game by opening the following url in a Firefox or MSExplorer navigator (not Google Chrome):
SeniorLudens platform: <http://demos-innovation-labs.com/sl/login>
username/password: playindra/play with **manager** clicked
- The Unity player will open.
- The game will proceed following the rules described above
- When the task ends, the user return back to the platform and chooses the next task

Level 0 Task 1

Welcome message:



Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 104
	WP4 – Pilot evaluation	

Fly through the environment:



Isometric view of the environment:



Demo of how to do zoom:



Demo of how to do panning:



Zoom and panning interactions allowed with the arrow keys of the keyboard and the mouse:



Zoom and panning interactions allowed with the bottom panel:



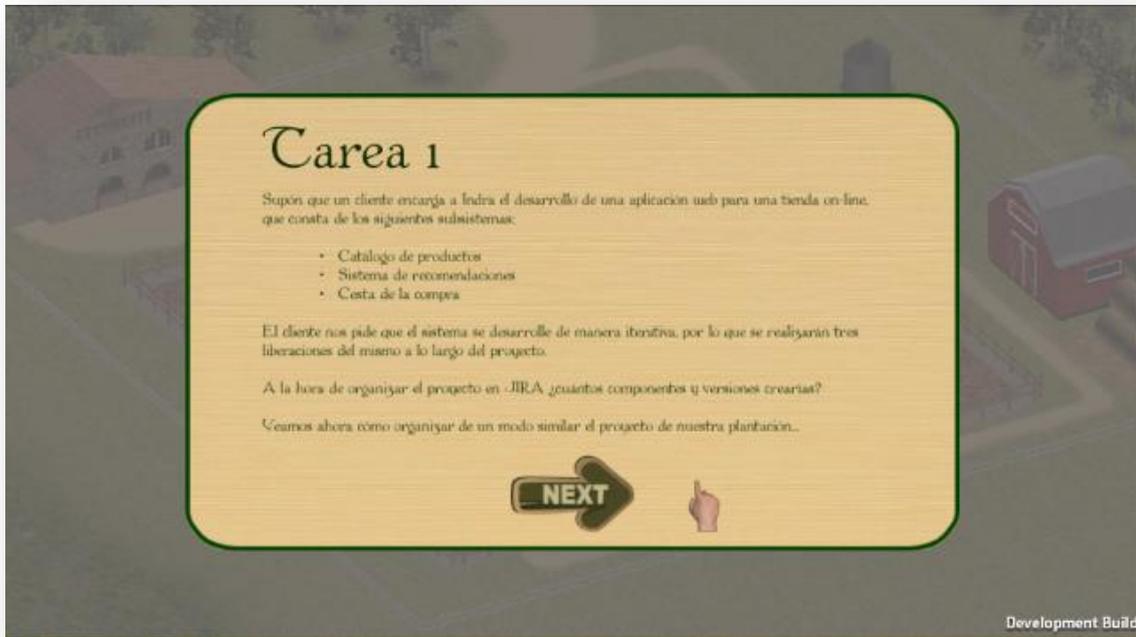
Goodbye message:



Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 108
	WP4 – Pilot evaluation	

Level 1 Task 1

First instruction message:



Second instruction message:



Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 109
	WP4 – Pilot evaluation	

Order form:



MERCAMIND Orden del pedido: 123456A
Fecha de pedido: 1 de Junio

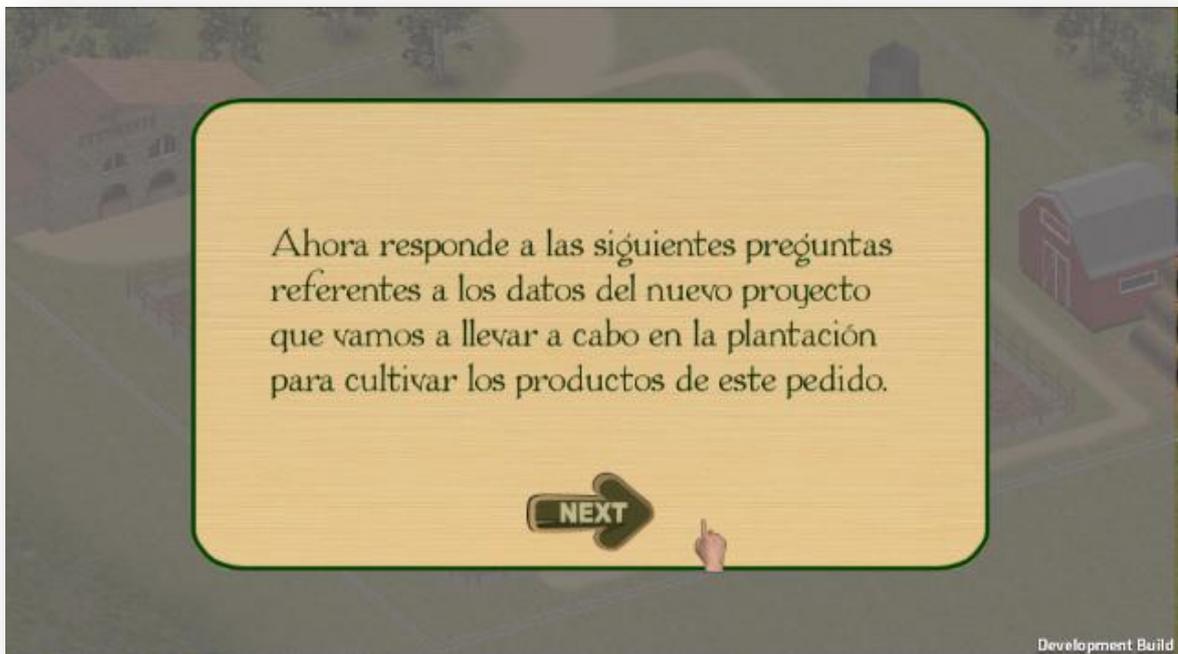
Plazo de entrega:	15 de Junio (15 días)	5 de Agosto (65 días)	10 de Agosto (70 días)
Facturar a:	MM España	MM Italia	MM Francia

PRODUCTOS

CEREALES			
Trigo	100 Kg		
Maíz		500 Kg	
FRUTAS			
Melones		100 Kg	100 Kg
Fresas		200 Kg	
Sandías			200 Kg
VEGETALES			
Lechugas			300 Kg
Espinacas			300 Kg

NEXT
Development Build

Third instruction message:

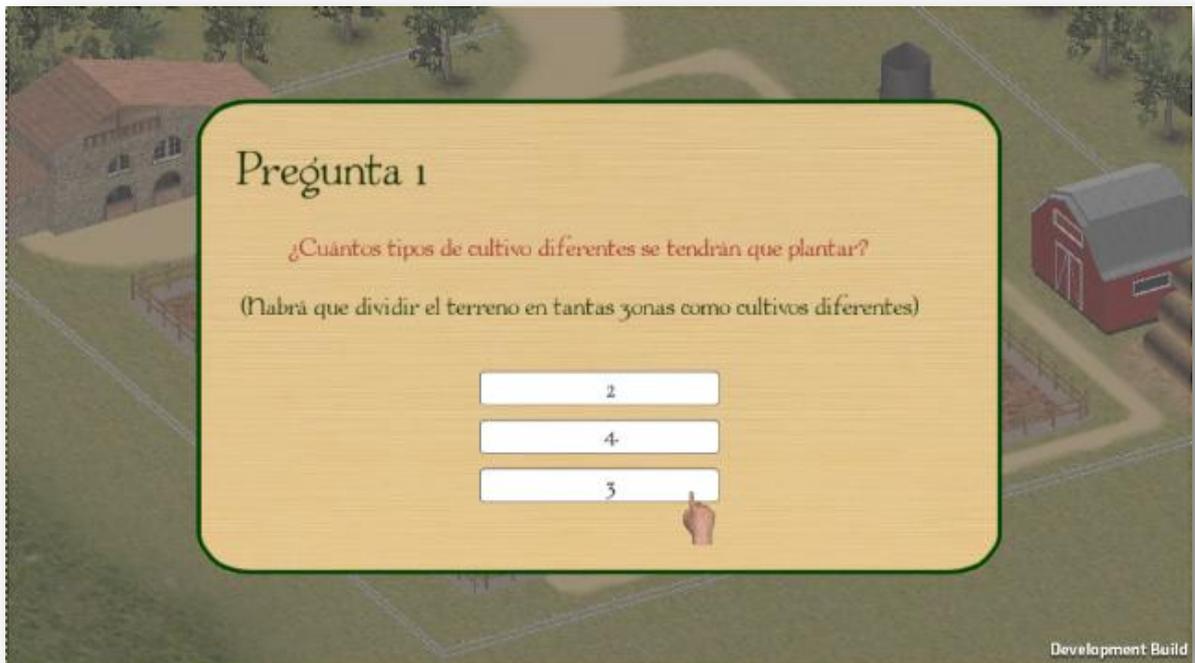


Ahora responde a las siguientes preguntas referentes a los datos del nuevo proyecto que vamos a llevar a cabo en la plantación para cultivar los productos de este pedido.

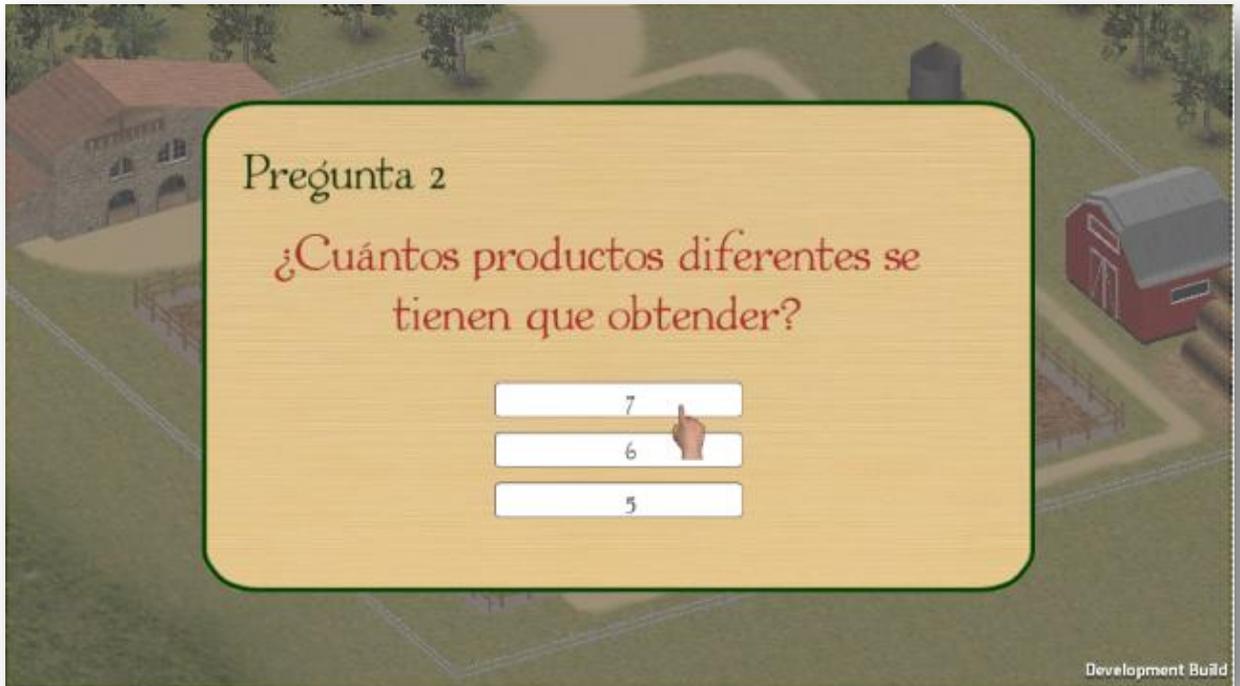
NEXT

Development Build

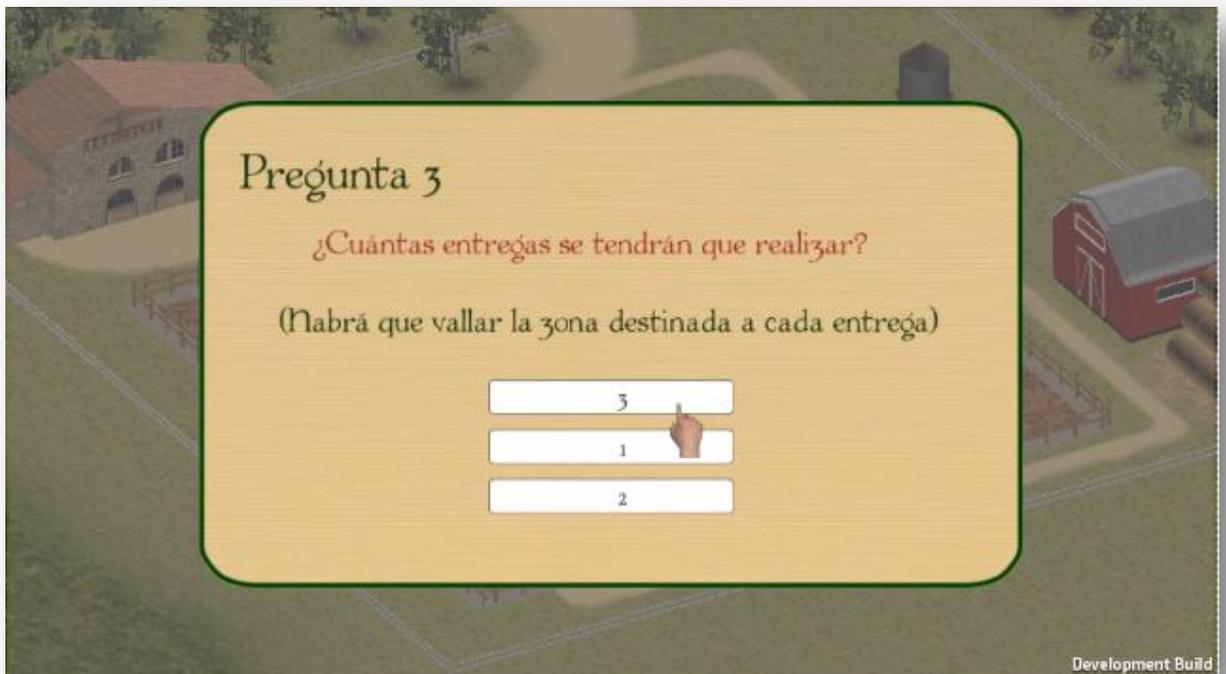
First question:



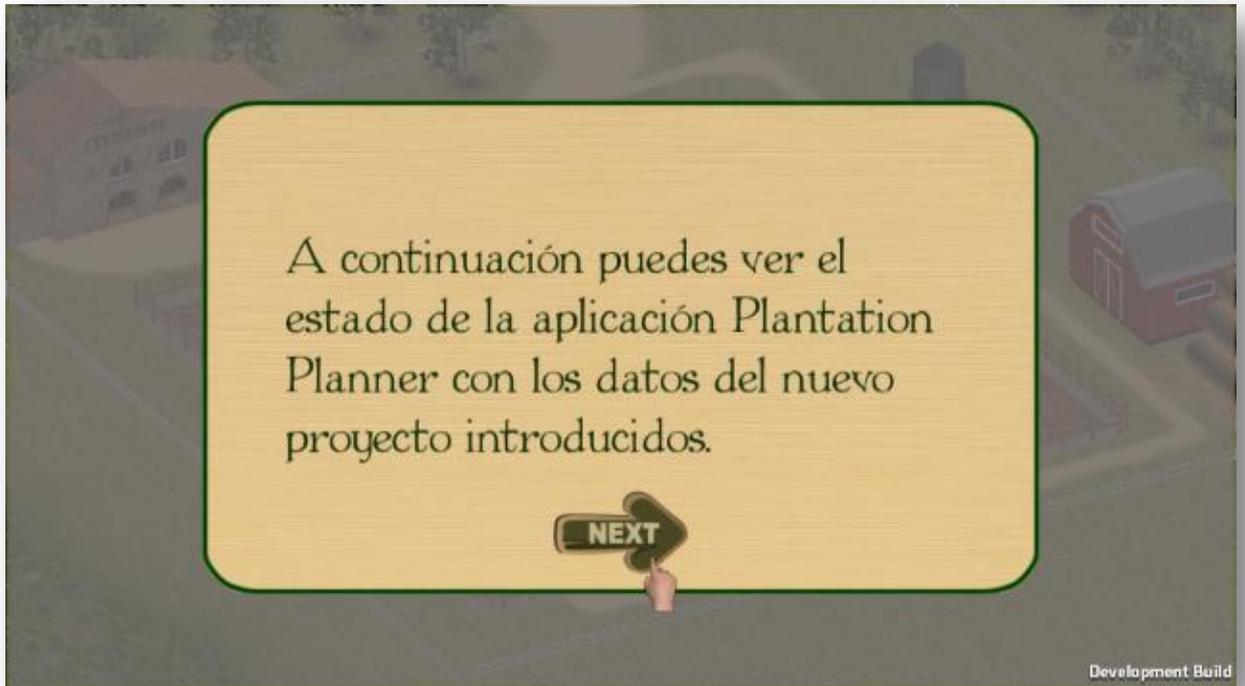
Second question:



Third question:



Fourth instruction message:



The *Plantation Planner* form with the answers:



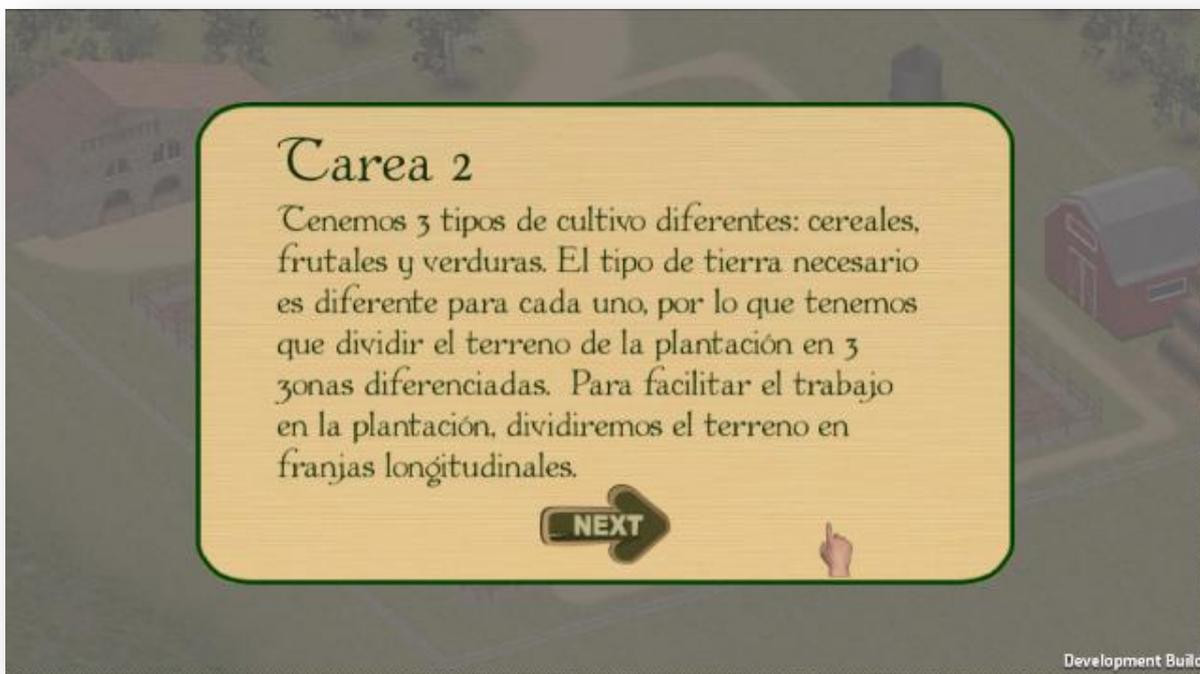
Summary of concepts message:



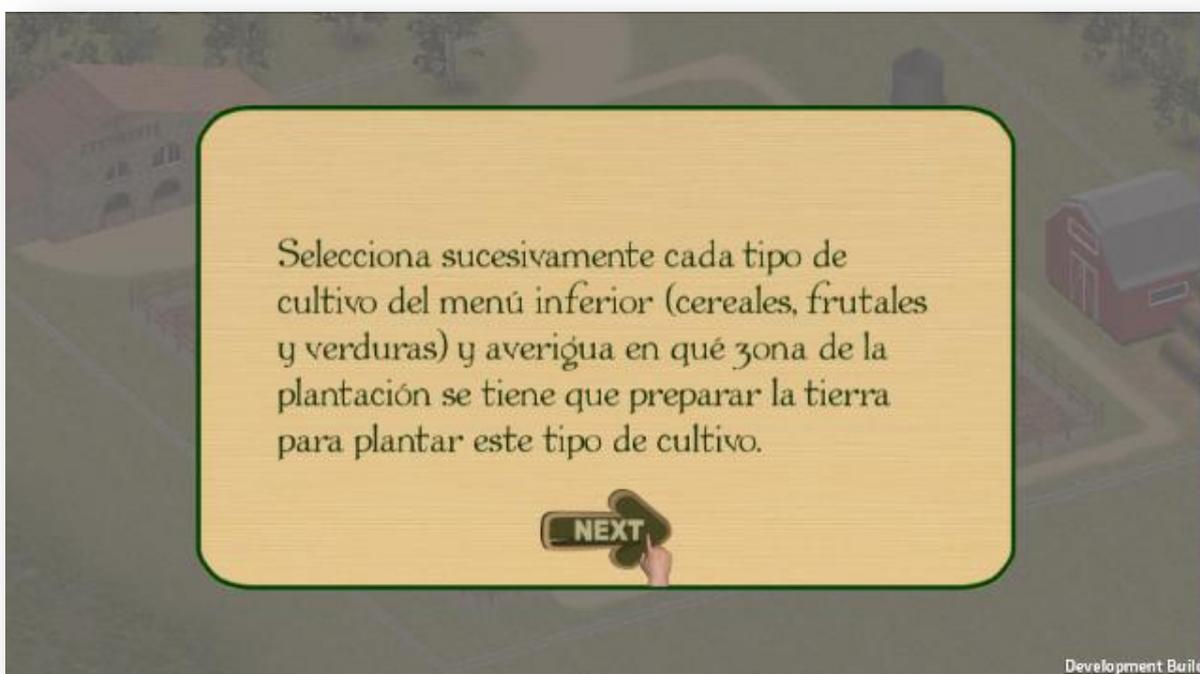
Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 114
	WP4 – Pilot evaluation	

Level 1 Task 2

First instruction message:



Second instruction message:



Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 115
	WP4 – Pilot evaluation	

Types of crop in the bottom panel:



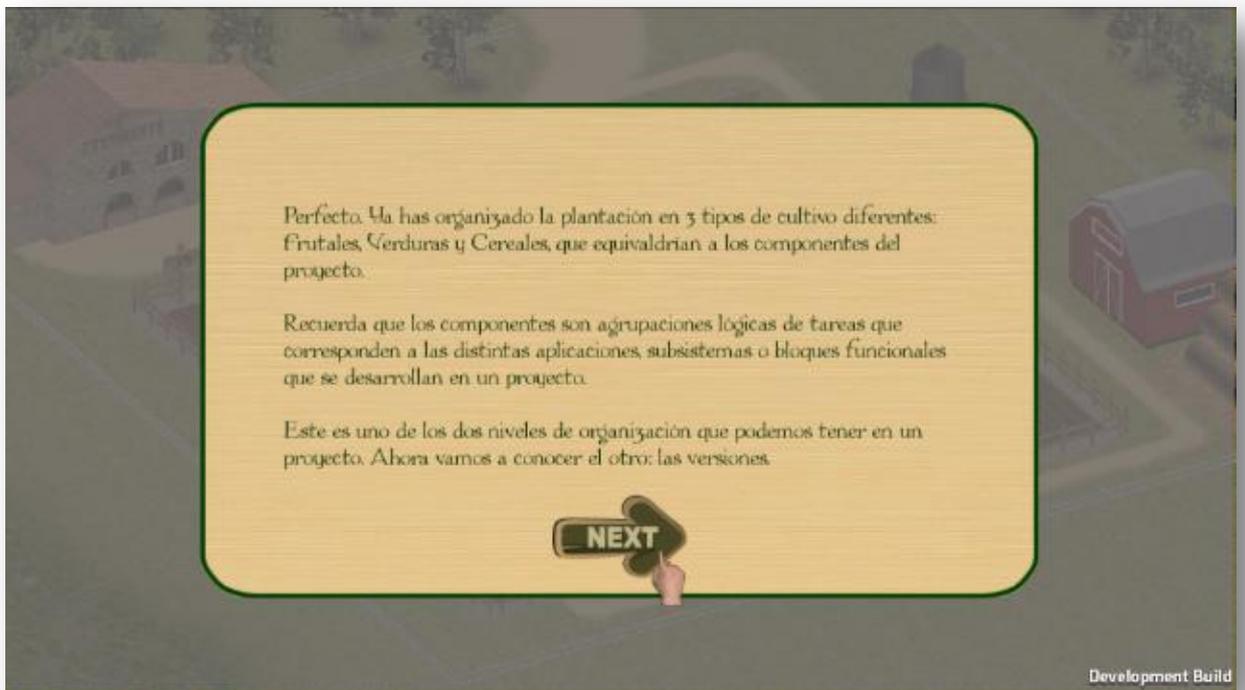
A type of crop selected:



The cultivation divided into three areas according to a different type of crop:

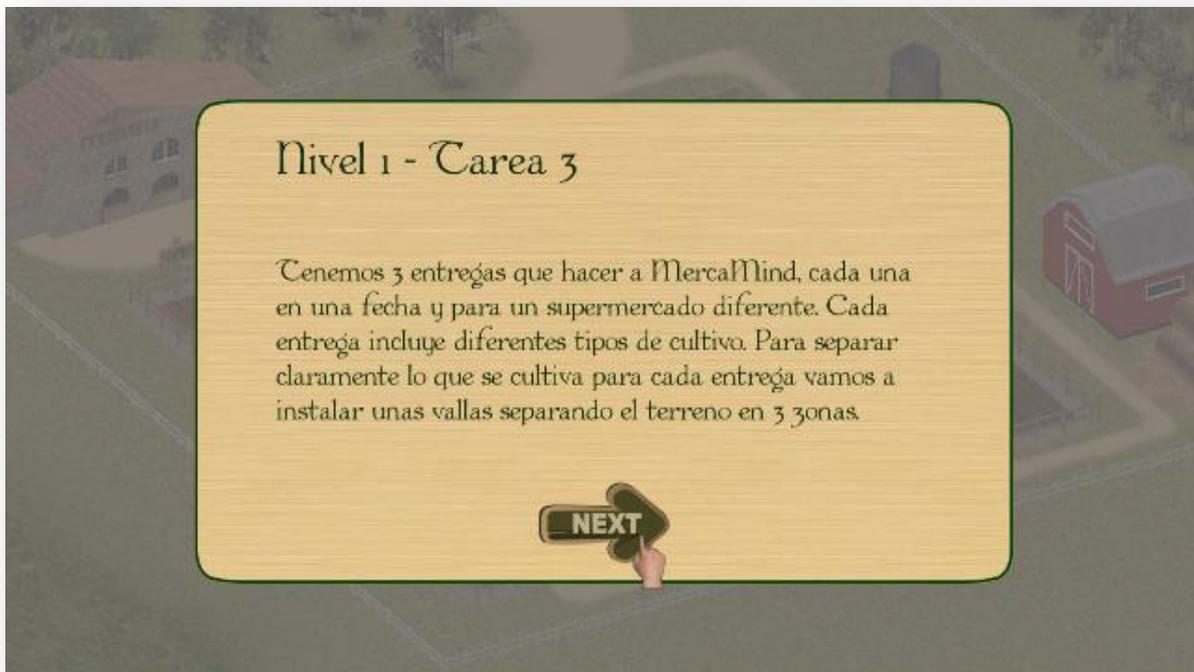


Summary of concepts message:

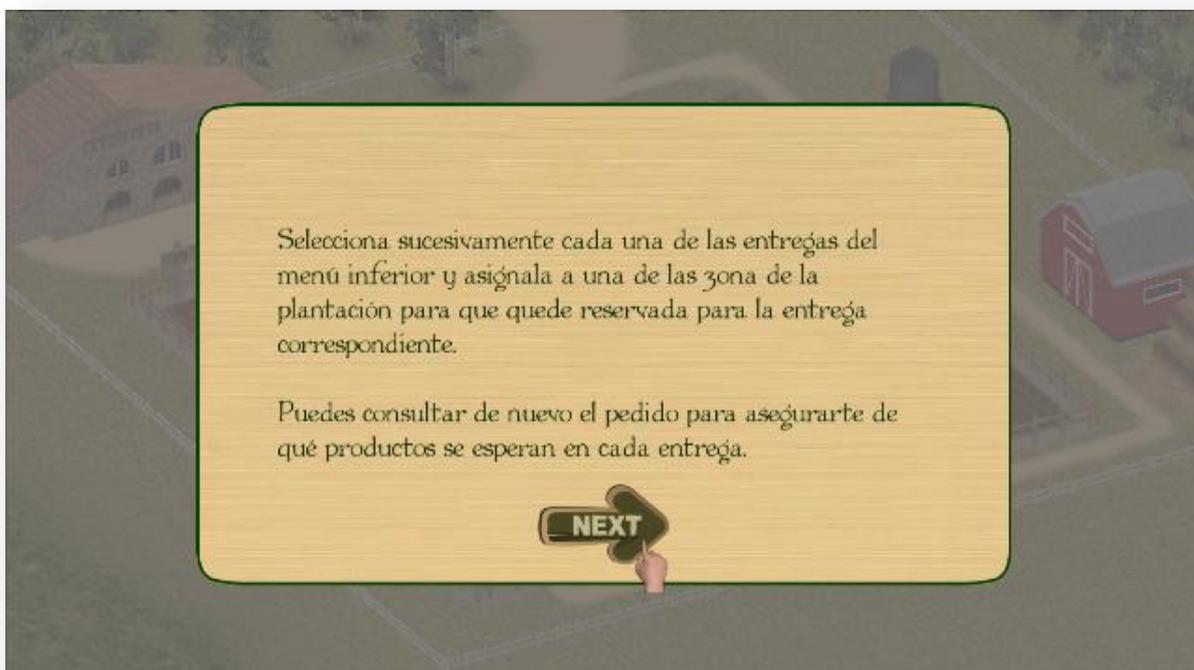


Level 1 Task 3

First instruction message:



Second instruction message:



Delivery selected:



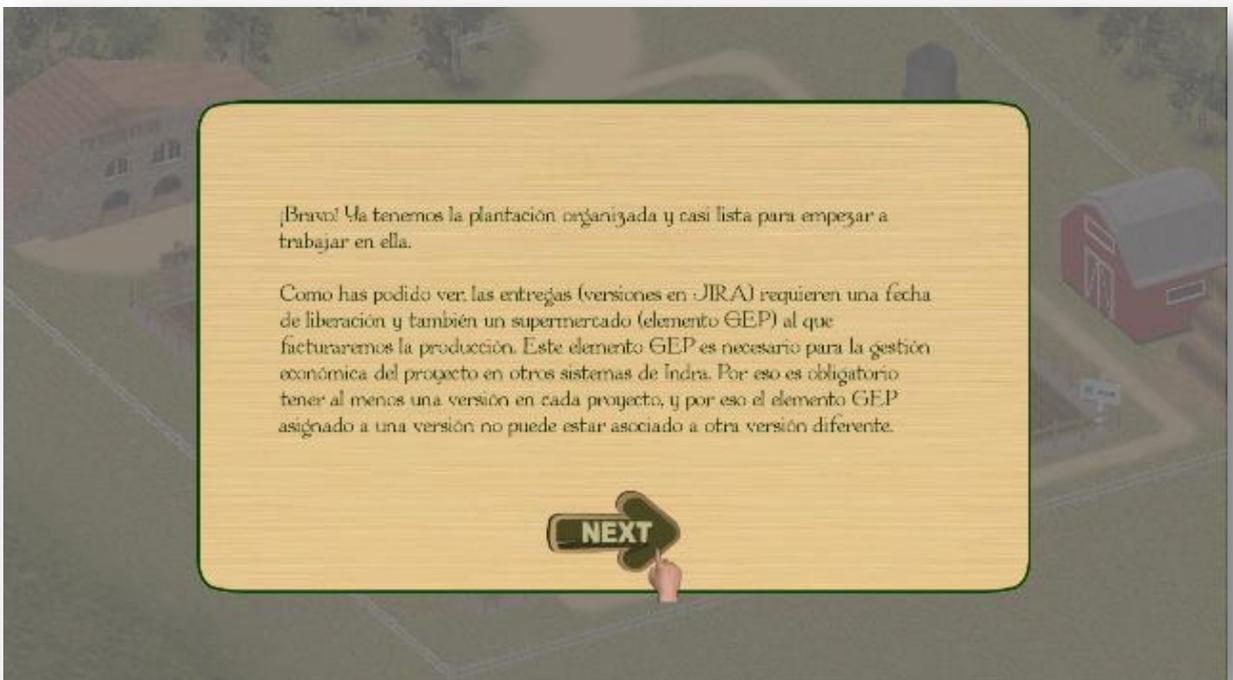
Zone selected with a determinate delivery:



Zone assign to a determinate delivery

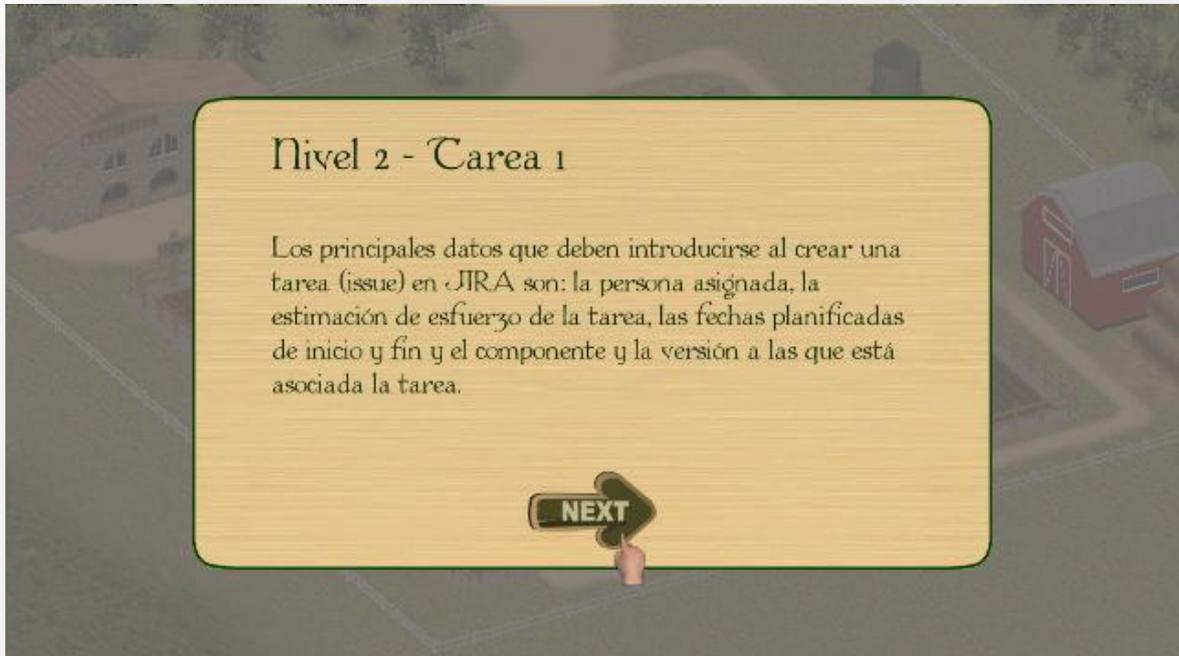


Summary of concepts message:

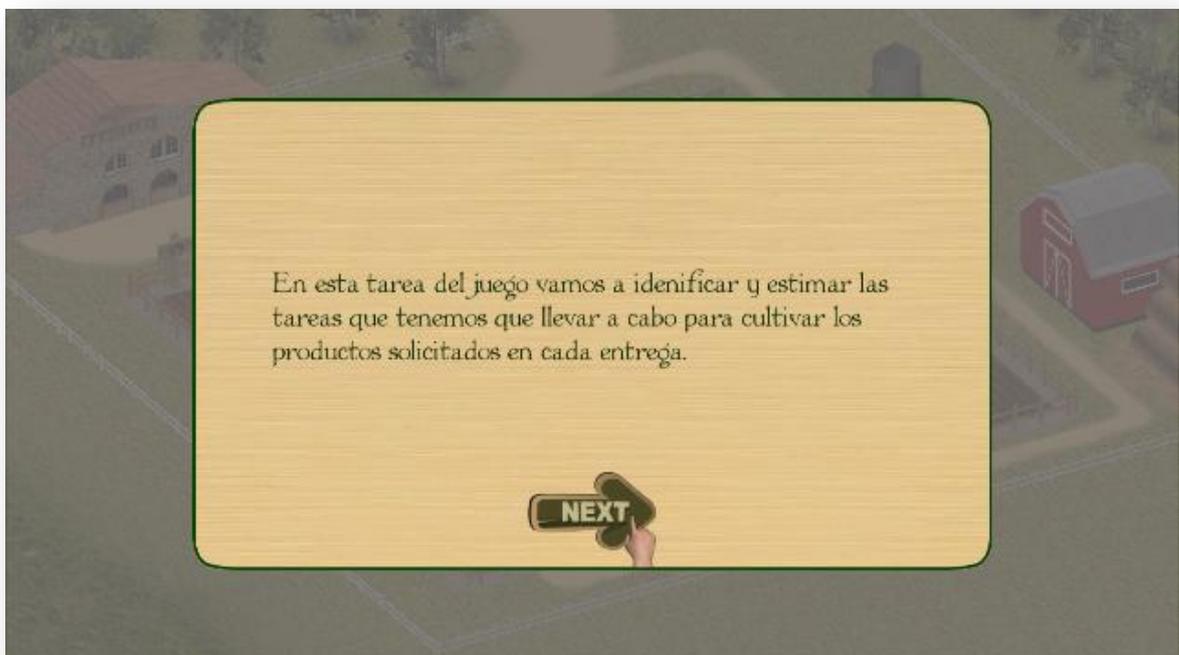


Level 2 Task 1

First instruction message:



Second instruction message:

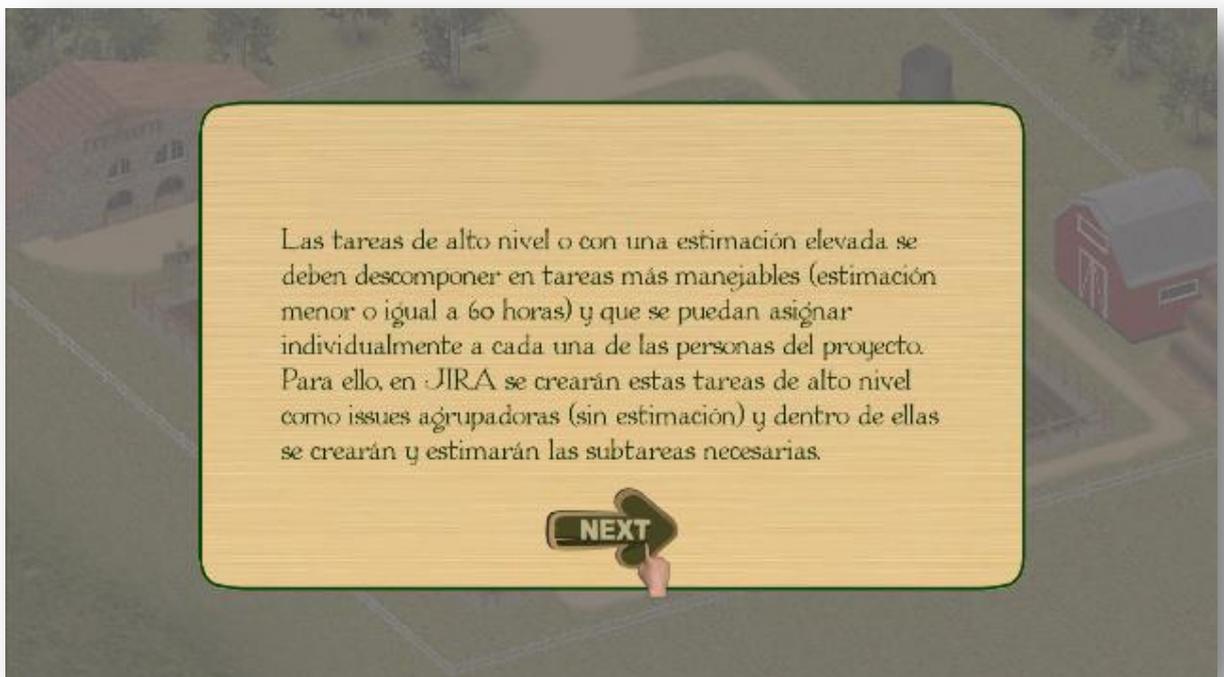


The *Plantation Planner* form with the different deliveries:

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 121
	WP4 – Pilot evaluation	



Concept message:



The *Plantation Planner* form with the different tasks to do for the selected delivery:

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 122
	WP4 – Pilot evaluation	

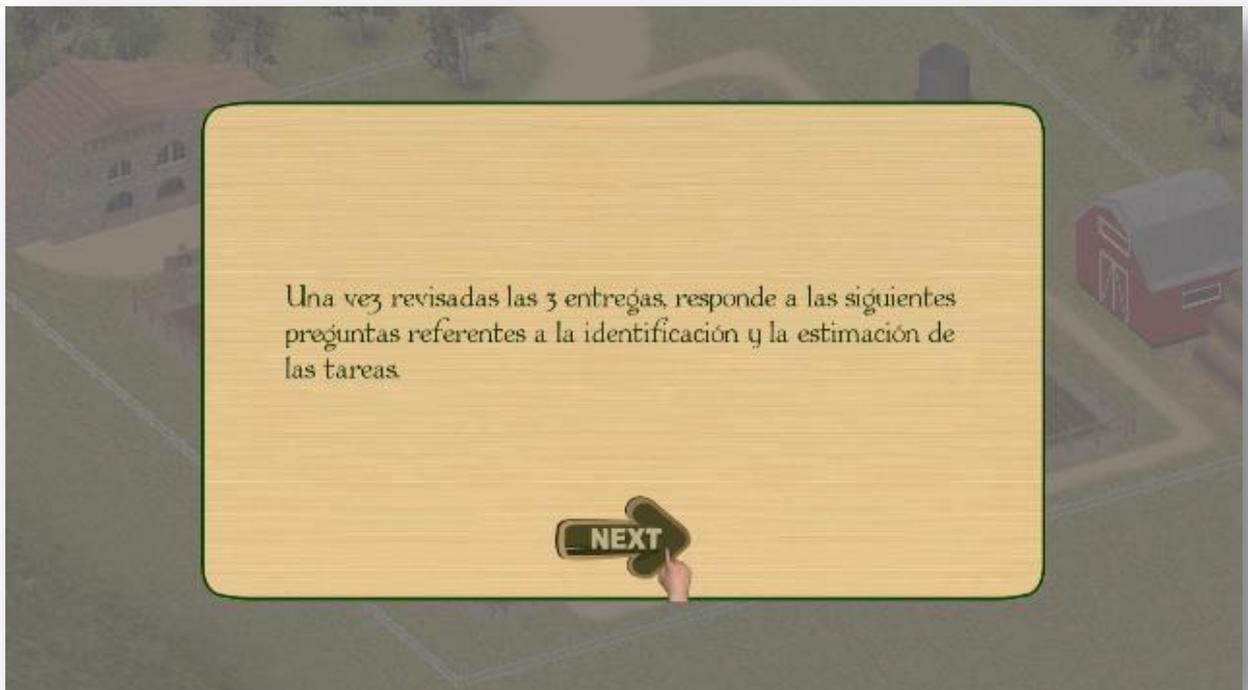


The *Plantation Planner* form with the different subtasks to do for the selected delivery:

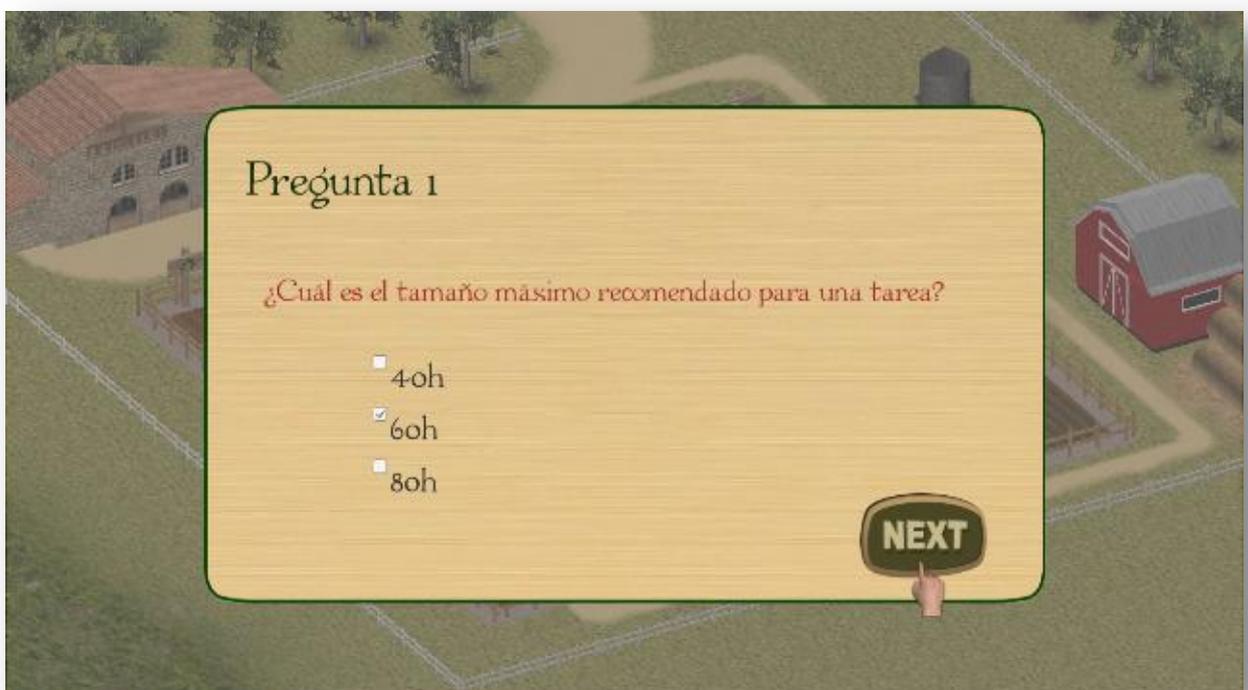


Third instruction message:

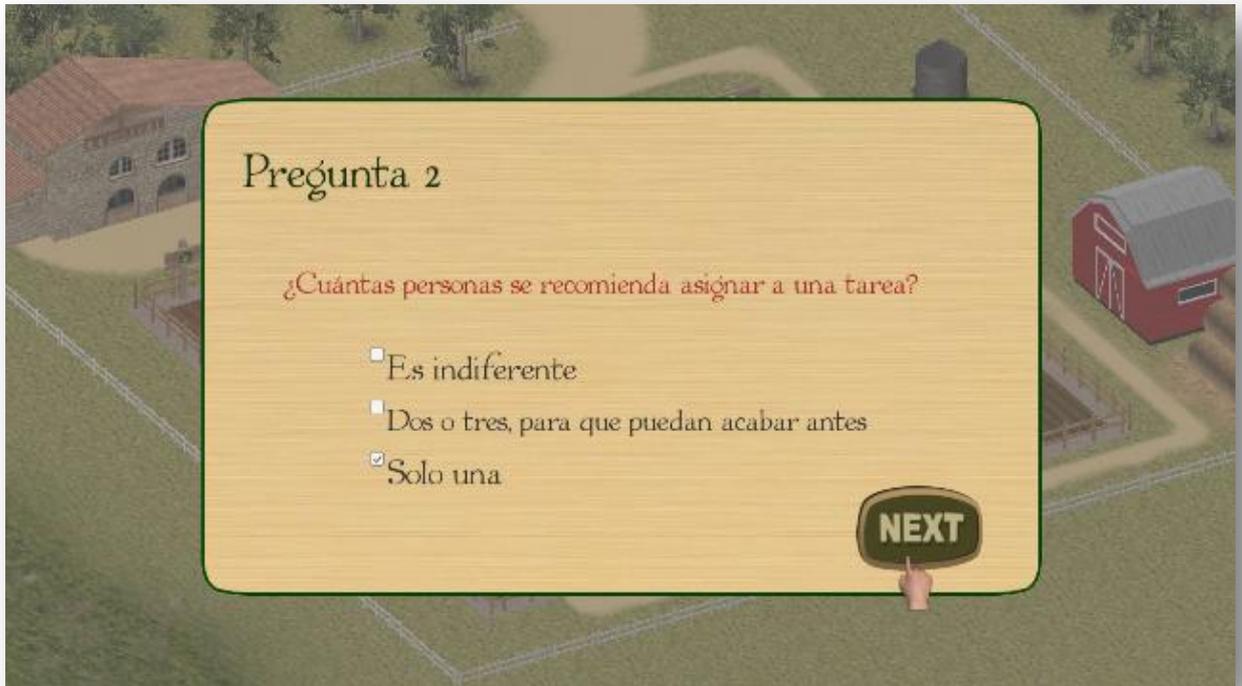
Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 123
	WP4 – Pilot evaluation	



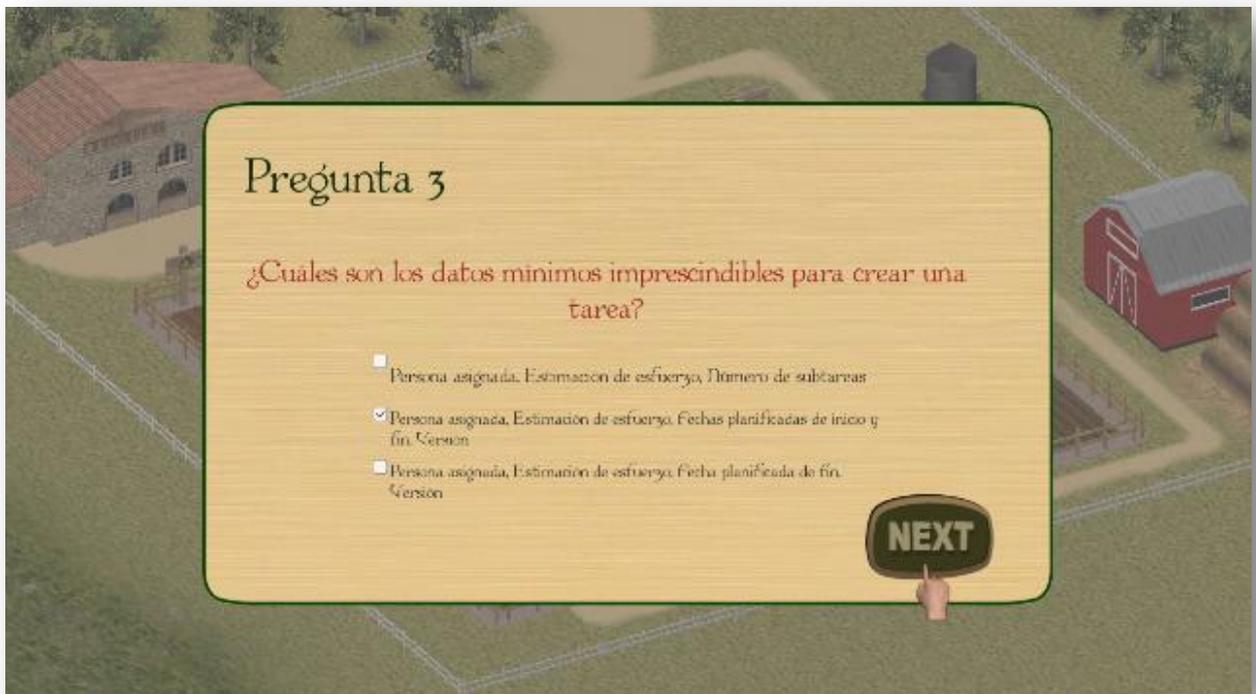
First question:



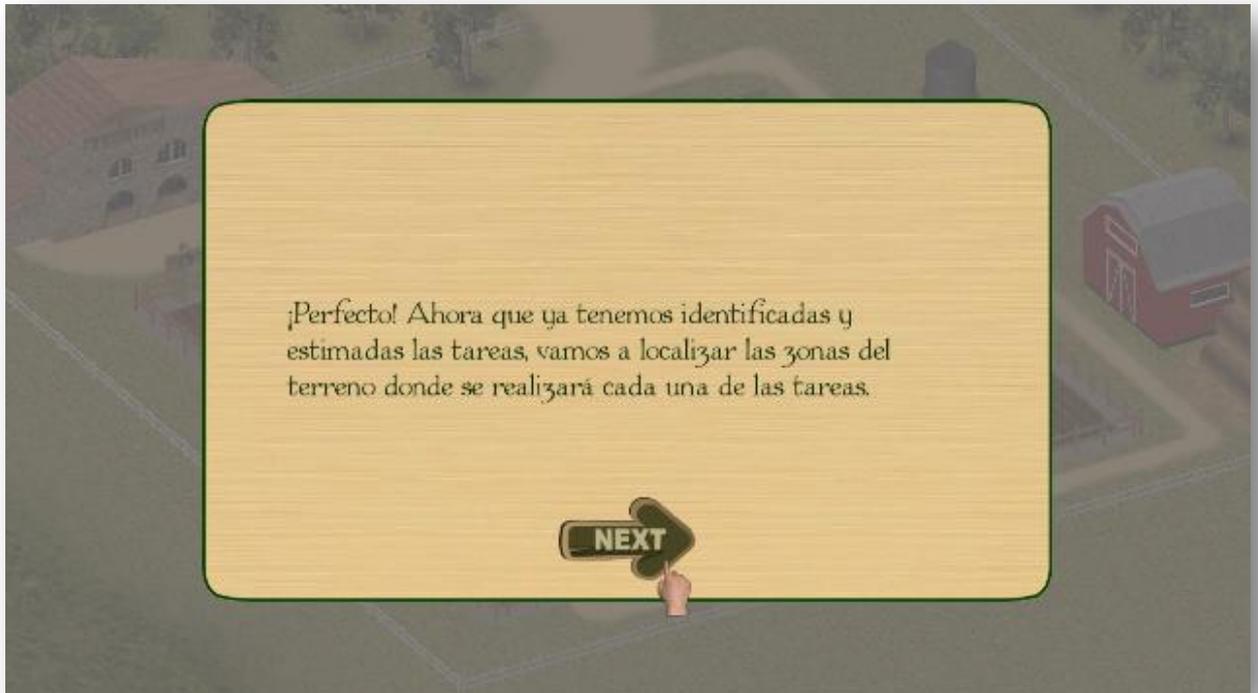
Second question:



Third question:



Summary of concepts message:



IT Use case Questionnaire

Answer the questions below.

How would you review the following aspects of the platform?	Totally disagree	Disagree	I don't know	Agree	Totally agree
General questions					
I understood the scenario	<input type="checkbox"/>				
I found the environment visually attractive	<input type="checkbox"/>				
Panning (moving around) the camera was easy	<input type="checkbox"/>				
I could not have pan through the game without the instructions	<input type="checkbox"/>				
Zooming (moving around) the camera was easy	<input type="checkbox"/>				
I could not have zoom through the game without the instructions	<input type="checkbox"/>				
The control of the game is intuitive	<input type="checkbox"/>				
The function of the tools in the bottom panel were easy to understand	<input type="checkbox"/>				
It was generally easy to play the game	<input type="checkbox"/>				

The game has an attractive presentation	<input type="checkbox"/>				
The game fulfilled the described rules	<input type="checkbox"/>				

LO 1 Level 0 task 1

It was easy to understand the instructions	<input type="checkbox"/>				
I understood how to do pan	<input type="checkbox"/>				
I understood how to do zoom	<input type="checkbox"/>				
I got a broad view of the farm	<input type="checkbox"/>				
I was surprised by the scenario	<input type="checkbox"/>				

LO2 Level 1 task 1

I understood that farm managing is a metaphor of project managing with Jira	<input type="checkbox"/>				
It was easy to understand the instructions	<input type="checkbox"/>				
It was prepared to answer questions after reading the form	<input type="checkbox"/>				
It was not prepared for questions after reading the form	<input type="checkbox"/>				
I could see that the <i>Plantation Planner</i> form had the values that I just gave as answers	<input type="checkbox"/>				
I would have liked to go back and read again the order form to proceed	<input type="checkbox"/>				

LO3 Level 1 task 2

It was easy to understand the instructions	<input type="checkbox"/>				
It was easy consult the order during the task	<input type="checkbox"/>				
It was easy prepare each area of the plantation for a determinate type of crop	<input type="checkbox"/>				
It was easy to realize when an area of the plot is already prepared	<input type="checkbox"/>				
I understood that the types of crops are a metaphor of the project components in Jira	<input type="checkbox"/>				

LO4 Level 1 task 3

It was easy to understand the instructions	<input type="checkbox"/>				
It was easy consult the order during the task	<input type="checkbox"/>				
It was easy fenced each area of the plantation for a determinate delivery	<input type="checkbox"/>				
It was easy to realize when an area of the plot is already fenced	<input type="checkbox"/>				

I understood that the deliveries are a metaphor of the project versions in Jira	<input type="checkbox"/>				
---	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

LO5 Level 2 task 1

It was easy to understand the instructions	<input type="checkbox"/>				
It was prepared to answer questions after reading the tasks and subtasks of each delivery	<input type="checkbox"/>				
It was not prepared for questions after reading the tasks and subtasks of each delivery	<input type="checkbox"/>				
The way to answer the questions was suitable	<input type="checkbox"/>				
I would have liked to go back and read again the order form to proceed	<input type="checkbox"/>				

What was the most difficult part to understand?

What did you like the most while playing the game?

IT Use case LEARNING Test

Id	Brief description	Metrics
1	Level 1 - Task 1	
1.1	Understand the requirements of a project	
1.2	Know how many components should be created	To be able to answer that there are three plantation areas of types of crops
1.3	Know how many versions should be created	To be able to answer that there are three plantation areas assigned to delivery dates
2	Level 1 - Task 2	
2.1	Know that you have to create the components	Having created three plantation areas of types of crops
2.2	Identify the components in terms of types of crops	To be able to answer that the Jira's components are equivalent to the types of crops
3	Level 1 - Task 3	

3.1	Know that you have to create the versions	Having created three plantation areas assigned to delivery dates
3.2	Identify the version in terms of delivery	To be able to answer that the Jira's versions are equivalent to the different deliveries
4	Level 2 - Task 1	
4.1	Know that you have to divide a project into tasks	Having created the tasks of all deliveries
4.2	Know that you have to divide the tasks into subtasks	Having created the subtasks of all deliveries
4.3	Know the maximum recommended size for a subtask (in hours)	Having answered 60 hours
4.4	Know the number of persons recommended to assign a subtask	Having answered one
4.5	Know the minimum essential data to create a subtask	Having answered the assigned person, the estimation of the effort, the planned dates of the start and the end, and the version.

Table- 19. Learning objectives IT use case for the second evaluation

Answer the questions below.

There are three different answers but the correct answer is one (X).

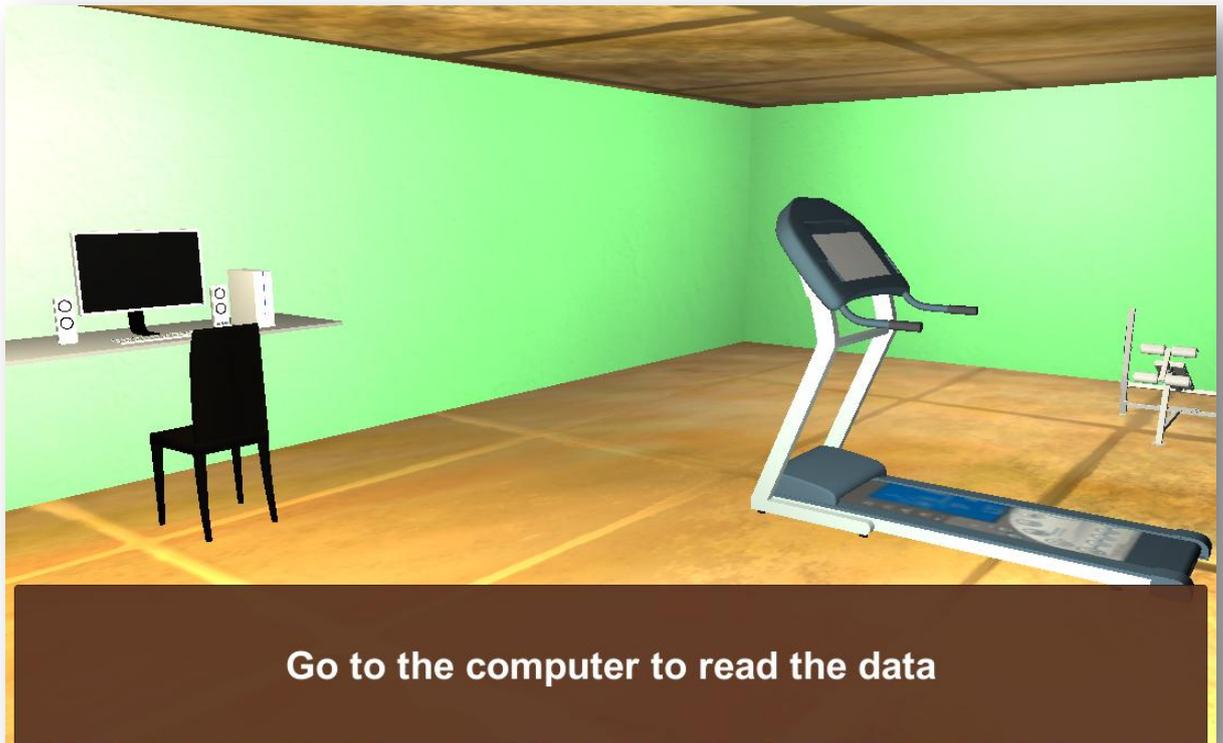
How would you review the following aspects of Use Case?	Answer DESCRIPTION	Answer (x)
Questions for Trainee		
1.1) In the game, the player's role is the farmer. What is its equivalent in a project managing?		
	ANS 1: The client	<input type="checkbox"/>
	ANS 2: The project manager	<input type="checkbox"/>
	ANS 3: The software developer	<input type="checkbox"/>
1.2) What is the correspondence of a Jira project component in <i>GrowYourProject</i> ?		
	ANS 1: Each area of plantation assigned to a supermarket	<input type="checkbox"/>
	ANS 2: Each supermarket order	<input type="checkbox"/>
	ANS 3: Each area of plantation specialized in a particular type of crop	<input type="checkbox"/>
1.3) What is the correspondence of a Jira project version in <i>GrowYourProject</i> ?		
	ANS 1: Each area of plantation assigned to a supermarket	<input type="checkbox"/>
	ANS 2: Each supermarket order	<input type="checkbox"/>
	ANS 3: Each area of plantation specialized in a particular type of crop	<input type="checkbox"/>
1.4) When you close a plantation area, you are...		
	ANS 1: Creating a version	<input type="checkbox"/>
	ANS 2: Creating a component	<input type="checkbox"/>
	ANS 3: Defining a requirement	<input type="checkbox"/>
1.5) The requirements of a project are equivalent in <i>GrowYourProject</i> to...		
	ANS 1: The order of all the supermarkets	<input type="checkbox"/>
	ANS 2: The order of one supermarket	<input type="checkbox"/>
	ANS 3: The order of one type of product for all the supermarkets	<input type="checkbox"/>
1.6) What is the first thing you have to do when you get the requirements of a project?		

	ANS 1: Assign persons	<input type="checkbox"/>
	ANS 2: Subdivide into subtasks	<input type="checkbox"/>
	ANS 3: Subdivide into tasks	<input type="checkbox"/>
1.7) What is the first thing you have to do after creating the tasks of a project?		
	ANS 1: Assign persons	<input type="checkbox"/>
	ANS 2: Subdivide into subtasks	<input type="checkbox"/>
	ANS 3: Assign hours	<input type="checkbox"/>
1.8) What is the maximum recommended size for a subtask?		
	ANS 1: 40 hours	<input type="checkbox"/>
	ANS 2: 60 hours	<input type="checkbox"/>
	ANS 3: 80 hours	<input type="checkbox"/>
1.9) How many people is it recommended to assign a subtask?		
	ANS 1: It is indifferent	<input type="checkbox"/>
	ANS 2: Two or three, so they can finish before	<input type="checkbox"/>
	ANS 3: Only one	<input type="checkbox"/>
1.10) What are the minimum essential data to create a subtask?		
	ANS 1: The assigned person, the estimation of the effort, and the number of subtasks	<input type="checkbox"/>
	ANS 2: The assigned person, the estimation of the effort, the planned dates of the start and the end, and the version.	<input type="checkbox"/>
	ANS 3: The assigned person, the estimation of the effort, the planned dates of the end, and the version.	<input type="checkbox"/>

Annex D.2. Rehabilitation Use case

Guided procedure Rehabilitation Use case

- User login: the user starts the game by opening the following url in a Firefox or MS InternetExplorer (not Google Chrome or MSEdge):
SeniorLudens platform: <http://demos-innovation-labs.com/sl/login>
username/password: playfcg/play
- 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

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 132
	WP4 – Pilot evaluation	

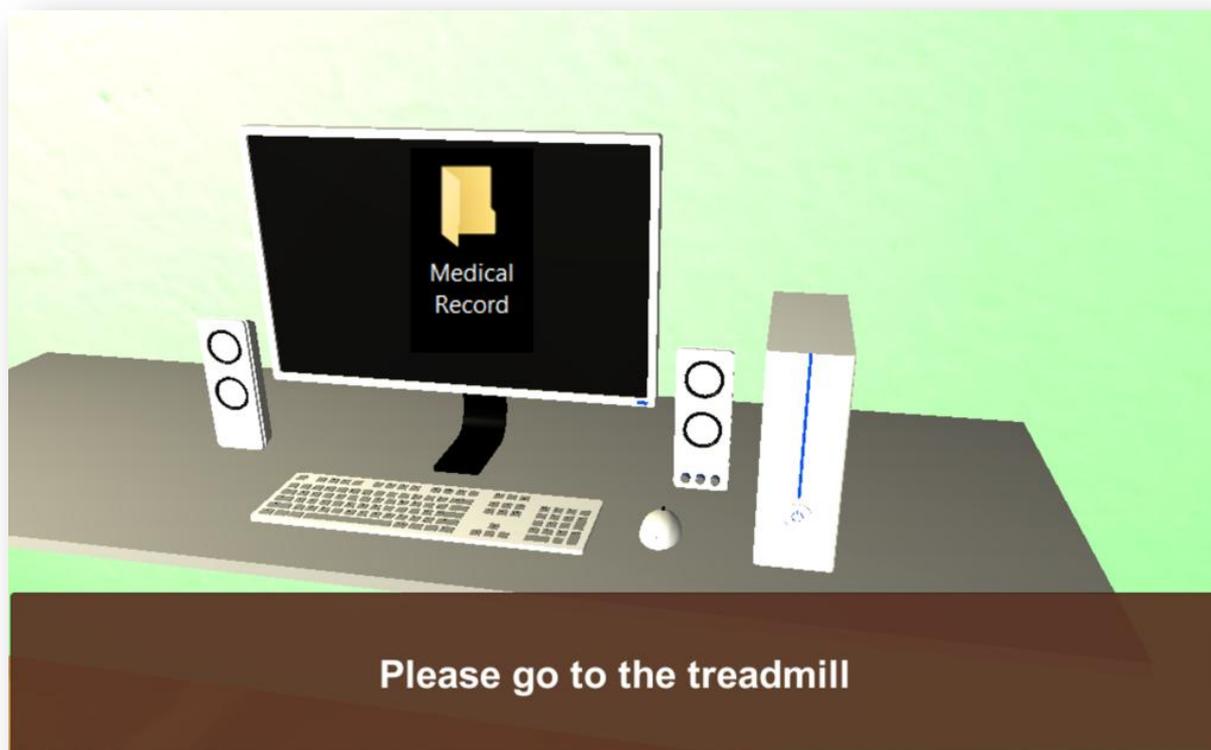


Figure 35. A frontal view of the virtual environment of the Rehabilitation use cas

- Move your mouse up and down on the medical record and read it carefully
- Press ESC to close the medical record
- Click on the monitor
- A form will appear and you will be asked how the handrails should be use
- A form will appear and you will have to choose which type of walk would be appropriate for the patient
- A form will appear and you have to decide what additional movement with the head should be done during the training on the treadmill
- A form will appear and you have to decide what additional movement with the arms should be done during the training on the treadmill
- Refer back to your supervisor

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 133
	WP4 – Pilot evaluation	

Rehabilitation Use case Questionnaire

Answer the questions below.

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

What was the most difficult part to understand?

What did you like the most while playing the game?

Rehabilitation Use case LEARNING Test

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
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	Questionnaire
1.2	To be able to extract from the clinical chart the relevant information for cognitive rehabilitation	Questionnaire
2.1.	To be able to identify the areas to be rehabilitated with motor exercises	Questionnaire
3.1.	To be able to identify the areas to be rehabilitated with cognitive exercises	Questionnaire

Focusing on the clinical data you've just analyse during the serious game, select the answer correct among the alternatives. There three alternatives, but the right answer is only one of them.

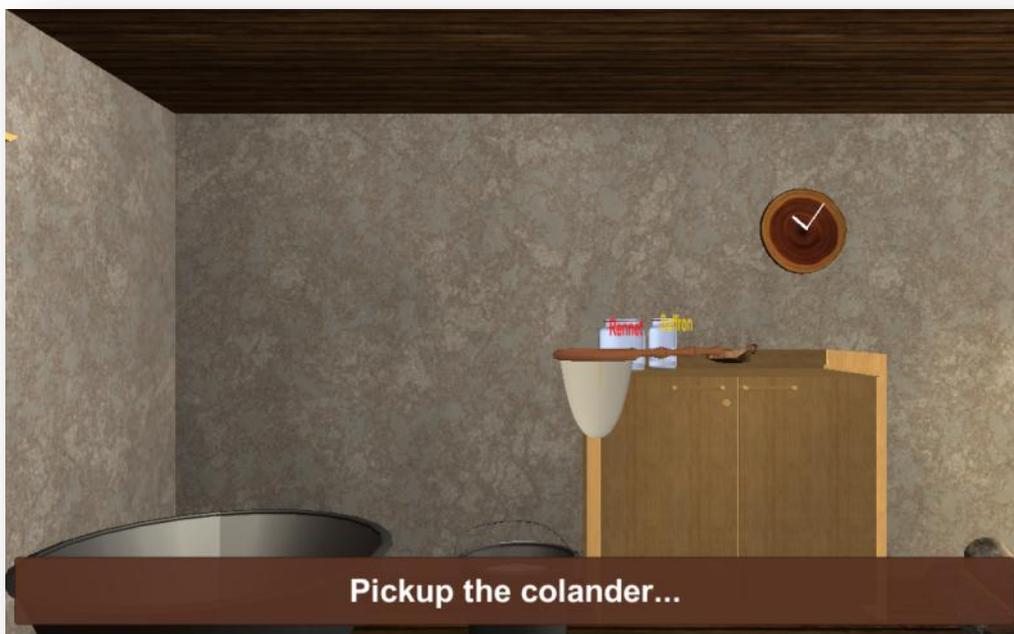
How would you review the following aspects of Use Case?	Answer DESCRIPTION	Answer (x)
Questions for Trainee		
1.1) Which function does Timed Up and Go assess?		
	ANS 1: Participation	<input type="checkbox"/>
	ANS 2: Functional mobility	<input type="checkbox"/>
	ANS 3: Heart rate at rest	<input type="checkbox"/>
1.2) Which function Rey Figure - copy assess?		
	ANS 1: Muscle strenght	<input type="checkbox"/>
	ANS 2: Executive functions	<input type="checkbox"/>
	ANS 3: Praxis	<input type="checkbox"/>
1.2) Which motor rehabilitative exercise is the most suitable for the patient on the basis of his clinical chart?		
	ANS 1: Walking Balance	<input type="checkbox"/>
	ANS 2: Walking using the handrail	<input type="checkbox"/>
	ANS 3: Arm pointing	<input type="checkbox"/>
1.3) Which cognitive rehabilitative exercise is not effective for the patient on the basis of his clinical history?		
	ANS 1: Verbal fluency tasks	<input type="checkbox"/>
	ANS 2: Denomination exercises	<input type="checkbox"/>
	ANS 3: Recall exercises	<input type="checkbox"/>

D.3. Traditional food production Use case

Guided procedure food production Use case

Obtain filtered milk

- User login: the user starts the game by opening the following url in a Firefox or MS InternetExplorer (not Google Chrome or MSEdge):
SeniorLudens platform: <http://demos-innovation-labs.com/sl/login>
username/password: playcbim/play
- The Unity player will open. You may need to authorize its running if it is the first time you launch it.



In this learning game you will learn the necessary steps to obtain filtered milk. For this you will need to put the colander on the basin and then to pour the raw milk from the bucket through the colander into the basin.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 136
	WP4 – Pilot evaluation	

Obtain skimmed milk



In this second learning game you will learn that you have to wait until the milk emergence and how to separate the cream from the milk.

Coagulate milk



Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 137
	WP4 – Pilot evaluation	

The third learning game is about coagulating the milk. You will learn that you have to pour the milk to the boiler, maintain the fire in order to heat up the milk and add rennet to it and to wait for the coagulation.

Obtain the correct consistency of the curd



In this fourth learning game for the production of cheese you will learn that you need to take the boiler from the fire, use the sword to break up the unpolished curd and let it quite for some time before you add the saffron. Further you will learn that you need to further break the curd by using the spino before you put the boiler back to the fire to heat it up again and take it off the fire to let it cool down.

Traditional food production Use case Questionnaires

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

What was the most difficult part to understand?

What did you like the most while playing the game?

Traditional food Use case LEARNING Test

The principal *interactive objects* of the second version of the game are 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)		
2	Obtain skimmed milk		
2.1	To be able to wait milk emergences in the basin	Time (between 12 and 36 hours)	
2.2	To be able to take away the cream from the basin	Using skimmer (spannarola)	
3	Milk coagulation		
3.1	To be able to transfer skimmed milk into boiler		
3.2	To be able to turn on the fire under the boiler	Using firewood	
3.3	To be able to overheat the milk into boiler	Temperature between 36°C and 40°C	
3.4	To be able to add the rennet into boiler	Fixed quantity	
3.5	To be able to wait milk coagulation	Time between 30 and 70 minutes	

4	Obtain the correct consistency of the curd		
4.1	To be able to remove the boiler from fire		
4.2	To be able to break the unpolished curd	Using sword	
4.3	Pause of the curd into boiler	Time between 10 and 40 minutes	
4.4	To be able to add the saffron into curd	Fixed quantity	
4.5	To be able to break the curd	Using “spino”	Between 1 and 3 broken with a frequency of 3-15 minutes
4.6	To be able to put the boiler on the fire		
4.7	To be able to overheat the curd into boiler	Temperature between 48°C and 53°C	Time between 20 and 50 minutes
4.8	To be able to remove the boiler from fire		
4.9	Pause of the curd into boiler	Time between 15 and 40 minutes	

Table- 20. Learning objectives Use case 3 for the second evaluation

After seeing the table 7 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	<input type="checkbox"/>
	ANS 2: The basin	<input type="checkbox"/>
	ANS 3: The table	<input type="checkbox"/>
1.1) Where you place the colander?		
	ANS 1: On the table	<input type="checkbox"/>
	ANS 2: On the basin	<input type="checkbox"/>
	ANS 3: On the box	<input type="checkbox"/>
1.2) What's in the buket that is located near the basin?		
	ANS 1: The filtered milk	<input type="checkbox"/>
	ANS 2: The raw milk	<input type="checkbox"/>
	ANS 3: Nothing	<input type="checkbox"/>
1.3) Which is the last sequence of the actions you do?		
	ANS 1: Mix up the raw milk	<input type="checkbox"/>
	ANS 2: Pour raw milk into basin	<input type="checkbox"/>
	ANS 3: Pour raw milk into box	<input type="checkbox"/>
1.4) Where do you skim the milk using Spannarola?		
	ANS 1: Into basin	<input type="checkbox"/>
	ANS 2: Into colander	<input type="checkbox"/>
	ANS 3: Into buket	<input type="checkbox"/>
1.5) Where do you transfer the skimmed milk?		
	ANS 1: Into buket	<input type="checkbox"/>
	ANS 2: Into basin	<input type="checkbox"/>
	ANS 3: Into boiler	<input type="checkbox"/>
1.6) What do you add to the skimmed milk?		

	ANS 1: Salt	<input type="checkbox"/>
	ANS 2: Saffron	<input type="checkbox"/>
	ANS 3: Rennet	<input type="checkbox"/>
1.7) Which object do you use to cut the curd?		
	ANS 1: Spannarola	<input type="checkbox"/>
	ANS 2: Sword	<input type="checkbox"/>
	ANS 3: Spino	<input type="checkbox"/>
1.8) How much time should you waiting for the curd on the "fascera"?		
	ANS 1: 5 minutes	<input type="checkbox"/>
	ANS 2: Between 15 and 60 minutes	<input type="checkbox"/>
	ANS 3: Between 1 and 8 minutes	<input type="checkbox"/>
1.7) Which object do you use to treat the crust?		
	ANS 1: Raw linseed oil	<input type="checkbox"/>
	ANS 2: Sword	<input type="checkbox"/>
	ANS 3: Olive oil	<input type="checkbox"/>

Annex D.4 In-game: Home Safety Use case script

Introduction

The **home safety** use case has been created to provide a familiar environment in which users from KBO could feel comfortable designing tasks about a topic in which they have some expertise: the safety at home.

After discussing the contents of possible games on safety in a focus group, a storyline of a simple task was proposed that integrates as many topics on safety as possible from those that were signaled in the focus group. The demo environment was adapted to integrated insecure elements. The goal of the session is to help users to create the proposed simple task using the task editor and seeing the results with the SL-Simulator, to analyze their difficulties, and take note of their impressions.

Proposed task contents

The proposed task according to the restrictions of time is the following:

Story

Introduction

Sequence of two messages: first, a welcome message is shown, and after a second message giving instructions, for instance “You have one minute to destroy all the objects that are insecure. Click on them and they will disappear”

Development

Players must destroy all the insecure objects by clicking on them during a given amount of time. Each click on an insecure object will be considered as correct and each click on a non-insecure object will be considered as incorrect.

Conclusions

The final score is shown within a message of good bye

Rules

Each correct object gives 1 point, each incorrect object withdraws 0 points.

Feedback

The scoring display is on during the game

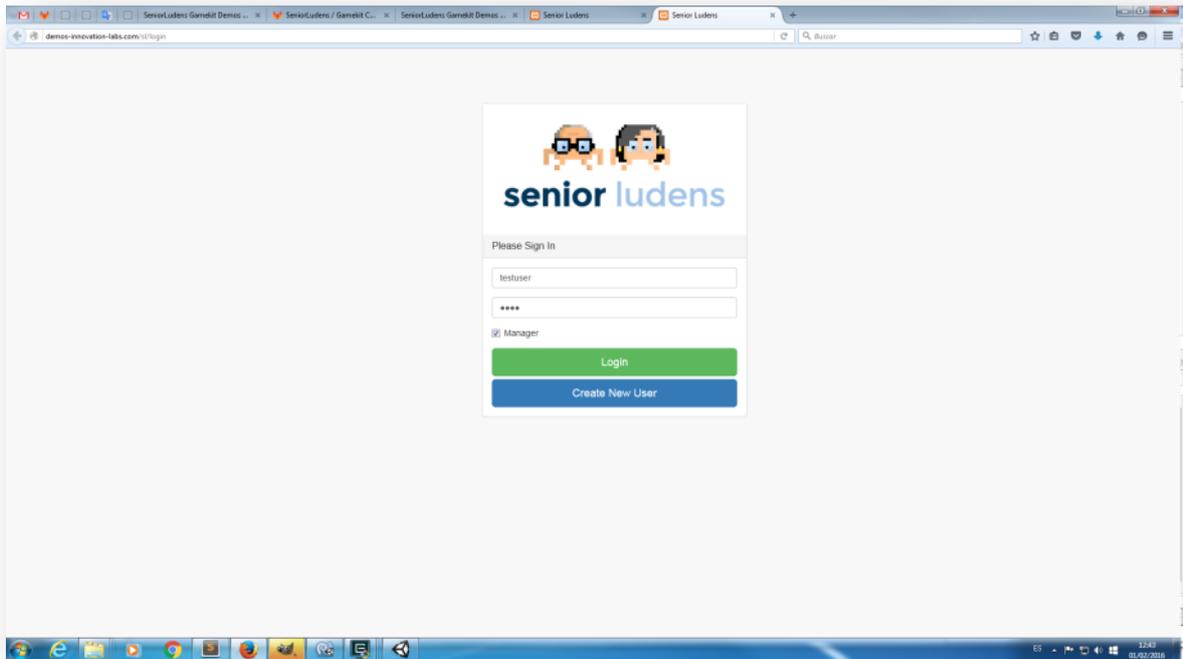
A message of feedback with extra information is displayed after each click. For instance if you click on the loose carpet the message can be: “ Good: a loose carpet can yield you to fall (and statistics about falls)”.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 144
	WP4 – Pilot evaluation	

Guided procedure

Step 1 Preparation

1. Login into SeniorLudens platform: <http://demos-innovation-labs.com/sl/login>
username/password: testkbo/test with **manager** clicked

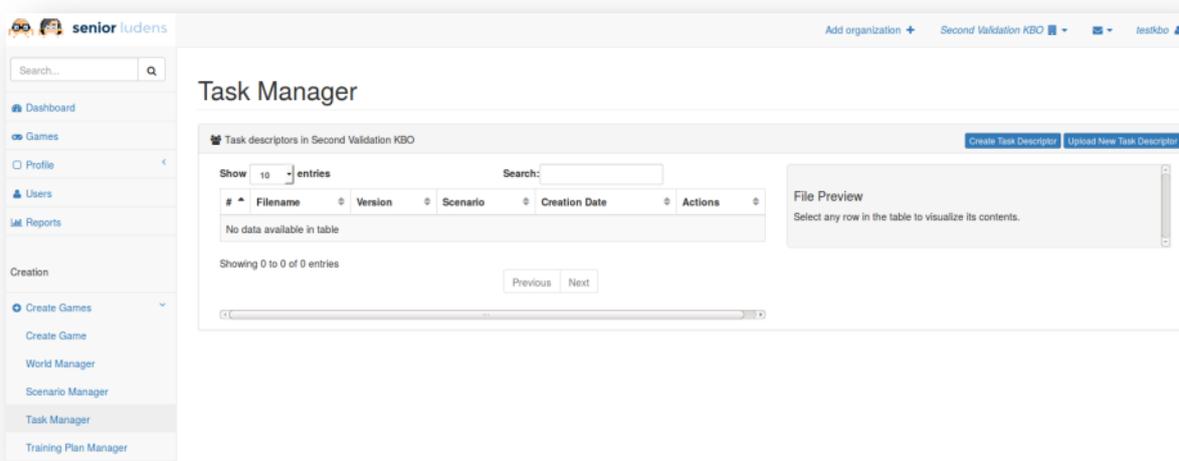


2. Navigate in the menus at left. The objective of the session is to create a new task as similar as this one as possible.

Step 2 Game creation

1. Login in the platform
2. Open the TaskManager tool

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 145
	WP4 – Pilot evaluation	



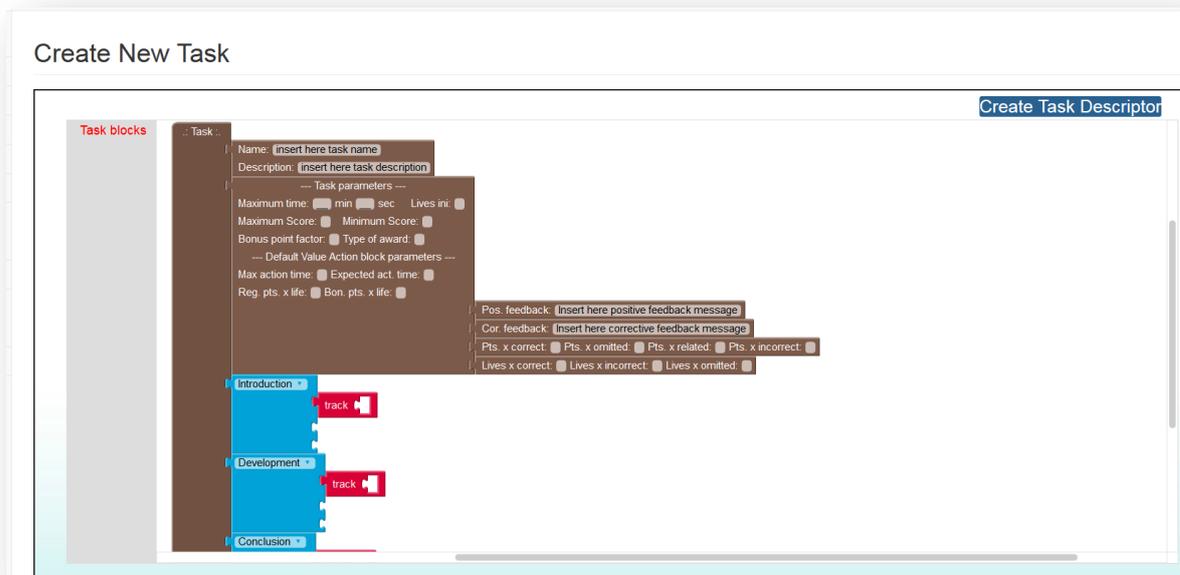
3. Select Create Task Descriptor

A pop window will ask you to select the scenario descriptor: choose the default.

4. Edit the general settings

There are many of them, but they all have default values. Our advice is to enter only the important ones:

- The name of the task: short, meaningful and without spaces. For instance if the name of the user is Karl: KomeSafetyByKarl
- Description: a short text, something like “A home safety game in a kitchen”
- Pos. feedback and Cor.feedback: These will be the messages that will be posted when the user performs a correct action and when he fails. You can put a text in Dutch, for instance “Goed gedaan” and “Jammer, niet goed”.
- Pts x correct: this means the points that will be awarded for each correct action. Put 1 for instance.



5. Create the introduction stage

For this stage as well as for the two next steps, you will need to define the task in terms of “blocks”. Click on “Task Blocks”, a list of possible blocks will appear. Select the one you want and put it where you want in the task descriptor. Do that as many time as needed. You can select, move and remove the blocks in the task descriptor. Try it for a while.

Now focus on the contents of the introduction step. In this stage, there will be only one track (only one independent thread of the narrative): the game will show first a central message that will last for some seconds.

Handling this message needs a sequence of three steps:

- display the message
- wait the amount of seconds you mentioned
- hide the message

For that, you need to define the introduction step as a *Sequence Block* with inside: a *Message Block* that will specify the contents of the message, a *Wait Block* that will specify the duration of the message and an *Action Block* in which you will ask the system to hide the message.

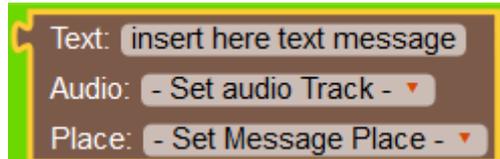
See below how the *Message Block* is inserted in the *Sequence block*



The other two blocks should be inserted after the Message Block, in the available slots inside the Sequence Block.

The contents of the Message Block is the following:

- Text: the text of the message Including carry returns. For instance “Welcome to Homesafety game”. Of course the text can be in Dutch.
- Audio: nothing, since we have not pre-recorded any message
- Place: the part of the interface in which you want the message to be posted. Choose: *CentralMessage*.



In the *Wait Block*, put the duration of exposure of the message (10 for instance).

Finally, the *Action Block* will be aimed at closing the message. The subject is the *system* and the action *HideMessage*.

6. Create the development stage

This stage will also have only one track (one independent narrative thread). In this stage, users are asked to remove the objects that can be considered as unsafe for any reason. Start with a simple case: the user will need to remove the carpet and the money near the door. Since these two actions can be done in any order, you should choose the *AnyOrder Block*. Within it, add two *Action Blocks*. In both blocks the subject is *user*, the verb *destroy* and the direct object of the first one is *carpet-beige* and *any money* for the second.

You can add this way as many insecure objects as you want (see the list below)

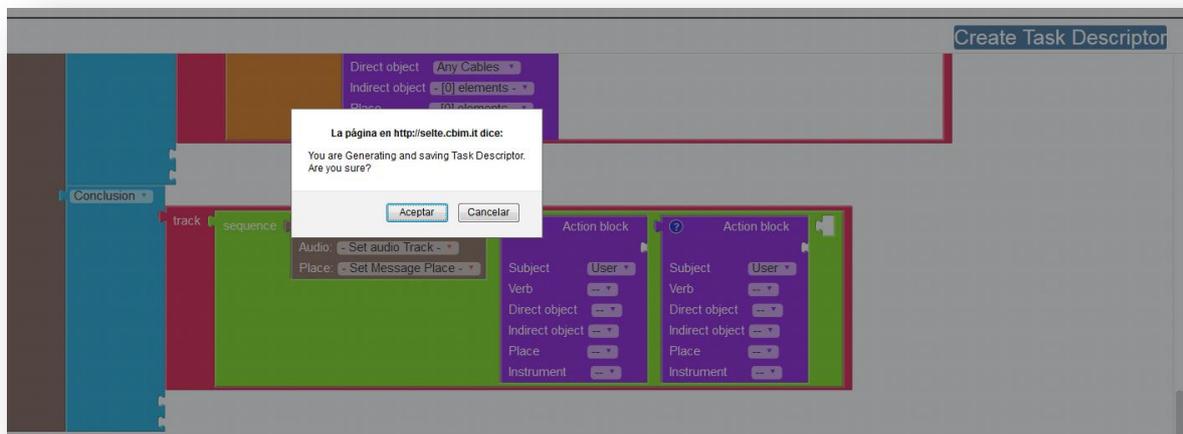
If you want a specific message to be posted after the carpet, substitute the corresponding *Action Block* by a *Sequence Block* having inside: first the *Action Block* `<user> <Destroy> <carpet-beige>`, then a *message block* with whatever text you prefer (“loose carpets may yield to falls”, for instance), a *Wait Block* (with the duration of the message) and an *Action Block* `<system><CloseMessage>`. In the image below, you can see a draft of this stage, with the *Wait* and *CloseMessage* action Blocks missing.

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 148
	WP4 – Pilot evaluation	



7. Create the conclusion stage

It will be just as the introduction: a sequence of three blocks (message, wait and action: <system><HideMessage>). Put the text that you prefer.



8. Save the task

Press the button Create Task Descriptor. A pop-up window will ask you for confirmation. Do it.

Insecure objects in the home safety use case

- Objects that are obstacles and can yield to falls
 - o A loose carpet
 - o An ironing table in the middle of the room
 - o A slipper half under the carpet that deforms it
 - o Untidy cables of the washing machine and the dryer
 - o Untidy cables of the radiator
- Objects that should be hidden from burglars
 - o Money clearly visible at the entrance, near the door
- Objects that cannot be at a child's reach
 - o A huge detergent can
 - o A bleach bottle on the lower open drawer behind the stove
- Misplaced objects
 - o A smoke detector just above the stove
 - o A roll of paper near the stove



Figure- 36. Visible money near the door

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 150
	WP4 – Pilot evaluation	

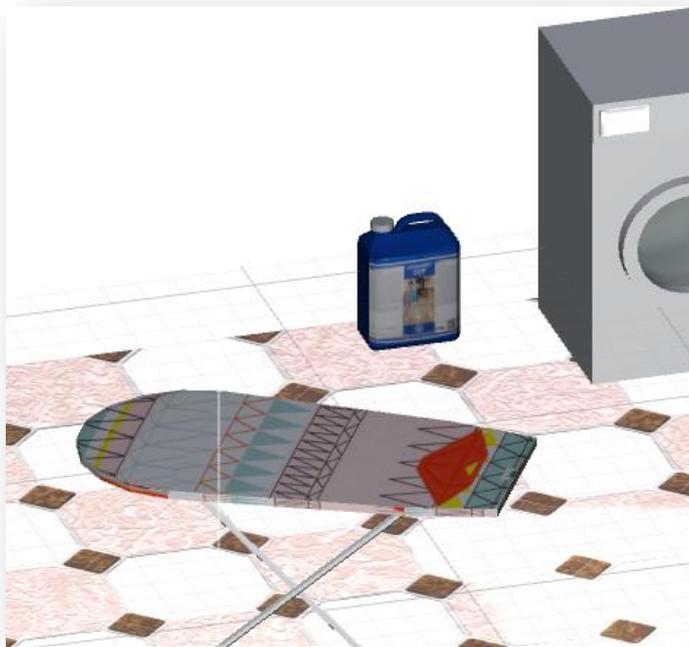


Figure- 37. Ironing table in the middle and accessible blue detergent



Figure- 38. Accessible bleach bottle and misplaced roll of paper

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 151
	WP4 – Pilot evaluation	

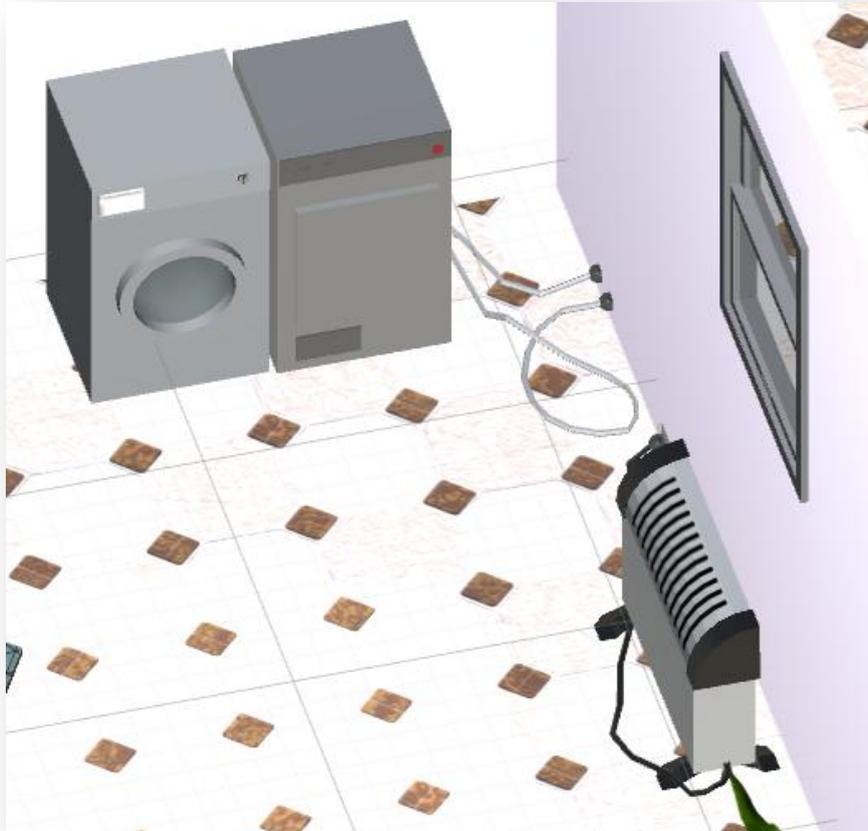


Figure- 39. Cables



Figure 40. Loose carpet and slipper out of place

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 153
	WP4 – Pilot evaluation	

Annex D.5 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

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.

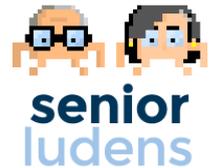
Imagine to come back when you were not an expert in your work-field (physiotherapy/ IT/ food industry). Think how you felt when you were learning you job.

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)

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						Absolutely yes
1	I enjoyed doing this activity very much	1	2	3	4	5	6	7
2	This activity was fun to do	1	2	3	4	5	6	7
3	I thought this was a boring activity	1	2	3	4	5	6	7
4	This activity did not hold my attention at all	1	2	3	4	5	6	7
5	I thought this activity was quite enjoyable	1	2	3	4	5	6	7
6	While I was doing this activity, I was thinking about how much I enjoyed it	1	2	3	4	5	6	7
7	I would describe this activity as very interesting	1	2	3	4	5	6	7

Annex E.3 Post-game: Flow State Scale (FSS)

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.

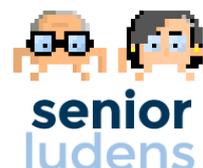
Taking into account this point of view, please use the rating scale to answer to the following questions in relation to your experience during the event you have just completed. These questions are related to the thought and feelings you may have experienced during the event. There are no right or wrong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

Annex F: User requirements Safety at Home

Element	+/-	Why	Visualization
Difficulty to find the house	-	Emergency service won't find the house either	Big tree in front of number of house
Loose tiles	-	Elderly person may fell	Loose tile
Light with sensor above front door	+	Burglary in spotlight when entering the house	Light which starts to shine when entering garden
		Elderly person has light when e.g. looking for keys in evening	
Big dustbin in the front garden	-	Burglars may climb on the dustbin and so enter balcony /second floor	Big dustbin in the front garden
String hanging out of the mailbox	-	Friends and relatives may easily enter home without key, but they won't be the only ones..	String hanging out of the mailbox
Dog	+	Frightens burglar, he will go to neighbour	Sound of dog; warning sign board with text/picture dog
Electronic security	+	Frightens burglar, he will go to neighbour	Same interventions as count for dog: isn't necessary to be real, only pretending will already scare off burglars
Camera protection	+	Scares burglar off	Camera above door
Neighbourhood WhatsApp group (maybe quite Dutch?)	+	Same effect as above mentioned two elements, but works for entire hood. Initiative in the Netherlands, where neighbours warn each other and police in suspect situations. Is mentioned at the entrance of the hood, at a traffic sign.	See above
Name plate at front door 'Mrs. Beijer-Blok'	-	People will know (at least in NL ;)), here lives a widow, so an elderly lady alone. Attractive target for burglar. Better: 'Here lives family Blok'	Name plate
Elderly scooter, rollator in garden, lockbox, electric bike,	-	Same as above: house will be indicated as vulnerable	Put elements in the garden
Sliding doors without wooden bar/protection strips	-	Are easy to force.	Sliding doors, try to open
Visible cylinder lock	+	Scares off and protects when burglar still gives it a try	Visible lock
High vegetation	-	Will make it easy to hide in the garden for prowlers	High bushes
Showing luxuries directly behind the window	-	Attractive to hack	Expensive objects exposed just behind the window
Barrier rod	+	To make it harder/impossible to enter house through windows	Open window without rod
Keys in the lock, even at the inside of the house	-	Door/window can be opened with fishing rod through, for instance, mailbox	
Lock at the barn	+		Barn with open door
Lock on bicycle in the barn	+	Important for insurance, locked even in the barn. If people still steal the bike, at least you can prove it was locked	Bike with keys left in the lock
Swing bar door guard / Door	+	To facilitate to open the front door a little to look who's there without possibility for visitor	Right and wrong use of the

security guard		to come in. Do not on without using! Emergency services cannot come in when necessary!	swing bar door guard
Spy in the door	+	To check who is in front of door. On right height	

Kitchen

Element	+/-	Why	Visualization
Loose electricity wires on the floor	-	Dangerous both for falling of the elderly and for short circuit	Bunch of wires lying on the ground, not clear to which device or machine they belong
Fire alarm at the right place (high, in the roof, but not directly above the cooking /fire!) With battery!	+	Helps to act and react quickly when fire appears	Fire alarm at right place
CO alarm at the right place: lower. Between floor and middle height. With battery!	+	You cannot smell, see, hear or notice CO, so important to be warned by the alarm	CO alarm at right place
Loose carpets!	-	Important cause for elderly people to fall, especially with walker	Carpets with tags, folded, laying skew
Detergents, cleaning liquids in low cabinets	-	Dangerous for (grand)children and elderly with dementia or forgetful elderly	Dangerous liquids with warning signs in low cabinets.
Medicines, colored pills in open cabinets	-	Same as for cleaning liquids	Loose medicines, pills
Safe ladder present	+	Important, so seniors don't use chairs to pick something from higher height	Ladder available
Slippery floor: olive oil, butter, raw eggs	-	Easy to fall	Shiny floor surface
Washing machine and dryer with space around it	+	Prevention for short circuit. Be careful with electricity and water	Indicate right place
High thresholds	-	Easy to fall, hard to enter room with walker	With or without thresholds, what is better?
Sleeping pets	-	Easy to fall, in kitchen extra dangerous	Sleeping cat or dog
Telephone	+	A telephone close by is important. If the telephone rings and is far away, a person needs to run, get stressed, leaves the cooking setting alone etc.	Telephone in the kitchen
Cooking with induction	+	No fire, no burning hands at invisible heat either	??
Wear right close, no long sleeves etc.	+	Sleeves can get fire, or pushing things down from the countertop	Hard to visualize, maybe to complex for the game

Fire

- Some people say fire in a *pan* has to be extinguished by a fire blanket, other people say with a cover.
- A *fryer* should not be extinguished at all: leave the home quickly. However, according to others, the cover should be used.
- Some extinguishers may be suitable, but that depends and is hardly to see in a game. Next to that, the extinguisher has to be tested every year. Even more difficult to see in a game.
- *Curtains* should be extinguished by an extinguisher.
- A fire blanket is most suitable for persons their selves.

Chat trick

A lot of time is spent on 'Chat tricks', a very important issue in the topic 'safety at home'. All the mentioned interventions mentioned in the session concerning prevention of burglary, are also to prevent chat tricks. Important is to be critical when someone at the door pretends to be from homecare, TNT, mail delivery, bank, in need of a toilet etc. Important tips and tricks from the respondents:

- When someone keeps you at the front door, also close/lock the back door! A buddy may enter the house via that side.
- Always use a Swing bar door guard / Door security guard and a spy to check the person in front of the door, before opening the door.

According to the seniors, a game about Chat Tricks can be very useful for education about home safety. However, in this phase of the project, it seems quite complex to develop /facilitate a game in which (misleading) chats have a big role, since it is hard to visualize.

Living room

Element	+/-	Why	Visualization
Too much furniture!	-	Dangerous for falling, short circuit, dust	Too many chairs, tables, decoration, flowers, book cabinets
Sharp extensions at furniture, for instance tables	+	Elderly people may hurt	Sharp table corners
Loose carpets!	-	Important cause for elderly people to fall, especially with walker	Carpets with tags, folded, laying skew
Candles without people in the room	-	Fire danger	Different candles. With/without holder, tea lights, which are most safe?
Loose (lady) hand bag	-	Elderly people may fall	
High thresholds	-	Easy to fall, hard to enter room with walker	With /without thres-holds, what is better?
Sleeping pets	-	Easy to fall, in kitchen extra dangerous	Sleeping cat or dog

Bathroom

Element	+/-	Why	Visualization
Anti slip mat	+	Shower very risk space to fall	Mat
Chair in shower	+	Extra stability	Chair
Anti slip floor	+	Extra stability	Relief on floor
Handles to hold when using toilet	+	Extra stability	Handles
Good lightning	+	For extra stability and view	Lights with clear buttons

General input concerning the game

When the attendees think of a game to learn about safety at home, different perspectives come up.

- The player is a burglar who wants to get into a home as quick as possible. If he can choose among several houses in a street, which one would be picked? Challenge for player is to determine burglary sensitive elements.

- The player is the elderly person in his/her own house. Elements to be incorporated in the game could be:

→ Make consequence of unsafe elements/behaviour instantly visible: Examples:

> Person climbs on chair instead of safe ladder > he falls;

> Someone falls > rest of the game his avatar uses a walker, stick or wheelchair; Malus points turned into handicaps.

> Door left open > robber is coming in

→ Make challenges, levels. First levels are more concrete things, objects on the way. Next levels more abstract and multi-layered: what to do first, what next etc.

→ Easy game elements:

> Visualize a situation (safe or unsafe), let the player choose out of three choices: how would you respond? Remove, move, add objects? Which ones?

> Detecting unsafe situations/objects by clicking on it

> Order the following situations from safe to unsafe.

> Show empty room: add the right interventions at the right place

→ Incorporate multicultural elements:

> Shoes in front of the door at a Muslim family's home

> Cultural sensitive cooking

> In some cultures/countries, people live mainly outside: is door closed?

→ Incorporate cognitive elements / knowledge. Examples:

> When you put carpets or other objects in the way of the elderly people, warning pops-up: *'Did you know every year 139 people out of 1000 get in hospital due to a falling incident?'*

> Or in a (multiple choice) question: how many people do you think..

→ Incorporate a 'hint-button' , if the player get stuck

→ Offer a good 'reward' . Why would people play the game? Or a ranking/battle

→ Game should be available in Dutch. The respondents are not able to play it in English.

→ Don't include a timer, that makes elderly people nervous. On the other hand: sometimes safety issues have to do with stress (leaving home in case of fire etc.).

Date 26/02/2016	D4.2 – Pilots evaluation results (M21)	Page 163
	WP4 – Pilot evaluation	