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"Mastering the MAS"

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TFG REALIZADO EN PROGRAMA DE INTERCAMBIO

TÍTULO: Mastering the MAS

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RESUMEN Y PALABRAS CLAVE

PALABRAS CLAVE:

Aplicación móvil, juego, jóvenes, museo, interactividad

RESUMEN:

Mi TFG consiste en una aplicación para el móvil dirigida a jóvenes que visiten el museo MAS en Amberes (Bélgica).

Es un juego desbloqueable en una de las exposiciones llamada "Antwerpen à la carte", creado con la finalidad de atraer a más público joven al museo.

Para desbloquearlo se ha de resolver un "quiz" que cumple varias funciones: guiar al usuario en la exposición, mantener su atención proponiéndole un reto y meterlo en la dinámica de la segunda parte del juego, la cual se podría jugar en cualquier lugar y crearía una comunidad que cumpliría la función de atraer más público joven.

MAS PLAY

Carla Büchsenschütz Cardoso

Cédric Lodewijckx

Cristina López Martín

Thomas Van Havere

Esra Sen

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01 Summary

In this document you will find all the information we gathered throughout the development of the project. First, you will find a short introduction to the team members and everyone's capabilities and backgrounds. Afterwards you will find the research phase where we give you an explanation about the exhibition "Antwerpen à la Carte" and we tell you about the GGULLIVRR games and the research we did on existing games.

We will also show you how we organised ourselves during the past months to finish this project on time and with a good result. Here we will also show the milestones we set ourselves to reach our goal.

Finally, we will explain the game to you in detail. This will explain the link that we made between a location based game and a simulation game and how this will benefit the MAS Museum. We will show you all the different aspects of the game: how it is played and linked to the exhibition, the graphics, the upgrades…

To make this project work we will also count with the support from the people from the MAS Museum and from our teachers and supervisors.

02

Introduction

2.1. Who are we?

Our teamname

The name consists out of two parts:

MAS

It refers to "Museum Aan de Stroom" because it is where the exhibition for which this game is being designed will take place.

MASPLAY

PLAY

Because we are developing a game, which will be played by the visitors of this exhibition, during their visit and afterwards.

Our teammembers

In our group we find students from different backgrounds. Cedric, from Belgium, studies Product Development at the University of Antwerp. Cristina and Carla, both from Spain are Industrial Design Engineering and Product Development students. Cristina at the University of Valladolid and Carla at the Polytechnic University of Valencia. The three together are responsible for the graphic design of the game. Cedric is also our project leader. Then we have Esra from Turkey who studies English Language Teaching/ Education and Training in the Dokuz Eylül University. She is responsible for the linguistic part of the project, and for establishing the link between the game and the exhibition. Thomas is from Belgium and he is an ICT Electronics student at AP Hogeschool. He is our programmer, so his task will be to develop the Demo for our game, and he is also responsible for communication with our supervisors.

Cédric Lodewijckx

Thomas Van Havere

Carla Büchsenschütz

Esra Sen

Cristina López

Fig. 1.1.

2.1. Our project

The main problem that we have to solve is that youngsters aged 16 to 18 do not feel attracted enough to the exhibitions by themselves. The Museum aan de Stroom wants to attract more people from this age group, because the percentage of youngsters that come to the museum compared to other ages is not that significant.

The project's result should be a game that makes the desired target group curious about the exhibition and gives it another dimension through the use of interaction with the museum's exhibition.

The youngsters should see the museum as an interactive place instead of a boring and unattractive space where they only need to go if it is mandatory, for example during school trip. The MAS will have a game that will be used as long as the exhibition lasts. It will be used as the hook to make them want to go to the exhibition, but it should also have an instructional side.

2.2. Solving the problem

To solve this problem, the **goal** is to make the exhibition more interactive and attractive in the eyes of the youngsters. Throughout the project we will develop a game (as a concept of a GGULIVRR game) that attracts youngsters and we will give an "extra, interactive dimension" to the exhibition so that it will be more attractive for young and old. All of this will be done without doing any changes bigger than adding a QR code to the exhibition.

The idea is to create a combination of a location based and a simulation game. In order to obtain it you have to go to the museum, because that is the only place where you can start playing it. The reason for that is that throughout the exhibition there will be different activities that the visitor has to do on his phone to obtain the different parts of the game by searching for objects or answers throughout the exhibition. This first part of the game serves as a tutorial, and once the visitor finishes it he has the whole game

to take home and keep playing.

To develop the idea and make the concept work we will work together, but the tasks will be divided between the members of MASplay, according to the knowledge earned in our respective studies.

We will have three people working on the graphics needed for the interface of the game: Carla, Cedric and Cristina. Programming the working demo will be Thomas' job, the programmer in the group and Esra will be responsible for creating activities that link the game to the exhibition.

03

Research Phase

3.1. The exhibition

"Antwerpen à la carte"

Cities are hungry. Feeding a city is a daunting challenge. The daily supply and sales of food, preparing it and eating it, and the waste processing define how the city grows, how it's shaped. For centuries now the port city of Antwerp also thanks its unique panorama to this. Here you can follow the hidden traces of food throughout the city.

Learn about ingredients and flavours that reach the port city of Antwerp from the dense countryside overseas, ever since the Golden Age of the 16th century. That supply could be seen, heard and smelled for a long time. Stroll along markets and visit small and large shops. Enjoy the wealth of eating and drinking businesses. Discover how food waste was recycled. Watch an unseen portrait of Antwerp as an eating city.

And what about the future? More than half of the world population is already living in cities. That percentage is quickly increasing, while agricultural land is decreasing. The challenge is enormous: how will those large urban populations feed themselves? Can the past provide inspiration?

- Text by the MAS

3.2. What is a GGULVRR game?

GGULIVRR - Generic Game for Ubiquitous Learning in Interactive Virtual and Real Realities, is a concept invented by Hiram Bollaert, Justino Lourenço and Philippe Possemiers. With a GGULIVRR game you have a mobile app / game in which you can discover learning content through interacting and getting in physical contact with it. A GGULIVRR game is designed for learners to practice and enhance 21st century skills while generating and playing mobile contextual games. To play the game one needs to

physically get in touch with real objects by scanning an intelligent tag, for example QR code or NFC tag. Then one gets contextual information about the specific object which can be part of a whole storyline.

Generic Game:

A GGULIVRR GAME is a mobile app. You can play this game using all typical mobile technologies – internet, networking, mobile interactions.

Ubiquitous Learning:

Learning is not just from a book. Learning can happen everywhere by exploring the real world.

Interactive Virtual:

A GGULIVRR GAME can present an interactive virtual world which you can explore by interacting with the mobile phone.

Real Realities:

Real objects are tagged with an intelligent tag. You can interact with those objects by exploring them and scanning the code.

At this time there already is a mobile framework to program a GGULIVRR game. But to develop such a game it is not necessary to use exactly this framework. It is more about the general concept of contextual learning which makes the app a GGULIVRR game.

3.3. What makes a game addictive?

"Keep it simple," it's not rocket science! Don't overwhelm the user with a complicated interface. The average focus span of a youngster is 8 seconds, so in these 8 seconds they need to understand how to use it and help them in the game.
(Think APP's like TINDER, just swipe left and right)

It needs to get them to **"another place"**: People are playing games because they don't want to be in their current situation, because they are bored...
The game can't put too much pressure on the user otherwise he/she is likely to give up and change your game for another one. Think about Candy crush and Angry Birds; you can play them everywhere and at any time without any time pressure or need for constant attention.

"We want control!" We as people like to have a certain feeling of control, take that control away and we are likely to get irritated. We like to express ourselves and when we do it it gives us a feeling of satisfaction (see the Sims, social media like Instagram or the choice of which vegetables to grow on Farmville). Besides to that we don't want to lose our effort! Again in Farmville the crops will die if you don't come back in time what makes the user come back more often cause they don't want to lose everything they 'worked' for. The fact that you can customize your land gives the game an extra strong point.

"Subconsiousness!" Make use of the fact that our subconsiousness is more likely and faster to make emotional decisions. For example, think about candy crush in relation to the sweet taste of sweets OR the colour/word test. Everytime the user fails he feels angry for making such a mistake and they want to try again.
JUST ONE MORE ROUND!? Give the user a challenge. Encourage this challenge by giving rewards. This makes the user feel good (releasing dopamine). Gives the user another challenge and so on. Make one fatal mistake and the user wants to do it again

"I'm number ONE!" We always want to be the best, at least better than the others. If we see someone score better than us we need to beat their high score. Even if it is going to take us all night to do it! (the use of avatars and your friends scores)

3.4. Inspirational games and apps

To start our research we asked the people from the MAS (Museum Aan de Stroom) if they already created a sort of app in the past. We found out that they had two apps on the market. There is an app called "Museum Aan de Stroom". This is an app that gives you some information about the MAS (Museum Aan de Stroom) and its surroundings. The second app that we found was MASup.

MASup
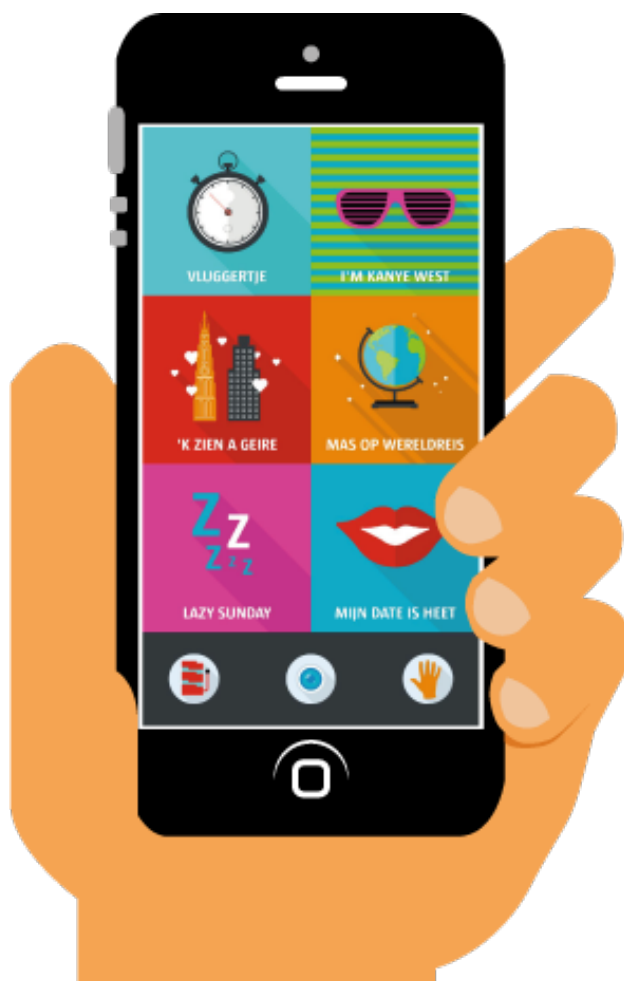
Fig. 3.1.

The MASUP app was an idea from "MAS in jonge handen" and came out in February of 2015. The goal of this app is that you chose one of the 6 routes. Then,you follow one of these routes trough the museum. Every route has its own theme and will take you trough different parts of the museum. The different themes are :

"Vluggertje": You will get to know the core of the museum fast and efficiently.

"I'm Kanye West": If you like to shine and you want to know about power throughout the ages.

"'k zien a geire" Here you can learn the best kept secrets and anecdotes from Antwerp.

"MAS op wereldries": Will take you on a world tour throughout the entire museum.

"Lazy Sunday": Take your time and relax while looking at the exhibits.

"Mijn date is heet": Will take you to the secret corners of the museum.

If you can't choose which tour you want to follow you always can let the app decide for you. If you find a nice spot that you want to remember you can take a picture with some cool effects via the app and post it on social media.

When you click on a certain route you will get a little overview of what this route contains. You will see the amount of time it's going to take and how many objects you will find. After you clicked the start button the app will guide you through the chosen route. To start, first you will need to buy a ticket. After that you can put your backpack away in one of the lockers. The app will tell you everything, from where the toilets on your route are to which floor you have to go to. During the tour you will get facts about the museum and the exhibition.

There are also a lot of minigames in the MASup app. Minigames like a little quiz about objects you might have seen on a floor, or questions which you have to answer with Yes/ No.

Another mini game is one where you have to drag buildings that are very recognizable in the Antwerp skyline to the right spot or drag objects in a sarcophagus.
Also there is a mini game where you have to complete a puzzle.

Clash of clans

Clash of clans is a popular mobile game created by "Supercell". It has been available internationally on the iTunes store since August 2012, and on the Google Play Store since October 2013.

In this game you will build your own army and lead your clan to victory by raising rage-filled Barbarians with glorious moustaches to pyromaniac Wizards. You will also build your own village to fend off raids and battle against millions of players worldwide. All of this will have to be done so that you can be part of the most powerful clan in order to be able to destroy your enemies.

Fig 3.3

Clash Royale

Clash royale is a game created by Supercell and it was published in the first quarter of 2016. This game borrows the settings from an earlier Supercell game Clash of clans.

This game is fought with cards. A card deck includes 8 cards chosen by the player to be his battle deck. The user can only own 48 cards at a time. There is also a random amount of common, rare, epic and legendary cards. These four kinds of cards are troops, buildings and spells. More cards are unlocked at each new arena which is based in the players' amount of trophies. These trophies can be gained or lost in battles.

Fig 3.4

Tribal Wars

Tribalwars is a browser based online game that situates itself in the middle ages. In this game everyone is ruler over his own little village. Under the rule of the player the village will become a great and powerful kingdom with a flourishing economy.

There are a lot of villages that will grow and create alliances between each other. In this way they will form a clan so that they become even more powerful. You will do this by conquering and raiding other players. Eventually you will dominate the world with your clan.

Fig 3.5

HayDay

At the beginning, you have only one house, one storage for vegetables and fruits, and one storage for goods and a few pieces of land to grow your crops. You should harvest them but is not necessary to be on time, because they are not decaying. After you level up, you have more diverse vegetables, fruits and goods. You also have many kitchen utensils such as an oven, barbecue, fruit press, etc. But you can buy these only if you have enough money or diamonds and some of them open after you reach certain level. You can trade your crops and goods with your neighbours and facebook friends. You can fulfill orders with your truck or ship. You also have one boat for fishing. After you reach a certain level, your mine will also open to be able to make some rings or necklaces.

Besides, you have a train to get customers from different places. You can also buy some beautiful things for your farm such as bikes, flowers, tables, chairs, pool or hammock,etc.

3.5. Graphic styles

In order to decide which kind of graphic style will be used for the development of the game, we made a few mood boards to get a clear view on the different possibilities. These can be found on the following pages.

Flat design (picture 1): It is a new and very popular style in the use of games. At the same time, it's simple and stylish and also consists of a few shapes. It's an easy style to make but it's important to give a lot of attention for the compositions and colour combinations, because these are the aspects that will make it a good or bad picture.

The games that use this style: Journey, Firewatch, Monument valley, …

Animated style (picture 2): It is one of the most popular styles for digital games, but also pretty hard to make, especially in the limited time we have. This style makes you go into a lot of details for the different characters, landscapes, but this kind of style makes the game look more professional.

The games that use this style: Angry birds, Islash, Clash of clans, Temple run, Farmville, …

Isometric/geometric design (picture 3): Like flat design, the geometric style is easy to make and looks pretty good. For this style, the geometric construction/composition and colour pallets are also very important.

The games that use this style: Monument valley, …

Typical illustrator style (picture 4): This is probably the hardest style we could do regardless of the amount of time we have. A lot of great comics and movies or festival posters are made in this style. However, the amount of labour that these pictures need is very big. It would be great to create a whole game in this style but it is just too hard to do for us.

Chosen direction for the game:
An indie game style consisting out of a combination between flat and isometric build up. The reason we chose this is that it looks good and is yet easy to make within the time limit we have.

All rights are preserved to the rightful owners of the pictures, all of these are found on Pinterest and still have their links to the places where they are pinned from. (https://www.pinterest.com/cedriclodewijck/antwerp-à-la-carte/)
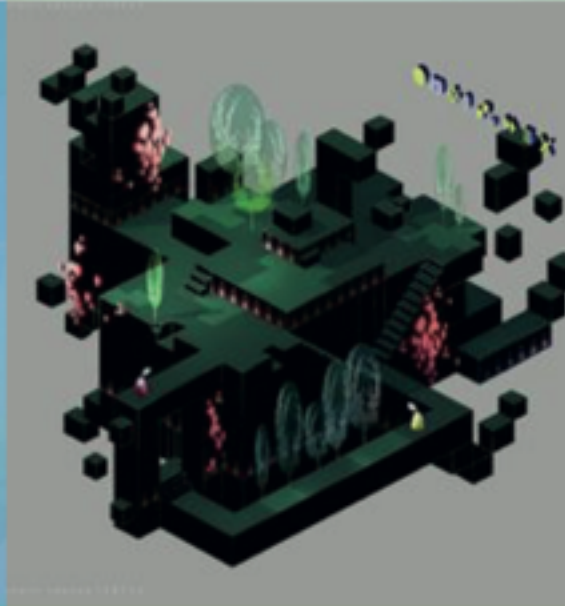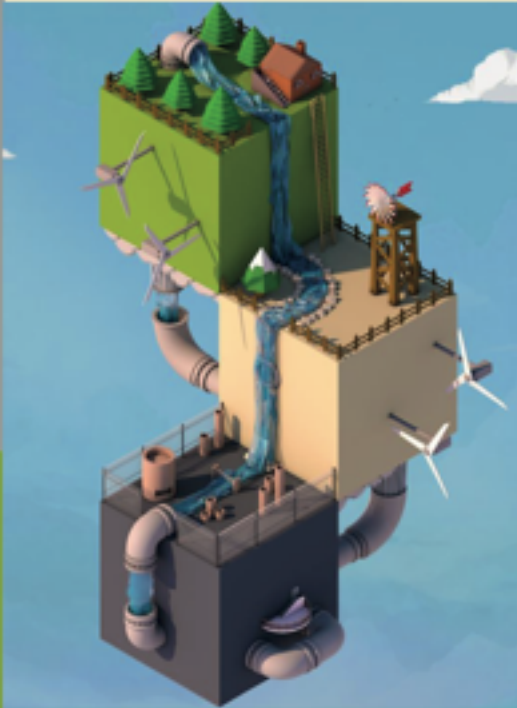
Fig. 3.6.

Fig. 3.7.

Fig. 3.8.

Fig. 3.9.

3.6. Questionnaire

To know what young people want from a museum we went to Don Bosco Hoboken to do a questionnaire. This questionnaire could give us more information about why youngsters are going to a museum or why not, which kind of games are popular among them and what their gaming habits are. (The whole google survey can be found at: https://goo.gl/M5ScC7)

On the question "Do you go to a museum sometimes?" we got the following results. (see fig 3.10)

53.9%
46.1%

Yes
No
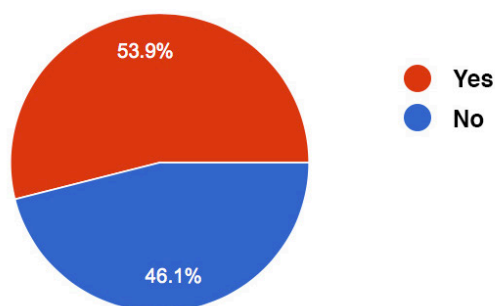
Fig. 3.10.

From these results we can deduce that more than 50% of the youngsters sometimes go to a museum.

When we asked if they had ever been to the MAS (Museum Aan de Stroom) more than 80% answered "yes". The reason for this is probably linked with why they go to museums. In the following chart you will see that more than 60% of the youngsters go to a museum because of school.

Now that we know if and why youngsters come to the MAS, we wanted to know what type of game they like to play.

19.7%
9.2%
60.5%

Out of interest
Because we have to do a project
Leisure time
School trip
Other

Fig. 3.11.

In the questionnaire we gave them a small list of games they could choose out of. This way we could find out which type of game they like the most. This list contained the following games:

- Temple run: This is a 3D game where you need to avoid obstacles.

- Angry birds: This is a game where you need to shoot birds to a structure with pigs on it. When the birds hit the structure it collapses and the pigs die.
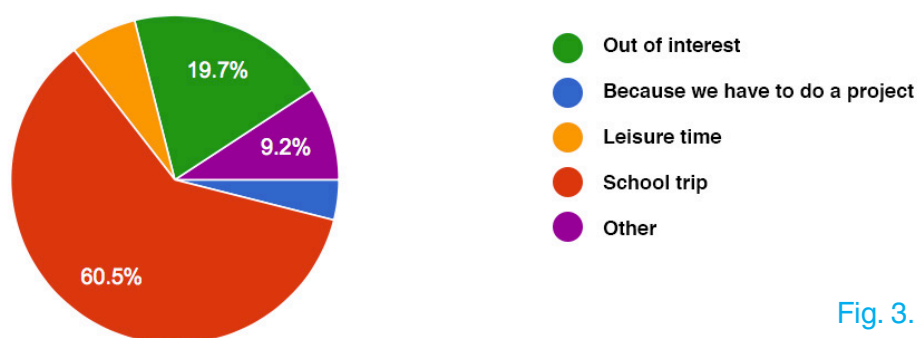
- Tribal wars: This is a browser based game with NO interface (only a map) that revolves around economics. Here you need the mine resources. With these resources you can then produce troops to wage war on to other players.

- Candy crush: Here you need to form a combination of candy to get points. It is a click based game.

- Other (overig):   In this section the youngsters where able to fill the blanck with the game they play most. A lot of youngsters chose to fill in this section instead of choosing one game from above.
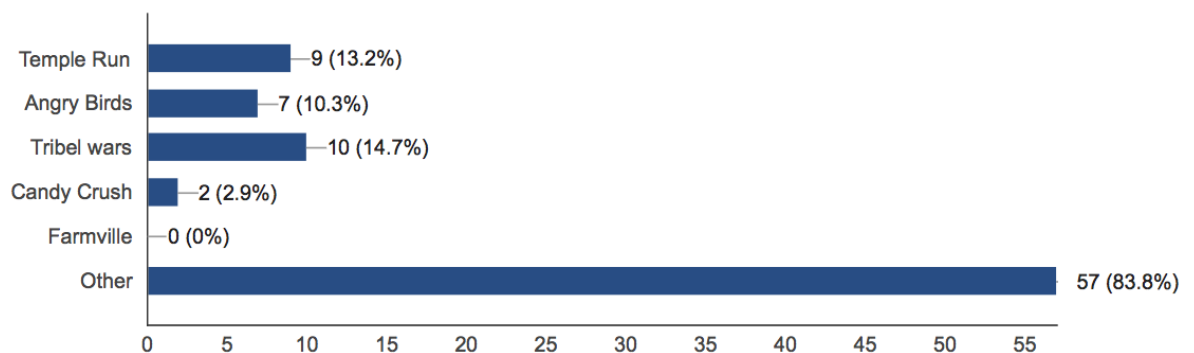
Fig. 3.12.

When we had all the results we saw that a lot of them wrote down some other games. We took a closer look and saw that there were two games that kept coming back: Clash of clans and Clash Royale. These games are both war games and both click based with a few 3D elements (for more information about these games, refer to 3.4. inspirational games and apps).

When we told them about the idea that the MAS wanted to implement the use of games into the exhibition and asked them if they would then be more interested to go to an exhibition, 60,5% of the youngsters anwserd yes.

39.5%

60.5%

No

Yes

Fig. 3.13.

Conclusion

The general conclusion that we can make out of the results is first of all that most of the youngsters have been to the MAS but not a lot of them have been there to visit the exhibitions themselves. If they did go to some of the exhibitions, most of them went with a school excursion and not voluntarily. So it could be interesting for us to give more attention to the fact that mo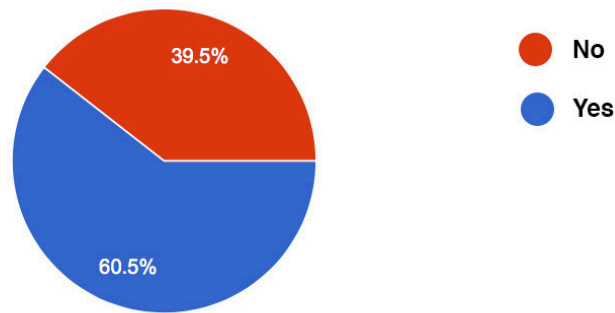st of them come in group and for this reason integrate a multiplayer option in the game that is played at the exhibition. Next to these results we can conclude that click-based games are indeed a good direction for further exploration. But young people like action and some rivalry, what makes it interesting to implement some warfare as well (but in less proportion than clash of clans or tribal wars).

In the questionnaire we gave them a text with some information about the exhibition itself (written in the same context and structure as they would have been in a normal exhibition). When we asked them about what they thought about it 52.9 procent said they did not like it because it was too boring, too long and too formal. A few even replied that they didn't even bother to read it.

This teaches us that we have to rethink how information is given to youngsters and that we should rewrite it in words that youngsters actually use. The youngsters of 'MAS in jongen handen' gave us the tip to work with stories and myths instead of long pieces of information.

The shortcoming of this questionnaire is that there were not a lot of girls at the DonBosco institute. Therefore more guys anwsered the questions. This maybe explains why warfare games get clearly a higher score .

3.7. Usability

Introduction to our project

For our project we are making a click-based simulation game for youngsters aged between 16 and 18 years old. "Mastropolis" is a game that gives the "Antwerpen à la carte" exhibition an extra interactive dimension.

The game consists of two parts: at one side we have the tutorial and the unlocking of the game. While at the other side, the user is able to play it at home as well.

When the visitor of the exhibition comes to the MAS, he/she needs to get a hint of where to get the game. When it's downloaded they will get a welcome screen followed by the first introductions.

We designed characters for each cluster, who will give you a short explanation of who they are and what their function is. These functions are linked to each cluster of the exhibition.

For example, the first cluster is about transporting food from the farms and factories to the cities. Here we have Captain Jacques that will give a short introduction about himself and will then ask you some questions about the exhibition itself. The user needs to find the answers in the first cluster of the exhibition.

Following the universal meaning of right and wrong, correct answers will be shown in green while false answers will be shown in red. When the user filled in the right answer he/she will see an achievement icon appearing. This will make clear what the meanings are of the different buildings and vehicles on the island.

The same rules apply for all the other clusters. This makes it easy and understandible for the player. The next image shows the welcome screen that you will ge when you enter the exhibition. Here are all the different characters of the clusters displayed.

Fig. 3.16.

From left to right: Cluster 1 ("Into the city") Captain Jacques, Farmer used in the game itself (he grows the food), Cluster 3 ("Dinner time") Chef Ato, Cluster 2 ("At the market") Maria the marketlady and Cluster 4 ("Out of the city") Shitty Joey.

Meaning of icons

Some icons have their meaning written on top of them, to avoid any confusion. Most of the icons really speak for themselves because they are universally used in games and software programs.

Profile: As we speak about someone's profile, we think of a person. This is the reason why we choose to use an icon of a person as a button to go to their profile.

Upgrade: Or level up, is shown as an arrow pointing up.

Settings: A gear is the most used icon to show where he/she can find the settings of the game, software, …

Statistics/ leader board: this one is shown as a listing, that represents the listing in the leader boards.

Money: we used a coin to show the user their current money statues

Experience: As used in all kinds of games, XP represents your experience level in the game.

Notifications: as mostly used on smartphones, we choose a round circle that will appear on a certain button if there is a new thing available, a request or even the amount of items you have

Close screen: most know icon to close a screen is the 'X'

Add value: when you want to add a certain value, like on a calculator, we press on '+'.

Subtract value: when you want to subtract a certain value you press on "-".

Meaning of gestures and how they are communicated

Swiping: The best known swiping icon is the one that is used on Apples IOS. It consists out of different circles that have different opacities. When the opacity of the circle is on 100% the user will know that he is on that screen. If the user sees that there are multiple circles, of which the others have a lower (50%) opacity, they will know that they are able to swipe to different screens *(see picture 1).*

Tapping: Tapping is the general, most common gesture that is used in this game. The user needs to tap on the different icons to be redirected to the screen they want. For example:

Buildings form the portals to different screens. When you press a building you will go to the screens that gives you information or show you the activities that are possible. When you press the profile icon, you will be redirected to your profile.

Extra concept gestures (these are not included in the demo)

Tap and hold: Move items to another location. The user can't place any item on any given location because of overlapping. To show if the user can place that item on that specific location, we could use the universal colour meaning of right and wrong. When you press and hold on a certain building, four arrows will appear. When the user is able to place the item at that given location, the arrows will show green. If he/she is not able to place it there, the arrows will show red.

Pinching: With the use of smartphones, zooming in or out will always happen by pinching the screen.

Icon and text sizes

Icons: We found that the best settings buttons for an IPhone 6+ (for which we make our working demo) need to be 87x87px. When we are talking about toolbars and navigation buttons, they need to have a size of 66x66 pixels. These sizes were calculated for when we were designing the graphic elements of the game.

For example, the size of our closing button is 57x64px and this is one of the smallest icons in our game.

Text: for the typography of the game, the text needed to be between 40 and 50 points depending on the use of it. We used Helvetica bold 50 points for the headings (like CLUSTER, HARBOR,…) and Helvetica bold, 45 points for the normal text.

Use of colours and their meanings

Items that belong together will always been shown in the same colour. For example, on the profile screen, you are shown the different items you have. We have Food items, Attack items and Defence items. Under these categories we have different kinds of items. The food items consist out of meat, vegetables, fish and grain. These four items are all shown in orange. The attack items are shown in blue and the defence items in green.

In the game you also belong to a faction of your choosing. All the backgrounds of the different screens will have the colour combination of that certain faction. For example: if you belong to "the house of Augmentulitalia", your background will be a gradient that goes from dark purple to red. Other factions have other colours.

Headings are always shown on a yellow ribbon and all the buttons are white with a opacity of 60% and a white icon (100%).
(see picture 1 and appendix e)

Game play

Feedback on achievements and feed-forward for upgrades

Feedback: From the moment the user achieves a certain goal he will see a pop-up that congratulates him. The pop-up will tell the user what he/she accomplished and how they can use the possible rewards. (see picture 2) The loading screen also gives feedback on how far the game is loaded.

Feed-forward: When the user clicks on a certain building they will see the upgrade screen first. On the upgrade screen they will see their current level (on the ribbon) and what their current capabilities are. As well as how their capabilities will improve after upgrading. (see picture 4)
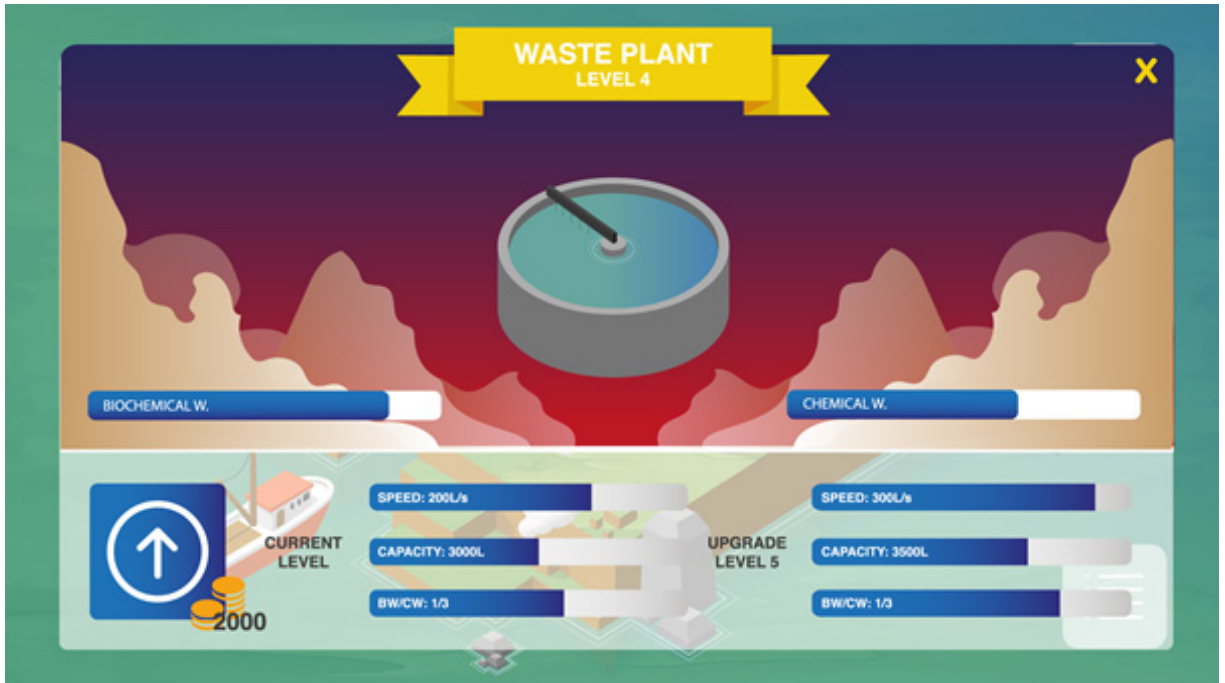
Build-up logic

The game has a pretty basic build-up. When you open the game you get the start screen which shows you the title of the game, the play button, settings and leader board. By pressing one of these buttons, you will be redirected to a certain screen. For example, pressing the start screen button will send you to the virtual playing field. The same rules apply to the virtual playing field. Pressing an item will send you to a screen related to that item. Pressing on the person icon will send you to your profile screen.

To get a clear view on the build-up of the game, take a look at the graphic walkthrough under the final concept.

User experience

Museum experience

The test itself

The test we did, consisted out of nineteen questions given on paper. We did this test to see if the questions gave the user an extra motivation to take a more detailed look at the exhibition. The participants were asked to fill in the papers by searching the answers between the different museum pieces. Some answers were pretty easy to find while others needed some more attention.

We also gave extra attention to the language used in the questions and what we should ask. This because we wanted to avoid creating a school test, like we got them in high school. Those questions would consist out of boring dates and facts.

We wanted to create a sort of treasure quest for the youngsters that would guide them through the exhibition and we tried to do it in a funny way. For example, one question is "Find the brown Volkswagen". The brown Volkswagen refers here to a piece of art that is shown in the exhibition, more specifically a picture of different kinds of cows.

The questions consisted out of multiple choice questions, fill-in questions and finding pieces in the exhibition

We looked at the amount of time they needed to fill in the questions, the difficulty of the questions and afterwards we took a look at how they perceived it.

The participants

For the test we had ten participants aged between 20 and 24 years old. We had six girls and four boys who filled in the questions. At first we wanted to use the youngsters of "MAS in young hands", but they had already seen the exhibition. This would make it easier for them to fill in the questions, what would not reflect the behaviour of someone who sees the exhibition for the first time.

The results

The results were pretty good. Almost all questions could be answered with exception, accept of a few that were apparently well hidden. We have changed these questions or have given a hint to make the search a little easier.

The museum experience of the user definitely changed. Before we did this test, we did a general check on how long it took to go through the exhibition without any questions. The average time took around 30 to 45 min. The visitors that got the questions, took around 1 to 1,5 hour.

Afterwards the participants were gathered back in the 'atelier'. Here we saw that a lot of them started discussing what the right answer was and where they found it.

Conclusion

The general conclusion is that we could see a drastic increase in the motivation of the participants and the attention that was given to the exhibition. This was shown by the amount of time and right answers that were given by the participants but also on their behaviour at the exhibition itself. In the beginning they were a little bored but after a while they really started searching for the right answers.

We would say that the implementation of the game at the exhibition would really give it an extra dimension and would make the visitor look in more detail to the museum pieces.

Remarks

The demo is not completely finished and can not be tested right now. We did do some test with screenshots on an IPhone 6+. The screens look good and are fully accessible. The only screen that would need some more work is the screen of the restaurant. This screen is filled with too much information which makes it hard to control. The buttons are a little too small.

Actually we would need to do some tests on the working demo but due to the time restraints we weren't able to do this. Then we could test the logical build-up of the game and see if the user can find all the information or actions he/she needs. But as said before, we wouldn't expect any problems on this because of the basic build-up of the game.

04

Planning and Schedule

4.1. Milestones and Interim results

Project concept

- Kick off project (February 16th): Get to know the members of the team, the project and supervisors.

- Project management presentation (February 19th): Presentation about what we are going to do and the amount of time that it is going to take to finish each activity.

- Initial meeting (February 22nd): First introduction to the exhibition. Explanation about the layout of the exhibition and some of the things displayed.

Project definition

a. Team strengths and weaknesses analysis (March 4th):

Distribute team roles and making arrangements. Get to know each other and the strengths and weaknesses of the team, and how to deal with them. See everybody's boundaries.

b. Project plan (March 7th):

- Gathering background information

- Team roles

- Contact information

- Smart goal

- Submit first version of the project plan

After finishing the project plan we will have all the tasks divided between the members of the group and a clear structure of the tasks that need to be done. We can start working in a more organised way.

Project ideation

a. Project research (Deadline March 20th):

- Youngsters (target group)
- Style research (Moodboards)
- Interest research (Moodboards)
- Market analysis: other museums, apps, games...

After doing the necessary research we got to know more about the interests of the youngsters and how to achieve our goal.

b. Project ideas:

- Brainstorming
- Morphological chart
- Persona's (March 20th)
- First concept (March 23rd):

With the brainstorming, the morphological chart and the persona's research method we got a clear idea of what we were going to develop after the Easter holiday.

c. MIDTERM REPORT (March 25th).

Once we had the concept defined for the midterm report we were ready to start working on developing it directly after the midterm presentations. So we got on it with the graphics, the programing and the linking the game to the exhibition part.

Project design

a. Storyboard (April 25th):

With the storyboard and the algorithm finished we had the layout ready to start developing the demo of the application. Thomas was ready to start programming; Cedric, Cristina and Carla had all the information about the needed screen to start designing the interfaces, and Esra had the necessary information about the exhibition to start linking the game to it.

b. Technical development (May 20th): We will have a functioning demo of the application. This deadline was not made because the programming took longer than expected as well as the graphic work needed for it. But by the hand in of the final report there will be a working demo of the game.

c. Testing (May 27th). Since the demo is not fully ready we cannot test the game completely. But there was some testing done, where some youngsters had to answer the questions that link the game to the exhibition (see 3.7. Usability).

d. Peer evaluation (May 27th). After the testing we did with the questions we had made for the game, we realised that we needed to make some changes.

e. FINAL REPORT (June 3rd). After we hand in the final report we will work on getting the final presentation ready.

This was what we planned in the beginning, we thought these dates were good to make sure we finished the different stages of our project on time. Until the midterm report these dates were followed in all stages.

Once we got to know the members of the group and our supervisors, and we had the first meeting, which gave us the necessary information to start working, first we made the project plan. This helped us to get a clear idea of all the steps we actually needed to do, and helped us organising the group.

After we handed in the assignments from the different subjects, we had more time to work fulltime on our project. We did all the research needed, researching other games, who the leaders are, what do they do, how do they do it,... Before developing the concept, it was also very important to know what youngsters like, so we did a questionnaire at the Don Bosco institute in Hoboken, where youngsters aged 16 to 19 answered it (for more information see 3.6. Questionnaire and the questionnaire can be found at https://goo.gl/M5ScC7)

We also started brainstorming (see Appendix C). For that, we sat together and started writing down all the ideas that came to our mind. We also put some brainstorming

papers in the offices from the Museum Aan de Stroom so the people from the museum could also contribute to the idea.

After the midterm report we started working on the actual game. This means we started to work on the graphic work needed for the different screens that the game contains. Meanwhile, Thomas started working on the algorithm and the programming of the game. We also started working on the questions needed to link the game to the exhibition. Esra was responsible for this part and she created a lot of questions based on the information we got from the exhibition. After the opening of the exhibition, on May 15th, we got a clearer idea of which questions were better and also we created some new ones, since from that moment we had the real exhibition to work with.

The working demo was not finished for the scheduled time and for this reason we could not do tests with it. Instead we tested the questions that link the game with the exhibition with 7 students aged between 20 and 24.

4.2. Gantt Chart

To get a more visual idea of our scheduling we created a Gantt chart, which you can find below.
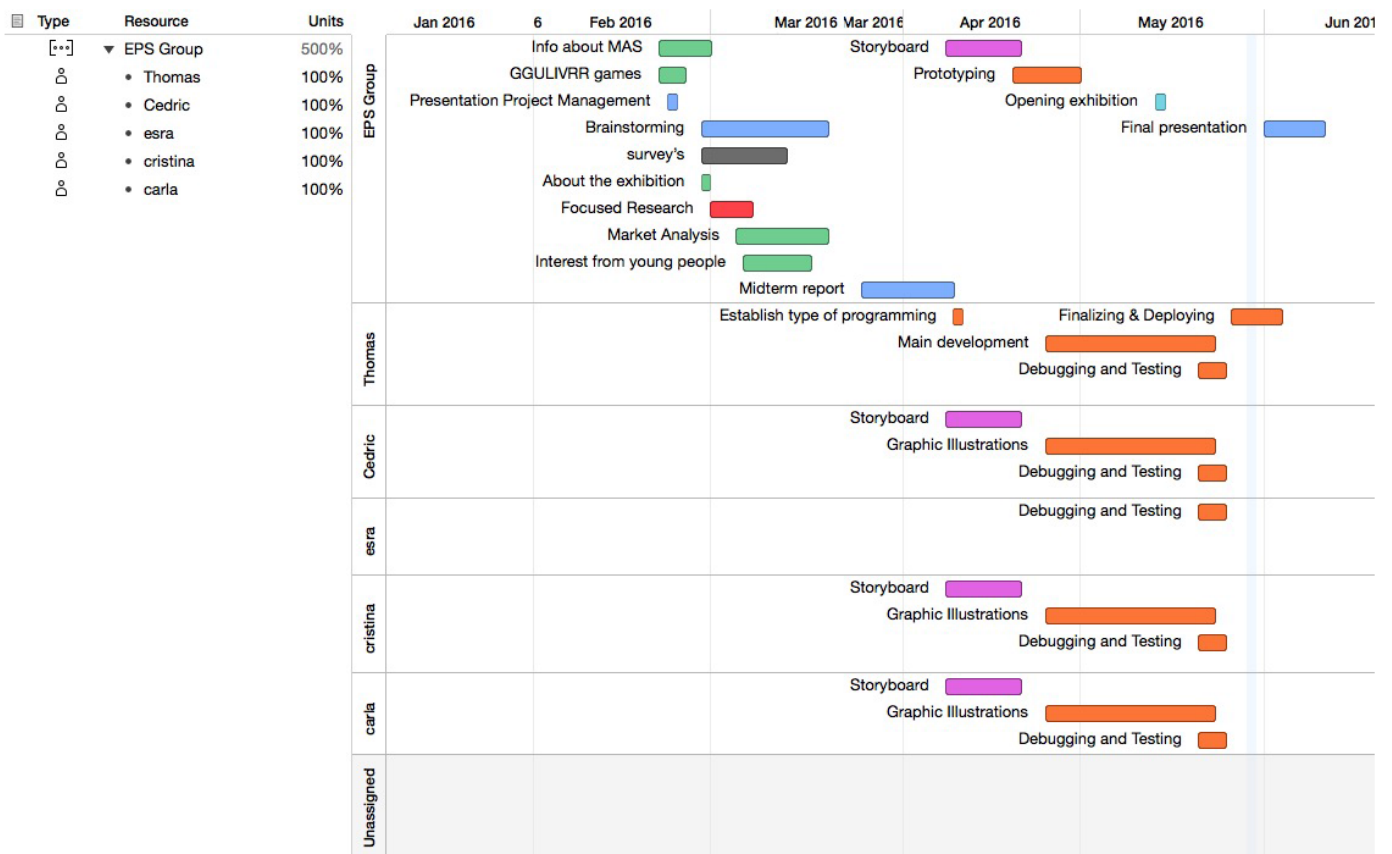
Mas gantt: Timeline

Fig. 4.1.

Mas gantt: Earned Value Analysis

Task	Planned Value	Earned Value	Actual Cost	Cost Variance	Schedule Variance	Estimate at Completion	Budgeted at Completion	Variance at Completion	CPI	SPI	CV %	SV %	TCPI
0) Mas gantt													
1) Mass Project													
1.1) Research													
1.1.1) Market Analysis													
1.1.2) Interest from young people													
1.1.3) Info about MAS													
1.1.4) About the exhibition													
1.1.5) GGULIVRR games													
1.1.6) Focused Research													
1.2) Design													
1.2.1) Brainstorming													
1.2.2) survey's													
1.3) Development													
1.3.1) Establish type of programming													
1.3.2) Storyboard													
1.3.3) Prototyping													
1.3.4) Main development													
1.3.5) Debugging and Testing													
1.3.6) Finalizing & Deploying													
1.3.7) Graphic Illustrations													
1.4) Presentations													
1.4.1) Presentation Project Management													
1.4.2) Midterm report													
1.4.3) Final presentation													
1.4.4) Opening exhibition													

Fig. 4.2.

05

Project Plan

5.1. Sponsors

As the Mas Team, we do not actually have sponsors. However, these are our supporters who are going to help us to improve our project (more contact information of each person can be found in Appendix A);

AP tutors:

Hiram Bollaert   Math and statistics teacher

Tom Peeters   Web development and programming

Museum aan de stroom:

Marieke van Bommel Director of the MAS

Email: marieke.vanbommel@stad.antwerpen.be

Education and Public:

Cathy Pelgrims Team Coordinator

Liene Conard   MAS in young hands

Katrien Loret   Production leader

Research

Leen Beyers   Curator of Antwerpen à la Carte and Team Coordinator

Marketing and Communication

Karen Vandenberghe Marketing and Communication, Team Coordinator

5.2. Stakeholders

These are the stakeholders in our project;

Interested in our project

Fig. 5.6.

Interested in the exhibition

Fig. 5.7.

- **The City of Antwerp** (attracting more tourists to the city)
- **MAS** (attracting more young people to the museum)
- **Food Establishments** (could attract more buyers if they get involved by the game)
- **Youngsters** (the target group that will eventually use the game, whose age is between 16 and 18 and are also the most important stakeholders.)
- **Schools** (teachers that would bring youngsters to the museum, school trips)
- **Other Museums** (those who are working on similar things, or would like to use it in the future)
- **Tourists**
- **Older People, >65** (A lot/some of them are really interested in what their grandchildren feel attracted by, and want to discover new things themselves).

5.3. Goals

The main goal of the project is to attract more youngsters to the museum. This by adding another interactive dimension to the exhibition 'Antwerpen à la carte' through

the use of mobile smartphones. In the beginning we were thinking about developing a GGULIVRR game because of the recommendation of our supervisor, Hiram Bollaerts. But by doing some brainstorming sessions we gradually changed course.

In order to reach our goal, we need to do a lot of research. We need to know what interests the youngsters, how to reach them, why they actually go to museums, what kind of games are on the market and so on. By answering these questions, we will get a clearer view on how to achieve our goal and make it successful.

To get a few answers on these questions we made a questionnaire that was given to students of the Don Bosco institute in Hoboken. We hereby would like to thank the vice director Dirk Boschmans for helping us to set up meetings with the students.

Also a lot of information, especially about the exhibition and the museum itself, was given by the people of the MAS who also gave us accommodation rooms where we can work freely on the project without disturbing any work forces.

For technical information and feedback, we can always rely on the help of our supervisor Hiram Bolleart and Tom Peeters. We would especially like to thank Tom as well for all the time he spends on helping us, while he is not our supervisor.

5.4. Costs and Benefits

The MAS hadn't foreseen any budget for this project. But to be able to reach our predetermined goal we need to have access to some materials and some sort of accommodation. As previously mentioned (under the section goal) the MAS has given us access to their offices. But after a few work sessions we asked for a separate room where we could work more freely and didn't disturb other people. This is when we got access to 'het atelier', a big room where we can do "whatever we want".

Besides access to the offices, we got access to all the exhibition rooms as well, so we could have a better view on what an exhibition in the MAS actually looks like and how it is built.

When we are talking about materials, we especially mean laptops and smartphones for every member of the team. But these are things we already have. Next to the physical materials we also need access to different kinds of programs like Xamarin, Adobe Illustrator, InDesign and Photoshop, but because we are still students we have free access to these programs.

Next to materials and accommodation comes knowledge, for which we mostly rely on tutors of UA and AP, supervisors and the workforces of the MAS. Which tutors can give us information about a certain aspect and their working field can be found in appendix A.

The workforces of the MAS can give us more information about certain aspects related to the exhibition and the museum itself.

06

Our concept

6.1. Previous concepts

Concept 1 - VR

The use of virtual reality headsets is a very popular trend nowadays and will surely be a part of our future. These kinds of new technologies always attracts the interests of youngsters. Through the use of VR we can literally give the exhibition a new dimension. The use of VR can be implemented in 2 ways: Augmented reality (see concept 6) and Virtual reality.

Under the section VR we can 360 degrees' environments that can transport us to different places which are related to the exhibition. For instance, in the part that is about how food is transported to the city, we can implement a 360 degree video of the harbour and so on.

Concept 2 - Ecosystems

(Original concept of Hiram Bollaert)
VME = five system need to stand in balance for the VME in order to be healthy. Each of the properties can be controlled by a button to adjust a shortage or an excess.

The fiive systems, the twenty-five properties and the manner in which they influence each other and the global health of the ecosystem are inspired by reality (and do not need to be real).

There is an online VME that evolves continuously, decays continuously and needs to be managed continuously.

The online version publishes the survival time of the current VME. As soon as a version is destructed due to mismanagement, the system reboots and manager gets a new chance and then survival time starts again at zero.

The online version publishes statistics that show the survival time (longest, shortest

and so on.), a leader board with the best managers (of the current version, possibly of other versions), and a list of current active managers.

The online version posts cries for help via FB, yellow, orange and red messages indicating that system is in unbalance, indicating which actions must be taken, inviting managers to act. Furthermore, the online version is visible for anyone but only managers can act using their phone.

Concept 3 – Treasure quest

This concept is about a game that makes the youth look with more detail at the paintings and so on. The game could be about a certain subject that needs to complete a mission where you need to make pictures (think about the guy that is urinating in the portrait of Antwerp) to help him and get a certain reward at the end of the exhibition.

Concept 4 – City tour

This concept consists of involving the city in such a way that gives a sort of tourist guide through Antwerp. You get a few challenges (related to the exhibition) that you have to do throughout the city by scanning the QR-codes in the exhibition. A challenge could be, for instance, taking a picture on a toilet or with a bartender or with a shopping cart and so on (photo's could be automatically posted on social media, try to start a trend for the funniest pictures). The challenges make the visitor see the city as well as make them go to old bars, restaurants, or factories and so on throughout Antwerp. We could also make "attraction points" in the city that are parts of the game (but also makes non-visitors curious about what's going on). With attraction points, we mean little art pieces hidden throughout the city (think of a milk bottle at the Melkmarkt). By scanning these pictures you get a new video about the history of that place or just a mark on the specific spots shown in the exhibition, for instance.

(WATCH OUT no boring dates and explanations but MYTHS and funny STORIES told in their own language)

In addition, it could be a combination with the concept 3 inserting a sort of treasure

map as shown on pinterest.

The difficult part is to give the visitors an award that is actually valuable to them, because this is going to decide the efford they are willing to make to complete the tasks.

Because the chef from 't Zilte (Michelin restaurant at the top of the MAS) has made his modern version of an old recipe as shown in the exhibition, it would be nice to reward the 'winner' with a diner for two in 't Zilte. (It isn't very expensive for the MAS but could attract a lot of people)

Concept 5 – MAS own social platform (for everything that has to do with cultural events)

This concept is about making a social platform in combination with different kinds of mini-games related to the exhibition it's meant for and also integrating a messenger window where people can ask each other questions about the parts of the exhibition, help with mini-games and challenges. It is also about using this platform also to inform about special events like jazz at the MAS, MASk, movie night on the rooftop, and so on. Furthermore, by using this concept, we can make the museum a place where people can meet and socialize instead of being a boring place where you have to be quiet and we can give the visitors direct information about they want to know, like a sort of Siri.

Concept 6 – Augmented reality

This concept focuses on giving people what they need by giving them a short introduction about each part of the exhibition. So they know what looks more interesting to them and what does not. It is a kind of quick overview.

Youngsters come in and through the use of augmented reality in combination with virtual reality, they get a quick introduction on every stand of the exhibition. This could be done, for instance, by using different colour lights that interact with the camera of the smartphone and by looking at it they get an explanation video on the screen.

It could also be used on the rooftop to interact with the city of Antwerp. By standing on a particular place, you could see the different places that are mentioned in the exhibition. For instance; by looking at the Groenplaats, you could get a rapid introduction about its history with a look at a few pieces from the exhibition.

This would attract a lot of people to stand on the rooftop, so it would be best to mark a place on the ground and on the glass mentioned under a different QR-code, by standing on that specific spot, entering that specific QR-code and looking at the point on the glass, you could get an overlapping interactive "video" about the different places in Antwerp. (interacting with the city without even going in or a fast way to communicate an extra city trip).

Concept 7 – And ACTION! (very extreme concept)

This concept focuses more on the attraction to the MAS. This concept aims to attract more youngster by making the museum a place of more youthly action. For this reason, different kinds of events could be organised such as movies at the MAS (on the rooftop like the American drive ins), or a deathride at the end of the exhibition, and so on.

Doing this concept, we could give the youth the possibility to hang out with their friends in the museum, or we could organise special events especially for youngsters. These events should be well communicated through social media.

The deathride idea could be an extra motivational factor to get their attention to the exhibition. If the youngsters can answer all questions they can, for instance, use the deathride. (The deathride isn't the concept, organising events is)

6.2. Final concept

1. Introduction

Our concept is a click-based game. You will download it at the exhibition and will unlock the different parts of it by solving questions about the clusters, then you will be allowed and prepared to play it outside of the museum and be part of a community existing of all the people who went to the Museum Aan de Stroom.

The point of the game is taking care of your own "city" by keeping the balance between the production of food and the waste it produces. The game is divided into four different parts, related to the exhibition: production of food (cluster one: into the city), market (cluster two: at the market), restaurant (cluster three: dinner time) and waste (cluster four: out of the city). At the end we have the future cluster with its different factions.

When you go to the exhibition, you will be able to unlock different parts of the game, and at the end, namely on the fifth cluster, you will see an explanation about three types of possible future scenarios.

Technological (robots managing the food and unprecedented transport technologies), agriculture (smaller sustainable networks, citizens manage the food themselves) and biological (new forms of life).

By the end of the exhibition, you will have to choose one of the factions that you want to invest in, so you will provide them with the food you produce and they will research ways to implement this way of living. The three factions will "fight" against each other to become the conqueror of the "Museum Aan de Stroom".

2. Linking it to the exhibition

Once the youngsters are at the exhibition, they will download the game that will guide them around the different clusters. They will have to follow the right order and pay attention to the exhibition, because they will have to solve questions or scan the right

QR codes.

When they solve the questions about the first cluster by going around and exploring it, they will get the harbor to go fishing and the land to plant vegetables, grains or take care of the animals to get meat.

In the second cluster, they will get the market place, to buy/sell from/to other players and store the food they produce.

In the third cluster, they will unlock the restaurant to make the dishes that they will give to their own faction.

In the fourth cluster, they will build the waste plant to manage the two different types of waste: chemical and biological.

3. Playing outside the museum

Because the main goal is to attract the youngsters to the museum, it seemed a good idea to us that you unlock the game at the exhibition. Afterwards, you will be able to play it outside. By doing this, we will create a community that will encourage other youngsters to go to the exhibition to unlock the game and play it too.

4. Gameplay

As we mentioned earlier, our game is based on four variables which have other sub variables: food (meat, fishes, grains and vegetables), market (buy, sell), restaurant (different dishes) and waste (chemical and biological).

The main goal of the game is to make sure your faction wins. You have two ways to contribute to this: providing the dishes your faction needs or boycotting the other factions.

First way: Traditional way > Providing food.

Depending on the day, the factions will need three or four dishes which the different players have to make to help their faction.

Production of food

The virtual playfield is divided into squares. At the beginning of the game, you will have a certain amount of squares that you can use. The amount of tiles will increase when you level up. At the start of the game, you will have to choose between the different forms of producing food: land or sea. To produce fish you will need a harbour and a ship to go fishing, to produce grains, vegetables and meat you will need land instead.

The food will need time to grow, the ships to get back from fishing and the cows to be prepared for slaughtering. By the time they are ready, the user will get a message to collect them, if he doesn't do in a certain amount of time, the food will rot and it will become biological waste.

The market

If the food gets collected, it will go to the storage in the market. The higher level you reach, the more storage you get. In the market the user can trade the food he does not need online with other players. The fresher the food is, the more it will cost, but if the user does not use it in time and lets it in the storage it will rot too, becoming biological waste.

The Restaurant

At the restaurant the user can mix the different ingredients so that he can make the dishes his faction needs. He will only need to click on the dish he wants and has to have enough food, that is needed for that dish.

The Waste Plant

Finally: the waste plant. Like we already said there are two different types of waste: chemical and biological. Here you will have to keep the amount of waste you produce balanced in order to keep it below the allowed level.

Chemical waste affects you in a negative way. If you have a lot, more than half of the permitted amount, your food will rot in a shorter amount of time and if you have less than half of the permitted amount, it will take more time to rot. Also, if you get over the predetermined limit, you will have to pay to get rid of this waste.

Chemical waste is produced by the packaging from the grains and the vegetables and the oil from the ships.

Biological waste affects you in a good way. If you have more than half of the permitted amount, your food will grow faster and if you have less, your food will grow slower. If you get over the predetermined limit, you will also have to pay to get rid of it.

Biological waste is produced by the animals and the food that gets rotten, because the player didn't collect it or trade it on time.

Second way to play -> Boycotts and natural disasters

For making the game more attractive to youngsters and to have more interaction between factions we decided to implement two extra features: the boycotts and the natural disasters.

Boycotts

To reach this extra feature the player will have to keep the balance in his city and level up until a certain level, from that point he will be allowed to build the barracks.

This building will be used to train the troops and defend the city. Here the player can also choose which player of a different faction he wants to boycott.

To protect their city, the player will have four types of characters: walls, "boom-kolen", poisoned cheese and hedgehogs. Every one of these characters will have an identity card with the explanation on how their defense mechanism works and on how many points of defense and attack they have. The player will buy them with money.

To attack other players there will be four types of animals available, these animals will be fed and trained with chemical waste, so the player will need a big amount of it to attack. The animals will be: kamikaze-rats, ninja-pigs, snails and evil bunnies. About the defense characters, these will also have its own explanation with the different points for defense and attack.

Natural disasters

To make it more interesting we thought about including natural disasters that will affect one faction and will be voted for at the exhibition by the visitors. The disaster will take place when a specific number of people has voted.

The visitors of the exhibition will vote for the faction that is going to be affected by the disaster. The type of disaster will be chosen randomly.

Examples:

- Earthquake: destroys your food at the market.
- Tsunami: destroys your ships.

5. The factions

As we said, there are three different explanations of future scenarios at the exhibition. Based on them, we created three factions and the player will have to choose one of the three.

Technological
A scenario where robots will manage the food and unprecedented transport technologies will exist.

Agriculture
Small sustainable networks where citizens will manage the food themselves being a more ecofriendly society.

Biological
New forms of life will appear allowing us to eat less or other things we never thought about.

6. Dividing tasks

To make this project a success we decided to divide it into four different parts: the different ways to teach the youngsters about the exhibition and unlock the game, the graphic design of the game, the algorithm and the development.

Esra is going to research the questions to unlock the game.

Cedric, Carla and Cristina are going to make the graphics.

Finally, Thomas is going to do the programming of the demo game.

6.3. First drafts

In order to give you an idea about what the game is going to look like, we implemented our vision on the interfaces as well as the graphic styles we are thinking about.
In this part you will find the interfaces in order of how they would appear in the game.

Basic idea on the start screen.

(Before this appears, you will get the logo from the MAS, MASplay and city of Antwerp, because they have been working on this project or are supporting us in a sort of way)
On the start screen you will get a login screen (see picture 1), where it would be nice that you can login with a Facebook account. On the left top corner you could find a link to the statistics of the different fractions. (statistics screen see picture 3)
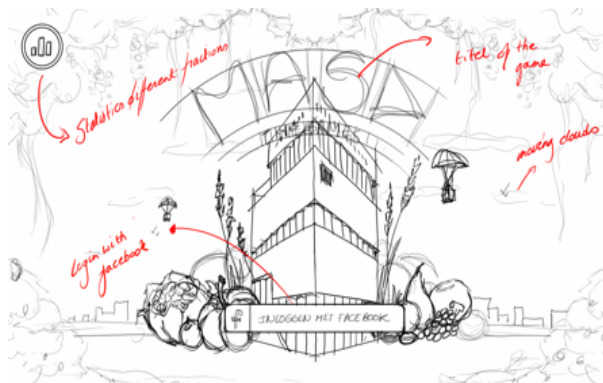
picture 1: login screen

picture 2: start screen
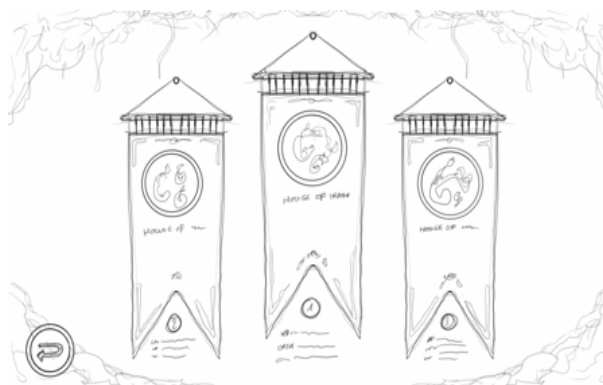
picture 3: faction leaderboard
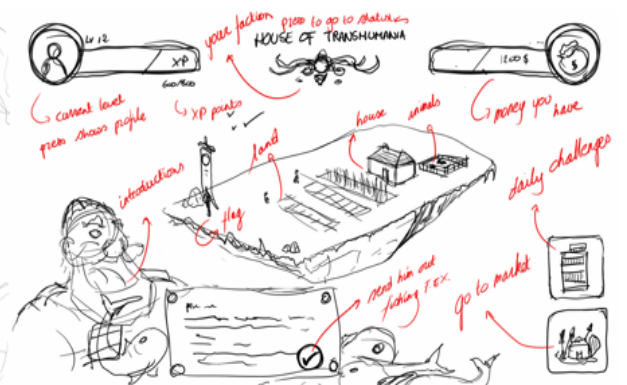
picture 4: playing field

After you have loged in with your Facebook account, there will be more options available on your screen (see picture 2). In the middle of the screen you will have a big play button that will bring you to your personal island (see picture 4). On the left side of the start screen you will have a button that will give you the high scores of your personal fraction, as a sort of leader board. On the right you have the last button for this screen that will mute the game play music, because a lot of people like to listen to their own music or are in a situation where music isn't allowed or appropriate.

The virtual playfield. (see picture 4)

After pressing the play button on the start screen, you will be sent to the virtual playing field. On this screen you will get a lot of information about the game and its buttons (on picture 4 you will find some indications about what each object means).

In the top, left corner you will find your profile picture, current XP points and how many more you need to reach the next level. In the top middle you will find the name of your faction and its logo. In the top right corner there is an indication on how much money you have and can still carry (so there is a maximum amount of money you can hold without spending it).

When there is some explanation needed in the game, this will happen below in the left corner by a character that is related to the explanation that is being given.

Then we have the right bottom corner. Here you will find two different buttons, at the top you have a button that displays a picture of the MAS. This is where you will find the daily challenges. For instance, how many dishes the MAS restaurant needs, what the required ingredients are and what kind of reward you will get once you have completed them. At the bottom, you will find a link to the market, where you can buy and sell items.
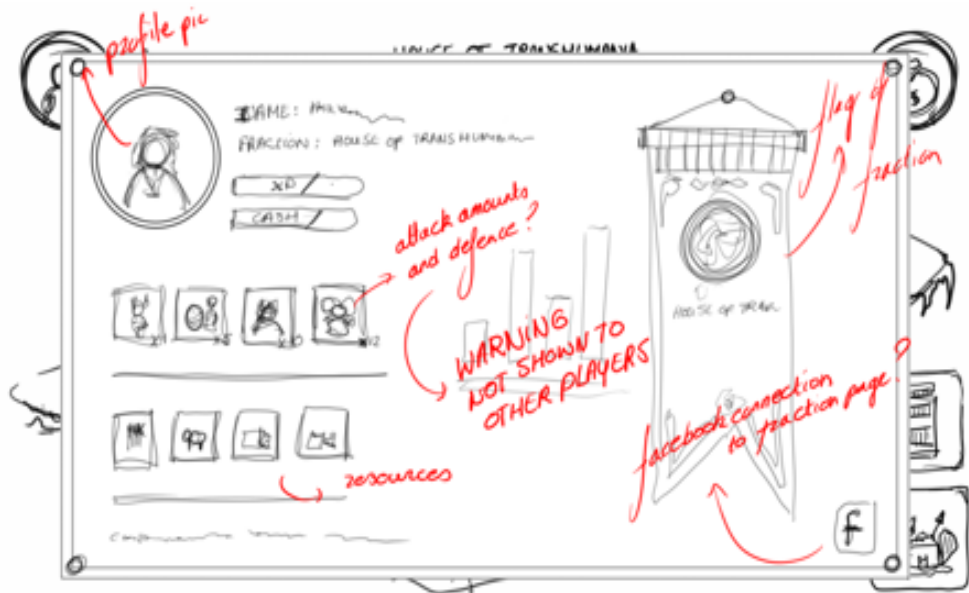
picture 5: profile screen

When pressing the profile button you will be sent to your profile page (see picture 5). On your profile page, you will find things like your username, the faction you belong to, your total amount of cash and XP points and an overview of the different amounts of items you have.

On the right side you could maybe find your factions flag and a link to your faction's profile page (a Facebook page and for instance when you like their page you get money).

When pressing the market place button, you will be redirected to the screen as shown on picture 6. Here you can buy and sell your items on your faction's market. (see picture 6)

picture 6: market

Control gestures

Picture 7: Zoom in/out

Zooming in and out could be done by pinching the screen.

Picture 8: Tap and hold

By tapping on an object and then holding it, you will be able to move it in two dimensions. This will be shown by four different arrows. When you are able to put it down on the chosen ground, the arrows will be green, and if you're not able to place it on that certain spot, the arrows will be red.

Picture 9: Tap an object

By just tapping an object, you will get two sub-buttons where you have the choice between upgrading that object or going to its information screen (see picture 10).

Picture 10: Information about a certain object

All the detailed information about a certain object is shown on this page.
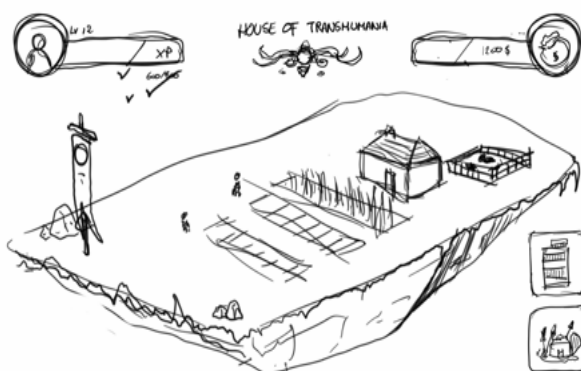
picture 7: Zoom in/out
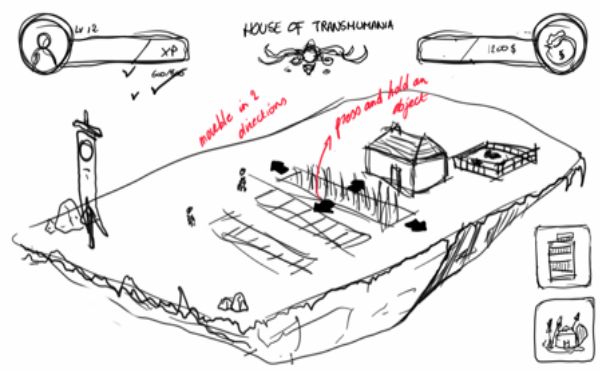
picture 8: move objects
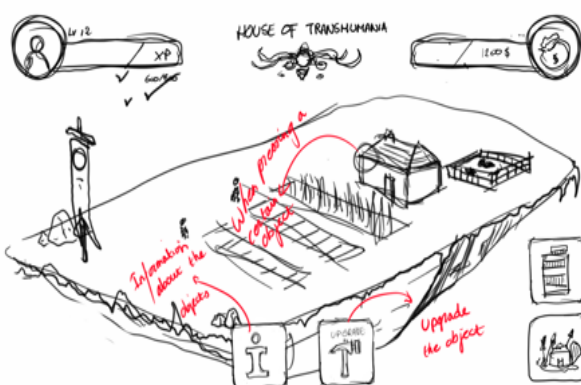
picture 9: tapping an object
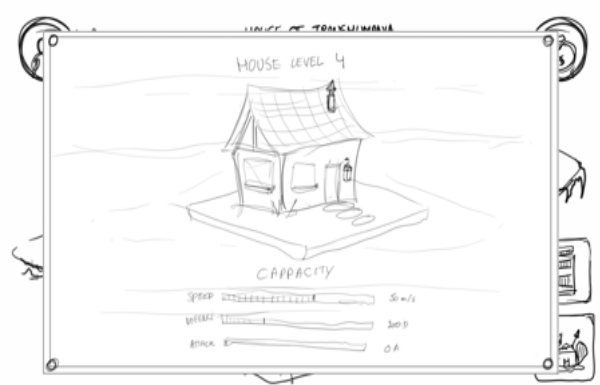
picture 10: information

07

Final result

7.1. Storyboards

In this section we will talk about the different screens of the game and show you how each one of them works and reacts when you click certain buttons.

Starting screen

When you enter the game you see the start screen. There you have three options:

(1) Start the game.

(2) Go to the leader board.

When you click button number two you go to the leader board and you see the three flags for the different factions, all of them are clickable buttons. By clicking on each of them you go to three different screens where you can see the position on the board and the points of each of the factions. For example, when you select number three you go to the screen above where you can see that the augmentulitaria faction is the first one on the leader board.

(3) Go to the settings.

When you click button number three, you will be redirected to the settings screen. There you have four options:

- Button number five allows you to change the language of the game.
- Button number six lets you turn the sound effects on.
- Button number seven does the same as button six but with the music.
- Button number eight gives information about us, the creators of the game.

STARTSCREEN

We kept the start screen pretty basic.
Here you can start the game, change some
settings or visit the leaderboard to have a
quick look at who is winning.
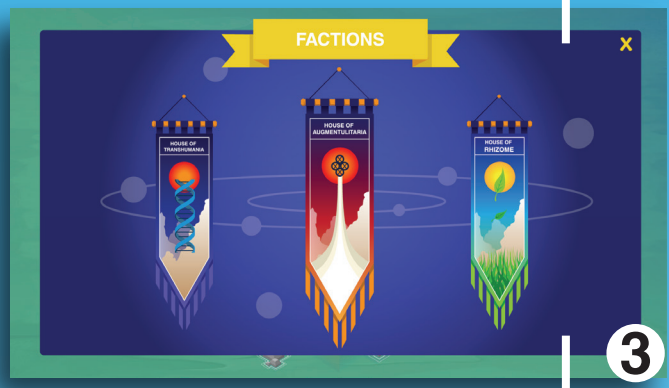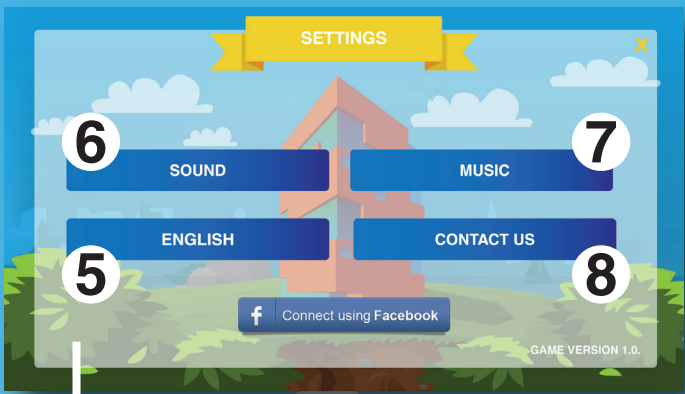
Fig 7.1

Playing field

After pressing the start button on the start page, you will arrive at the virtual playing field.

Here you will see all your different buildings which can be pressed. After pressing these icons, you will go to the different information screens related to that building. These icons and their storyboards will be explained in the next few pages.

In this part we will talk about the general buttons that can be found on the playing field. Here we have button number one **(1)** and button number two **(2)**.

(1) When you press this button you will be sent to the profile page. Here you can see all your food, your defence and attack characters as well as the icon of your faction and your profile picture (linked to your Facebook account). Pressing 'X' will take you back to your virtual island

(2) When you press this button a pop-up will appear with two options on it. Here you can choose between settings and going back to the main menu. Both of these screens are explained under the storyboard of the starting screen. Pressing the 'X' will bring you back to your virtual island.

STORYBOARD
PLAYINGFIELD

In this screen you see the storyboard for the top buttons of the virtual playingfield.

MAXIME VANDIJCK
LEVEL 3

HOUSE OF AUGMENTULITARIA

1200

11   235/300 XP

1

SETTINGS

SOUND

MUSIC

ENGLISH

CONTACT US

Connect using Facebook

GAME VERSION 1.0.

2

MASTROPOLIS

START

1200   11   235/300 XP

SETTINGS

MAIN MENU

On the next pages you will find more information about the different buildings and vehicles.

Fig 7.2

The waste plant

This screen shows the information about the waste produced on your island. At the top of the page, you have two bars **(1 an 2)**. Bar **(1)** shows the overall amount of chemical waste, while bar **(2)** shows the amount of biological waste.

An the bottom, we find the upgrade button **(3)**, which will allow you to upgrade the level of the waste plant by paying the amount of money shown.

Right next to it we find three bars **(4)** corresponding to the current level which show the speed at which waste is handled, the amount of waste that you are able to have and the balance for chemical waste. This last one will make your food rot faster if it is higher than it should be. On the right bar is shown the same information but for the next level.

The farm

When you press the farm you get the farm screen where you are able to see and do several things.

First you see the upgrade button **(5)** which will permit you to buy the upgrade for the next level.

You are also able to see the amount of tiles that you are allowed to have on your current level on the bars **(6)**, as well as the amount of tiles allowed on the next level.

Finally, you find the place tiles button **(7)**, which will allow you to place the tiles on your island that you did not use yet.

STORYBOARD
WASTE PLANT
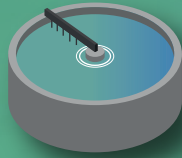
Here you see the storyboard dedicated to the settings, play and leaderboard button and where they redirect you to.

WASTE PLANT
LEVEL 4

X

1 OCHEMICAL W.

2 HEMICAL W.

3 CURRENT LEVEL
2000

SPEED: 200L/s
CAPACITY: 3000L
BW/CW: 1/3

4 UPGRADE LEVEL 5

SPEED: 300L/s
CAPACITY: 3500L
BW/CW: 1/3

FARM
LEVEL 4

X

5 CURRENT LEVEL
TILES: 6
2000

6 UPGRADE LEVEL 5
TILES: 8

7 PLACE TILES
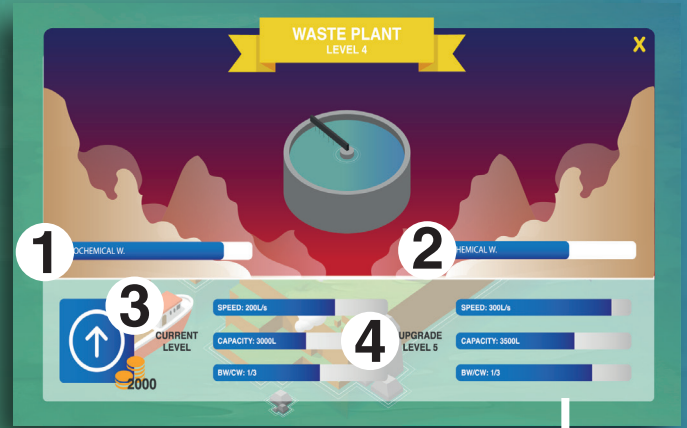
STORYBOARD
THE FARM

Here you see the storyboard dedicated to the settings, play and leaderboard button and where they redirect you to.

Fig 7.3

The Market

When you click on the market icon you get the first screen **(1)** with your available storage. When you swipe to the right once you can see another screen where you can buy or sell your food. There are four buttons **(2)**, each one corresponds to one kind of food, from the left to the right: grains, fish, vegetables and meat. To buy you only have to select the quantity of food you want with the plus and minus symbols and click on "BUY" **(3)**, then you will be redirected to another screen where you could see the offers of other players **(4)**. Selling is the same as buying but you have to click on "SELL" instead of "BUY".

Swiping again you find the upgrade button where you can see your current and next level. If you want to level up your market you have to press the upgrade button **(5)**.

STORYBOARD
THE MARKET

In the market you can buy and sell food, check your current storage and upgrade it. Food can also be bought from and sold to other players.

To switch between the screens you see on the right, you will have to swipe to the left or the right. The first screen you will see is the upgrade screen. To go to the others you need to swipe right.

MARKET LEVEL 4

CURRENT LEVEL — SPEED: 1 h 40 min — **5** — UPGRADE LEVEL 5 — SPEED: 1 h 35 min

MARKET LEVEL 4

4 — 100 🌾 150 | 100 🌾 180 | 100 🌾 185 | 100 🌾 200 | 100 🌾 210 | 100 🌾 215

MARKET LEVEL 4

2 🌾 +0 − | 🐟 +0 − | 🥬 +0 − | 🥩 +0 − | BUY **3** / SELL

MARKET LEVEL 4

1 — 20 🌾 | 30 🥬 | 65 🐟 | 45 🥚

Fig 7.4

The Restaurant

On the top part of the restaurant screen you will be able to see which dishes you are able to make in order to sell them to the MAS. Here it shows the ingredients for every dish and the amount of each ingredient needed. The prepared dishes will be sent to your faction, to give them points to make them win.

On the left side of the screen you find the daily challenges **(1)**. These dishes are the ones that the MAS needs the most that day, and you will get extra points for preparing them.
On the right side you have other dishes **(2)** that you are also able to prepare, but this will just give you the normal amount of points.

By clicking on the prepare button **(3)** that is right next to the dish you will make that dish, and it will go directly to the MAS, giving you the amount of money showed on it.

On the bottom part we find the upgrade button **(4)**, allows you to upgrade the level of the restaurant by clicking on it, as long as you have the amount of money and XP needed. On the bars on the side you can see the amount of time that it takes to prepare a dish in your current level and how much time it will take in the next level.

The Harbour

When you click on the boat you get the harbour screen. Here you find the "Go fishing" button **(5)**, which allows you to send your ship away to fish so it can come back with some fresh fish.

Afterwards you find some bars **(6)**. The bars on the left show you the speed and the capacity of your boat on the current level. The bars on the right show you the same information but for the next level.

To upgrade your harbour you have the upgrade button **(7)**, which again shows you how much you need to pay for the upgrade, and by clicking on it you get the upgrade for your harbour.

STORYBOARD
RESTAURANT

At the restaurant you can use the different ingredients so that you can make the dishes your faction needs. You will only need to click on the dish you want.
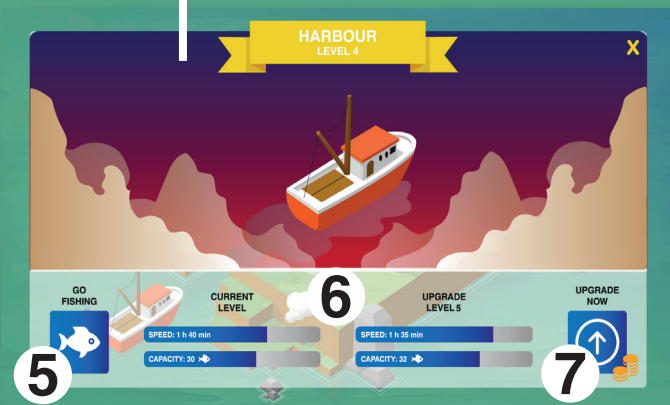
STORYBOARD
HARBOUR

Whenever you go fishing, you will get XP points. You can sell your fish at the market in order to gain money or you can use them to make dishes for your restaurant.

Fig 7.5

The Barracks

When you reach player level five, you unlock the barracks. Here you will be able to attack other players and train your attack or defense characters. When you press the barracks building on the virtual playing field you will get access to all the different information screens.

(1) After pressing the barracks building, you will be sent to the upgrade screen of the barracks. Here you can see the current status of your barracks, the upgrade button and see how it would change after it the upgrade. Pressing 'X' will take you back to the virtual island. Swiping will bring you to number two **(2)**.

(2) Here you can choose between going to the attack characters, defence characters and targeting your enemies.

(3) Pressing the sword on the second screen will take you to the different attack characters. Here you can choose between the different characters, and by pressing it you will get a detailed overview.

(4) Here you can see all the information needed for the different characters. You can also buy and upgrade them here.

STORYBOARD
BARRACK

At the market you can buy and sell food, check your current storage availability and upgrade it. Food can also be boughtfrom and sold to other players from your faction.

EVIL BUNNY
LEVEL 1

CHEMICAL W. NEEDED: 5
TIME NEEDED: 18 min
DEFENSE: 20
ATTACK: 80

BUY
40+5c.w.

4

BARRACKS
LEVEL 1

CURRENT LEVEL
AMOUNT OF TROOPS: 129
SPEED: 20min

UPGRADE LEVEL 5
AMOUNT OF TROOPS: 159
SPEED: 15min

1

BARRACKS
LEVEL 1

Press the character to get more information

Attack characters, can be used to attack other players and boycot their production. By pressing one of the characters you get more information about their abilities and the amount of money and time needed to train them and let them win your battles.

3

BARRACKS
LEVEL 1

ATTACK CHARACTERS
DEFENSE CHARACTERS
TARGET YOUR ENEMIES

2

swipe between them

Fig 7.6

The defence characters follow the same principle.
Because of the time limit we were not able to finish the "target your enemy" screen.

7.2. Questions about the exhibition

As we already said, our game consists out of two parts and the first one is a tutorial of the game where you have to solve some questions about the exhibition. This way we get the youngsters to pay attention to the exhibition and also we guide them throughout it.

To make these questions Esra prepared a vast document by looking up the information that we had about the exhibition, because it was not ready yet. The opening of "Antwerpen à la carte" on the 14th May allowed us to select the best ones and to make some new.

After this we asked the people of the MAS for their thoughts about the questions and then, we brought some youngsters to the MAS to check if they were good or not. We had to change some questions because some of them were too difficult but the principal feeling about the test was pretty good.

In the demo application, we only implemented one question per cluster but any of them need a QR code because this was very difficult for our programmer.

Below you can find the final questions and the screens with two of the implemented ones (harbour and waste plant).

Final questions

Cluster one: into the city

Question 1:

From where were bananas imported to Antwerp?

a)   Congo

b)   Malaysia

c)   Brazil

d)   Australia

Question 2:

Which animal was used to carry the milk carts in the past?

A dog or dogs.

Question 3:

What was ship number 4 used for in the past?

a)   Getting bananas from overseas

b)   Transporting coffee from Brasil

c)   Transporting barrels of herring

d)   Carrying people overseas

Question 4:

Which two products have been imported from the same countries since 1550?

Oranges (from Spain) and cane sugar (from Brasil).

Question 5:

Where do the ingredients of Elixir d'Anvers come from?

a)   Spain, America and Indonesia

b)   Belgium, Brasil and Australia

c)   Brasil, Spain and Russia

d)   Australia, Russia and Indonesia

Question 6:

What is the old name of Antwerp? (Find this in the paintings!)

Antverpia.

Question 7:

Find the incinerated pellets of grains from the hanzehuis (number 4, grains part cluster one).

This is an example of a question that will need a QR code implementation. We selected this one because it is possible to hide the QR code due to the fact that you have to open the drawer where the pellets are.

Cluster two: At the market

Question 1:

In the 1550s, where was the only market where you could buy fish?

Vismarkt

Question 2:

Find the brown Volkswagen (cow) in the exhibition!

(number 2,tableau b)

This one will probably also need a QR code implementation.

Question 3:

There is a little boy at the cattle market. What is he doing?

Milking a cow

Question 4:

How much water do you need to produce one beer? Hint: Look for the orange juice!

a)   75L

b)   60L

c)   45L

d)   30L

Question 5:

What do Polish people generally eat at Christmas?

Fish (carp).

Question 5:

Why is the man in picture number 23 blowing the horn?

To announce that the bread is ready.

Cluster three: Dinner time

Question 1:

How much does OXO cost at Wah Kel's restaurant?

1,50 frank.

Question 2:

Who is the owner of the El Warda restaurant?

Fátima.

Question 3:

Cuperus is a coffee and tea bar that you can visit there even today. When was it founded?

1823.

Question 4:

What is this used for?

a)   Hanging pots

b)   Burning the stove

c)   Cutting meat

d)   Sweeping

Question 5:

When did the port of Antwerp become the second largest in Europe?

1950.

Cluster four: Out of the city.

Question 1:

Where could you find the Royal Water Toilet in Antwerp?

a)   Groenplaats 12

b)   Keizerstraat 60

c)   De Keyserlei 36

d)   Meir 50

Question 2:

What is the difference in total food production person/year between Europe/North America and Sub-saharian Africa/South Asia and Southeast Asia? (In kilogram)

900-460=440 kg.

Question 3:

In which painting there is a man who is defecating?

a)   Summer and winter landscape by Abel Grimmer

b)   City and countryside pictured as one by Jean Baptiste Bonnecroy

c)   Winter in the Kempen area by Florent Crabeels

d)   View over Olinda, Brazil by Haarlem

Questions 4:

Between the years 1832 and 1892 Antwerp was hit five times by a cholera epidemic. Each epidemic caused hundreds of deaths. No efficient cure was found for this disease affecting the bowels. There's a saint in the exhibition who was worshipped by people during these epidemic times. He is...

a)   Saint Valentine

b)   Saint Sebastian

c)   Saint Patrick

d)   Saint Rochus

Questions at the game

Fig. 7.7.

WELCOME TO THE CLUSTER

· **Presentation of the character**
· **Little and funny explanation about the theme of the cluster**

CLUSTER 1

CAPTAIN MORGAN
Ahoy! I just arrived with a bunch of fish. Help me with the load out, will ya!!

CLUSTER 1

From where were bananas imported to Antwerp?

Congo

Malaysia

Australia

Brazil

CONGRATULATIONS

You have unlocked the harbor.
Now you are able to go fishing.

YOU MADE IT!

· **You answered the questions correctly**
· **Now you have the boat and you can go fishing**

Fig. 7.8.

CAPTAIN JACQUES

He will help you at the harbour and give you the needed information at any moment.

MARKET LADY

This is Maria, she will help you at the market and give you the needed information at any moment.

CHEF ATO

This is Tom, he is in charge of the restaurant and help you out whenever you need it.

SHITTY JOE

This is Joe, he works at the waste plant. If there is something you should know, he's the one that will tell you.

FARMER

This is Franky, he takes care of the crops, the animals and the farm.

Fig 7.9

CHARACTERS
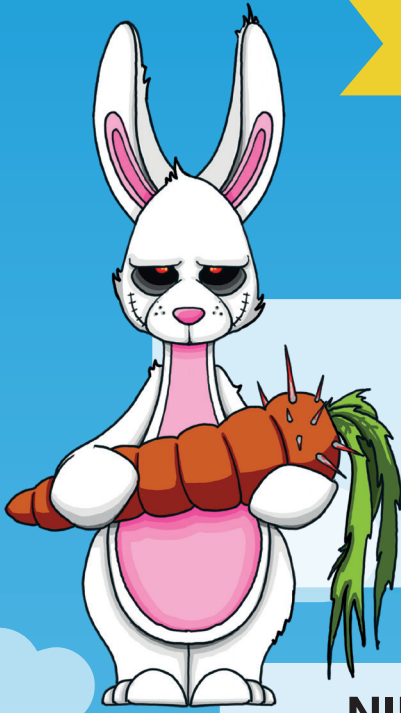
EVIL BUNNY

The evil bunny is the manifestation of pure evil. Born as a normal cute bunny but mutated to a monster that is always ready to kick some ass!

NINJA PIG

Trained by mystical dragons in the Far East, these ninja pigs are perfect for secret assassinations. These pigs can be trained to a high level of Wushu and Kung Fu.
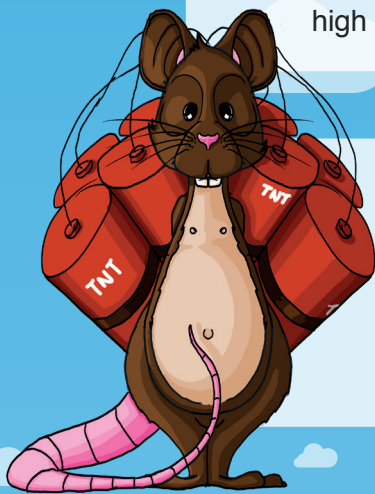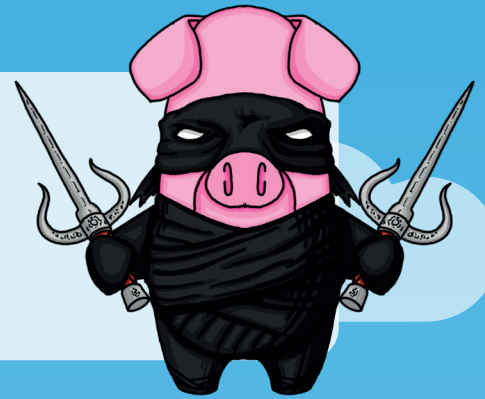
KAMIKAZEE RATS

Always strapped and ready to go. These little fellows take out your enemies facilities in no time.
Favourite bomb: good, old fashioned TNT.

NUCLEAR SNAIL

This little snail fell in a jar of chemical waste and mutated to a powerful detonator, ready to nuke any town/building on your command.
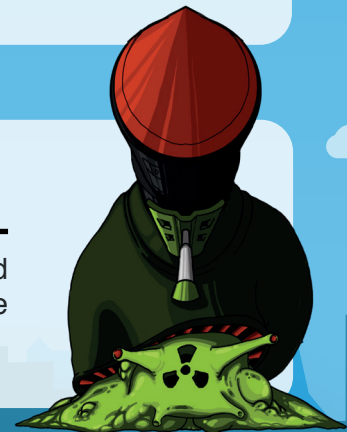
THE ATTACK CHARACTERS CAN BE FOUND IN THE BARRACKS

Fig 7.10

Loading Screen

Here you can see the loading screen that will appear if the game is loading. It consists out of the logo and the city and water in the background.

App's icon

This is the icon that will appear on your phone. The image refers to the start page of the game. You can see the MAS and its island with the city of Antwerp in the background. For android users the logo will have sharp corners while on IOS they have rounded corners.

7.4. Programming the game

Project

As previously mentioned we made a concept/demo game for the MAS museum. This game is a location based activation game. In the following text you will read which technologies where used and how it was programmed.

Features

The game consists out of two parts. The first part is the tutorial. This part is fully functional and could be implemented if the people of the MAS should desire so. In this part you can solve a few questions to unlock different parts. All of the Questions at the moment are multiple choice. This was a deliberate choice because of the limited amount of time and resources.

After you completed the questions/tutorial you will be able to play the game anywhere you want. This part of the game is unfortunately not finished. The basics are already there, but there was no time to create an entire back end system for the game. This system would take care of all the players statistics, the disasters and other events that were planned in our virtual world.

Technologies used

For programming the game we used the C# programming language. This was chosen because our programmer is familiar with the language. We also chose it for its cross platform capabilities when it is combined with Xamarin. Xamarin is a program that is used to develop cross platform applications.

For the programming itself we used a few frameworks. The most important framework we used is the monogame framework with XNA. This framework gives us the ability to draw the game on a virtual canvas. There were different frameworks that we could have used like CocsSharp or UrhoSharp. We decided not to use the CocsSharp/UrhoSharp

framework because it is pretty new and there is not that much support/documentation for it.

For the working parts of the game like upgrading a building or buying a unit at the barracks we did not use a special framework. What we did, however, is create a separate class for every building or action in the game. This is usually done in programming for the reliability of the programme or, in our case, the game.

The programming

When the time came to start programming it was actually a bit hard. The reason for this was that there was no graphical art that could be programmed so we could not implement any logic or other clickables in the game. We needed to start the programming because we only have one programmer. He solved this making a skeleton application.

This application is the basis of the game. In this app he put the different menus and he could start by implementing and learning how to use the frameworks and the xamarin programme. After the skeleton was finished he started to program the game logic. He did this with the help of Microsoft visual studios. In this programme he made an WPF form. This is a windows program where you can put buttons and programme some logic behind it. In this WPF form he created the entire game logic so that he only needed to copy it when all the graphical art was finished.

As mentioned the game is written in C# and we used monogames with XNA and a lot of costume created classes. If you would like to know more about the programming itself or if you would like the source code of the game for yourself you can get all the files from our GitHub.: https://github.com/thomasvanhavere/MASTopia

What works

Like previously said the game is operational. In theory you could go to the MAS and play the game. Not all the questions are in the game but you can still solve the ones that are already in there. After solving the questions of a cluster you get the building of the cluster. Afterward you can keep playing and upgrade your buildings, farm, buy troops and craft some dishes at the restaurant.

STARTSCREEN :

Play button: Brings you to the general play screen/island.

Settings button: Here you can click the buttons. They will change but nothing will happen in the game.

Faction button: Here you can see some information about the factions. However there is no leaderboard available yet.

The Island: The island is fully functional. Altough, the experience and money should be taken from a back end service instead of being stored locally.

The faction flag: You will get the same menu then when you click on the faction button.

The barracks: Here you can buy the troops and upgrade your barracks. Not all the troops are done. You should also be able to attack but since we don't have a back end service we could not implement that.

The boat/harbour: You can upgrade the harbour and see how much fish you get per hour. The manual fishing mode is not working at the time of writing this report.

The Market: On the first screen you can see how much resources you have. On the second screen you can buy some resources. This is partially functional. You can buy and sell some resources against some hardcoded variables. On the third screen you can upgrade the market for more storage.

The restaurant: Here you can make some recipes if you have enough resources. You can also upgrade. This has an impact on how fast the food is made.

The farm: You can upgrade the farm, but you can not place the tiles yet.

The wast plant You can see all the statistics about the waste and you can upgrade your waste plant.

Profile button When you click this you see the amount of resources you have. The faction and troops are not implemented yet.

Menu button Here you can go back to the main menu or go to settings menu.

The future

In the future we could do some unit testing on the game. This is a method which will test individual units of the source code. It will set one or more variables to check if the game could sustain itself when it is used by many people or for a long time.

We could also deploy our application to the Xamarin cloud testing unit. This is a cloud based service from Xamarin which will virtually play the game using unit testing. With this we could check if there are some problems with different versions of IOS or android or if some devices cannot handle the game.

08 Conclusion

8.1. General Conclusion

After the midterm report we had to start working hard on the development of the game, due to the fact that we only had the concept. For this reason, we divided our tasks in three groups: graphic design (Cedric, Cristina and Carla), programming (Thomas) and the questionnaire (Esra).

Mastropolis is a mix between a location based and a simulation game. This means that you have to go the MAS to unlock the game. This will be done by going through the exhibition and answering questions so the visitor will have to pay attention.

The Mastropolis game can have a good influence on the behaviour of youngsters that visit the exhibition. Through the use of mobile applications, the museum can make visitors look more into detail at certain pieces and let them find surprising facts that they otherwise wouldn't have noticed. The use of a game gives them a goal to achieve. For a lot of youngsters, going to a museum is an obligation and not something they will do on their own. This game could change their behaviour and the way they look at museums in general.

The graphic style used in the game is simple but attractive and popular amongst the group age we are aiming for. By using this style, animations can be made faster and easier.

The target group that we were given is not an easy one, but we think that with our concept we can reach them and get them to come to the Museum Aan de Stroom. But at the same time it is a game that can be played by all ages, it will be accessible for all the people who has a smartphone.

As a conclusion, we think we have successfully finished our project and that we can be satisfied with our final result. We also enjoyed our time and got to make new friends on the way.

8.2. Individual Reflections

Carla Büchsenschütz

When I found out about the EPS project I thought that it would be a nice way to finish my studies. I liked the idea of working in group on a project with people from different nationalities and backgrounds. To me it sounded much more interesting than working on my final project by myself back home. For the program itself I did not really have any expectations though.

To work in a group, it is important to get along well with your team members. In order to do this, we first tried to get to know each other. Sometimes we went after meetings out for some drinks and did different activities as a group, like day trips. To contribute to the teambuilding, I participated in all the activities that were done and try to come up with plans. This made us come closer, and we could say that now were are not only team members, but friends.

To make the project a success we worked all together as a team. At the beginning we had some difficulties with one member, but they were quickly solved. From that moment on we were able to work efficiently and in a more comfortable atmosphere.

First we worked on developing the concept, where all of us were free to share their ideas, and every idea was welcomed. Here for me it was a bit hard at first, because I'm sometimes scared to share my ideas. This is worst if it is people I don't really know, which was the case at the beginning. But the work atmosphere in the group is great, and everyone supports and encourages each other to participate, so that problem went quickly away.

At the beginning we did not have that much time, because we also had a lot of lessons. In my opinion some of the courses were helpful, like project management, which helped us organize ourselves and get a first overview of all the tasks that we were going to have to do during the semester. But I think others were not that useful, at least not for our project. One good thing about having lessons was that all the groups came

together and we got the chance to get to know the other components of the different EPS groups and about their projects.

After we had the concept for the game we divided up the work considering everyone's strengths. In my case, since my background is industrial design, I got into developing the graphics with Cedric and Cristina. We were responsible for creating all the graphic work for the game. Here we first talked about what we have to do and then once we knew all the screens we had to make we divided the work among us three.

During the whole process of developing the game, when we could not really decide on something, like which design was better or more suitable for the game, or we had to make important decisions, we made them by letting everyone share their views and opinions. We discussed what the best option was and made the decision together. Sometimes if this did not work, we moved on to voting, but always respecting the other members.

Regarding the program, I think it gives you a first impression of what working life can be like. Here you have to work in a group with people from different backgrounds. This also happens in most companies and that is why I think this program helps you grow a bit in a professional way.
We are also developing a real life project, which if it is well done could be used by the MAS museum. I think this also gives you an extra kick to do your job better.

Something that I really like about this program is also the international aspect. I like the fact that is not only for Erasmus people, but that you also get to work with local people, which can also show you about the city and country. I have been away before and I think that going abroad gives you a new view of things and makes you grow in a personal aspect, making you more independent and stronger.

In my opinion we have been working very well as a group. Not only that we get along very well but we also get the work done on time and with good results. I think we can be very satisfied with our results for this project. I'm very happy that I chose this program, not only I got to know great people but I also got to learn a lot from them.

Cedric Lodewijkcs

I used the knowledge I gathered during my studies of product development to start the project of in the right direction. At my university, we learned the different stages every project needs to go through and applied these to our project.

Also the knowledge I gathered during the lessons of usability, ergonomics, psychology and Adobe products really helped to bring this project to a good end. From my point of view my team members and I, really made a good and elegant conceptual game for the MAS museum. Which, we all hope, will be implemented in the exhibition.

I functioned as the team leader of the group. For me it was very important that everybody shared his vision about the project, because everybody has some kind of knowledge that the others haven't. So, it's important that everybody had influence on the decisions that were made. That's why we choose for a democratic approach.

Carla, Cristina and I took the graphical part on our shoulders. Under graphics we understand everything that's related to design. The final/midterm report in InDesign and the graphic design of the game in Illustrator. I'm talking about the characters, the questions, the island, the flags, the buildings and so on. Next to that we tried to research all our work and took a look if they had positive outcomes.

When talking about my communication role in our project, I tried to keep everybody motivated while working and after work. Next to that I think it was really important to get to know each other better and invited all the team members to different parties, pubs and different cities through out Belgium. This made our bond stronger which reflected itself to our group work. Sometimes a little too much what made me call the group back to order and focus on the project. My team members asked me a lot what they needed to do, so I think I also divided a lot of work between them.

For the final report I worked on the explanation of the game concept in both a graphical and textual manner. I made sure that all the storyboards, of all the different screens, were clear and understandable.

As for my reflection on the project work we have done, I think we did a good job. We did what we had to do in an efficient way. Maybe we sometimes had to work a little further on the project instead of the team spirit but in general, we got a good result. I think I can say I will never forget these couple of months and I made some good friends as well.

I noticed that as a product developer it's easier to get a quick inside view on different kinds of working fields, because of the multidisciplinary education program. I also noticed that students of product development have a better view on how we actually need to start a project. We see which methods can help us at the different stages of the project development. However, I noticed that our college program focusses to little on programming software and applications. It would mean a real upgrade for our training because this is something that's going to be very important in the future.

Due to this project and due to Thomas, I noticed the increasing of interest in the development of apps and games. Now I am doubting to focus more on these kinds of project in my future studies.

After the Midterm report we got a lot of positive feedback. Especially about our presentation and concept. I tried to improve the different mistakes I made in English speaking as well as writing. Next to that, I wanted to make the final presentation way better than the midterm report so I watched a lot of tutorials online on how to give presentations and analysed the great giants as Steve Jobs.

On a personal level, my future plans changed a lot. Now I really want to get in the APP design industry but in relation to products like designing home automation applications or games.

My goal for next year is to master Adobe After effects so I can make good animations which can be used to make games. Next to that I really want to learn how to program. As far as group works go, I would like to become a better leader because I would really like to start my own business in the future.

Cristina López Martín

When I chose to do the EPS project I had no expectations, I wanted to do my final project abroad and doing it in group sounded very good to me. Now I am really pleased with my decision, I think that the way my group has worked during all this months has been very satisfying, as well as our final result.

Working in a group can be very difficult, especially when you don't know anyone of your team. I am not the most outgoing or talkative person but I think teambuilding is an important part to make a project a success. You have to know your peers and have a relaxed environment while working, particularly when your project involves as much creativity as this. Because of that I tried to socialize with my group members as much as I could, for example not saying no to hang out together after the meetings or by proposing trips to other cities. From my point of view I have achieved my purpose, most of the team we are now good friends and can complement each other while doing our tasks.

At first we used to meet every day of the week, we needed a concept for our game and we had a lot of tasks from the different lessons of the university. Actually, I think that we had too many classes and many of them were useless for our project or too early in the schedule. For example, the "crossmedia communication" lesson was a way too early for our project, because we had no idea of what we were going to do and coming up with a logo without knowing anything of your product is pretty difficult and also worthless, due to the fact you will probably change it later. But until the midterm report we did a lot of brainstorming sessions until we had our final concept and the entire group needed to be present to talk about the different ideas.

Then, after the midterm report our way of working changed a bit. We also used to meet at least twice a week and always on Mondays with our supervisor Hiram, but we had divided our tasks and everyone had something to do, so our meetings were mostly to check the progress and talk about the problems we could have. For example, Cedric, Carla and I worked on the graphics, so the first day we talked about the different screens and what they had to have and we divided them equally. Also, when we did not know what to do we always could ask the others for help, for instance, we had several

problems to decide how to do the start screen of the app so everyone came up with ideas and finally we made our choice.

Our game has two parts, one is the tutorial of the game which guides you throughout the exhibition and the other is the game itself. For the first one we needed some questions related to the exhibition but it was not open until the 14th May so Esra made some, but until the opening we could not check them properly so we had to change them later. With this example I wanted to say that developing an app without seeing the involved product can be very challenging but it also makes you to expand your mind and to be more creative.

The different backgrounds of the members of the group has also been very good, although we are three product developers we sometimes have different forms of working and we have to complement between us. We have learned a lot of things from each other and from the project. Now we know the developing process of an app and the importance of the design. Thomas is the programmer and sometimes he had problems with the alignment of the buttons because we, the designers, did not make a perfect design.

In conclusion, I am really happy to have had this opportunity. By my point of view this has made me to improve many things, such as teamwork skills or my English, and also to get to know different and amazing people from whom I learned a lot of things. I also think I have been very lucky with my group, due to the fact we could organise ourselves in a very good way achieving great final results.

Esra Sen

First of all, I would like to mention about my background and then why I have preferred this project. I am Esra Sen from Turkey and I study English Language Teaching at Dokuz Eylül University. MAS project was my first choice because I thought it was the most enchanting, appropriate and beneficial one for my field of study in comparison to other projects in the EPS programme.

What was your specialist contribution to the project work?

In this project, I was responsible for all the linguistic parts of the project, because I study English Language Teaching. For this reason, I checked grammatical and vocabulary mistakes, spelling and sentence constructions. Furthermore, I tried to write more formal and professional reports and assignments for my team. My second responsibility was to create activities and write questions in order to link our game to the exhibition. Therefore, I researched for paintings, objects, statues, texts and photos that are present in the exhibition now. Afterwards, I wrote nearly seventy-seven questions in order to achieve our goals. In this stage, Cathy Pelgrims, who is our team coordinator in the MAS, helped me a lot. She gave me information about them and also she showed them to me. Another point I was responsible for was to learn youngsters' interests and expectations regarding games and museums. I prepared a questionnaire so that I could get information about this subject and then two of my team members delivered this questionnaire to high school students and we analysed the results of the questionnaire.

What was your contribution to the project communication?

Arranging meetings with our supervisor, tutor, people from the Museum aan de Stroom and other people whom we needed to contact and sending e-mails to them was generally in the responsibility of Thomas, because he is good at communicating with people. As a group, we always met on Monday with our supervisor and sometimes with people from the Mas. We generally tried to meet every day in order to carry out our project successfully.

In addition to this, we also used some social platforms for both informal and formal communication.

For example, Facebook was mostly used for sharing some documents, pictures or asking questions to all team members and also to our supervisor.
Dropbox was being used to store all documents about our game, exhibition or useful things that were relevant to our game.
Whatsapp was mainly used to make appointments with the entire group, to ask questions or to discuss new ideas or tasks.

Pinterest was generally used for sharing graphical content, illustrations or pictures that could be useful for our project.

Trello was mainly used so that our tutors could give us feedback on the work that we did and for sharing documents with our tutors.

What is your opinion of the work process you have been through?

At the very beginning of EPS, I thought that it would be a very hard and intensive programme for me. Actually, I was a bit disappointed at the beginning, because we have had a lot of courses and assignments when we started the programme, so I was really exhausted in those days. Moreover, I thought it focused on very technical subjects, which meant that I had to work hard to follow the programme. In addition, it seemed that it was not really related with my study field and I did not know what I was going to do very well and how to contribute to this project. Afterwards, I realised that it was about attracting youngsters and I could use my experience and teaching knowledge to contribute to the work for this project. In addition, when we learned both our individual and team capacities and started to know each other very well, everything started to continue flawlessly.

In my opinion, we became a really good and qualified team, because everyone's attitudes and beliefs were taken into account and we were respectful to each other's opinions and values since the beginning of the project. We also solved some problems or decided on new things and concepts about our project by discussing, voting and brainstorming. In my mind, these are the things that make a team unique and successful.

What did I learn about my specialization?

Actually, I am a bit upset about this matter, because I could not give my experience and all my knowledge that comes from my background to my team members as much as they did. They know everything about project and developing a game more than me. However, I tried to do everything so as to help them as much as possible. I did my best in order to get positive results from our game. Learning youngsters' interests, linking our game to the exhibition, checking grammar, vocabulary mistakes and writing a formal report can be regarded as my specialized contributions. Also, I developed my speaking

by communicating with students from different countries, my writing and listening skills by doing assignments. Thanks to the EPS, I came out of my shell, because this is vital to be a teacher. In addition to this, I loved working in groups and sharing ideas with other people. In summary, I learned a lot of essential things about project work and teambuilding which are for sure very important skills in professional life. This project has been a pretty great experience for me.

What is your opinion of the achieved project results?

We, as the Masplay group, reached the goals that were decided in the beginning, because we have a very good and feasible game concept and we developed a demo and also found a name for our game. In addition, every person fulfilled her/his responsibilities perfectly. We did our best!

Which actions did you take to improve after the midterm presentation?

After the midterm presentation, we had already had a main game concept, so we tried to improve this and started to develop our game. We worked so hard in order to finalize our concept. To be able to finish it on time, we shared the responsibilities and tried to meet every day. I was going to link our game to the exhibition; hence, I started to read texts about the paintings, statues, pictures and so on. Then, I wrote questions and actions about them.

How did you contribute socially to the performance of the teambuilding?

I was both the implementer and the team-worker of our group. I have a good working discipline, so I really worked hard in order to do some important things on time and I was always willing to fulfill my responsibilities that were necessary for our project. Sometimes I was not very creative and active in brainstorming session but I always did my best. I generally preferred working on my own in silent places, because I work more effectively and concentrate much better when I am alone. However, I was always present in all important meetings and discussions. In addition to this, in order to improve teambuilding in meetings, I tried to be present and share my ideas as much as I could.

What are your intended points of improvement on a team and personal level?

My intended points of improvement on a team level are

- Fulfilling responsibilities
- Being part of a group effectively
- Working collaboratively

My intended points of improvement on a personal level are

- Being creative
- Being open-minded
- Coming out of my shell
- Developing my analytical thinking and problem solving skills

Thomas Van Havere

I am Thomas Van Havere, 22 years old and the past semester I worked together with a team of international students to make a game for the MAS(Museum Aan de Stroom) museum. In this report you will read all my though on the evolution of the team and the project from the last semester. I will discuss how the project evolved, what my contributions where, the thought on my team members and how we worked harmoniously together.

For the MAS project we needed to make a game. We decided after some brainstorming that I would be a mobile game. This mobile game would be programmed by me, Graphics would be done by our designers.

Before I could start to program I needed the graphical content for the game. Therefor I needed to wait a bit. But from the moment the first parts where done I explained to my team members how they needed to export there graphics so I could use them easily and could start working on the programming.

Of course when you are working in a team with people from different backgrounds you will sometime have some arguments. In our group we always solved this by democratic vote. For example at the end of our project we wanted a Icon for the game. Because

our designer team didn't agree on one design we chose one democratically. We also had our supervisors. They gave us weekly feedback and helpt us with the brainstorm and anywhere they could.

One of the things I learned when working in our group is that people with different backgrounds don't always know what is possible in the other ones field of study. There where manny occasions that the designers asked to put something in the game that was not impossible but not feasible in the time we had. It also happend vice versa. They sometimes thought it was impossible but in fact it was fairly easy.

When writing the final report I was still very busy with making the working demo of the game. However I took the time to write a part on how our game was developed and which technologies i used. Eventually the demo game was finished and it is currently running as a alpha test on all of our team members smartphones. So I think it is safe to say that our team worked long and hard to get where we are now. If you look at the midterm report you will see that we promised a working demo game. But in manny aspects we have exceeded what we had predicted in the midterm report.

Over the course of our project we had a lot of meetings. From the beginning up until the end we would meet almost every day. Of course our meetings weren the only time we met. We had a few receptions at the MAS museum that we would attend and represent the MASPlay team. On the last reception that we went to, the opening of "Antwerp a la carte" we met Carolyn Steel. She is the author of the book where the exhibition and our game is based on. We had a lengthy conversation with here about our project and the exhibition. Of course the events at the MAS weren't the only things we did as a group. We also did some traveling and visited some local bars.

During the EPS course I learned how to communicate better with people that I don't really know. I also became a more social person and learned how to communicate with people with a higher function. I also got a impression of how it would be in a real working environment. For the future I would like te keep improving my social skills. I think the eps course has given me a good start and set me on the right path to become a more cultural person. As for our team it was a great semester with great team members. If you look at the beginning you can see that it was a bit awkward but this rapidly changed and after a few week we became a great team and even greater friends.

8.3. Acknowledgments

For creating this project we've had some help. Hereby we would like to thank the people that helped us getting this far. We would like to thank "Lien Conard", "Leen Beyers" and Cathy Pelgrims" for giving us the necessary information, workspace and support to work on our project. We also like to thank "Tom Peeters" for his support and his technical assistance and "Hiram Bollaert" for his support and his ideas. For helping us with our questionnaire given to the youngsters, we would like to thank Vice principal "Dirk Boschmans", teachers and students from DonBosco Hoboken technical institute. We also want to give our thanks to all the teachers from the EPS programme for giving us the opportunity and the necessary teachings to get the project to a successful end.

Thank you all, the MASPLAY Team.

09

Appendix

APPENDIX A
Contact information

Carrying out the project

- **Carla Büchsenschütz Cardoso** – Product development (including control and research) and graphic work.

  Industrial Design Engineering and Product Development

  Universidad Politécnica de Valencia

  Tel: 0483490936

  Email: carla.bc94@gmail.com

- **Cedric Lodewijckx** – Project leader (control over the process of development and research), communication to interested parties and graphic work.

  Product Development

  Universiteit Antwerpen

  Tel: 0476287457

  Email: cedriclodewijckx@msn.com

- **Critina López Martín** – Product development (including control and research) and graphic work.

  Industrial Design Engineering and Product Development

  Universidad de Valladolid

  Tel: 0488004474

  Email: criloma94@gmail.com

- **Esra en** – Linguistics (notes and documentation) and planning.

  English Language Teaching/ Education and Training

  Dokuz Eylül University

  Tel: 0483473654

  Email: 94esra@gmail.com

- **Thomas Van Havere** - Technical development (programming) and communication to interested parties.

    Student Electronica ICT

    AP - Hogeschool Campus Ellermanstraat

    Tel : 0476756661

    Email : vanhaverethomas@gmail.com

Supervisors and tutors

Director of the MAS

- **Marieke van Bommel**

    Email: marieke.vanbommel@stad.antwerpen.be

Education and Public:

- **Cathy Pelgrims** (teamcoordinator)

    tel + 32 3 338 44 80 | gsm + 32 485 61 67 21

    Email: cathy.pelgrims@stad.antwerpen.be

- **Liene Conard** (MAS in young hands)

    tel + 32 3 338 44 81

    Email: liene.conard@stad.antwerpen.be

- **Katrien Loret** (Production leader)

    Email: Katrien.loret@stad.antwerpen.be

Research

- **Leen Beyers** – curator of Antwerpen à la Carte and team coordinator

    Email: leen.beyers@stad.antwerpen.be

Marketing and Communication

- **Karen Vandenberghe** – Marketing and Communication, team coordinator
  Email: karen.vandenberghe@stad.antwerpen.be

AP tutors

- **Jan de Vries** (project management)
- **Hilde van Hinbeeck** (social work and project planning)
  Hilde.vanhimbeeck@ap.be
- **Tom Peeters** (web development and programming)
  tom.peeters@ap.be
- **Hiram Bollaert** (Maths and statistics)
  hiram.bollaert@ap.be

UA tutors

- **Ingrid Moons** (marketing)
  ingrid.moons@uantwerpen.be
- **Achiel Standaert** (Usability psycology)
  achiel.standaert@uantwerpen.be
- **Koenraad Keignaert** (sociology)
  koenraad.keignaert@uantwerpen.be
- **Alexxis Jacoby** (Methodology)
  alexis.jacoby@uantwerpen.be
- **Wim Maes** (Adobe products)
  wim.maes@uantwerpen.be

Collaborating with MAS

- Lava design – working on the graphical work

    Asterdwarsweg 5

    1031 HR Amsterdam

    the Netherlands

    +31 (0)20 6 222 640

- FELT architects – working on the scenography

    Forelstraat 55b

    B-9000 Ghent

    info@felt.works

- TEMPORA – working on the multimedia

    Rue de Suisse, 29

    1060 Bruxelles

    Belgique

    T +32 2 549 60 60

    info@tempora.be

- PANTOPICON -- works on the FUTURE cluster

    Cogels Osylei 36

    2600 Antwerp

    Belgium

    +32 3 2978708

APPENDIX B
MASplay branding

At the courses of cross media communication, we set a base for the branding style of our team. Here we made a logo and some graphical elements that represent our team and will be used in presentations.

MASPlay

As mentioned in the beginning of the midterm report, our team name is MASPlay which consists of the words MAS (museum aan de stroom) and Play (because we are making a game). Besides this, when you pronounce the name of the game, it has a undertone like 'must play'.

Logo (see picture 1)

For the logo we started by sketching a lot on paper and picked the best ones out. This is where we got the ideas of the triangles. The eventual logo exists out of three triangles, where the first two shape the M of the MAS and the last one represents a play button, like you can find on a PlayStation console for instance.

Colour pallet (see picture 2)

Our colour pallet had to be young and fresh because of our target group. That's why, we decided to use the following colours. The orange colours represent warmth, spontaneity, extrovertion and freedom. While the blue or green colours represent a sort of balance and clarity.

The green colours will be used in lower quantities. The head colour of our team will be the orange tones in combination with a gradient from yellow to orange.

Typography (see picture 3)

For the typographical elements we have chosen to use Helvetica, a sans-serif font that looks fresh. We specifically chose for a sans-serif because of the fact that serif fonts have a sort of 'old look and sense'.

MASPLAY

fig 8.1

C=0; M=37; Y=79; K=0

C=0; M=76; Y=65; K=0

C=25; M=100; Y=36; K=23

C=80; M=22; Y=44; K=5

fig 8.1

C=45; M=0; Y=49; K=0

fig 8.2

Helvetica regular

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890.,?;:/=+@

Helvetica Bold

**ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890.,?;:/=+@**

Helvetica Oblique

*ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890.,?;:/=+@*

fig 8.3

APPENDIX C

MAS PLAY

Pro's :)

- EDUCATIONAL
- GOOD RELATION WITH MAS + EXH
- EASY
- GO CRAZY AS HELL WITH ANIMATIONS + SOUNDS

- SOCIAL INTERACTION / COMMUNITY
- COMPETITIVE
- YOU NEED TO COME BACK
- CAN PLAY OUTSIDE MAS ASWELL
- FEEL RESPONSIBLE (TAMAGOUCHI)
- FOR EVERYBODY (AGE AND GENDER)
- CUSTOMIZEBAL

CONS :(

- TO SERIOUS?
- BORING?
- BIG SO, SUSTAINIBLE COMMONITY
- HAS TO STAY COMPATITIVE
- FACTIONS NEED TO STAY TO BE EQUAL
- REPETITIVE → ALWAYS THE SAME!?
  └ UPGRADES/BALANCE
- NO INTERACTION BETWEEN CLANS?

BRAINSTORM

"ANTWERP À LA CARTE"

Interactiever maken van de tentoonstelling

Voor jongeren (16-18)

WHICH GROCERIES? BUY MY NEIGHBOURS.

"DON'T BE AFRAID TO WRITE YOUR IDEA DOWN"

"ANTWERP À LA CARTE"

YOU MAKE YOUR OWN GAME

MINIGAME RECODE

SOCIAL MEDIA — ATTRACT YOUNGSTER TROUGH USE OF "COMMERCIAL"

(ONLINE OR OFFLINE) MULTIPLAYER

SNAPCHAT EFFECTS

DIGITAL CARD GAME

SIM/AVATAR

COMPATIBLE

2D OR 3D

TREASURE HUNT — QR-CODES

THE GAME NEEDS TO BE:
- FUNNY
- CATCHY
- ATTRACTIVE
- ADDICTIVE
- INSTRUCTIONAL
- CREATIVE
- EASY RULES
- COMPATIBLE
- MULTILANGUAGE?
- COMPETITIVE

APPENDIX D

Persona's

TOBIAS PAUWELS

AGE 17
OCUPPATION CHEMISTRY STUDENT
STATUS IN A RELATIONSHIP
LOCATION BERCHEM, ANTWERP

PERSONALITY

Extrovert — Introvert
Thinking — Feeling
Judging — Perceiving
Ambitious — Unmotivated
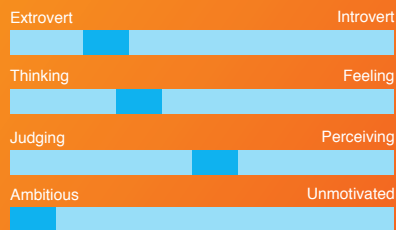
GOALS

Wants to get a nobel prize in chemistry
Wants to become a teacher

HOBBIES

Music, gaming (smartphones and playstation), trumpet and plays in a band

DISLIKES

Cats, fashion, taking the bus and he is allergic to nuts

LIFESTYLE

Enjoys science
Doesn't go to museums very often
A lot of friends
He has a hamster named Rufus
Only child
Has a younger girlfriend, Sarah, 15
Mother called Rita and father called Simon

KEVIN HANSEN

AGE 18
OCUPPATION POLITICAL SCIENCE STUDENT
STATUS SINGLE
LOCATION MORTSEL, ANTWERP

PERSONALITY

Extrovert — Introvert
Thinking — Feeling
Judging — Perceiving
Ambitious — Unmotivated
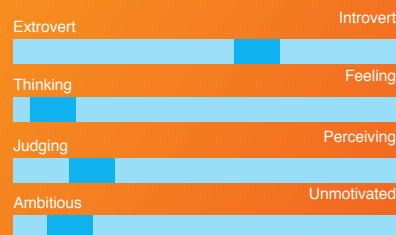
GOALS

Wants to become the president of Belgium
Wants to meet his favourite actor Eddie Murphy
Does not want to marry

HOBBIES

Camping, reading articles and newspapers, surfing on the Internet, walking alone

DISLIKES

Sunbathing, watching horror films, eating spaghetti

LIFESTYLE

Prefers to stay and study at his home generally
Drinks with his only friend Jordan at weekends
He has two dogs
His mother called Nora and father called Boris
He has three younger sisters called Celine(14), Chloe(10) and Claire(5).

ANNA DENIS

AGE 16
OCUPPATION PHOTOGRAPHY STUDENT
STATUS IN A RELATIONSHIP
LOCATION MORTSEL, ANTWERP

PERSONALITY

Extrovert   Introvert

Thinking   Feeling

Judging   Perceiving

Ambitious   Unmotivated
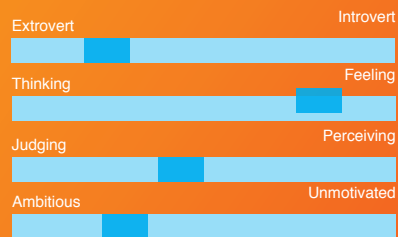
GOALS

Wants to go to Louvre Museum in Paris in order to see Mona Lisa's portrait
Wants to go to safari in Africa in order to take photos of wild animals

HOBBIES

Taking photos, fashion, painting and skating

DISLIKES

Driving a car, waking up early, sitting with talkative people in the same place

LIFESTYLE

Visiting art museums and galleries very often
Going to gym twice a week for yoga classes
Travelling to enjoy picturesque places to take photos
Has a older brother, George 25 who is a stage actor
Mother called Claudia, father called Timothy

Profile see
all of your
items

go to settings or
main screen

Market
buy and
sell food

Farm
plant and
produce
food

current amount
of XP

Waste
plant

current amount of
money

Food truck
make dishes to
earn money

Fishing boat
catch some fish

1200

11   235/300 XP

Barracks
boycot other players

Show informationn
related to your
faction
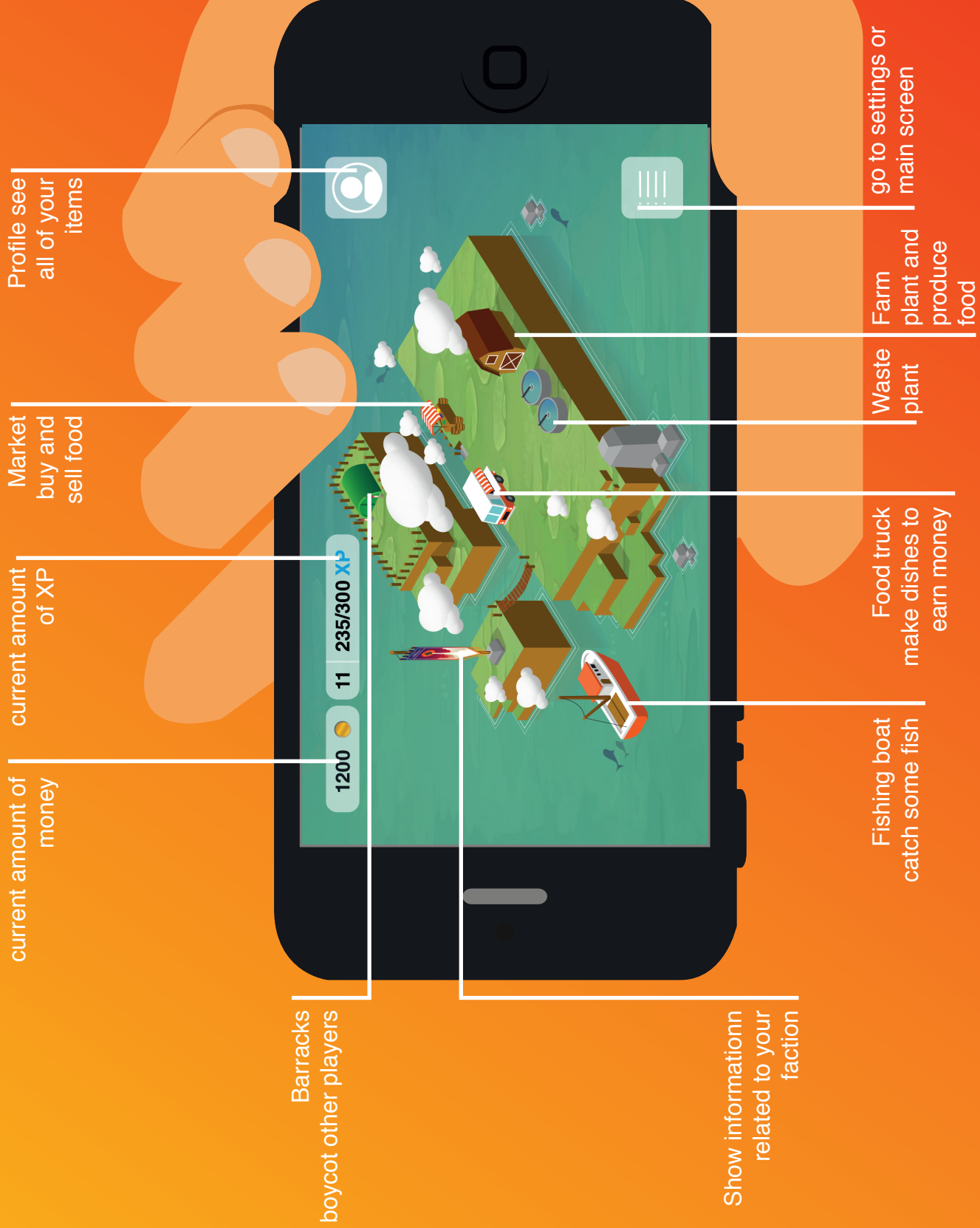
APPENDIX E

APPENDIX F

BEX Coins

At the beginning of the project we were told to give coins to the different teams. In exchange for these coins we could use a certain teammember of that group to help us with a certain aspect of our project.

Here for we gave six coins to the Energy Wizards because of the fact that we helped each other with the midterm presentations. Each team gave their presentation by using a projector while the other team would listen and give some remarks on where they needed to work on.

Next to this we wanted to give two more coins to the Sustainable Market, because some of them helped us with filling in the questionaire at the exhibition. We delivered our questions to them and then they went to the exhibition in order to answer our questions.

APPENDIX G

MASplay

WHAT	WHERE	WHY
Location based and simulation game	Museum Aan de Stroom Exhibition Antwerpen à la carte	To attract youngsters aged 16 to 18

THE EXHIBITION: How food shapes the city

At the market

Dinner time

1 Into the city

2

3

4 Out of the city

5 Where will our food come from in the future?
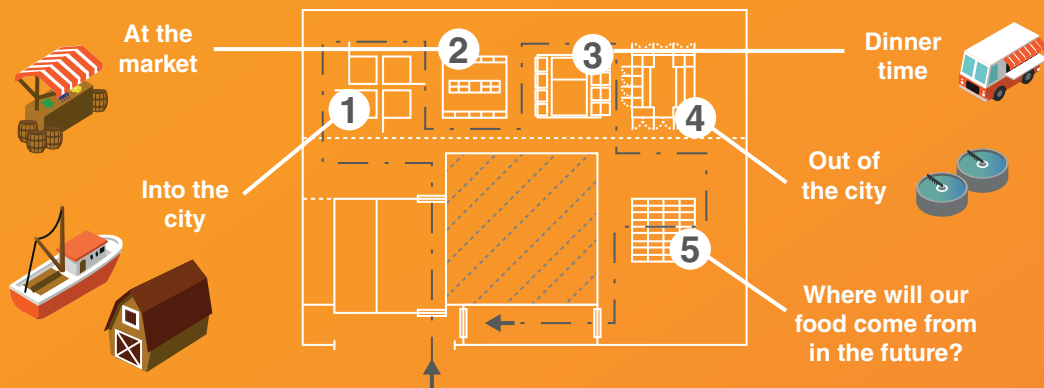
THE FINAL GAME

The game consists of two parts: first you have to unlock the game at the museum and learn how to play it, then you can play it at home.

UNLOCKING THE GAME

Guide the youngsters throughout the exhibition
- Solve questions about each cluster
- Each cluster unlocks one building

PLAYING AT HOME

Create a community to attract other youngsters to the MAS
- Keep the balance on your island
- Help your faction with food

Barracks
(extra feature)
Boycotting the
other players

Storage
Trading with
other players

Your
faction

Going
fishing

Planting
food

Keeping the balance
between biological
and chemical waste

Cooking
the food
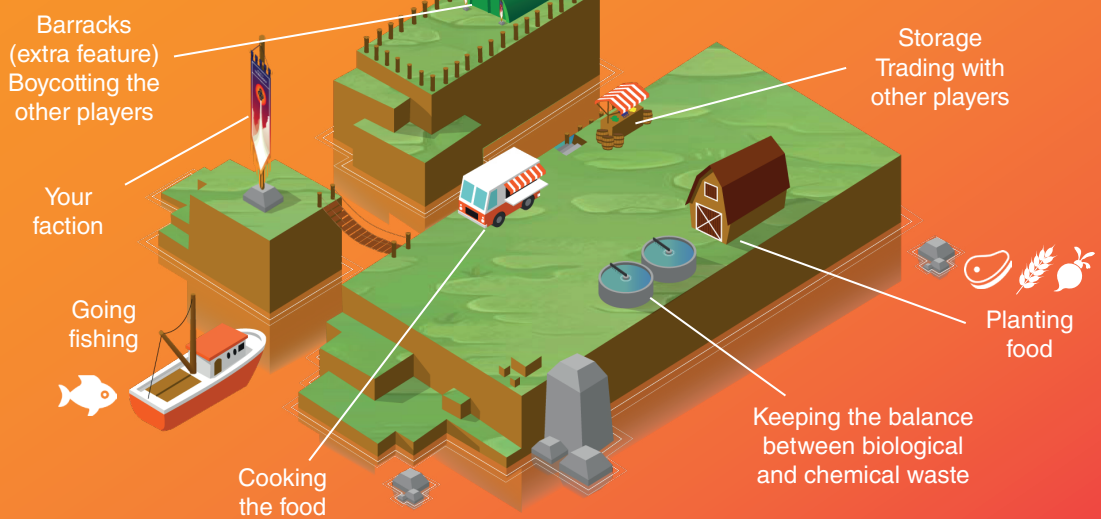
Carla Büchsenschütz Cardoso | Cedric Lodewijkx | Cristina López Martín | Esra Şen | Thomas Van Havere

APPENDIX H

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APPENDIX I

Images

2. Who are we?

3. Inspirational games and apps

4. Planning and schedule

5. Project planning

8. Appendix