Project
passionfruit

INTERACTIVE PRODUCT DESIGN STUDIO

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INTRODUCTION

For this project we will be undertaking research and generating initial concepts around Augmenting Urban Experiences, however we have decided to take an in depth focus on environmental impact. What we want to explore is how various data points surrounding environmental impacts from human behavior (waste, transport, energy etc.) Can be visualised through day-to-day interactions in public spaces.

We will do this through generating basic concepts surrounding the augmentation of existing public area interactions and in some concepts even propose new methods of interactions in these spaces. The overall objective of this project is to be able to provide information to a user about the space they are occupying through well considered interactions.
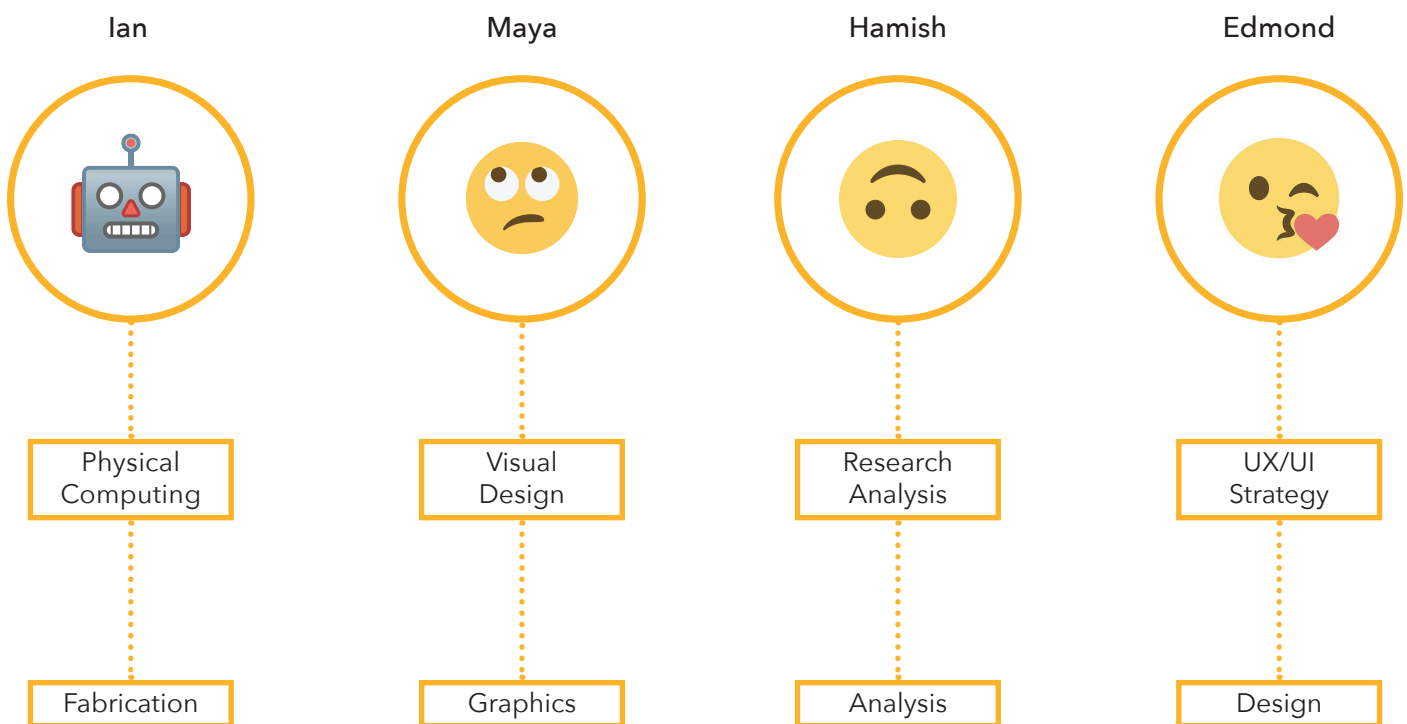
Augmenting Urban
Experiences

Public Areas

Visualising Localised
Information

VISUALISING
ENVIRONMENTAL
IMPACT

GROUP CHARTER

As shown below our team, The Passion Fruit Project, has a diverse range of skills to draw methods and approaches from. We will work towards ensuring our project stages are completed in a timely and high quality manner. We will do this by maintaining certain rules and guidelines for our team members to ensure we achieve effective communication and maximise the diverse skills each member has to offer.

Ian	Maya	Hamish	Edmond
Physical Computing	Visual Design	Research Analysis	UX/UI Strategy
Fabrication	Graphics	Analysis	Design

We will ensure transparent and easy collaboration of work by using google docs to compile our work. We will use FB messenger to communicate along with email. Work will be allocated based on skill in certain areas and even workload distribution.

FB Messenger	Google Drive	Skill	Share of Work

CONCEPT - DOGITAL

Waste littering is a major issue which impacts the purity of waterways and cleanliness of streets. Common activities can raise bad habits which can lead to these problematic practices without users understanding what impact they are actually making. Over 38% of Australian households own pets which results in lots of waste. Waste which is not picked up can lead to contaminated waterways and the overuse of plastic bags leads to lots of landfill space, both of which are not good for the environment.

To promote proper waste collecting practices, we have conceptualised the Dogital, a re-designed dog bin to make throwing away dog waste more user friendly whilst raising awareness on alternative methods on throwing away dog waste to help the environment.

Implementation of the Dogital could be widespread with applications for may public parks with the support of local councils. The Body of the installation could be made from a composite ABS Aluminum such a Dia bond commonly found on the exterior of commercial buildings. It's low cost and high weather resistance would help keep down unit costs for such an installation. Low cost sensors and controls built on the arduino platform would keep development costs down. The back lighting could be achieved with low cost LED strings and similarity used for the capacity display. The increasingly low cost for LED screens would make implementing the display very achievable.

CONCEPT - DOGITAL

Problem
Dog waste littering contaminating waterways, the overuse of plastic bags for picking up dog waste and the lack of digital components with dog bins.

Solution
Re-design dog bins to make throwing away dog waste more user friendly whilst raising awareness on alternative methods on throwing away dog waste to help the environment.

The Dogital: A bin which is improved by digitising components to make the experience more user friendly to encourage and promote proper dog waste practices.

Justification
• Dog walkers face multiple struggles when walking their dog such as:
• Not being aware of where bins are located to throw away their waste
• Having bins be overfilled
• Unhygienic methods on throwing out their waste
• Thinking that using plastic bags is the only/most environmentally friendly option they have

Although the health risks associated with not picking up dog waste is not a primary concern with littering, it is important to encourage habits where dog walkers pick up their dogs waste and trash's them appropriately as it promotes a clean environment. When the average user then establishes that habit, they can then take the next step to dispose of their dogs wastes in more ecological methods to reduce plastic bag usage and landfill space.
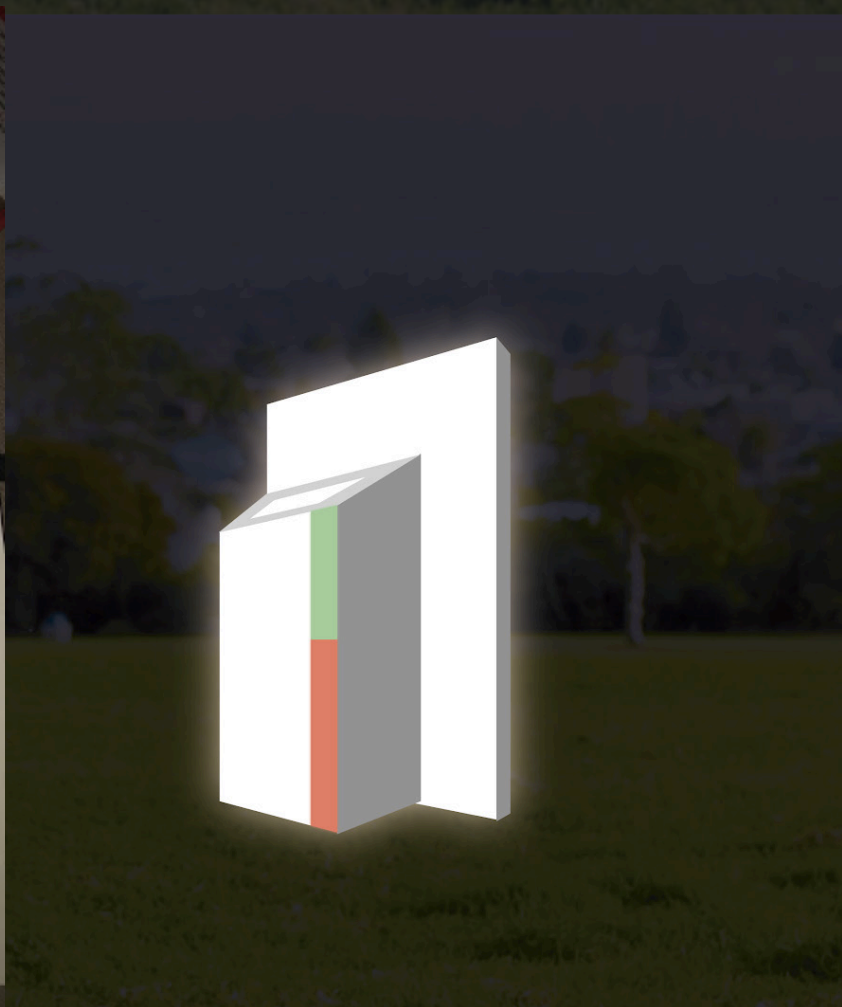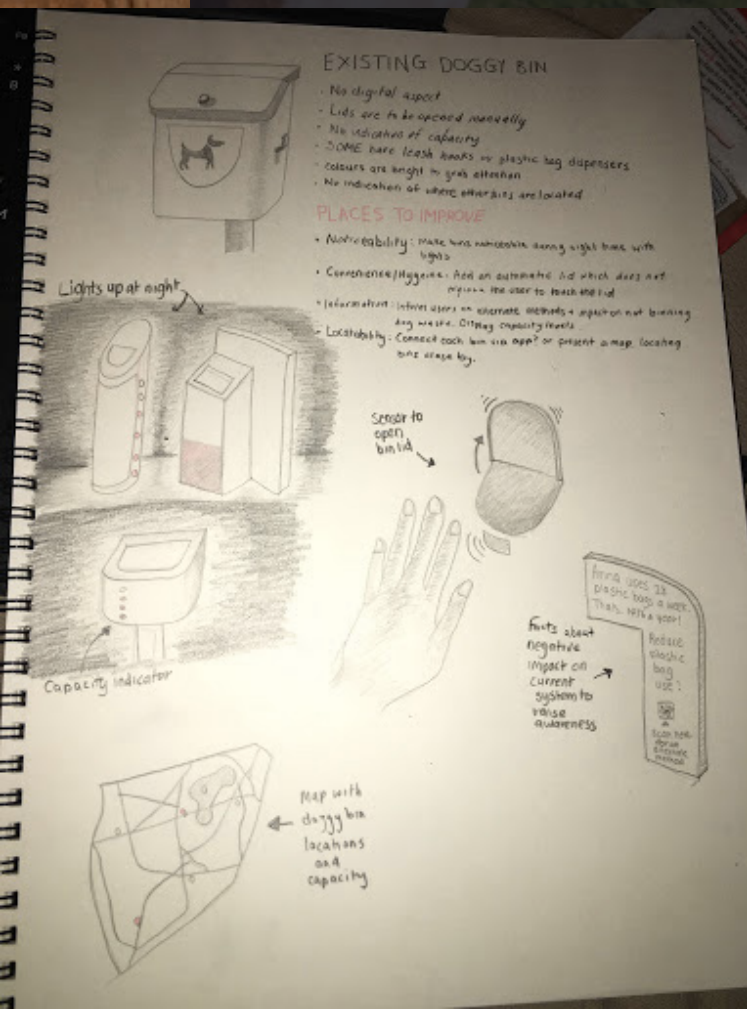
Features of New Dog Bin
Lights to indicate bins current capacity
Sensors to open bin to dispose trash
Map of area with lights to represent bins within the space and each bins current capacity.
Screen to promote/bring awareness to ecological disposal methods of dog waste.
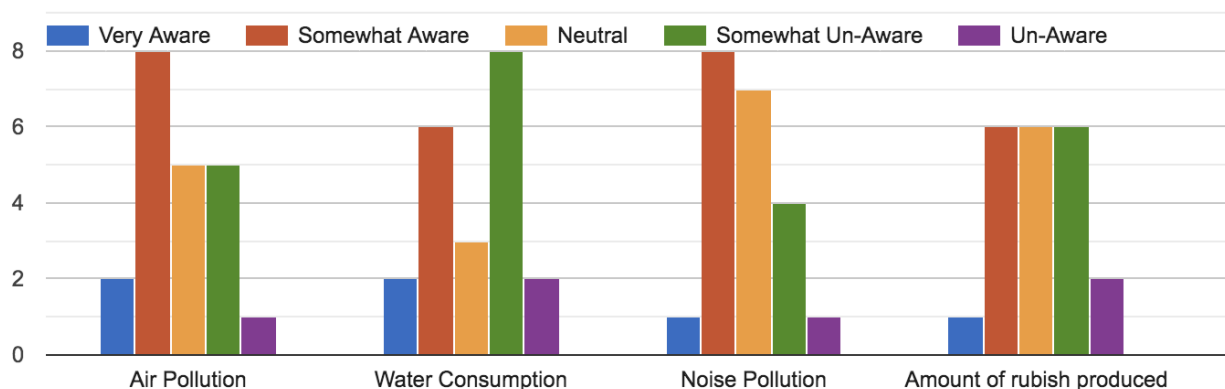
CONCEPT - THE ISSUE WALL

Environmental Awareness exactly refers to the state of being aware of the natural environment and making choices that would benefit - rather that hurt the earth.
In reflecting on the overarching issue of environmental impact, it can be recognised that the first step in approaching this problem is through awareness. Individuals and the greater community must first have astute understanding of the fragility of our environment and the importance of its protection before solution creation can take place. (Pachamama Alliance, 2019)

Furthermore, in analysing public opinion due to the increasing interconnectedness of the world. Through the internet and social media, individuals are gradually becoming for knowledgeable and concerned about matters that impact the environment.

- In 2007-08, 82% of Australian adults (12.8 million people) reported that they were concerned about at least one environmental problem.
- Over half of adults (53%) said they thought the natural environment was declining.
- In 2007-08, almost three-quarters (73%) of adults said they were concerned about climate change. (Australian Social Trends, 2010)

How aware of the following issues do you feel people in your city are.

CONCEPT - THE ISSUE WALL

Through our user research we discovered that the majority of individuals averaged in the somewhat-aware category in regards to issues in their own city. From this inferring information from our background research, it highlights the fact that individuals seem to place more importance on global environmental incidents rather than problems in their own community.

Problem
With digitalisation of majority of the world's information, there a millions of present information about environmental issues but what are the ones that are truly meaningful to users in their present society.

The Issue wall aims to be a modern take on a centralised network of information, utilising projection based format to engage and highlight users while they are commuting. The installation utilises web article headlines to showcase pressing environmental issues, shared by users to the wall.

Data Input
Present day web articles collected from the internet / User articles shared to the wall.

Interactions
• Collective projection of present environmental issues in society.
• Users can interact with the links as well as read the web articles.
• Users can share articles they feel are important.
• Users can also interact with an app, where they can keep in touch with the problems being shared.

Technology
Hardware: Kinect camera Hardware / Projector / Digital display / Phone
Software: Internet connection / Processing /

When utilising the Xbox Kinect for our concept we were envisioning a 4 step process:

1. Firstly the users would walk into the range of the Kinect where depth sensors chips would measure the distance the light travels.
2. From this the information would create a depth map that perceives users interactions and movements.
3. This would then be sent to our projection and digital interface, initialized through the Processing language.
4. Finally from there the product will be coded to enable user data points to be shared to the projection on the wall.

CONCEPT - THE ISSUE WALL

Issue wall - Interactive projection based installation artwork
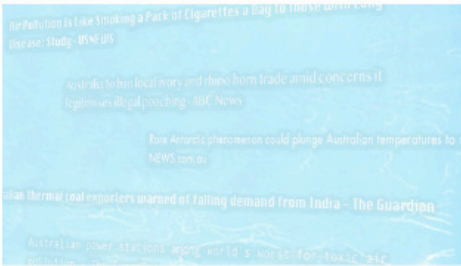
Individuals walk by a wall where their attention is caught by present news headliens.
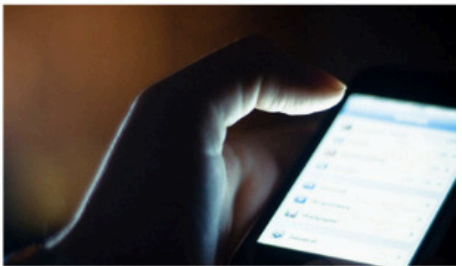

Users can walk up to the wall and interact with the multiple issue links on the wall.
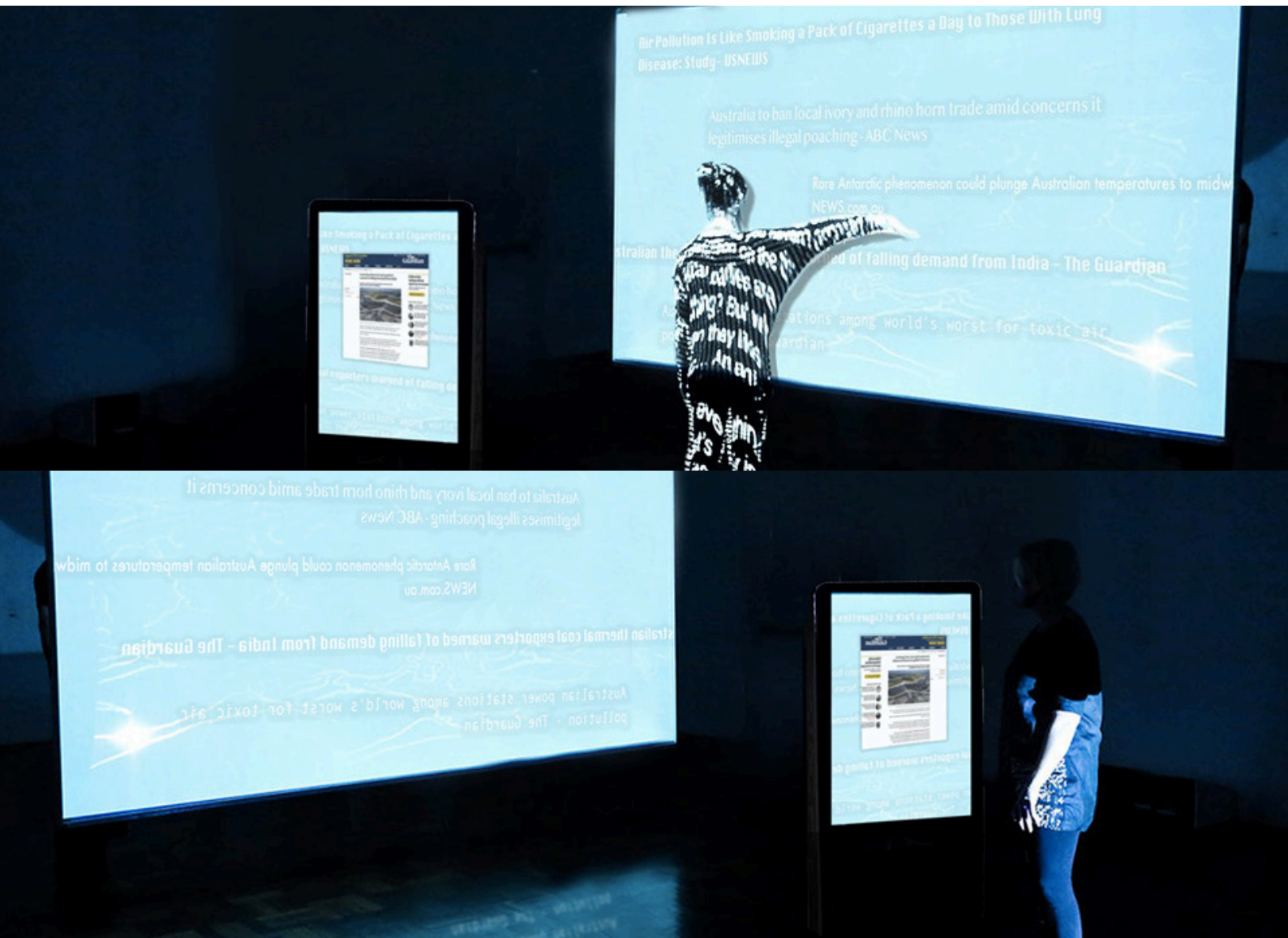

User also interacts with the digital display and interact with the links.

Users select the links on the display and start reading pressing environmental problem articles.

Users can also use social media to share articles to the wall which they feel are important. as well as using the issue wall app to keep reading other articles.

CONCEPT - THE BREATHING TREE

According to the World Health Organisation - Ambient air pollution, made of high concentrations of small and fine particulate matter, is the greatest environmental risk to health—causing more than 3 million premature deaths worldwide every year.

"Air pollution is a major cause of disease and death. It is good news that more cities are stepping up to monitor air quality, so when they take actions to improve it they have a benchmark. When dirty air blankets our cities the most vulnerable urban populations—the youngest, oldest and poorest—are the most impacted."
Dr Flavia Bustreo, WHO Assistant-Director General, Family, Women and Children's Health.

According to our user research 66% of our respondents. Consider air pollution to be either a very important or somewhat important issue in urban areas. A report by The Australian Institute of Health and Welfare in published 2007 reported that there were close to 3000 deaths as a result of urban air pollution in 2003. More than double the number of road fatalities in the same year.

Despite the considerable health risks posed by air pollution 47% of respondents in our survey felt that people where only 'somewhat aware' of the issue of air pollution and 52% of respondents were neutral or Unaware of the issue.

CONCEPT - THE BREATHING TREE

Solution
Dynamic lighting display built on trees in public spaces. The installation changes colour in response to the local air pollution levels. The lights fade in and out in a breathing pattern that runs up and down the tree. The intensity of the breathing pattern responds to people in the vicinity.

Interaction: Breathing pattern increases with movement, Observe colour change in response to pollution levels.

The colour of the lights hanging in the tree would change colour in response to the air pollution levels in the immediate vicinity of the tree. Moving from Green - Blue - Yellow - Red as the pollution level increases. This is designed to serve as a constant reminder to those in the area of the impact of the air they are breathing.

The lights will fade gently in and out in response to the amount of movement in the trees immediate vicinity. When there is high activity the rate and intensity will increase. When activity is lower or people are mostly still the rate and intensity will decrease. The goal is to increase people's connection with these trees and give them a personality and a dynamic presence.

Hopefully this will encourage us to protect our urban green spaces and build new ones. To encourage communities to lobby and support initiatives that improve their environments.

Technology: Arduino, pollution sensors, RGB LED, Laser or ultrasonic sensor.
Location: Indoor plants, or larger installation on outside trees.

Feasibility
Implementation of the breathing tree could be expansive with applicability in many urban areas. It could be easily installed on any tree without damaging the host tree using temporary fixing.
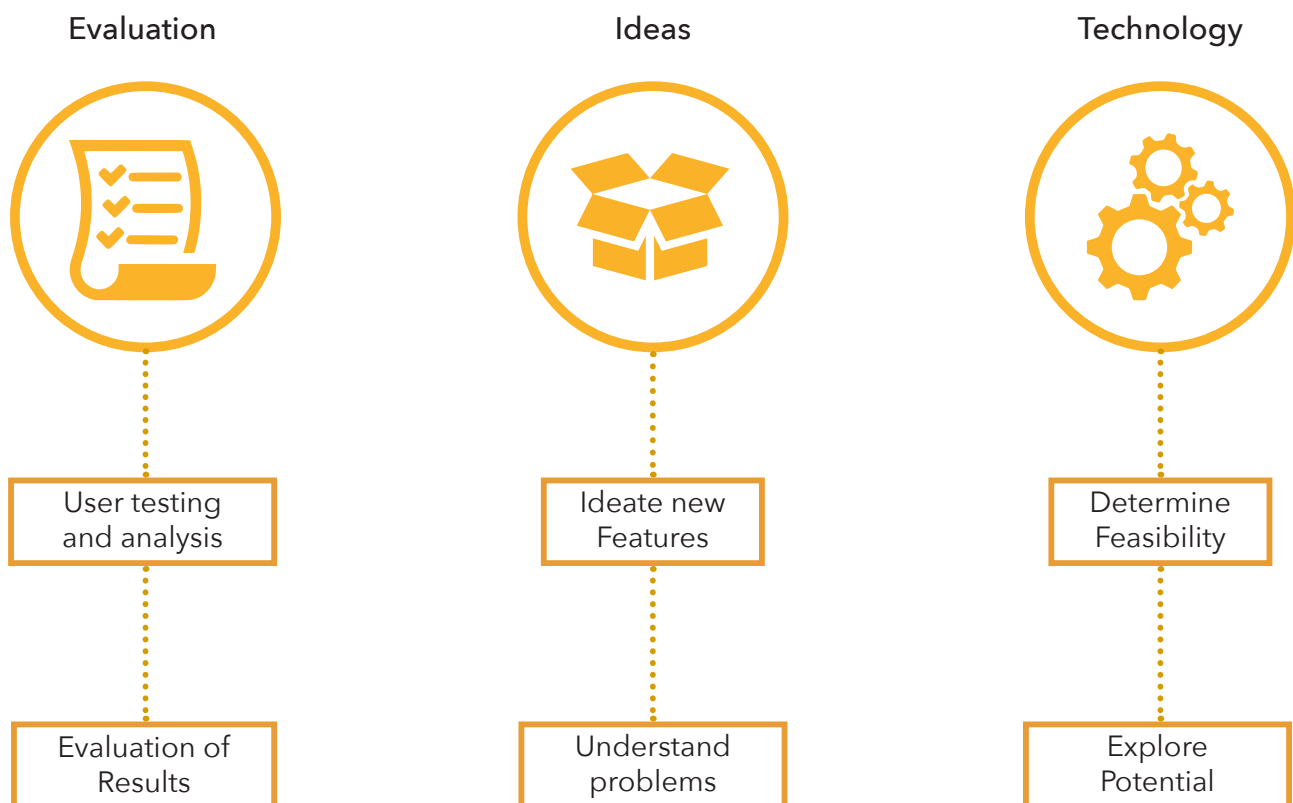The main control system and sensors would be housed in a generic weatherproof casing available for similar exterior electrical installations. Using an arduino controller and low cost ultrasonic sensors for motion and particle detectors for air pollution levels we are able to keep implementation costs low. The arduino environment with access to extensive libraries and community projects should make development easy. The cost and feasibility of hanging lights would depend on the access and size of the tree. However there are many existing exterior rated addressable RGB lighting products available for relatively low costs.

REFLECTION - NEXT STEPS

Following this initial work on our concepts, it is now important that we test these ideas to determine their quality. This will involve a range of user testing and evaluative methods. Following from this it will be essential for us to iterate our preferred and most effective concept in order to remove design flaws and maximise its value. Finally, we will have to do further research into the required technology to ensure a funtional prototype is both feasible and viable.

Evaluation	Ideas	Technology

| User testing and analysis	Ideate new Features	Determine Feasibility
Evaluation of Results	Understand problems	Explore Potential

APPENDIX

Discontinued Concept - What if?

This concept uses AR to show users, through a large screen in a public space, what an area might look like under certain environmental pressures. The user will be able to interact with this screen by changing certain variables, such as time, personal energy consumption, Co2 emissions, etc. Each of these variables will change the way the image is augmented. The goal of this concept is to show the effects of certain lifestyle decisions on the environment both today and in the future.

Interactions: Touch screen (sliding scales)
Technology: AR, Kiosk style vertical display (TV screen)
Functionality: Camera on the back of the screen will capture a live image of the area, which is then modified through AR depending on how a user adjusts the controls
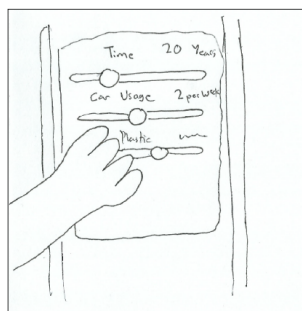
1. Normal Activity   **2. Discovery**   **3. Interaction**   **4. Result**
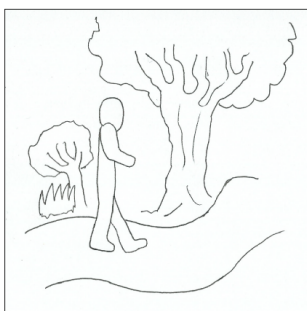
User is walking through a public park
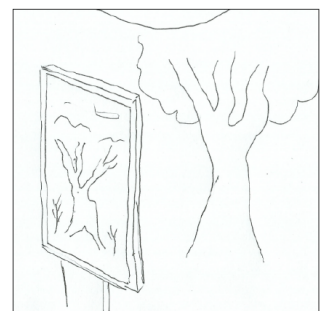
They come to a display screen. The screen appears to be showing the background directly behind it
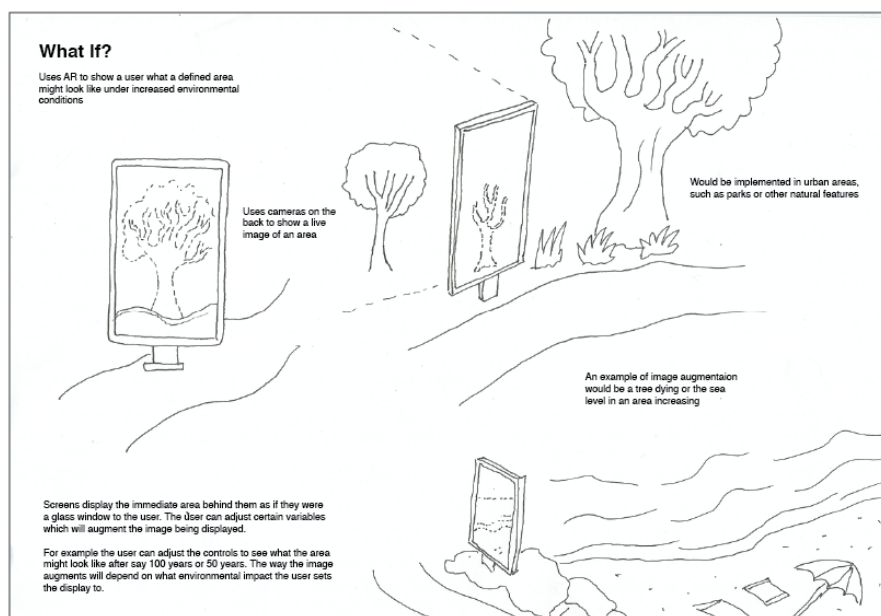
There a number of variable controls the user can adjust

The AR image will change depending on what changes the user has applied

What If?

Uses AR to show a user what a defined area might look like under increased environmental conditions

Uses cameras on the back to show a live image of an area

Would be implemented in urban areas, such as parks or other natural features

An example of image augmentation would be a tree dying or the sea level in an area increasing

Screens display the immediate area behind them as if they were a glass window to the user. The user can adjust certain variables which will augment the image being displayed.

For example the user can adjust the controls to see what the area might look like after say 100 years or 50 years. The way the image augments will depend on what environmental impact the user sets the display to.

APPENDIX

Market Examples - The Issue Wall Concept
- Sakura Festival World Square
- Utilises technological interactions to engage users about events occurring in the community.
- Users can walk up to a play area which is linked to a video feed and large led screen where they can play interactive games.
- The interactions are fairly similar to the issue wall, as well as the fact that it utilises the same technology Xbox Kinect. The differences are mainly that the projections is elevated and that it has been gamified. Hence from this we can infer that users have a high possibility of actually interacting with the Issue Wall.

Functionality- The Issue Wall Concept
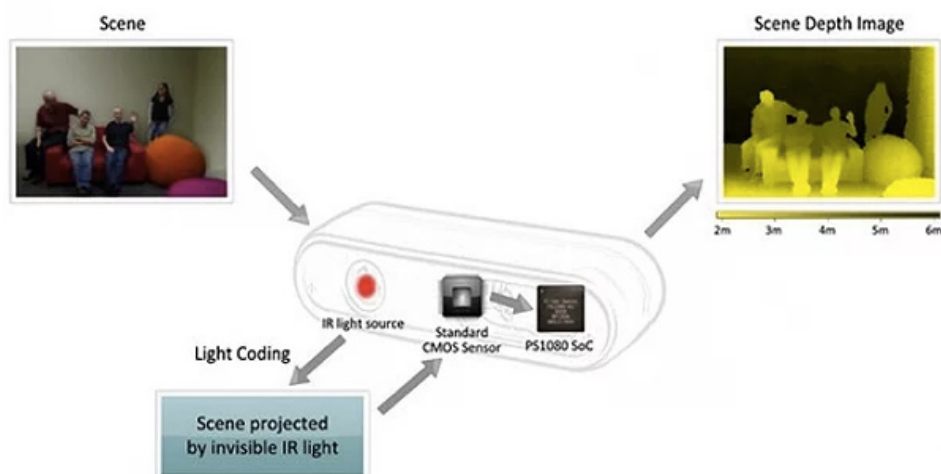
- Australia has one of the highest pet ownerships in the world.
  - 60% own pets. Estimated 62 million pets.
  - Dogs are most common pets with there being 38% of households with one (4.8 million)
  - NSW and Victoria has 60% of total pet population
  - Pet increase set to increase as 13% plan on getting a pet within the next year (2019)
  - There are over 4 million dogs in Australia each producing up to 100kg of waste annually.

From <https://www.bokashi.com.au/EnsoPet/Why+Compost+Pet+Waste.html>

- Increase of household pets/family pets has resulted in increased demands for dog-friendly public areas which also lead to the increase of more public surveillance when regarding concerns around dog aggression, feces, etc.
  - Concerns with dog waste:
    - Contamination of water/polluting waterways
    - Affecting marine life due to water contamination
    - General uncleanliness of areas
    - Transmitting disease to wildlife
    - Social relations and urban politics
- Problem with dog waste bins
  - Environmental impact of using plastic bags
    - All feces are sent to landfills which then do not decompose at an environmental rate.
    - A large amount of waste consists of inevitable plastic bags, taking up lots of landfill space.
    - Plastic bags ultimately encase the waste which can contain lots of disease and bacteria.
    - Bins eventually get full which deters people from throwing rubbish away
    - Smell coming from bins

  "Scooping not only creates humanised order; it is also a practice that maintains the right of dogs to (some) public space and the place of human–dog partnerships in urban cultural life"

- Current methods or solution
  - Encouragement to compost dog feces
    - Bokashi Composting Australia
- Dog waste littering

Problem

Waste littering is a major issue which impacts the purity of waterways and cleanliness of streets. Common activities can raise bad habits which can lead to these problematic practices without

users understanding what impact they are actually making. Over 38% of Australian households owns pets which results in lots of waste.

To promote proper waste collecting practices, we have conceptualised the Dogital, a re-designed dog bin to make throwing away dog waste more user friendly whilst raising awareness on alternative methods on throwing away dog waste to help the environment.

Solution
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- Dog walkers face multiple struggles when walking their dog such as:
  - Not being aware of where bins are located to throw away their waste
  - Having bins be overfilled
  - Unhygienic methods on throwing out their waste
  - Thinking that using plastic bags is the only/most environmentally friendly option they have
- Although the health risks associated with not picking up dog waste is not a primary concern with littering, it is important to encourage habits where dog walkers pick up their dogs waste and trash's them appropriately as it promotes a clean environment. When the average user then establishes that habit, they can then take the next step to dispose of their dogs wastes in more ecological methods to reduce plastic bag usage and landfill space.

Features of New Dog Bin
- Lights to indicate bins current capacity
- Sensors to open bin to dispose trash
- Map of area with lights to represent bins within the space and each bins current capacity.
- Screen to promote/bring awareness to ecological disposal methods of dog waste.

Survey Findings
Although with very limited survey results, key findings are:
- Users are using plastic bags
- Some users use "biodegradable bags" but relies on this due to no backgroudn research
- People are concerned about convenience and cost when it comes to investing in more ecological methods.
- Users believe that it is ok to leave dog waste when in natural environments
- Lights and safety a concern for users when going on nighttime walks
- Users are concerned about lack of bins located around areas and also smell and hard to find.

Problem

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To promote proper waste collecting practices, we have conceptualised the Dogital, a re-designed dog bin to make throwing away dog waste more user friendly whilst raising awareness on alternative methods on throwing away dog waste to help the environment.

Market Research
- Looking into solutions for this issue, there are not any which utilise any technology or contain any digital components. Although such a common part of many people's lives, the user experience of dog owners have been neglected proving in the lack of solutions for this issue.
- Alternative method to disposing dog waste
    - EnsoPet - a compost bin for dog waste
    - Users have to buy and plant it themselves but there is no technical aspect.
    - Not a very good solution for those who don't have time to take extra steps to recycle dog's waste.
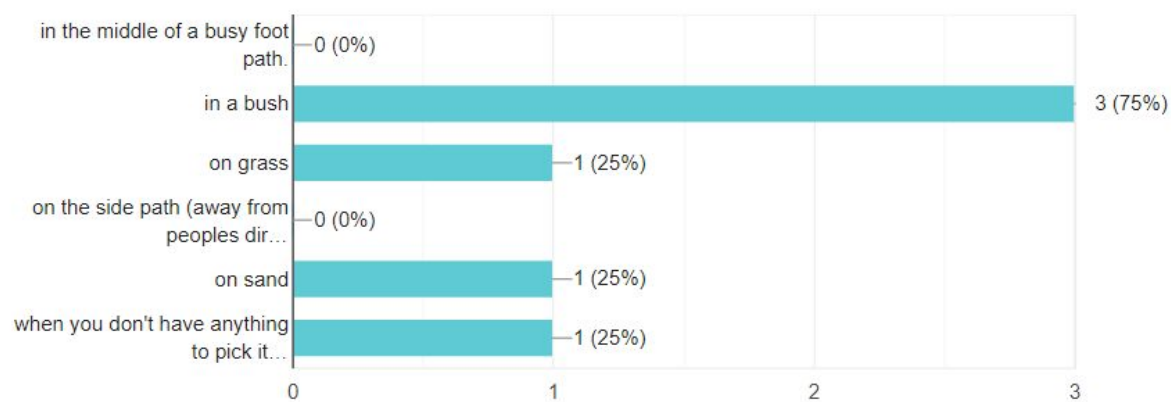
Feasibility
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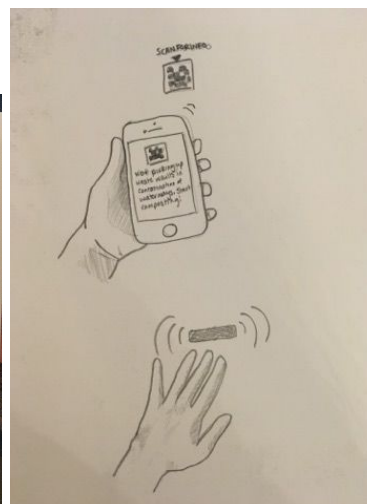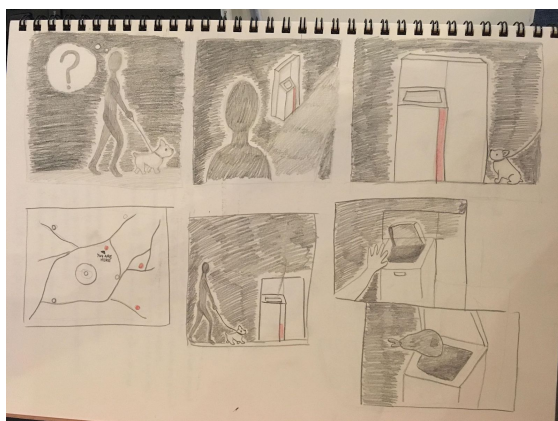
Do you believe any of these situations are acceptable to not pick up your dogs waste?

4 responses

| Option	Count
in the middle of a busy foot path.	0 (0%)
in a bush	3 (75%)
on grass	1 (25%)
on the side path (away from peoples dir...	0 (0%)
on sand	1 (25%)
when you don't have anything to pick it...	1 (25%)

Do you believe this is the best way for the environment? Why so?

4 responses

Probably not, since bags dont decompose

no but any other method is inconvenient

I believe the council ones are biodegradable, have not researched though

I dont really think about it

What do you use to pick up your dogs waste?

4 responses

Bar chart:
- Council provided doggy bags: 1 (25%)
- plastic bag: 2 (50%)
- plastic bags: 1 (25%)
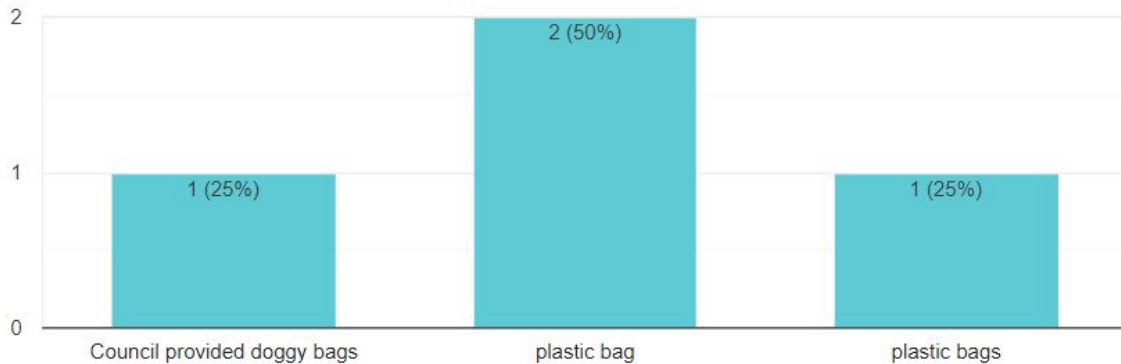
If you found out about a more ecological method of how to dispose of your dogs waste, would you do it? Why? Why not?

4 responses

Depends on cost.

If it is easy to carry or do then maybe

Probably, depending on out convenient it is

Not if its inconvenient for me

If you have walked your dog during nighttime, what was your experience? Do you have any concerns?

4 responses

No i have not

i usually avoid night time as its not very safe and i also do not feel motivated

Not much lighting

Not enough lights

What do think about public dog bins? Are their aspects about it which you wish would change or be added? (it can be anything, be specific)

4 responses

They stink and are hard to find

sometimes they are too full so i have to look for other bins

More locations

hard to find if unfamiliar with area and very dirty

Sources

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