



LEAP 5S Demonstrator Reference Manual



Erasmus+

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LEAP 5S software manual

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I. Introduction

5S is the name of a workplace organization method that uses a list of five Japanese words: *seiri*, *seiton*, *seiso*, *seiketsu*, and *shitsuke*, meaning *sort*, *set in order*, *shine*, *standardize* and *sustain*. The list describes how to organize a work space for efficiency and effectiveness by identifying and storing the items used, maintaining the area and items, and sustaining the new order. The decision-making process usually comes from a dialogue about standardization, which builds understanding among employees of how they should do the work. The 5S can be seen as being a basis of a lean manufacturing or production system (or simply "lean") which is a systematic method for waste minimization within a manufacturing system without sacrificing productivity. The 5S methodology can also be applied outside of manufacturing to any kind of process or environment in need of being streamlined and optimized. More specifically, the 5 branches of the 5S methodology can be described as follows:

Sort

- Make work easier by eliminating obstacles.
- Reduce chances of being disturbed with unnecessary items.
- Remove all parts or tools that are not in use.
- Segregate unwanted material from the workplace.
- Define Red-Tag area to place unnecessary items that cannot immediately be disposed of. Dispose of these items when possible.
- Waste removal.

Set In Order

- Arrange all necessary items so that they can be easily selected for use.
- Make it easy to find and pick up necessary items.
- Place components according to their uses, with the frequently used components being nearest to the work place.

Shine

- Clean your workplace on daily basis completely or set cleaning frequency time to time
- Keep workplace safe and easy to work.

Standardize

- Standardize the best practices in the work area.
- Everything in its right place.
- Every process has a standard.
- Standardize color coding of usable items

Sustain

- Also translates as "do without being told".
- Training and discipline.
- Ensure all defined standards are being implemented and heard.
- Follow the process, but also be open to improvement

The 5S software aims at raising the awareness of the players to this concept and how to manage or implement it in their work life. This software is mainly targeted towards all kind of engineering students but the core concept can be broadly applied to almost all projects situations. To demonstrate that the 5S concept can be applied broadly, three scenarios have been selected:

- Working as an employee of a pharmacy trying to serve customers
- Working in a scrapyard as a crane operator to find interesting spare parts
- Working in an office on a computer and trying to accomplish computer-based tasks

The game is supposed to be played in sessions of 20 minutes to half an hour on any type of computer (Windows, Mac OS X, Linux). The demonstrator is multilingual: English, Spanish, Portuguese, Estonian, and Greek are the currently supported languages. The software has been created using Unity.

II. Word of caution

The demonstrator is a work in constant progress. This means that the online version of the game is updated frequently in order to add new features and correct bugs, up to several times a day. So until the software reaches it's very final version, this manual is also a work in progress.

You might find for example that there are some discrepancies between some screenshots and the actual images included in the manual, or maybe some features in the software are not detailed in the manual. Don't worry, it just means that a new version of the manual is about to be published.

If you have any question, please feel free to send an email to the lead developer at this email address, he will answer you promptly: olivier.heidmann@gmail.com.

III. The Software

1. Gameplay concept

The players are placed in a certain work environment (a pharmacy, a scrapyard and a computer screen) for a week and are supposed to accomplish a certain number of tasks, based on finding certain objects in a limited amount of time. Given how the working environment is set up, those tasks are quite difficult to achieve as they might prove time consuming. The players can try to improve their work environment by themselves or by the application of the 5S methodology.

Because the span of the software spans over several different type of application of the 5S methodology, we consider that the last S (sustain) is demonstrated by putting the player in many different environments and make them apply 5S repeatedly. For that reason, the first 4 of the 5S are directly implementable in-game by the players.

Each workday for the players lasts 180 seconds (3 minutes), from 7 o'clock in the morning up to 7 in the evening. There are 5 workdays in total before the end of the game. Finding an object asked for will bring points to the player and applying one of the 5S methods will demand an investment in terms of game time.

2. The introduction screen

5S Demonstrator



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Figure 1: The introduction screen

On the introduction screen of the demonstrator the user is greeted with the LEAP and European Community Erasmus+ logo. This screen fades out in 2 seconds.

3. The main menu

The main menu of the game is the entry point of the player into the 5S game. According to which scenario the player wants to explore, three different variations of the menu exists:

- A pharmacy (Figure 2)
- A scrapyard (Figure 3)
- An office building (Figure 4)



Figure 2: The pharmacy main menu



Figure 3: The scrapyard main menu



Figure 4: The office main menu

Those different screens are here to make sure the players have selected the right scenario for his usage. by situating them in an unmistakable context. All the main menus share the same structure and have the same interactive elements:

- a flag (the turquoise box in Figure 5) to choose the language the game is displayed with. Available languages are: English, Estonian, Greek, Spanish and Portuguese.
- a question mark (the blue box in Figure 5) which prompts the display of the help menu (see Figure 6), giving some info to the players about the main menu and how to interact with it
- a door (the purple in Figure 5) which will start the game
- a signpost with two signs (the red box in Figure 5) corresponding to the two other available main menu variations
- a yellow taxi (the orange box in Figure 5) for exiting the game
- a LEAP sign (the green box in Figure 5) to open the LEAP project web portal page if the players want to access additional information about the project (See Figure 7)



Figure 5: The interactive elements in the main menu

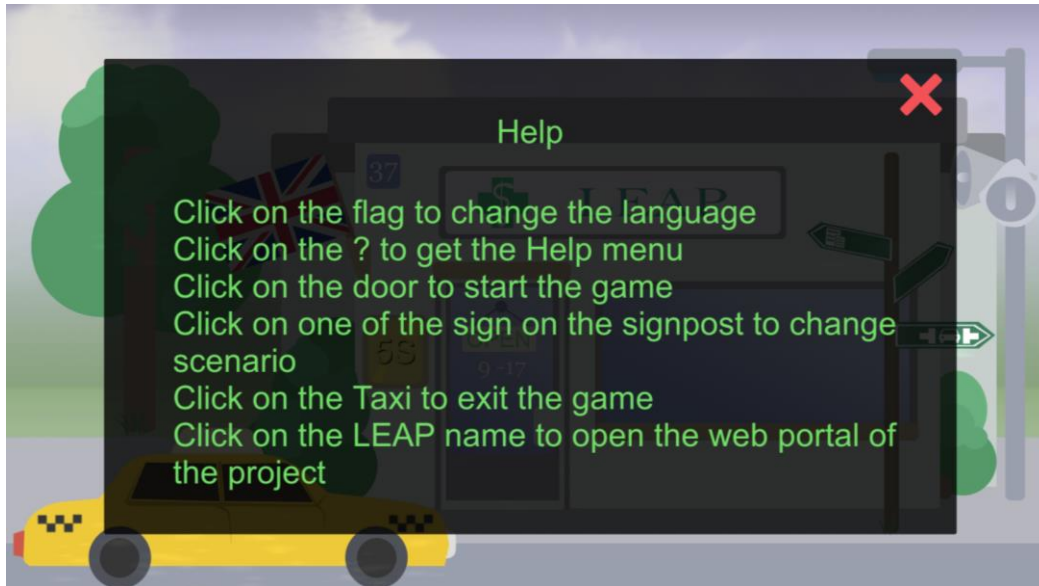


Figure 6: The help menu

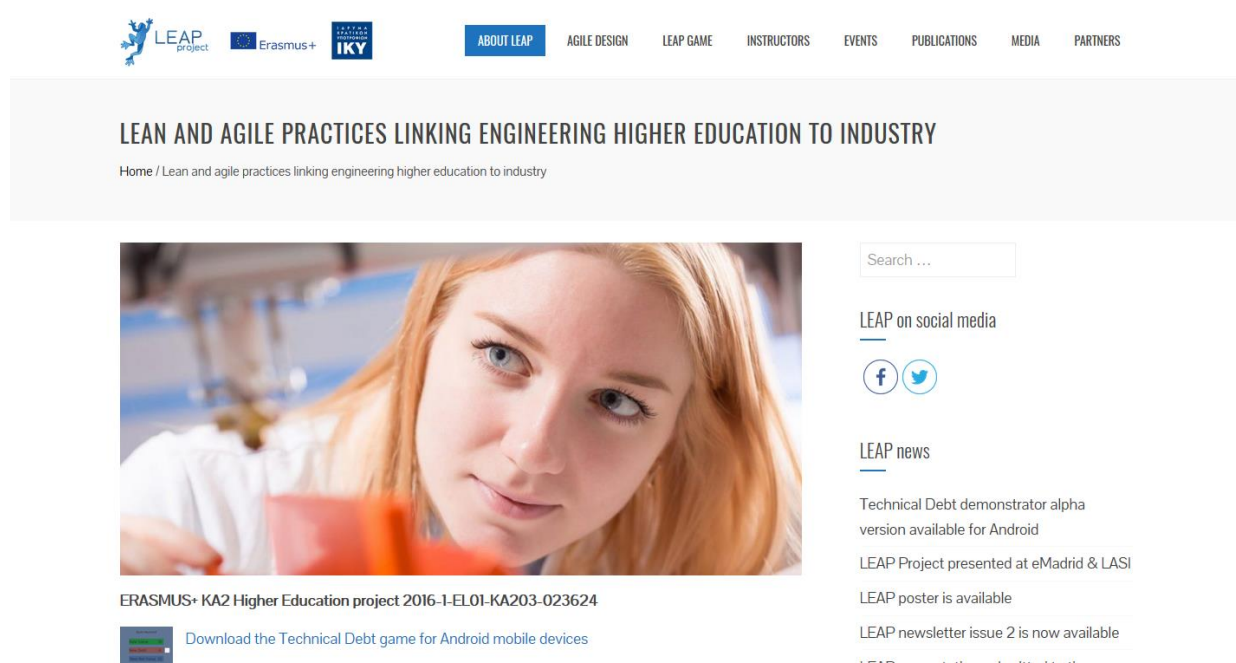


Figure 7: The LEAP project portal

4. The Pharmacy game

a) Introduction

Once the players have clicked on the door on the pharmacy main screen, they are transported inside the pharmacy game. The first thing they see is a prompt asking them if they want to play the game in story mode (a tutorial explaining the mechanism of the game step-by-step) or if they want to experience it in standard mode.



Figure 8: The initial choice

If the players are new to both the game and the concepts of the 5S methods, it is advised that they start the game in story mode as it contains explanations both on the game and the 5S methods in general.



Figure 9: The tutorial

b) Game interface

The players will move around the main character (the pharmacist) as he needs to find the right medication according to the prescriptions brought by the pharmacy's customers. To move the character around, the players simply have to click on the floor or on one of the objects in the game scene. The user interface has been integrated into the game itself and contains the following elements:

- a clock (the blue box in Figure 10), indicating current time. The game starts at 7 o'clock in the morning every day for 5 days and stops at 7 o'clock in the evening. Customers start to arrive at 9 o'clock and will stop arriving at 6 o'clock.
- a panel (the green box in Figure 10), allowing the user to implement one of the four first actions of the 5S methodology.
- a TV screen (the orange box in Figure 10) showing the current score of the player. Each medication correctly delivered to a customer nets a hundred points.
- a set of loudspeakers (the red box in Figure 10) which triggers the option menu



Figure 10: The user interface in the pharmacy

The other interactive elements on the screen include

- The 8 set of shelves visible in the pharmacy
- The boxes containing medication
- The elements lying on the floor and impeding the path of the pharmacist
- The clients

When the players click on an unsorted element lying on the floor, they are prompted with this screen:



Figure 11: Sorting the objects on the floor

If they answer positively, the pharmacist will go and put the object in its rightful place.

When the players click on a set of shelf, the pharmacist will move next to the shelf and the screen will zoom on the content of the shelf. Notice that by default the medications displayed are quite dusty, which can make reading their tag difficult. A set of shelves will never hold more than 9 objects, with 3 objects maximum per shelf.

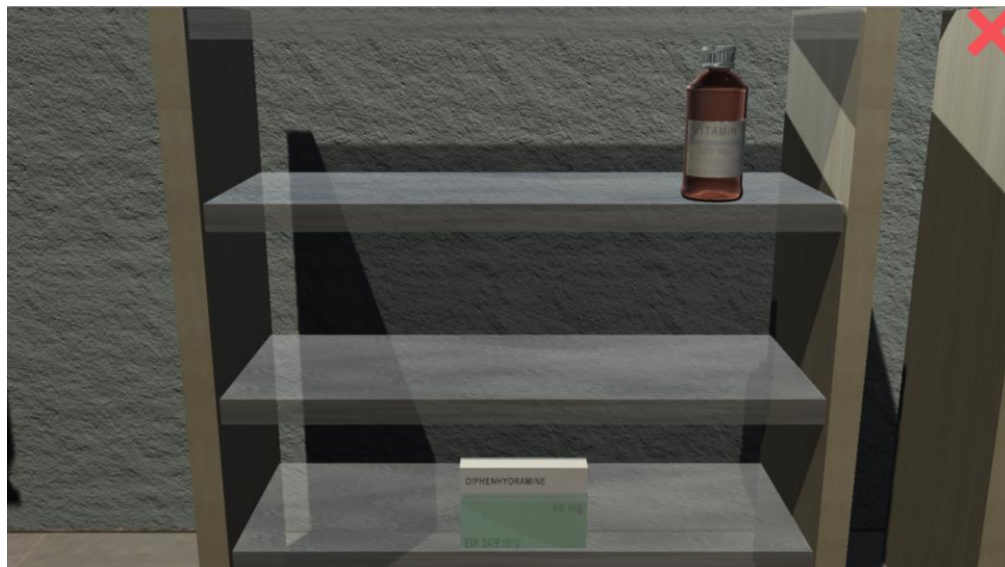



Figure 12: A closer view of a shelf


The red cross in the top corner of the screen allows the players to zoom out and come back to the normal camera view.


When the players click on one of the shelved medications, an interaction wheel of 4 possible actions appears. Any medication present on the shelves can be clicked on, but also the empty spaces present on the different shelves, in order to allow the players to pick up and put back medications.




Figure 13: The interaction wheel of an object




The  icon allows the players to dust up the object and make the tag more readable.

The  icon allows the players to pick up the object.

The  icon allows the players to put an item in the players' inventory back in place. A player's inventory can only hold one item at any given time.

The  icon allows for a closer view of the selected object.

Medications exist in three different possible forms:

- a box 
- a jar of pills 
- and a bottle of syrup 

There 8 possible medication names asked by the customers and available in the pharmacy:

- aspirin
- tylenol
- amoxicillin
- doxycycline
- rozerem
- diphenhydramine
- vitamin A
- vitamin B9

The medications come in 5 possible concentrations:

- 50 mg
- 100 mg
- 250 mg
- 500 mg
- 1000 mg

Each medication also has an expiration date, to be compared to the date displayed on the in-game clock.

When the players click on the magnifying glass button, an even further zoomed in view of the object will be displayed. On the right hand side a panel will display all the information pertaining to the object and on the left hand side the players will be able to color code by themselves this information by clicking on the correct color.

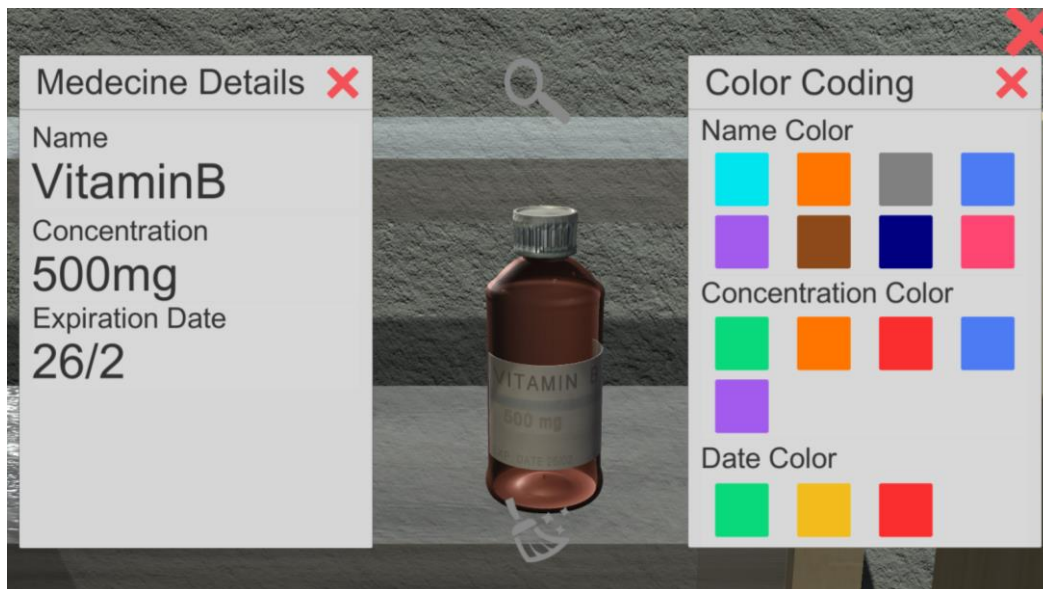


Figure 14: Closer view of a medication

c) The game flow

Once the in-game clock shows that it is past 9 o'clock, customers will begin to arrive in the pharmacy. They all will ask for a certain number (between 1 and 3) of medications. Once the pharmacist has retrieved them by picking them up and bringing them to the customer, the customer will leave and a new one will arrive. Each time a medication is delivered properly, the players score 100 points.



Figure 15: A customer just asked for two medications

Once the players are starting to use the 5S methodology, the pharmacy will see drastic changes taking place. The players are free to either try to sort everything in the pharmacy by themselves or use the automated 1S/2S/3S/4S implementation button on the wall. Clicking on those buttons will trigger the implementation of the corresponding method but will cost some time.



Figure 16: The player is warned using a 5S method requires some time



Figure 17: Implementing 1S

Clicking on the 1S button will clean up all the objects which were lying on the floor and put them at their proper place (fire extinguisher, mop, bucket and so forth).

Clicking on the 2S button will color code all the medication available in the pharmacy according to a color code which will be displayed as a legend in the bottom left of the screen (see Figure 18).

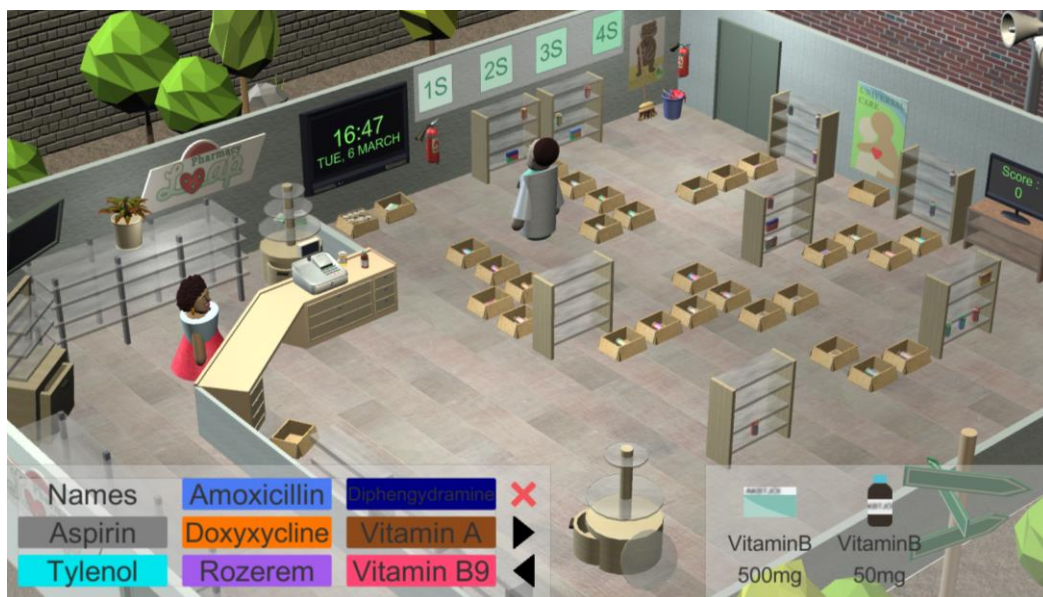


Figure 18: Implementing 2S

Clicking on the 3S button will clean up the entire pharmacy, getting rid of any dust. All the medications tags become much more readable.



Figure 19: Implementing 3S

Clicking on the 4S button will get rid of all the cardboard boxes which were lying around and put the medications on color-coded set of shelves (one set of shelves per type of molecule), where each shelf in a set of shelf corresponds to a type of expiration date (red for expired, yellow for soon to be expired and green for a remote expiration date).



Figure 20: Implementing 4S

WARNING: Clicking on one of the 5S buttons will only implement the method for as much time the worker still has left in his day. If a task starts at 18:00 and requires three hours, only 1 hour worth of the task will be done. The rest has to be done the next day by clicking again on the relevant S button.

Once all the 5S methods have been implemented, finding the right medication becomes a much more straightforward task and requires much less time.

When the 5 in-game days are over, the game stops and displays a game over message.



Figure 21: The Game Over screen

5. The Office game

a) Introduction

Once the players have clicked on the door on the office main screen, they are transported inside the office game. Contrary to the pharmacy and scrapyards scenario, this game is created in a 2D environment.

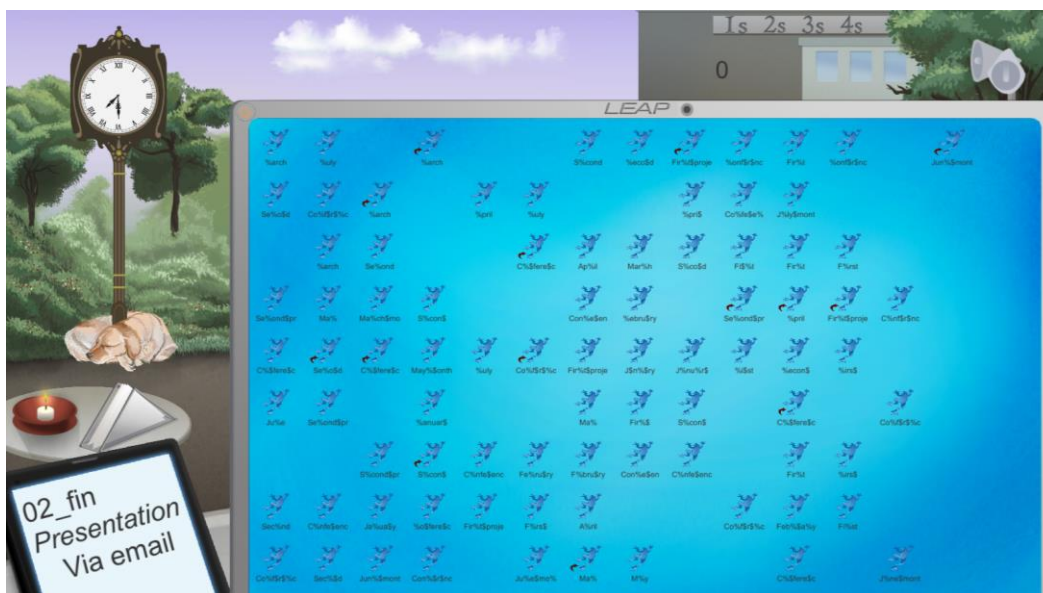


Figure 22: The 2D environment of the office game

No tutorial has been designed for this game as it is pretty straightforward and follows the same logic than for the pharmacy game.

The idea of the game is that the players are given an urgent mission during their day off. They just received a foreign laptop with many very important files on them, but the computer is such a mess that operating on it is difficult at best.

The problems with the files are numerous. They don't have a proper icon; some have typos in their name, their names are too long, there are some shortcuts lying around, and no file is being properly ordered into a relevant folder. The screen of the laptop itself is dirty and cluttered with undecipherable post-its.

The players receive instructions via their cell phone to send some of those files by email, and the more they send the more score they will net.

The game starts at 7 o'clock in the morning and will stop at 19 o'clock in the evening. Those 12 hours in game correspond to 15 minutes of time. Contrary to the pharmacy game, this game only spans on the length of one day.

b) Game interface

The players are sitting in a park, at a table in a café with a laptop open in front of them. They can interact with their environment by clicking on it. The user interface has been integrated into the game itself and contains the following elements:

- a clock (the blue box in Figure 22), indicating current time. The game starts at 7 o'clock in the morning and stops at 7 o'clock in the evening.
- a panel (the green box in Figure 22), allowing the user to implement one of the four first actions of the 5S methodology.
- an indicator (the orange box in Figure 22) showing the current score of the player. Each email sent correctly nets a hundred points.
- a set of loudspeakers (the red box in Figure 22) which triggers the option menu

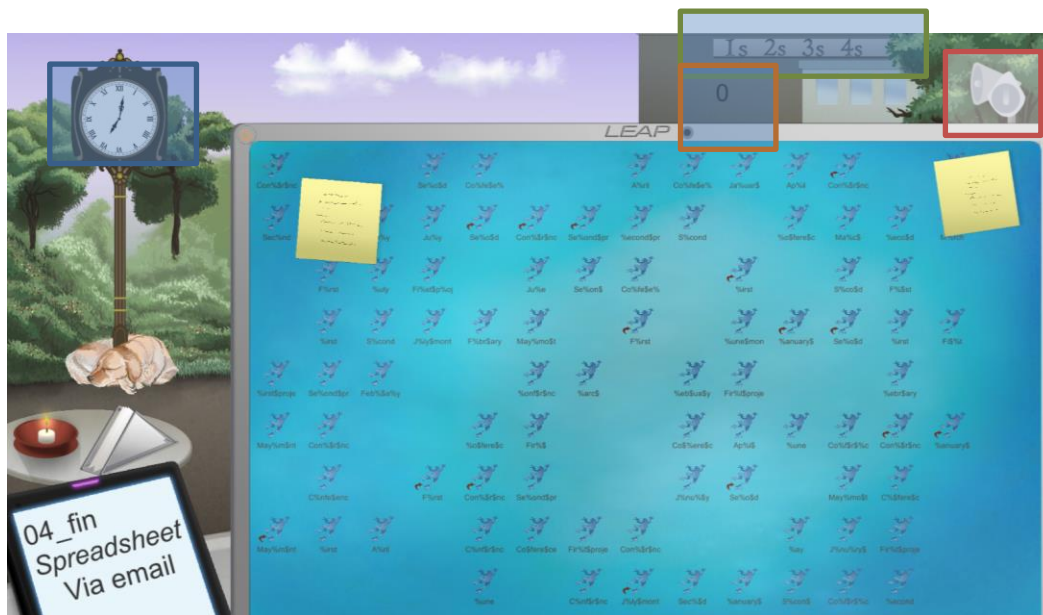


Figure 23: The user interface in the office

The other interactive elements on the screen include

- The set of wipes on the small table.
- The post its.
- Any space on the laptop screen, whether it's empty space or a file

The players receive their instructions through their cell phones, which displays three relevant pieces of information. The abbreviated name of the file on the first line, the type of the desired file and the way the players should send the file (for the moment only by email is implemented).



The players can create new folders to help them manage the files by clicking on an empty space of the laptop's screen and selecting the right option.

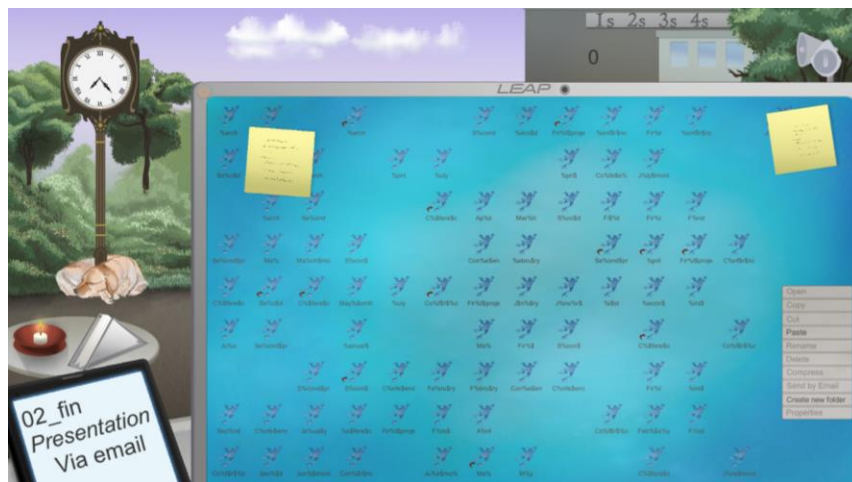


Figure 24: Options when clicking on empty space

The players can also manage the files themselves in a very comprehensive way (copy/cut/rename/delete/compress/send by email/view properties) by clicking directly on one the files. Files marked with a red arrow are actually shortcuts of files, and not files themselves.

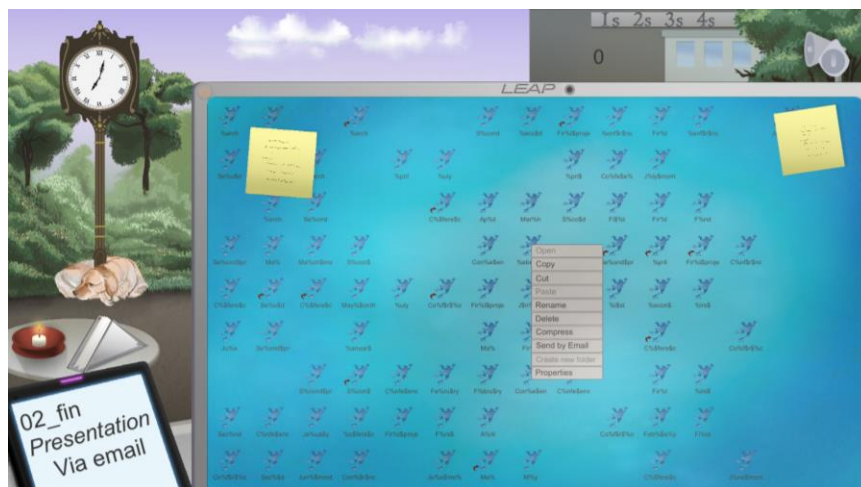


Figure 25: Options when clicking on a file

When the players display the properties of a file, they can see the file's name and the file's type and associated icons.

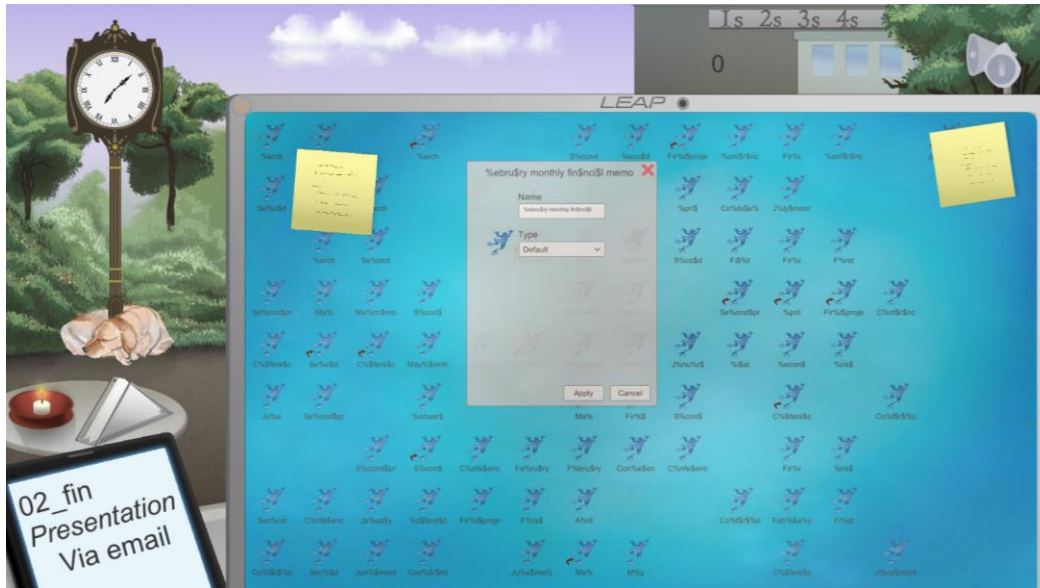


Figure 26: File properties

The file type can be selected from one of the 9 defined file types. Each of the defined types have their own icon. By default all the files have the type "default" and are associated with the LEAP frog icon.

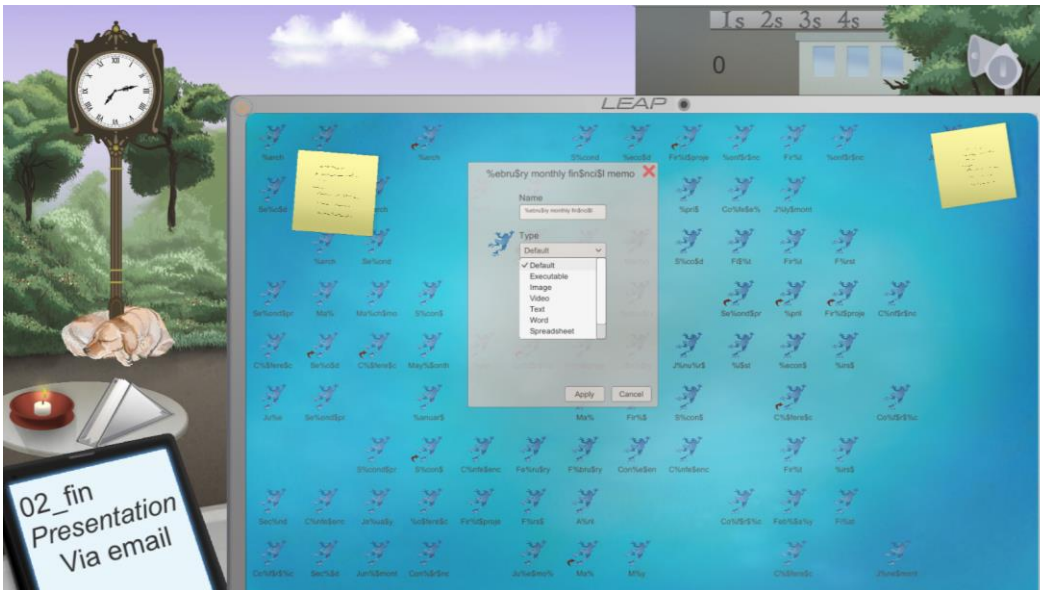


Figure 27: File types

c) The game flow

Once the in-game clock shows that it is past 9 o'clock, the players have to begin to retrieve the demanded files and send them by email. They can either try to do this by themselves using the above-described tools, or they can try to use the 5S methodology. Clicking on any of the 1S/2S/3S/4S buttons shown on the background building will trigger the use of the corresponding methodology.

By clicking on the 1S button, the users will clean the dirty computer screen and get rid of the post-its.

By clicking on the 2S button, the players will automatically assign the right type and icon to all the files.

By clicking on the 3S button, the users will rename all the files in a very efficient manner, corresponding to the file name they receive on their cell phones.

By clicking on the 4S button, the players will see all the files being automatically moved into a folder corresponding to their file type.

Once a file has been sent successfully by email, a green tick appears on the cell phone and a new file is requested.

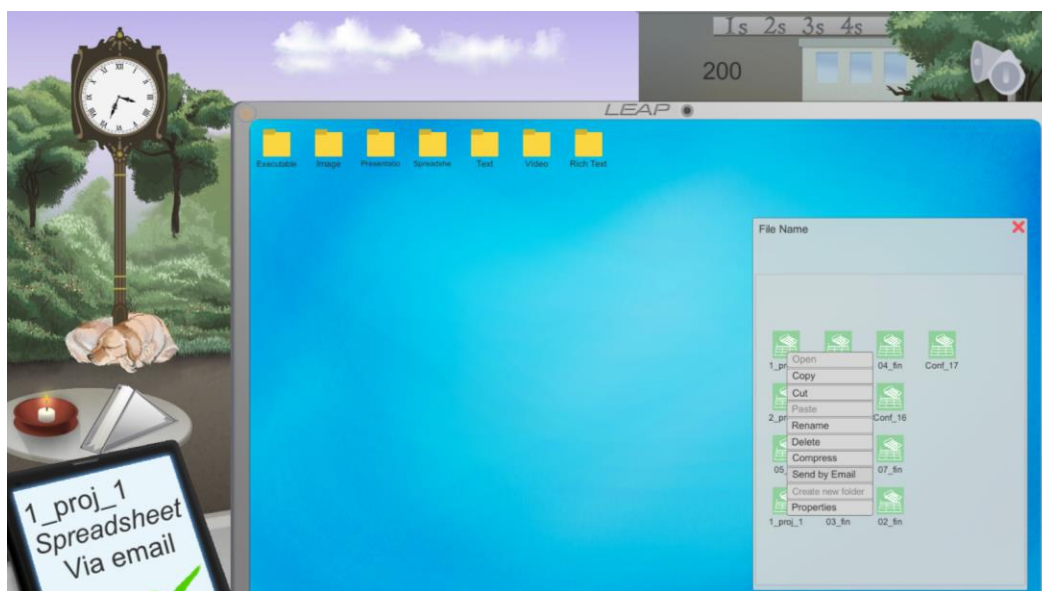


Figure 28: Sending a file successfully

Once the clock has reached 19h00 and the time is up, the players are prompted with the game over screen, showing them what is their current score and what the highest score has ever been.

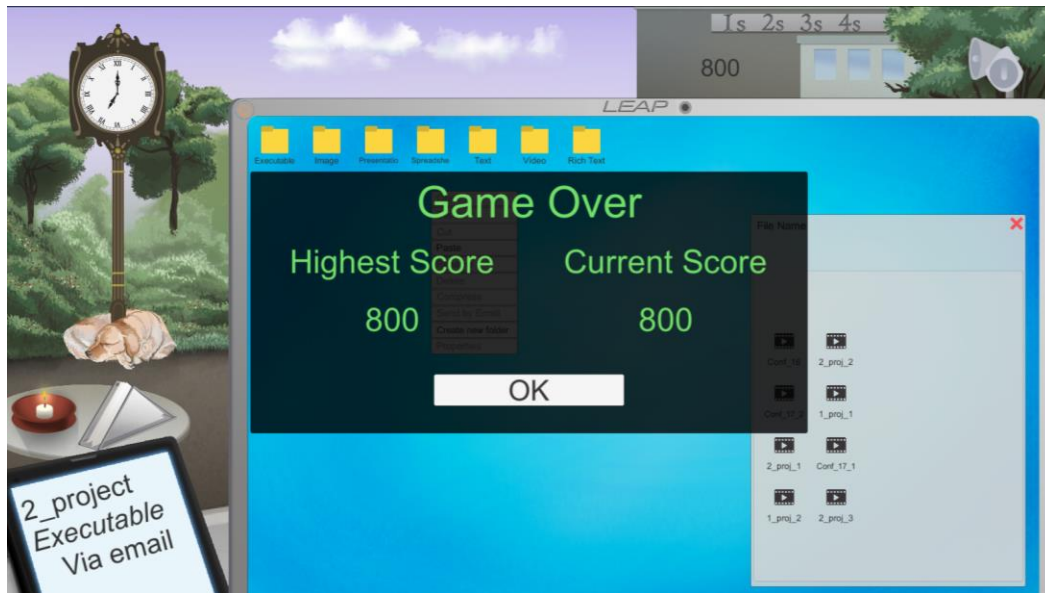


Figure 29: The end game screen

6. The Scrapyard Game

a) Introduction

Once the players have clicked on the door on the scrapyard main screen, they are transported inside the scrapyard game.



Figure 30: The 3d environment of the scrapyard game

No tutorial has been designed for this game as it is pretty straightforward and follows the same logic with the pharmacy game.

The idea of the game is that the players are the handlers of a crane and they are tasked to retrieve spare parts from the cars in the scrapyard.

The game starts at 7 o'clock in the morning and will stop at 19 o'clock in the evening. Those 12 hours in game correspond to 8 minutes of time. As it is the case in the office game, this game only spans on the length of one day.

b) Game interface

The players' point of view is the one from the worker sitting inside the crane. They can interact with their environment by clicking on it. This makes the crane arm move around. The user interface has been integrated into the game itself and contains the following elements:

- a clock (the blue box in Figure 30), indicating current time and date. The game starts at 7 o'clock in the morning every day for 5 days and stops at 7 o'clock in the evening.
- a panel (the green box in Figure 30), allowing the user to implement one of the four first actions of the 5S methodology.
- an indicator (the orange box in Figure 30) showing the current score of the player. Each spare retrieved nets a hundred points.
- A second indicator showing the players which object they have to retrieve (the purple box in Figure 30)
- a set of loudspeakers (the red box in Figure 30) which triggers the option menu



Figure 31: The user interface in the scrapyard game

The other interactive elements on the screen are the cars, which the players interact with via the crane. The players receive their instructions through the task panel, which displays which specific spare part has to be retrieved.

The players can click on a car in the scene. Once the head of the crane arrives to the car's position a new user interface will pop-up showing which spare parts are available at the selected car (Figure 31).

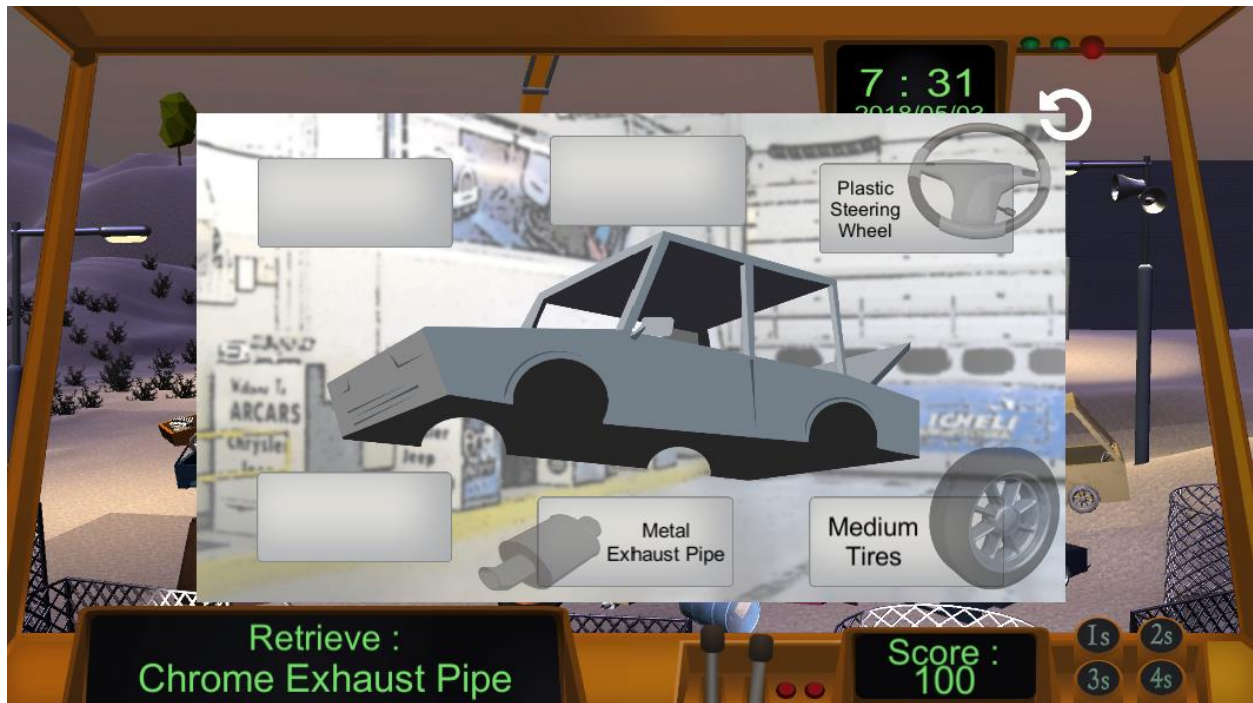


Figure 32: Car user interface

If the selected car has the spare part that the players are tasked to retrieve, it will be brighter than the other available spare parts, the players can click on it to retrieve it (Figure 33).

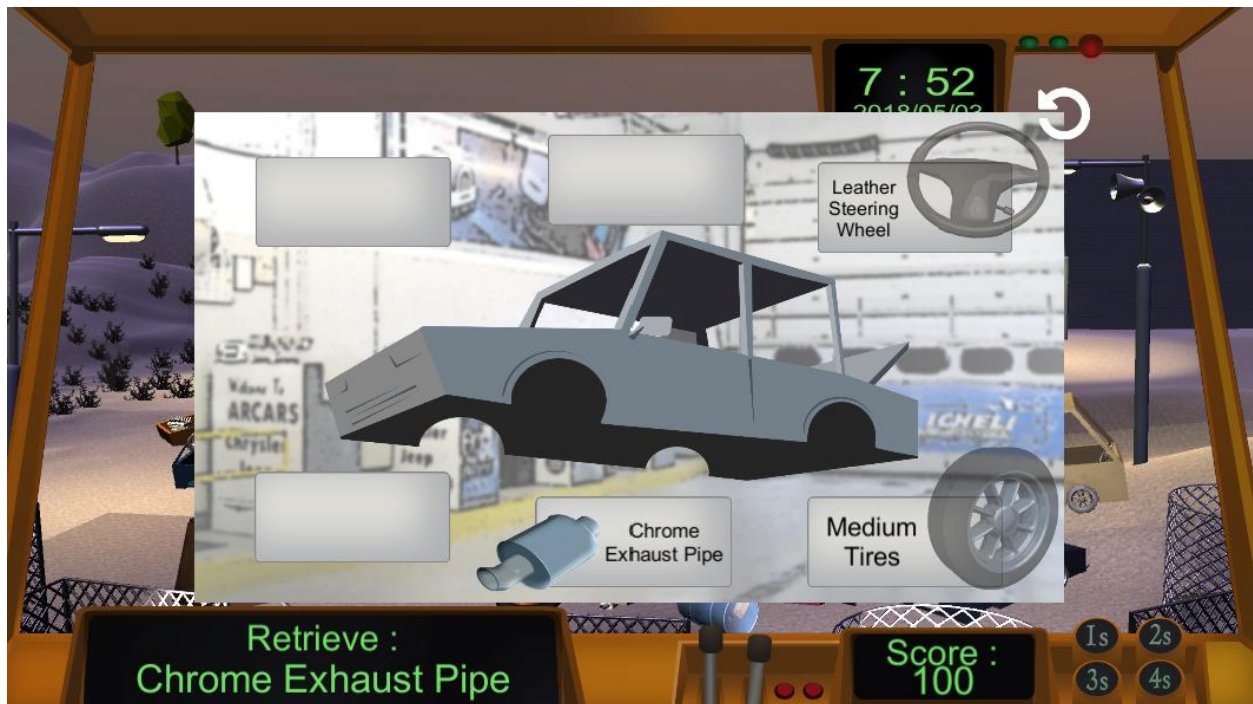


Figure 33: Car user interface when the spare part to retrieve is available

c) The game flow

Once the game starts the players have to retrieve the demanded spare parts. They can either try to do this by themselves using the above-described tools, or they can try to use the 5S methodology. Clicking on any of the 1S/2S/3S/4S buttons shown on the bottom right side of the inside of the crane will trigger the implementation of the corresponding method but will cost some time.

Clicking on the 1S button will clean up all the junk objects which were lying on the ground (barrels, wooden boards, metal junks)



Figure 34: Implementing 1S

Clicking on the 2S button will color code all the spare parts available in the scrapyard according to a color code which will be displayed as a legend in the top left of the screen (see Figure 35).



Figure 35: Implementing 2S

Clicking on the 3S button will clean up the entire scrapyard, getting rid of any dust. All the spare parts become much more visible (see Figure 36).



Figure 36: Implementing 3S

Clicking on the 4S button will get rid of all the cars which were lying around and put the all the spare parts on containers (one container per type of spare part).



Figure 37: Implementing 4S

Once all the 5S methods have been implemented, finding the right spare part becomes a much more straightforward task and requires much less time.

Once the clock has reached 19h00 and the time is up, the players are prompted with the game over screen and they can click the exit button to return to the main menu (see Figure 38).



Figure 38: Game over screen

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