

Summative Assignment

GROUP: MIGHTY

THATO MARCUS PHILLIP MAKGABUTLANE , XOLANI LONWABO
MAQUNGO, ORERATILE RANWASHE, GUNDO PHATHUTSHEDZO
SIKHWIVHILU, MARCO SMIT

Table of Contents

FigureList:.....	2
What is the task?.....	3
Task 1 – Proposal of two game ideas	4
1. We want to discourage soil pollution.	4
2. We want to discourage failure of water infrastructure	4
Game Ideas.....	5
Idea 1	5
Idea 2.....	5
Task 2 – High Concept Document	6
The nature and scope of the problem the game will address is... ..	6
The demographic and player type.	7
The relevance of the selected problem.....	7
The broad strategy of the game.	8
A description or mood board of the game.	8
Task 3 - The core concept, theme and genre of the game.....	0
Description of core gameplay, including objectives, challenges and game progression	1
Description of core game elements (game world, story, main characters and level design)	1
Description of core game mechanics	3
Concept style guide for user interface concept	3
Concept art of game assets	5
Concept art of a game character.....	7
Concept art of the game world.....	9
Description of sound effects, music etc.	9
Possible example sounds that are being used:	9
Referencing	11

Figure List:

Figure 1: 3xastudio. 2016. Pickup Dump.	3
Figure 2: Chotwitnote. 2024. Pipes.....	3
Figure 3: Saqib24. 2024. Cartoonish Building Models.....	4
Figure 4: GameCraftPro. 2020. Cartoon Town - Buildings and Environment.	4
Figure 5: Mrlunettes. 2022. On the road / Adventure Kit.....	4
Figure 6: Junaid. 2019. Running Man.	5
Figure 7: VIS-All-3D. 2021. Video Project - Scene 2 (Test).....	5
Figure 8: Cooper. 2015. LowPoly Cartoonish House.	5
Figure 9: TankStorm. 2021. SciFi Building_45.....	5
Figure 10: Nesterenko, N. 2023. Overwheight man.....	6
Figure 11: Nesterenko, N. 2023. Cheerful successful man	7
Figure 12: Nesterenko, N. 2023. Female hiker travelling	8
Figure 13: antonmoek. 2018. Polygonia Low Poly City Pack	9

Group Members, their roles and responsibilities:

- THATO MARCUS PHILLIP MAKGABUTLANE - Code Designer
- XOLANI LONWABO MAQUNGO – 3D Designer
- ORERATILE RANWASHE – Code Designer
- GUNDO PHATHUTSHEDZO SIKHWIVHILU – Sound Designer
- MARCO SMIT – User Interface Designer

Ideation of XBCG7311

What is the task?

We are tasked with designing an ethical 3D game which falls under the broad theme of “Games for Community Engagement”

We know a game cannot solve the problem, but it is an excellent tool to raise awareness while playing a game. You must handle the problem with care and empathy, and ultimately, by the end of the game, the player should be thinking about the issues these communities face.

Task 1 – Proposal of two game ideas

Our targeted age range is **18 and above**. People over the age of 18 is more prone to act upon such problems than the younger generation as they are more mature in understanding the impacts, have more financial status and credibility than younger kids. The younger audience already has a wide spread of different awarenesses, so we are looking into creating a different view for our target group.

1. We want to discourage soil pollution.

Our reasons for this are:

- Regions in South Africa have large wastes, unrecycled objects and enormous amounts of rubbish.
- Townships in which a lot of litter reside, is not only an eyesore, but also unhygienic. It creates non-sanitary living, which in effect has a negative connotation towards the human lifespan.
- There are dangerous items and chemicals, like drug needles, on the ground which are bad for children when they find them and try to use them.
- Littering causes soil and air contamination.
- Littering negatively impacts on both the animals and ecosystem in which they reside.
- Large, littered areas bring about pests that carry various diseases.

2. We want to discourage failure of water infrastructure

Our reasons for this are:

- Large pieces of infrastructure that needs to be replaced due to damage or old age, as well as the contamination of fresh water.
- Poorly maintained infrastructure causes days of water outages and increase water scarcity.
- Uncontrolled sewerage and industrial waste causes high levels of water pollution.
- The contaminated water causes different diseases to either spread or grow, and cause serious illnesses like diarrhoea, trachoma or guinea worm.
- Water pollution can also cause cholera or hepatitis A.

- Without clean water, an ecosystem is lead towards starvation and dehydration, as residents won't be able to make food or have any means of staying hydrated through the unflattering ways of climate change.
- Water pollution causes greenhouse gas emissions and would thus greatly affect our ecosystems.

Game Ideas

Idea 1

You, as a business owner, oversee a recycling company. You are instructed to roam the town grabbing garbage located at designated areas of the city and then deliver said garbage back at the company by sundown and on time. Your workers will then sort through the garbage and try to recycle possible items of value to receive a higher initial income than selling it off regularly or disposing it.

Every day will be a new level. It is up to you to keep the streets clean and be sure your truck stays well maintained and that you have selected the needed upgrades to not only ensure your truck can handle the increasing capacity of trash, but also to upgrade your company to hire part time truckmen to handle different loads outside of your city as well as different sorters for recycling. You can either treat the day as fast paced by speeding up time or let the game idle creating you a passive income between picking up and sorting garbage.

As for your own duties it is up to you to be able to maintain the load capacity of garbage as well as your truck's efficiency over time, because the end of a day could result in your income and speed in which you process. All these aspects influence your practices as a business owner and your popularity to the town. If your popularity becomes negative, you lose the game and in turn the people will not use your services anymore and will turn to more lucrative businesses.

Idea 2

In this game it is your responsibility to ensure that the town's water systems and sewerage systems are maintained, and water leaks are repaired by replacing the pipes within the system fast and diligently.

You will be designated one group of workers, working as one unit inside a truck. They will in turn roam the streets and fix, as well as maintain and upgrade these pipes. With passing time, these fixes/upgrades of the pipes will yield a return and generate a profit. As your company grows, so does your working force, as well as the number of areas you can reach with your trucks. It is your responsibility to:

1. Show the trucks where and when they need to reach certain destinations.
2. Buy the needed equipment for upgrades.
3. Ensure equal pay for both workers and drivers.
4. Hire the necessary work force to complete the objectives and daily tasks, receiving an extra bonus in the process.

It is then your responsibility to maintain the company and insure it stays running as long as possible. Possible pitfalls for the defeat of the game could be:

- Capital is over negative 100 000(this is to ensure the player has a chance to grow money back)
- Workers strike, because of unequal pay.
- People strike, because of low quality service or unequal service throughout the city.
- The amount of pipe bursts flooding the city.
- Or you have reached your goal of a million rands.

Note:

The reasons we chose this demographic is because we are looking towards Bartels Taxonomy of the achiever player arch type. We also want to emphasize that your actions have consequences.

Task 2 – High Concept Document

After task 1 we chose and expanded on the idea of using idea 2 for our game.

The nature and scope of the problem the game will address is...

Water Infrastructure which is an essential resource of carrying our water to us daily. In South Africa the upkeep of 'quality of water' and the 'presence of water' has been deteriorating over the last couple of years. Stoll (2022) states that the causes of the water crisis in South Africa are due to economic scarcity as there is a lack of investment in the water's infrastructure as well as physical scarcity (which is the lack of rainfall) in recent years. Stoll (2022) went further to state that the effects of the water crisis are due to failing water infrastructures causing water leaks, it has also resulted in people digging unsafe boreholes and some residents have turned to water deposits that are extremely unhealthy (contaminated water supplies).

The solutions provided to us by Stoll (2022) is that we should build water-sensitive cities and that we should practice water planning and management that will ensure sustainable water access and cleaning/drainage.

Masilela (2023) states that the residents of Hammanskraal went on a protest as they have been without clean water for about 2 months and went further to state that some community members went to neighboring streams to drink water from there, but sadly contracted stomach aches as well as diarrhea. Masilela states that the community members of Hammanskraal kept fighting with the municipality to provide them with water even going to the extent of asking for lawmakers to intervene and provide them with clean water.

As stated, the water crisis in South Africa is severe as there is not sufficient clean water, there are water shortages and at times this can be because of the government/ municipality's negligence or incompetence.

The problems we hope our game will be able to address are as follows:

- Education and awareness of water pollution and the need to be diligent in having clean water at times.
- Educate players about the consequences of water pollution and how it can affect human health as well as the ecosystem.
- Possibly educate players about the health risks of water pollution.
- Educate people on how to save water.

The game can educate players about the importance of working together as a community to prevent water pollution and the positive impacts this has on the country, in which each person can contribute to saving water in either trying to shower for shorter periods, using bath water for gardening or stop running taps and even close taps when they brush their teeth.

The game can educate players on sustainable practices/entrepreneurial practices taken to manage water as well as recycling water.

We aspire to create a game that will raise awareness about water scarcity and water pollution and educate players on the harmful effects of water pollution as well as educating them on ways to prevent and solve these problems.

The demographic and player type.

The overall demographic for this game falls in the category of 18 and above. We aim the player type to be an **ACHIEVER** player type.

The achiever player type fits well with our chosen demographic as leading people to finish just a few small tasks a day gives a sense of accomplishment, be it on an app or in real life. This would give them fulfilment and bring them to eagerly help their community and their need to look after their water resources and help keep the water clean.

The relevance of the selected problem.

The pollution of water is an issue for everyone including our chosen demographic. Research done by Nkwonta and Ochieng (2009) identifies surface water pollution as a serious environmental problem in rural areas of South Africa as there is a large amount of household waste that is disposed on the roads and ultimately running into the storm water systems or creating an open sewage amongst the area. The environment in which people in rural areas live, can be harmful to their health as they could contract viruses and other diseases such as cholera, hepatitis A and dysentery. They further reveal that water samples taken from a stream in Soshanguve, had shown the causes for pollution were fertilizer runoff which contributed 50%, pesticides contribute up to 10% and household waste contributing 30% of pollution to

Task 3 - The core concept, theme and genre of the game.

Game Name: Our City, Our Water

Visual Style: Cartoonish, 3D Game, top-down view with a cartoonish UI system implemented

You are tasked with keeping your town's water system maintained and cleaned. The current water system has become so filthy with sewage water and storm water running into the main source, including the broken infrastructure. It is your responsibility to replace the pipes within the system, fast and diligently.

You play as the main character but will be led by a tutorial guide/character, named Fred, who was the previous owner of the company, but he lost his willingness to continue the business. Due to the daily water consumption demand, the age of the water infrastructure and the current problems of not saving water or filtering new water properly, causes your pipes to continuously break. You will have to fix leaking pipes and send out workers to change those pipes. Note that we have decided to add small hints into the game to educate people on how to save water.

In the full game you will start with a small area in the rural side of the large city and will work your way up to building enough capital to support the suburban area. Ultimately, your focus should be on both, because if you don't manage them equally, you will inevitably lose to the game's conditions.

For the prototype you will be given a small city, in which the rural area will be the largest in demand and the suburban area not so much. It is then your responsibility to focus more on the one area than the other.

For both game areas, you must upgrade or hire more experienced workers, that will deliver a better quality of work, possibly saving you on the number of workers and the need to pay high wages.

Theme: Modern day, Environmental: such a game fosters an environmental task, in which players are tasked with restructuring and rejuvenation of the world and the negative impacts throughout the years.

Genre: Strategy: such a game looks at patterns and player behaviour throughout the game. Their actions have consequences.

This game looks at what the destruction or degradation of water systems brings to our current life and how we should be aware of this current problem in our lives.

It also brings a small amount of education into what our current government is supposed to be doing and what is expected from people to help save water.

This fosters affection as this affects a large amount of our economy and communities in what we see and experience in our day to day lives.

You can live without electricity, but you cannot live without water.

Description of core gameplay, including objectives, challenges and game progression

You are the new owner of a company responsible to maintain the town's water infrastructure. You will be designated a group of workers, working as one unit. They will in turn roam the streets and fix, as well as maintain and upgrade these pipes.

Your company will receive notifications from the local municipality, of pipes that are leaking that needs to be fixed or replaced. This will be pipes from households (sewerage and run off water) to the water works, storm water pipes to the town's catchment dam as well as pipes from the town's water works to the households.

These fixes/upgrades of the pipes will yield a return, measured by how quickly reported problems get fixed and the size of the water replacements. This will generate a profit for your company that needs to be used to pay your weekly wages and procure equipment and consumables.

Bonus money can be earned by educating people on water spillages and water conservation.

As your company grows, so does your working force, as well as the number of areas you are able to reach. It is your responsibility to:

1. Show the trucks where and when they need to reach certain destinations.
2. Buy the needed equipment for upgrades.
3. Ensure equal pay for both workers and drivers.
4. Hire the necessary work force to complete the objectives and daily tasks.

It is up to you to ensure that your company stays running as long as possible. Possible pitfalls for the defeat of the game could be:

- Cashflow is over negative 100 000 (this is to ensure the player has a chance to grow money back)
- Workers strike, because of unequal pay or not getting paid on time.
- People strike, because of low quality service.
- The amount of pipe bursts flooded the city.

You have reached the end of the game if your cashflow balance is more than 100 000 negatives.

Description of core game elements (game world, story, main characters and level design)

Game World:

You are designated to start off in a singular suburban area and you will expand your outreach with the increase of time.

This area was historically neglected and will have a lot of pipes leaking and sewerage systems not in place.

Main characters:

You play as the main character, who will be mentored by a tutorial owner, who was the previous owner of the business, but lost his willingness to continue the company.

Tutorial guide character – Fred

Work team – workers that will replace the pipes (random names will be generated)

Municipal manager – Tebogo - person from municipality who will give feedback of good work or complains on work not performed on time

Public – a general crowd - general character in places where pipes need to be fixed. Bonus points can be obtained if you interact with them and educate them on water conservation.

Tebogo, the new city municipal manager will tell you more about the city's degrading over his period of life as he lived in the town himself.

Side character - Gina – a lady from town who speaks on behalf of the public and tells you to investigate and treat other people with humility and kindness, but Tebogo steps a lot in and gets in the way. You learn Tebogo might have greed growing as well. It is up to your actions to show whether you are interested in helping the community or the municipality first. Either way, each has their benefits and choosing the correct option at times could be beneficial to you in the long run.

The demo will play out as you, an outsider looking for a new start in this small town. You meet up with Tebogo and Fred in which you have a brief yet informative conversation. As your company expands you turn to other people like Gina who will tell you more from her side what she might think the municipality is doing wrong.

Based upon your first decision here on whether you decide to help fund Gina or not, you either get a bonus 15% work speed for the rest of the game or you do not.

When you buy your first plot of land, both Gina and Tebogo will want to talk to you and based upon your recent income, you can choose to either fund Gina or Tebogo to bring the town back to life. You will clean up a street and if you chose Tebogo you will receive an extra 5% income boost for the next few minutes.

After playing the game for over 10 minutes the story will come back in. You must choose to fund either Gina or Tebogo, this time Gina will give you 20% percent rather than 15% work speed, or if you chose Tebogo you will get a bonus 5% income rate.

As you play every hour in the game you can choose whether to fund Gina or Tebogo at any time and based upon your choosing their statistics for their bonus will go up.

This helps you with your decision on supporting the community or the government. It is in no means to try and push you to either side, it is only there to tell you who you will be influencing.

Level design – One single expansive level, that grows over time. You will obtain experience and when reaching every 3rd level, you will unlock more of the area, and you will become more responsible. Some areas you will also need to pay to unlock the area.

Description of core game mechanics

The game mechanics for our game *Our City, Our Water* will be as follows:

The players will be required to replace the water pipes within the system in a manner that is both fast and diligent. Players will also be timed in this aspect thus players should be mindful of the time as their decision-making and speed matters as they would need to complete the task in time.

The players will have a designated group of workers, each group will work as a single unit to complete the task.

The players will not only be required to fix the water pipes, but they will also have to ensure that the water pipes are maintained.

The players at times will have to invest the money so that the yield they made from fixing the water pipe help them generate more profits.

The more the players' company grows, the more their working force also grows as well as the number of areas the players can reach at a time.

The players will have to navigate the maintenance trucks to where they are supposed to go as well as give the trucks instructions when they need to reach certain destinations.

The players will have to purchase the equipment that they need when they are upgrading their system.

The players will have to ensure that both their drivers and workers get equal pay.

The players will have to hire the necessary workers/workforce to complete the objectives as well as the daily tasks.

Conclusion

To summarise our game mechanics and why we chose them, we carefully thought of our game mechanics during our brainstorming sessions, as we were trying to come up with a game that would not only educate people about the importance of water systems but also show the people the amount of maintenance/ work that is required in having water that comes from taps as well as having clean water.

The game will be an effective tool that can foster players who play it to value their water more and help players understand what can happen if our water pipes are not well maintained. *Our City, Our Water* will also teach players that maintaining water pipes is a task that numerous people must do together. The players will also see that at times for a city to have a quality water system some sacrifices will have to be made to maintain the water quality and maintenance of the water pipes.

Concept style guide for user interface concept



Rough conceptual outline of player login to ensure player security and overall creation of different players.



Close and play buttons – you use both these buttons to either play the game, close the tab, exit game, play background sound, play effects. These are controller buttons



Checkbox and Pause buttons – you use both these buttons to either click the checkbox in the settings manager and use the pause button to stop the game and choose whether to close the game and/or go back to the main menu.



PowerUp and Volume button – You can choose to check whether to support Tebogo or Gina and shows you how much you can contribute to them to power up your company. As for the volume button it is simply used to mute or unmute the main sound or music of the game



Heart and Options button – the heart opens a tab in which it will indicate the happiness of the town on each section of your actions board and give you back statistic. The options button will open up the options tab



Simple worded actions buttons that will be used to perform the necessary actions or roles to influence the game either in a large or small way.



These are a few of the example sliders we could be possibly using in the creation of our game when working with sound



These are simple aesthetically pleasing backgrounds for both tabs or buttons to use.

Concept art of game assets



Figure 1: 3xastudio. 2016. *PickUp Dump.*



Figure 2: Chotwitnote. 2024. *Pipes.*

Here you will find different concept art of 3d and 2d objects that will most likely be used within the game, which are free as well.



Figure 3: Saqib24. 2024. Cartoonish Building Models.



Figure 4: GameCraftPro. 2020. Cartoon Town - Buildings and Environment.



Figure 5: Mrlunettes. 2022. On the road / Adventure Kit



Figure 6: Junaid. 2019. Running Man.

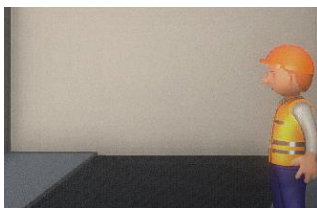


Figure 7: VIS-All-3D. 2021. Video Project - Scene 2 (Test).



Figure 8: Cooper. 2015. LowPoly Cartoonish House.

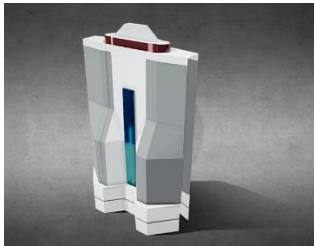


Figure 9: TankStorm. 2021. SciFi Building_45.

Concept art of game characters



A pop-up version of Fred – this overall figure will help a player visualize what Fred looks like.

Fred is a tutorial guild character in which you will only see him in the beginning but never again after that.

Figure 10: Nesterenko, N. 2023. Overweight man eyeglasses happy 2D cartoon character stock illustration



A pop-up version of Tebogo – this overall figure will help a player visualize what Tebogo looks like.

Tebogo is a nice man at first, but as the story continues, he becomes more and more hungry with power, just showing you how corruption could lead someone. Luckily Gina is there to fight against him.

Figure 11: Nesterenko, N. 2023. Cheerful successful man semi flat colorful vector character stock illustration.



A pop-up version of Gina – this overall figure will help a player visualize what Gina looks like.

Gina is the community member there to help you and possibly stop Tebogo at times to not go back to the corrupt ways as the previous municipal senator. She speaks for the people and guides the way to building a better community. You can learn a thing or two from her, but it is ultimately your decisions that count.

Figure 12: Nesterenko, N. 2023. Female hiker travelling with backpack semi flat colorful vector character stock illustration

Concept art of the game world



Figure 13: antonmoek. 2018. Polygonia Low Poly City Pack.

Overall, you will see a grided creation for the small town/city we have decided upon. This is merely concept art to help indicate how we will individually section each part of the city to help the player grow from one section to another starting off with a small suburban location at number 1 up until number 4 where you will get more into the city area of where your trucks must go. With each sections comes more consumptions and choices to be made by the player.

Description of sound effects, music etc.

The background music will be sounds of a busy town that is highly active.

There will be sound made by the truck as it drives around to locations that need to be cleaned and repaired.

There will be sound added to the construction and the maintenance of the pipes

There will be sound to indicate the happiness and anger of the town and city

There will be sound to indicate the completion of the task at hand and any notifications that will be given to the player.

Possible examples sounds that are being used (Not concrete):

City sound busy effect for in game: <https://www.youtube.com/watch?v=LZbElxhiJRM>

City background music playing gently: <https://www.youtube.com/watch?v=oAOrrI8fCUk>

Truck arrives horn: <https://www.youtube.com/watch?v=Fpi8ze69NBs> (will cut out sample)

Construction noise effect: <https://www.youtube.com/watch?v=7QcABTg4VtI>

Happy sound effect: <https://www.youtube.com/watch?v=TdPk5-nT-aE>

Unhappy/Anger sound effect: <https://www.youtube.com/watch?v=VRECg42otTs>

Completion of task: [Chime | Royalty-free Music - Pixabay](#)

Notification sound: [Notification | Royalty-free Music - Pixabay](#)

Creation of game in XBCG7312

Title of the game:

Our City Our Water

The issue and the communities we are addressing.

Our City, Our Water is an innovative simulation and strategy game that immerses players in the critical challenges of managing the water supply systems in a certain region. Designed to educate and inspire, the game combines realistic expectations with engaging survival mechanics, pushing players to make tough decisions on where they would need to either fix and lead their company to ensure access to clean, sustainable water.

With an emphasis on strategy, money management, and expansions, the game challenges players to tackle the water crisis while navigating the economic growth and pressures of a need for clean drinking water. This thought-provoking experience is tailored for an audience of 21 years and older, empowering them to connect with the importance of water conservation and sustainable practices in a deeply personal way.

Genre

- Primary Genres: Simulation, Strategy, Survival
- Themes: Environmental awareness, civic responsibility, and socio-economic challenges.

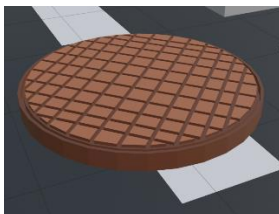
Target Audience

- Primary Audience: Adults aged 21 and older, particularly those interested in strategy games, civic responsibility, and environmental advocacy.
- Demographics: Educated, socially conscious individuals who enjoy intellectual challenges and making a positive impact through gaming.

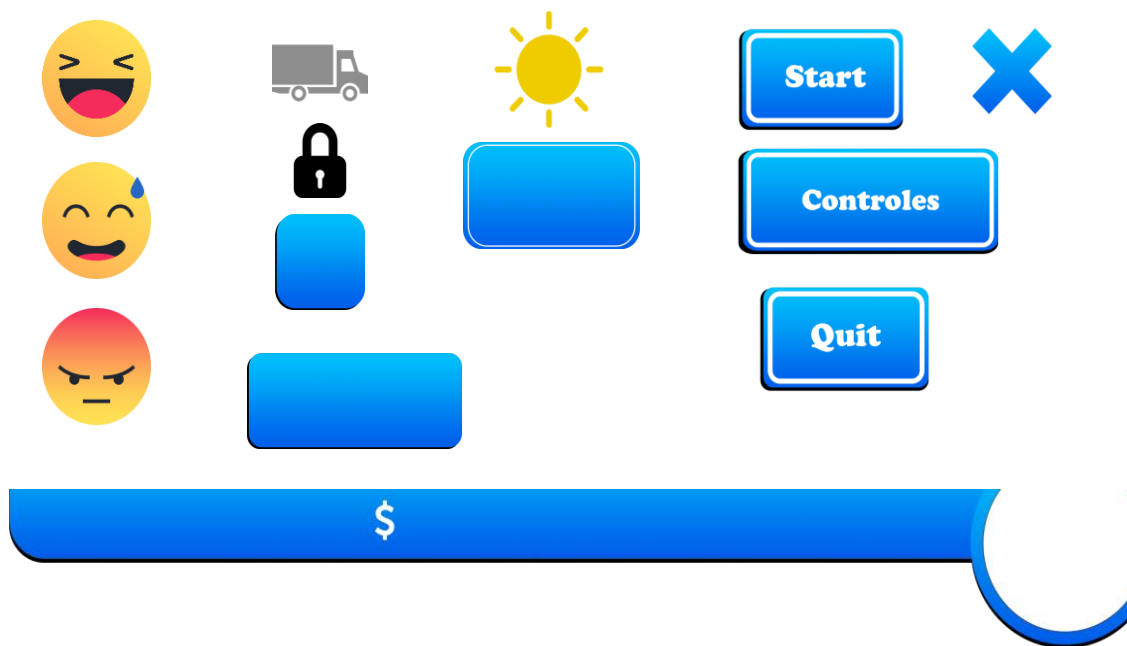
Assets and Characters in the game:



As you can see we added a variety of buildings and foliage and different roads to give the feel of a busy, yet growing city, broken up into different sections over the game to amplify the idea of growth.



For our trucks and manholes, we kept the tone lighter and a bit more focusable on what truck is meant to be sent out and how each of them are unique between one another based upon their numbers. This essentially brings the player to see in real time where and how the trucks are doing.



In terms of UI elements, we took a comprehensive approach, combining the custom designs from a variety of websites into singular user-friendly components. This mix allowed us to create a cohesive and unified style across all aspects of the design and implementation within the game. The goal was to offer a UI that felt both familiar and fresh, allowing players to instantly feel connected with the game world through clear and visually appealing elements.

Each item on the UI serves a specific purpose, with its own strengths and weaknesses, encouraging players to interpret their unique connection with the game. This connection relies heavily on the visual representation of each element, where images and icons function as intuitive symbols. We wanted players to instantly recognize what each element represents in relation to their gameplay experience, reducing the need for explanation and promoting immersion.

Game rules, specs and instructions to players

Game core rules:

- **Water Infrastructure Management:**
 - Players oversee the development, maintenance, and upgrades of water infrastructure, including pipelines, reservoirs, desalination plants, and wastewater treatment facilities.
- **Manhole and Repair Management:**
 - Players must inspect and maintain manholes to prevent leaks, contamination, and blockages. Failure to do so leads to public dissatisfaction and increased costs.
- **Economic Strategy:**
 - Players manage budgets by allocating funds to repairs, expansions, staff training, and research into sustainable technologies.
- **Water Quality Monitoring:**
 - Introduce mechanics for measuring water quality across regions, requiring actions to improve cleanliness through advanced filtration, chlorination, or sustainable solutions.

Game Objectives

Primary Goal:

Ensure the city has access to a sustainable and clean water supply while maintaining economic stability and citizen satisfaction.

Secondary Goals:

- Expand the water network to underserved areas.
- Optimize water distribution for growing populations.

Player Interactions

- **Decision-Making:**
 - Players make choices about where to allocate resources, which neighborhoods to prioritize, and how to balance costs and benefits.
- **Dynamic Events:**
 - Randomized events like droughts, floods, political interference, and protests force players to adapt quickly and make tough decisions.
- **Citizen Feedback:**

- A happiness meter reflects public sentiment based on water availability, quality, and response times to issues like broken manholes.

Progression System

Levels or Chapters:

The game progresses through increasingly challenging scenarios, such as starting in a small township and expanding to manage a metropolitan city.

Upgrades and Research:

Unlock advanced technologies (e.g., smart water meters, leak detection systems) or policy options (e.g., subsidies for water conservation) as players progress.

Survival and Strategy Integration

Resource Management:

Players manage limited water resources during droughts, balancing supply between residential, industrial, and agricultural demands.

Long-Term Planning:

Players must account for climate change and urbanization, ensuring their infrastructure can meet future demands.

Key Performance Indicators (KPIs)

- Water quality index: Measures how clean and safe the water supply is.
- Public satisfaction: Reflects citizen happiness and trust in the player's management.
- Financial stability: Tracks the balance between revenue (e.g., water tariffs) and expenses (e.g., repairs, expansions).
- Environmental impact: Monitors pollution levels and sustainability practices.

Victory Conditions

- Victory is more focused on the survival time of the player and maintaining high water quality standards over the surviving period.
- Keep citizen satisfaction above threshold to survive.
- Achieve financial growth by expanding services and balancing costs effectively.

Penalty Systems

Neglecting infrastructure leads to increased costs, public dissatisfaction, and potential game-over scenarios like being fired as the city's water manager.

Replay ability and Difficulty Scaling

Multiple difficulty expansions provide challenges for new and experienced players.

Optional goals and achievements encourage replayability (e.g., zero water wastage or 100% satisfaction).

Unique Selling Points (USPs)

- Real-world relevance to South Africa's water crisis.
- Blend of survival mechanics and strategic planning.
- A focus on community happiness and sustainable practices.
- Educational insights into water management and environmental conservation.

Instructions to players:

How will we talk to the player?

Taking them to a separate scene from our main gameplay scene where they can practice first. (Ask the player again when another game starts if they want to play the tutorial again.). Action type of sequence with UI Prompts to explain things – meaning the tutorial will give the player a prompt and with that prompt the user will need to follow an action and when complete they will move on to the next prompt.

What are we looking into on our tutorial level?

1. Controls

- Click and drag to move around in the 2d area – make the player move around along the x and y and track them for a certain amount of area
- Right click to pan around city – track the usage of the right mouse when panning the city and track the usage for a certain amount of time
- End goal: move around to look at each of the manholes

2. Buying trucks

- Buy a truck from the UI – let the player click the button to buy a few trucks to see where the button is located

3. Buying upgrades

- Click on manholes to upgrade them – user will need to click, upgrade and close on a few manholes to upgrade them and get them used to it

4. Expansions

- Force player to watch expansion – when the prompt comes up an expansion will be forcefully shown to the player, letting them move around and see the new manholes

5. Buying upgrades for trucks (End of Tutorial)

- After all trucks are bought and have 1 expansion (minimum requirements) and then allow upgrade trucks – let the player buy all the trucks and then a new UI will pop up to allow upgrade of trucks in which the player will have to upgrade them a few times to see

how they change and upgrade until level 3 for expansion 1 of the map(hint to the player that they can upgrade the trucks to level 5 when they have the 2nd expansion)

- Throw the player into the game – when the player has gone through the tutorial, they are automatically thrown into the game scene

Idea:

Cap the number of upgrades of trucks to level 3 for expansion 1 and to level 5 for expansion 2

Player Test Report

Player Test Report 1: Corbin

Corbin found the game to be exciting and easily understandable, but a bug was received when he was able to look under into the ground of our city, meaning our camera limitation code wasn't implemented structurally and caused him to lose time on fixing the camera. We noted this bug and therefor introduced a more robust camera into the scene that collides with the floor rather than allowing it to peak down into the ground.

Player Test Report 2: Nasser

Nasser found the game to be a breath of fresh air, but what bothered him was the one bug with the trucks in which some had a hard time finding their way back and taking longer than expected. This bug was noted and taken care of by recalculating the ai's navigation function we were able to fix the problem and allow the trucks to choose the fastest traveling option.

Minimum system requirements

For PC:

- **Operating System:** Windows 7 SP1+, Windows 8, Windows 10, or newer (64-bit only); macOS 10.13 High Sierra or newer.
- **Processor:** Intel Core i3-6100 / AMD FX-6300 or equivalent.
- **Memory (RAM):** 4 GB RAM.
- **Graphics Card:** Integrated graphics like Intel HD Graphics 520 or equivalent. Dedicated GPUs like NVIDIA GeForce GTX 460 or AMD Radeon HD 5770 are preferable for smoother performance.
- **Storage:** 2-4 GB of available space.
- **DirectX Version:** Version 10 or higher.
- **Additional Software:** Unity Player dependencies (installed automatically with the game).

For Mobile:

- **Operating System:** Android 5.0 (Lollipop) or later; iOS 11.0 or later.
- **Processor:** ARM Cortex-A53 or equivalent (mid-range modern devices).
- **Memory (RAM):** 2 GB RAM.
- **Graphics API:** OpenGL ES 3.0 / Metal.
- **Storage:** 500 MB - 1 GB of available space.

Objectives of the game

- **Raise Awareness:** Highlight the dire state of South Africa's water infrastructure and the socio-economic impact of water scarcity.
- **Inspire Action:** Empower players with knowledge and practical solutions to take action in real life.
- **Engage Emotionally:** Foster a deep emotional connection to the importance of water conservation through personal and community-driven narratives.

Potential Additions

- **Historical Context Mode:** Explore the history of water management in South Africa and how past policies shaped current issues.
- **Interactive Community Projects:** Players can organize educational campaigns, clean-up drives, or fundraisers to improve community morale and reduce water wastage.
- **Climate Simulation:** A long-term game mode simulating the impact of climate change on water availability over decades.

Referencing

Adobe stock. 2024. *Modern water supply and sewerage system. Underground pipeline works. Water supply and wastewater disposal of a residential city. Close-up of underground utilities. View from the big pipe.* [Online]. Available at: <https://stock.adobe.com/za/images/modern-water-supply-and-sewerage-system-underground-pipeline-works-water-supply-and-wastewater-disposal-of-a-residential-city-close-up-of-underground-utilities-view-from-the-big-pipe/550245457> [Accessed 17 March 2024].

Alamy. 2010. *Concrete pipes transported on the M40 motorway, Warwickshire, UK.* [Online]. Available at: <https://www.alamy.com/concrete-pipes-transported-on-the-m40-motorway-warwickshire-uk-image375329548.html?imageid=7EEBF22E-608E-4728-B054-D676490D1B32&p=14086&pn=1&searchId=ebb7d3f1696bbe5ebfb21904b785ffa1&searchtype=0> [Accessed 17 March 2024].

antonmoek. 2018. *Polygonia Low Poly City Pack.* [Online]. Available at: <https://sketchfab.com/3d-models/polygonia-low-poly-city-pack-432dd12039064cc1b8bea41ea38b4e2c> [Accessed 17 June 2024].

Big Long Truck Horn Sound Effect. 2015. Youtube video, added by Xylote.com. [Online]. Available at: [Big Long Truck Horn Sound Effect](#) [Accessed 01 November 2024]

Cape Town Today. 2024. *Emphasising the Necessity of Scheduled Water Supply Maintenance in Urban Development.* [Online]. Available at: <https://capetown.today/emphasising-the-necessity-of-scheduled-water-supply-maintenance-in-urban-development/> [Accessed 17 March 2024].

City sound effect 1 - downtown. 2012. Youtube video, added by TheMSsoundeffects. [Online]. Available at: [\(154\) City sound effect 1 - downtown - YouTube](#) [Accessed 01 November 2024].

construction site sound effect. 2020. Youtube video, added by Yuna Espinosa. [Online]. Available at: <https://www.youtube.com/watch?v=7QcABTg4VtI> [Accessed 01 November 2024].

Dylan Sitts - Gentle Echo (Royalty Free Music). 2023. Youtube video, added by Epidemic Lounge. [Online]. Available at: [Dylan Sitts - Gentle Echo \(Royalty Free Music\)](#) [Accessed 01 November 2024].

finn.appleton (Freesound). 2024. *Notification. [Sound Recording].* Available at: [Notification | Royalty-free Music - Pixabay](#) [Accessed 01 November 2024].

First response Drainage. 2024. *When Should you Contact a Drain Repair Company?.* [Online]. Available at: <https://www.firstresponsedrainage.co.uk/how-to-know-if-you-need-a-drain-repair-company/> [Accessed 17 March 2024].

ikonochris (Freesound). 2024. *Chime.* [Sound Recording]. Available at: [Chime | Royalty-free Music - Pixabay](#) [Accessed 01 November 2024].

Indie DB. 2014. *Small Chronicles.* [Online]. Available at: <https://www.indiedb.com/games/small-chronicles/images/updated-store-ui> [Accessed 17 March 2024].

Lesso. 2024. *The Ultimate Revelation of Water Supply Pipe.* [Online]. Available at: <https://en.lesso.com/blogs/water-supply-pipe-revelation/> [Accessed 17 March 2024].

lol. 2024. *Are sure your car is insured for riots?*. [Online]. Available at: <https://www.iol.co.za/motoring/industry-news/are-sure-your-car-is-insured-for-riots-2037685> [Accessed 17 March 2024].

Masilela, B. 2023. *Hammanskraal water crisis is not new, it is 16 years in the making*, 23 May 2023. [Online]. Available at: [TIMELINE: Hammanskraal water crisis is not new, it is 16 years in the making \(iol.co.za\)](https://www.iol.co.za/news/south-africa/hammanskraal-water-crisis-is-not-new-it-is-16-years-in-the-making-20230523) [Accessed 20 March 2024].

Mike. 2024. *Improving the water supply network for the city of Szeged*. [Online]. Available at: <https://www.mikepoweredbydhi.com/global/references/emea/overview/improving-the-water-supply-network-for-the-city-of-szeged> [Accessed 17 March 2024].

My Broad Band. 2023. *The false narrative about South Africa*. [Online]. Available at: <https://mybroadband.co.za/news/investing/504768-the-false-narrative-about-south-africa.html> [Accessed 17 March 2024].

Nesterenko, N. 2023. *Overweight man eyeglasses happy 2D cartoon character stock illustration*. [Online]. Available at: <https://www.istockphoto.com/vector/overweight-man-eyeglasses-happy-2d-cartoon-character-gm1804570439-548759536> [Accessed 17 June 2024].

Nesterenko, N. 2023. *Cheerful successful man semi flat colorful vector character stock illustration*. [Online]. Available at: <https://www.istockphoto.com/vector/cheerful-successful-man-semi-flat-colorful-vector-character-gm1614303164-531173170> [Accessed 17 June 2024].

Nesterenko, N. 2023. *Female hiker travelling with backpack semi flat colorful vector character stock illustration*. [Online]. Available at: <https://www.istockphoto.com/vector/female-hiker-travelling-with-backpack-semi-flat-colorful-vector-character-gm1491279997-515673116> [Accessed 17 June 2024].

News24. 2024. *Water relief: Cape Town's bulk maintenance operation over, taps being turned back on slowly*. [Online]. Available at: <https://www.news24.com/news24/southafrica/news/water-relief-cape-towns-bulk-maintenance-operation-over-taps-being-turned-back-on-slowly-20220919> [Accessed 17 March 2024].

Nkwonta, O.I and Ochieng, G.M. 2009. *Water Pollution in Soshanguve Environs of South Africa*, *World Academy of Science, Engineering and Technology* 32. [Online]. Available at: https://www.academia.edu/70828193/Water_Pollution_in_Soshanguve_Environs_of_South_Africa [Accessed 20 March 2024].

Plumber to your door. 2022. *underground pipes, blockages*. [Online]. Available at: <https://plumbertoyourdoor.com.au/blog/what-causes-underground-pipe-damage-.html> [Accessed 17 March 2024].

pvc pipe fitting. 2024. *What Types of Pipes Are Used for Underground Water Supply Lines?*. [Online]. Available at: <https://www.pvcpipefitting.com/what-types-of-pipes-are-used-for-underground-water-supply-lines/> [Accessed 17 March 2024].

ShutterShock. 2009. *Big truck with flatbed trailer hauling plastic pipe*. [Online]. Available at: <https://www.shutterstock.com/image-photo/big-truck-flatbed-trailer-hauling-plastic-37883971> [Accessed 17 March 2024].

Shutterstock. 2016. *Set of smile emoticons isolated on white background. Line icons emoticons. Happy and unhappy smileys. Emoji set. Green and red color. Vector illustration.* [Online]. Available at: <https://www.shutterstock.com/image-vector/set-smile-emoticons-isolated-on-white-391280212> [Accessed 17 March 2024].

Sswm.2024. *Water Distribution Pipes.* [Online]. Available at: <https://sswm.info/sswm-university-course/module-2-centralised-and-decentralised-systems-water-and-sanitation-1/water-distribution-pipes> [Accessed 17 March 2024].

Stoll, D. 2022. *Water Crisis in South Africa: Causes, Effects, And Solutions*, 05 October 2022. [Online]. Available at: [Water Crisis in South Africa: Causes, Effects, And Solutions \(earth.org\)](https://www.earth.org/water-crisis-in-south-africa-causes-effects-and-solutions) [Accessed 20 March 2024].

Swaraja. 2021. *South Africa Riots: Indian High Commission In Touch With South African Govt To Ensure Safety Of Indian Community.* [Online]. Available at: <https://swarajyamag.com/news-brief/south-africa-riots-indian-high-commission-in-touch-with-south-african-govt-to-ensure-safety-of-indian-community> [Accessed 17 March 2024].

The Conversation. 2023. *The family home in South African townships is contested – why occupation, inheritance and history are clashing with laws.* [Online]. Available at: <https://theconversation.com/the-family-home-in-south-african-townships-is-contested-why-occupation-inheritance-and-history-are-clashing-with-laws-213100> [Accessed 17 March 2024].

Wii Sports - Groan Sound Effect. 2018. Youtube video, added by SiL3nt BULLet. [Online]. Available at: [Wii Sports - Groan Sound Effect](https://www.youtube.com/watch?v=SiL3ntBULLet) [Accessed 01 November 2024].

Wii sports wow. 2021. Youtube video, added by Nor skie. [Online]. Available at: [Wii sports wow](https://www.youtube.com/watch?v=WiiSportsWow) [Accessed 01 November 2024].

You press. 2011. *Riots: A wake up call for the black community.* [Online]. Available at: <https://yopress.org.uk/riots-a-wake-up-call-for-the-black-community/> [Accessed 17 March 2024].