
AIM - Space Challenge : Engagement and Awareness incorporated in an informative and playful Mobile Tycoon Game

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Introduction

Space missions have social, public and scientific purposes. However, it is sometimes too complex for the general public to understand them. Therefore, it is hard for the public to feel engaged to space missions since they are not exposed to them in their daily lives, even though the missions are really valuable for humanity.

The game "AIM - Space Challenge" was developed to create awareness and engagement of the proposed space mission Asteroid Impact Mission (AIM). This is a mobile tycoon game which gives an informative and playful experience of AIM and its research and development.

This project was originated as a collaboration between MediaLAB Amsterdam and the European Space Agency (ESA). There were five students involved in the project, all with creative and technical backgrounds. The main goal of the project consists of researching the topic and develop an interactive product based upon the research and user tests.

Problem statement

The general public find it hard to understand space missions. They don't stay engaged to them, since they are not involved in their daily lives, which results in forgetting about them.

Research question

"How to create awareness and engagement on European citizens between the age of 16 and 24 about ESA's space mission AIM, with a game as a playful and informative medium?"

Client description

The European Space Agency (ESA) is an intergovernmental organisation that deals with projects around space missions, human spaceflight, space research, space for earth, satellite systems and fostering the European economy. ESA was founded in 1975 and has 22 member states.

ESA works with other space agencies on a regular base. They maintain partnerships with NASA, JAXA (the Japanese Space Agency), ISRO (the Indian Space Agency) and the DLR (the German Space Agency).

ESA has five sites in Europe. The ESTEC (European Space & Technology Centre) is situated in Noordwijk (NL). The AIM team consists of a few Engineers and Project Manager Ian Carnelli. The contacts for this project are Communication

Manager Linda Carrette and Telecommunication Engineer Paolo Concari.

The overall project of this proposed space mission is called AIDA (Asteroid Impact and Deflection Assessment). AIDA consists of two spacecrafts: ESA's AIM and NASA's DART (Double Asteroid and Re-direction Test). AIM will mainly focus on researching a binary asteroid system. It's a technology mission and has multiple objectives. One of them is performing an inter satellite communication system. DART will target the asteroid and creates an impact.

All space missions need to be approved by the General Director and the Council during the Council meeting. This takes place (every year) in November. The director and the board divide the budget over the registered space missions. Meaning AIM doesn't have a green light yet.

Limitations and Needs

Limitations:

- Having a time gap of 4 years till AIM actually launches
- People do not know (or barely know) ESA, what it stands for, what they do and why the work that they do is important
- ESA does not want to cause any panic amongst European citizens about a potential asteroid-impact on earth
- The decision for a game as the final product is certain
- AIM is not been officially approved by the General Director and the Council
- It is not about making money, so they can not ask the players for money in the game

Needs

- Awareness and engagement about space missions
- Acknowledgement and appreciation for their work
- People to know about AIM
- People to know about ESA
- An approval on the mission
- A video (trailer) of the game to show on Asteroid Day
- A scalable target group
- The game needs to be informative but also fun
- Not focused on the asteroid impact (DART / NASA) but on AIM (ESA)

Methodology

During the research and development of this project, a few research & design methods¹ were used. Following are the methods and the description of them that were used.

1. MoSCoW : A MoSCoW diagram stands for: Must have, Should have, Could have and Would like, but would not get. It is a helpful method to organize the requirements, which are needed for the product you are developing.
2. Desk research : Desk research is about finding valuable information about your research topic, in order to advance your knowledge.
3. Prototype Test : Prototype testing is having a draft version of your product and letting your target group use it. The

¹ the methods are from 'Design Method Toolkit' developed by MediaLAB Amsterdam

objective of prototype testing is to see how your target group is using your product and mark their responses.

4. Survey : A survey is comparable to a questionnaire where you ask your target group to fill in questions you would like to have an answer on.

5. Interviews : Interviews is having a conversation with your target group. The objective of doing interviews is to get to know your target group, in combination with finding out how they think about your research topic.

6. Brainstorming session : Brainstorming is a group method where you all conduct your ideas around a specific topic. The objective is to gather insights and reflect them on your product.

7. Love/-breakup letters : Instead of directly asking people what they like or don't like about a particular product or service, this method gives insight into their perceptions by eliciting feelings based on real-life experiences and interactions through writing a love or breakup letter.

Result

1. MoSCoW

MoSCoW is a helpful tool which we used to describe the things which are needed to be in the game.

- Must Have :
- General Information of AIM

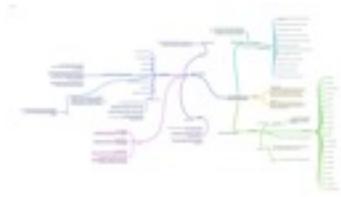
- Gameplay of breakdown of AIM
- Balanced gameplay mechanics
- Main gameplay resources
- Visual Assets that fits the game concept and considering the target group.
- User Interface that works well with the game concept and help users play in right way in order to advance
- A Story with a message and clear goal for the player to solve a problem
- Sound Effects that triggers players the feeling that the game concept generates

- Should Have :
- Personification to help the players engage themselves to the game
- Background Music to create an atmosphere that makes players feel like they are doing a space mission

- Could Have :
- Various animation to make the game more playful
- Space navigation where users can see the progression they make and get a feeling of being in the space.

- Would Have :
- Marketing campaign for the game

Infographics
Research Result of ESA



For link to the Infographics,
please see: [https://
drive.google.com/open?
id=0B6JX6-
Gu3UGUN3V5YU9sNjhTZk0](https://drive.google.com/open?id=0B6JX6-Gu3UGUN3V5YU9sNjhTZk0)



Research result of AIM
For link to the Infographics,
please see: [https://
drive.google.com/open?
id=0B7UjIYr4Goobay1MWncyR21
uT3c](https://drive.google.com/open?id=0B7UjIYr4Goobay1MWncyR21uT3c)

2.Desk research

A. ESA and AIM

a.ESA

Two mind maps were made out of the research. One for Space for Earth and the other one for How ESA Works. This information about ESA can be translated into trivia. While playing the game, the player is presented with several facts about ESA. In that way, the player learns not only about AIM, but also about ESA, plus it makes the game a bit more informative.

b. AIM

AIM is part of the overall project AIDA (Asteroid Impact and Deflection Assessment). Also is NASA's DART (Double Asteroid and Redirection Test) → impact mission, targets asteroid

The binary asteroid system consists of two asteroids. The bigger one is called Didymos and the smaller one named Didymoon. Didymoon will be researched by AIM and targeted by DART.

The AIM spacecraft carries a lander (MASCOT-2) and CubeSats on board. These are necessary to scan the asteroid and setup the laser communication system.

The asteroids in this mission won't form a threat to the Earth → there is no possible impact going on

Insights

Two infographics were made after the research. The infographics show a timeline with the entire mission and all

its challenges. The challenges are an interesting part to use for the game (i.e. in the mini-games)

B. Game genres

These are the most popular genres for mobile phone games(1-18):

- Action
Action games emphasises physical challenges, including hand-eye coordination and reaction-time. The genre includes diverse sub-genres such as fighting games, shooter games and platform games
- Role-playing game (RPG)
RPG is a genre in which players assume the roles of characters in a fictional setting. They take responsibility for acting out these roles through a process of structured decision-making or character development
- Puzzle
Puzzle games emphasise puzzle solving. The types of puzzles can test many problem solving skills including logic, pattern recognition, sequence solving, and word completion
- Strategy
Strategy is(e.g. video or board game) in which the players' uncoerced, and often autonomous decision-making skills have a high significance in determining the outcome
- Tycoon
Tycoon games are a simulation of a real life organisation, usually a certain business or a simulation of a group of people. They refer to a large-scale economic game where one can play from a management point of view

Result²

From the top downloaded games for mobile in the Google Play Store and Apple App Store, following games on both platforms are founded.

(All of these games have been in the top downloaded games for at least a year)

Game	Genre	Player Total(Android)
Temple Run 2	Action	6,079,386
Candy Crush	Puzzle	14,362,096
Clash of Clans	Strategy / Tycoon	24,678,862
Simpsons Tapped Out	Tycoon	3,200,371
Subway Surfers	Action	18,753,826
Angry Birds	Puzzle	4,705,235

Because only Android is mentioned (and Android is about half of the market), it is assumed that the total number of players will be about twice as many since this is the case for other games as well.

Insights

Based on this, the most common game genres are the Action, Puzzle and Strategy games.

Following is the rank of those games:

1. Clash of Clans
2. Subway Surfers
3. Candy Crush

With all the collected data and information, the tycoon genre is the best for the game. However to be entirely sure, more research on Tycoon was required to confirm if the tycoon genre is the best and most appropriate genre for the game.

Therefore, the following research, *C. Game genre conclusion: Tycoon*, was conducted.

C. Game genre conclusion: Tycoon

Tycoon is a managing work in a detailed 'fun' way by the means of resource management (with real time being the biggest resource) and relating tasks in the form of quests or missions.

Result of the research

Tycoon has two requirements that were required by the client, ESA. Followings are the requirements:

- Let people know about Space Missions (AIM) (Tycoon)
- Let people know about the research for space that's beneficial for earth (Strategy and Tycoon)

Insights

Tycoon was identified as the most effective genre for our game because a tycoon triggers stronger engagement and awareness than other game genres.

The main mechanics of a tycoon, which is building and managing, gives the players a more engaging experience. It can incorporate a story and quests, which helps players to go through the breakdown of AIM and understand why this mission is important.

The game has to contain the following elements that the tycoon genre has.

- Story: This will be done by the quest line. This is a series of events in which the player has to do something in order to

² For link to the document: <https://docs.google.com/document/d/1VjuhLQSBKtyCiffAi3f9K0m2LiBW4p4CXISD2s0tQI>

advance. These events tell them the breakdown of the mission and they have to do it.)

- Achievements: a purpose to continue playing and redoing the mission
- Social Aspect: players can invite via Facebook to help each other out
- Build Space centre (build to earn to build)
- Rewarded for coming back

D. Engagement by story

Insights

Having a story has strong advantages for our game because it offers challenges, generates motivation, holds attention, sparks curiosity, creates a unique experience. The AIM mission is a story itself. What's really important (in case of Storytelling) is to incorporate a message in the story, so that the target group will know why ESA is doing AIM.

Key-words (19-20)

- Narrative Storytelling
- Visual Storytelling
- The Effects of Storytelling
- Storytelling in Games
- Persuasion by Storytelling
- Storytelling for different Cultures
- Storytelling on a psychological level

E. Visual persuasion

For helping the users understand the game and help keep playing it, some rules introduced in the Fogg Behavioural Model(21) are being used.

The *Pleasure/Pain* element in the Fogg Behavioural Model (FBM) is used as a motivator for users to keep on playing the game. In the case of the AIM - Space Challenge game, pain is avoided as it can be a negative association. Pleasure is used as it is a primitive response.

Pleasure can be found in upgrading the buildings. It is hard work to get to an upgrade, so it has to be rewarding. The buildings change shape and grow larger with sparkle-particles and pleasing sound effects, which is rewarding for the player its hard work.

The same goes for the patches. Patches are rewarded to players when they level up. The new patch gets shown in the top, a sound is played and particles fly away to bring attention to the new patch. Leveling up also gives the player the ability to do more in the game, which is also rewarding.

To make sure everything is touch-friendly, the Human Interface Guidelines by Apple³ is being used. In these guidelines everything about tap-sizes and interactions on smartphones is explained.

For helping users understand everything in the User Interface, the icons have been tested with fifteen people from the target group in a paper prototype of the game. The target group understood all the icons, because those icons are used in different apps as well. This helps reduce the amount of 'Brain Cycles' described in the FBM.

In the end, for the user the most important thing is that it works. As written by Jef Raskin(22), it is not about the device, the way of input, the code behind it. If it does not work as expected, they do not play it.

³ Apple Human Interface Guidelines: <https://developer.apple.com/ios/human-interface-guidelines/>

Clickable Prototype Test

Following images are the prototypes which were used for Prototype test for Art with UI

From the top, AIM #1, AIM #2, AIM #3, AIM #4



3. Prototype Test

For both Story and Art we used these two methods for testing with our target group.

A. Art & UI style

a. Clickable Prototype Test

Prototypes of different Art style and Use Interface (UI) were built to be tested. They were tested with 33 users.

Description of Used Prototypes

AIM#1 has the most minimalist art style, AIM #2 has different ground colour to give more various type of ground of Earth, in AIM #3 the buildings have more details on them and AIM #4 is designed with futuristic style to give more feeling as if players are in space.

The images used in the Clickable prototype test are shown in the side bar on the left.

Test Result

Summary

- Most voted favourite at the end of the survey: #4
- Most consistent high votes only: #3
- Least liked/lowest votes: #1

Comments of respondents combined :

- They like #3 a lot as well, because it is more detailed, but they miss the 'cool futuristic' part.
- They think #4 doesn't feel like Earth anymore or it feels like nighttime.
- They like the cleanliness of the designs, as they do not unnecessarily clutter the screen.
- The simple style looks very nice.
- The dark #4 is a bit like a big dark blob, if merged the lighter and happy part of #3 it will be the best version.

- #1 and #2 are too minimalistic.
- The buildings need to be portrayed with their own meaning. For example, HQ with big antennas on the roof, Development building with couple of versions of the rocket. Show what the building is actually meant for. Functional parts of the buildings.
- Even though the buildings will probably not look that special in real life, they would like the buildings to be very cool for a game.
- #1 is often found a bit too childish.
- #2 is too empty, but people like the idea of different kinds of flooring and some think space agencies are located in desolate desert areas.
- #3 for serious message, #4 for fun.

Insights

AIM #3 and AIM #4 should be combined. Futuristic and Light / Happy Earth together.

*Below are the prototypes built in InVision which is an application where people can quickly build simple clickable prototypes.

AIM #1: <https://invis.io/MF765HTQ3>

AIM #2: <https://invis.io/JZ76HK3TX>

AIM #3: <https://invis.io/SG79SWK3R>

AIM #4: <https://invis.io/TN798ZN2F>

b. Cold Call Test

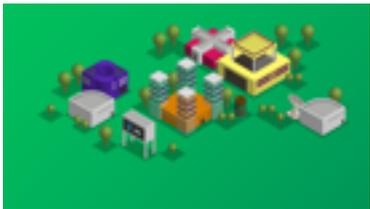
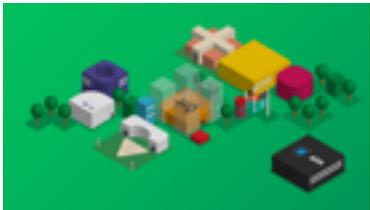
Cold calling in this case refers to walking up to people with no prior knowledge and asking them their opinion.

The images used in the Cold call test are shown in the side bar on the left.

Cold Call Test

Following images are the prototypes which were used for Cold Call Test.

From the top, AIM #1, AIM #2, AIM #3, AIM #4



Test Result

We asked 33 people who belong to our target group. This is the result of the test:

- 52% liked AIM #3 and 30% liked AIM #2.
- 01 (03%) respondent liked AIM #1
- 10 (30%) respondents liked AIM #2
- 17 (52%) respondents liked AIM #3
- 05 (15%) respondents liked AIM #4

Insights

AIM #3 and AIM #4 should be combined. Futuristic and Happy Earth together.

- The buildings in vivid colour with green background and sky give the player the feeling that they are building a space centre on the Earth. It is related to the actual mission.
- A new style with more detailed version of AIM #3 combined elements of AIM #2 was used, implementing futuristic elements that the users requested.

4. Survey A. Story

Two story concepts were drawn on paper and made into a storyboard. The storyboards were circulated to conduct an online survey (Google Docs). The idea of the survey was to gather information about what the target group thinks about the stories and if they like them or not. The survey contains the two storyboards plus description and questions around it.

⁴For link to the result of Interviews and survey on story, please see: <https://drive.google.com/open?id=0B6JX6-Gu3UGUUnVqRWdFTThKb1k>

Test Result

The results were conducted (together with the results from the interviews) in an infographic. These were the most interesting points:

- 11 people filled in the survey
- The average rate for the first story (Dinosaurs) → 6.0
- The average rate for the second story (Humans) → 6.5
- The first story (Dinosaurs) was mentioned as "childish"
- People liked the time travel idea

5. Interviews

A. Story

The interview method was used to test the two story concepts, conducted in storyboards. The objective of this user test was to find out which story was the most attractive and why. The reason why there has also been tested through interviews was because of the different approach and interpretation of the stories (telling about it instead of the target group reading it). The results were conducted in an info graphic. These were the most interesting points:

- 60% of the 13 people who were interviewed know ESA.
- 95% of the 13 people has an interest in space.
- Two stories⁴ were tested, 90% liked the second story.
- The second story was more realistic and exciting than the first one
- People liked the idea of saving the Earth.
- All 13 people were not frightened by the idea of a possible asteroid impact in a near future.

B. Mini-game genre

13 people were interviewed about the behaviour around games in general and mini-game genre.

Result

- 70% play Mobile Games
- They play at waiting moment
- They like easy, short-time, beautiful, high pace
- They dislike notifications, waiting-slow-pace

- 60% likes beautiful game
- 33% likes Puzzle game
- 33% likes Sports game

- 2 disliked too simple game,
- 3 disliked fighting aggressive game
- 3 disliked slow-paced game
- 1 disliked for educational game

Insights:

The mini-games have to be fast-paced, simple enough to learn but challenging enough to be fun. Users play mini-games during 'waiting-moments'

6. Brainstorming session

A. General Graphics

Insights

- The Graphics style should be approachable for the target group.
- Since the objective of the game is targeted to a broader audience, the visual style of game has to be kept distinguishing from other existing space theme games which are targeted to 'gamers'.

- Corporate Identity ESA should be used for recognisable ESA style.

B. User Interface

UI elements that the game needs:

- a. Game Icon
- b. 'Patches' for showing progress and rewards
- c. Buttons for building menu/Quests
- d. Tutorial UI
- e. Dialogue box
- d. Icons of main resources(Gold/Research-points) in the game
- f. Information boxes
- g. Progression map
- h. Time progression bar
- i. Warning window
- j. Mini-game introduction

7. Love/-breakup letters

A. Mini-game insights

Games people talked about on the letters were:

- Love Letters:

The Sims (pc)

Dumb ways to die (mobile)

Color switch (mobile)

Fun run 2 (mobile)

Dota 2 (pc)

Heads up (mobile, RL)

Call of Duty (pc)

- Breakup letters:

GTA5 (pc)

Candy crush (mobile)

Figure1 : Virtual overview of the game screen when the player reaches level 10.

Flappy Bird (mobile)
Dumb ways to die (mobile)
Blizzard (pc)
Threes (mobile)
Happy bird (mobile)

- Love letters: 3 PC / 4 mobile
- Breakup letters: 2 PC / 5 mobile

Insights

- The game should be challenging but not contradict the - player's morality.
- The game should be not too easy, but not too difficult.
- the game should stay refreshing.
- The game should be fun.
- The game should have achievements and challenges

The results from this research were narrowed down to what has to be implemented in the game:

- Achievements
- Learning while playing
- Introducing new mechanics from time to time
- It should stay the right amount of challenging (the flow)
- Enough mechanics
- The game should encourage players to come back.

Conclusions

The target group has been provided with an interactive game that is transparent and understandable for them. The game

portrays the actual mission and shows the breakdown per step. Each step contains a challenge.

Our solution is to offer the users a playful and informative method, which gives a playful experience of understanding the space mission.

After the research with methods that we used, we reflected the results and insights on the end-product.

Followings are the overview of the end-product.



figure1:overview of the game

A. Gameplay

a. Main Gameplay Mechanics

- Building space centre : Players build their own space centre to execute AIM.
- Quests : Players play the quests (a series of events which are the breakdown of the mission) in order to advance. These lead users to the story and give them goals to play.

- Achievements : It gives player's purposes to continue playing and redoing the missions.
- Strategy : Players need to make sure they do the right tasks in the right order, in order to advance.
- Social Aspects : Players can invite others via Facebook and share their experience and knowledge about AIM.

b. Main Game Resource

- Coins : It is the primary currency of the game, which allows users to buy buildings and other components. Players get them in the beginning of the game.
- Research Points : It is the secondary currency of the game.
- Players get research points : by playing mini-games from the Mission buildings. They can level up the buildings with it.
- Level : Represents the level where the player is.
- Hammer : Build icon, selecting this will open a pop up window where there will be a list of buildings that can be build.
- Quests : A lists of tasks that are needed to be done in order to advance.

c. Type of Building Assets

RESOURCE buildings	MISSION buildings	DECORATIONS
Headquarters	R&D Centre	Flags
Exhibition Centre	Mission Control	Installation
Science College	Launchpad	Trees

- Resource Buildings: These buildings generate money resource.
 - Headquarters (HQ):The building is the base of all operations. This is where human resources is situated and where you get your salary.
 - Exhibition Centre: The Building is a museum with space-related things. People need to pay an entrance fee to visit the Exhibition Centre, which will generate money for your mission.

- Science College: At the Science College, students are being educated to become Engineers, Scientists and Astronauts. The collaboration between your Space Centre and the school provides you with money.
- Mission Buildings: The players can play mini-games
 - Research and Development centre(R&D):The building is a technical facility where you prepare the AIM mission and build the satellite.
 - Mission Control: The building allows you to navigate the satellite in space and control the inter satellite communication links.
 - Launch Pad : The Launchpad building is used for launching the rocket with the satellite inside.
- Decorations: Personalization for the player
 - Flag: Flags are there to decorate your Space Centre and give it a nice look.
 - AIM Installation: The Installation is a decoration that looks like a pillar with the AIM satellite on top of it. it is a marker for the AIM mission.
 - trees: Trees are there to decorate your Space Centre and give it a nice look.
- Time-machine: time-machine is part of the story of the game. In the story, the player has to time-travel from the future to present day to execute the mission in order to save the earth.

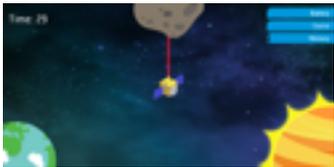
B. Mini-games in the game

Each mini-games can be played through mission buildings. the mini-games are a simulation of the parts of mission in space. comprising the launch, the travelling and the necessary research. Each time the players complete a mini-game they will receive points.

B. Mini-Games



Mini-game 1.:
Match making



Mini-game 2.:
Researching the Asteroid System



Mini-game 3.:
Flying through Space

The images of the mini-games are on the sidebar on the left.

- Mini-game 1.: Matchmaking
It can be played through *Research and Development Centre*, connecting the wires on the motherboard of the satellite and make sure each wire is connected to the right spot.
- Mini-game 2.: Researching the Asteroid System
It can be played through *Mission Control*. There are three matters that players should keep in mind. They need to 1) get data from the asteroid, 2) charge the battery of the satellite from the sun and 3) send a signal to the earth. They should position the satellite in a way that they can manage to do all three of them by rotating the satellite and aiming either earth, sun or the asteroid.
- Mini-game 3. : Flying through Space
It can be played through *Launch Pad*. The game portraits after the satellite leave the earth and fly through the space. The players need to dodge the space debris that they will encounter in space to make sure the satellite reaches to the asteroid system safely.

C. Graphics

a. Building assets

The Buildings can be upgraded when the players become higher levels and have enough 'coins' and 'research points'.

Description of the building visual assets

The images of buildings in the box above, are place in order of level. As the buildings upgrade, they get bigger and more detailed. The buildings are built in isometric perspective and they have minimalistic style. The vivid colours of the buildings are referred to ESA's Corporate Identity Guide. Also

• Resource Buildings

• Head Quarters (HQ)



• Exhibition Centre



• Science College



• Mission Buildings

• Research and Development centre



• Mission Control

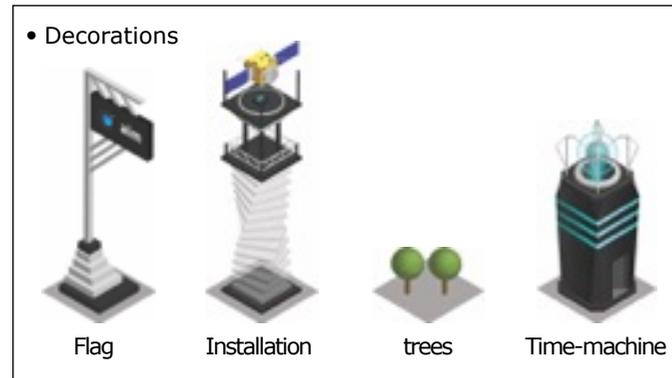


• Launch Pad



the colours were chosen in order to aim broader audience.

- The Headquarters have ESA's logo on the top of it so that it creates the engagement of the space mission be ESA.
- The Mission Controls have satellite dishes on top of the buildings to show their role as mission controls in space centres in real life.
- The Launch Pads have rockets on it to show their role as launch pads in space centres in real life.



- The decorations has similar tone of colours except for trees. The flag has ESA's official AIM logo. The installation has a mockup of AIM satellite on top to symbolise AIM. The trees was built in minimalistic style to fit the general art style in the game.
- The time-machine is designed in futuristic style since in the story of the game, the player uses it in the future. It is also presented on the intro video in same graphic style.

D. User Interface

a. Style guide

Style guide is to make sure that every designer makes assets for the game in the same style. The guide focuses on:

- Colours
- Shapes
- Buttons
- Composition
- Grid
- Fonts and size



b. Patches



Figure 2: Patches

Figure 2: Images of Patch box. The box opens on the screen when the players get a new patch after they level up.

Icon



Buttons

Each buttons trigger main gameplay in the game. and the colours follows ESA's Corporate Identity Guide.



Menu button: The button shows options that players can control in the game and information about the game.



Quest button: It shows the quests every time the players are assigned new quests.



Build button: It opens a window with buildings that players can build.



Progress map: It opens a screen that shows how far the player advanced in the game.

Level Bar



It shows the patches and levels that players achieved.

Players get patches when they level-up by completing missions. The patches tell the story of AIM visually while providing links to more information about AIM.

c. Buttons UI



Figure3: Main UI without background on the mobile screen. *the detailed description and images are in the side bar on the left.

The buttons style fit the general art style of the game. To make sure everything is touch-friendly, the Human Interface Guidelines by Apple⁵ is being used. In these guidelines everything about tap-sizes and interactions on smartphones is explained.

d. Icon

The icon has the AIM satellite with Earth and the Didymos double asteroid in the background in order to show the overview of the game. An icon is the first interaction of every

mobile application on a mobile screen. Therefore it is important to make sure it gives the overview of the game properly. The image of it is on side bar on the left.

e. Compositions of the UI assets

Every window boxes in the game has the same shape of the corners to be consistent visually. The positions of all the UI assets are aligned with main UI (menu buttons, resource bars) to lead the players to right way.

E. Story

Story description

Around 2500 A.D. an asteroid is about to hit the earth. In order to stop this, you need to travel to the past with a time machine. Once you arrive, the first thing you have to do is to build your own Space Centre and perform a space mission called AIM: Asteroid Impact Mission. The mission is about sending a satellite into space, to reach a group of asteroids and doing research on them. The series of tasks include a breakdown of the AIM mission in form of mini-games, which will help you to upgrade and level up your Space Centre. With the gathered data and information, you will travel back to the future, to prevent the asteroid impact and save the earth.

⁵ Apple Human Interface Guidelines: <https://developer.apple.com/ios/human-interface-guidelines/>

Recommendations

Following is the list of features that can be implemented or improved in the end-product.

Usability

- User testing
- Improved user experience
 - Clear UI
 - Clear what to do
 - Clear tutorial

GamePlay

- iCloud
 - Add online save file
 - Add save sharing over devices
- Notifications
 - Add notification for building done
 - When you didn't check for a long time
 - When mini-game lock is gone
 - When upgrading is done
 - When a high score has been beat
- Game Centre
 - Highscore list
 - Global
 - Friends
 - Achievements
- 3D touch
 - Quick play mini-game
- Being able to have more than 3 mission/resource/decorations in the menu
 - New UI
 - New buildings

- Scrollable field
- More items
 - Quests
 - Decorations
 - Buildings
 - Mini games
 - User levels
 - Bigger grid
 - New buildings
 - Unlock new parts
 - New Missions
- Twitter Support
 - To share game
- More Agile code
 - Easier to add items
 - Less loading time
 - Less bugs
 - Easier fixing
- Code cleaning
 - Quicker loading
 - Easier to read
 - Easier to fix bugs
- Better interaction medium
 - Notification when you pressed something greyed out
- Balancing
 - Tycoon
 - Add building upgrade timers
 - Tasks (time/reward)
 - Mini games
 - Equal score
 - Good difficulty increase
- More options in skymap

- Show more progress
 - Show active AIM research
- Easier way to replace buildings
 - Button to activate replace screen
 - Building click = automatic replace screen
- Achievements
 - Add to game centre
 - Compare to friends
 - Achievement List
 - Share on facebook
 - Share on twitter
 - Reach level
 - Questline done
 - Good mini game score
- 3rd currency
 - To speed things up
 - Got from achievements
 - Got from sharing
 - Can be done with quiz about aim (mini game?)
- Add video splash screen
 - After current static splash-screen
- Profile with their information
 - Option to change name
 - Achievement list
 - All high scores
- Events
 - Can be done from real life events (asteroid day)
 - Let people come back to the game
 - Seasons (winter/summer)
- Support button
 - Info about aim

- Info about game
 - Bug report
- Update log page
 - Show what's new in the game (after a update)
 - Show what's going on with AIM
- More sharing to social media
 - After new high score
 - After new achievement
 - After new level
 - After completing a questline
- Quick switch from mini-games to tycoon
 - Loading screens
- Fix mini-games
 - Cheats in mini-game 1 and 2
 - Assets for mini-game 3
 - Bubble spawn in mini-game 1
 - Spawn Speed in mini-game 2
- Smoother gameplay
 - Smooth zooming
 - Smooth scrolling
 - Smooth UI using
- Move buildings by swipe
 - Hold your finger to choose new position

Assets

- 3D Buildings
- Life elements
 - Day/night cycle
 - Grid colours
 - Clouds
 - People walking around
- New Build building menu

- Animations
 - Building upgrades
 - Resource collection
 - Waiting time
 - Upgrade
 - Achievements
 - Mini-games
- UI in Mini-games
 - Pause screen
 - Timers
 - Health
 - Score
- More "Juice"
 - Particles
 - Upgrade
 - Task Done
 - Time lock done
 - Level up
- More clickable badges to see info
- Different languages
- Level Audio
- Reduce pack size
 - Use smaller audio files
 - Reduce size of the building images
 - Reduce size of background screens

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