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Master's Thesis
Academic Year 2022

SOCIALLS: Turning Public Walls into a
Character to Create a Playful, Story-Based
Experience



Keio University
Graduate School of Media Design

Alaa A Al-Maliki

A Master's Thesis
submitted to Keio University Graduate School of Media Design
in partial fulfillment of the requirements for the degree of
Master of Media Design

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Abstract of Master's Thesis of Academic Year 2022

SOCIALLS: Turning Public Walls into a
Character to Create a Playful, Story-Based Experience

Category: Design

Summary

In recent years, many companies and researchers find walls a major point of interest. They have used an ample of methods to increase the interactivity and responsiveness of walls which include but are not limited to; projecting art onto walls, and adding sensors (motion sensors, conductive inks, etc.). These methods have extended into public spaces through using playful ways to add life to mundane, dull places. Thus, in this research, I perceive that the future public walls, "Socialls", will have a character of their own fueled by the power of storytelling. This would enable these walls to add life to any space they're installed in as well as have a future possibility of being a data registry that could react to weather conditions, daily events, and people's emotions. As well as, be able to hold history of space. Thus, in this paper, with an aim to explore a different playful way in which walls could be used to provide a fun experience to people in public spaces. I take advantage of the boring idle time spent while waiting and design the waiting experience itself (in a future bus stop setting) while highlighting "Sociall", the wall character's, interaction with others through storytelling.

Keywords:

storytelling, playful design, interaction design, responsive environments, animation

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Chapter 1

Introduction

1.1. Background

1.1.1 Problem and Research Goal

When I first started this research, the reason for choosing walls and wanting them to be a character of their own was the possibility of “what if walls could be a pet instead of a robot?” It would not be a must to have to use a physical object that has a body and instead it could be embedded in your own environment and be a whole data registry. So, “in turn would that make the environment more responsive?”. Thus, when I first started and since my idea was mainly a private indoor project the main problem my research tackled was of virtual assistant technologies being not too responsive when it comes back to emotional responses. I began thinking of ways of how could an environment , specifically walls, be able to interact with us in a way that would also improve our mood. Then, I found out through my research about “Empath” a Japanese startup which is an emotional intelligence that could detect emotions through voice analysis and then help others from there by responding to their emotions accordingly. [1] That further intrigued me into searching up what other forms of “expressiveness” I could add as a contribution. Coming from an animation perspective, a facial expression, the main basic element of interaction is what makes characters’ feelings more valid in the eyes of a viewer. Therefore, I started adding on such aspects of “character” which would turn walls into lovable interactive surfaces within a private setting. Starting off from that, I reached the second phase of the process where I had made my first prototype and through it I discovered my idea could be better implemented in public spaces.

For the public space stage, I asked myself how and why would my idea be implemented and be useful. There were many answers for that and three best

feasible scenarios I came into conclusion with. Beginning with the increase of playfulness in cities to unwind, and to allow people to have a fun time away from their usual distractions, their phones. That way they can remember to interact, and look at their surroundings too. Playfulness in general after all, has proved to not only help with creativity but also help coping with stress. [2] Therefore, I had chosen “waiting areas” as a location to test out my prototype. It did not have to necessarily be a bus stop but I chose that to take advantage of the idle waiting time, to test the interactivity of Sociall. Since, first and foremost, the goal was whether Sociall can make others feel empathy towards it as a wall character or not. That made it the main research goal, for this specific research paper stated as “With a backstory, and distinct expressive eyes for a character design, would others be able to perceive Sociall as a character of its own?” further talked about in the fourth chapter.

Moving on, this research does not stop here, despite what is stated above being the main goals at this point. I further aim to expand it. With the final goal being to expand it to help tourism in cities where people less frequent. Given the fact that 68 percent of the population is set to live in urban areas by 2050. [3] A lot of older, history filled spots will be abandoned, and people might not know the history of them. Thus if we could leave a data registry in the walls of such historical areas’ walls, that could tell people who visit about the history of that town which would be efficient for future generations and would increase tourism in the future. However, one might question the reason behind the choice of walls rather than anything else in the environment, so I will be explaining why in the sections below.

1.1.2 Walls as a Medium of Creativity

Walls, one way or another, have been used as a medium to express creativity throughout times. Some people would hang pictures on the walls to advertise or decorate. While others would adorn their walls with aesthetically pleasing wall-papers. Even kids treat it as a huge canvas that they would unleash their creative talent onto through drawing. Thus, whether by using means of technology or by using other means, humans always found ways to make sure their walls were beautiful. That is because whether public or private, walls form an immense part

of a person's surroundings that a person is unable to ignore especially after urbanization.

An ample of companies take advantage of such space to enhance creativity. Furthermore, since the focus of this research is on public walls rather than private, a famous example regarding that approach would be "The Facebook Wall" [4]. It is a semi-public wall, used by employees within the office of Facebook to jot down their thoughts and ideas. Just like the concept used in the Facebook application of writing on someone's page which is referred to as "Wall". Facebook expands the idea further into real life by using a real wall. Other examples of traditional ways of using walls creatively, is the design of Yudo's Yokohama office in Japan by the Japanese architecture firm Kamitopen. The wall design with colorful pipes hanging onto it as shown in (Figure 1.1.2), allows the employees to communicate in a creative unconventional way despite being in different locations within the office. By using the wall as a medium for hanging objects, in this case pipes, employees can enjoy a playful way of communication that nurtures creativity within the office.

There are endless examples of other walls that foster those feelings such as "donor walls" that provide a form of recognition, "ideation walls" that allow others to brainstorm, and many more. Thus, similarly, this research focuses on walls which are everywhere within a city to spark a sense of curiosity and creativity by taking advantage of natural interactions one would have with a wall, for example, leaning against a wall or even sticking things onto the wall.

1.1.3 Walls in Storytelling and Animation

Since ancient times, humans would personify objects around them when they tell stories. They would give names to treasured possessions, and talk to trees or ask questions to rocks as an example. Apparently, that's no coincidence. We as humans, tend to personify objects around us, unconsciously giving everything human qualities. It is an innate quality that humans have had since long ago. People love personifying objects and giving names to things. It helps people lessen their sense of loneliness as social beings. The more lonely people are the more keen they are to personify things according to a recent study. [6] In other words, it is also why writers use personification often when writing stories. It is a form

Figure 1.1 Yudo's Yokohama Office Creative Walls



(Source: "A Look Inside Yudo 's Cool Yokohama Office" [5])

of entertainment when bored.

Within the story realm, walls have been portrayed in many creative ways. Starting off, in English Literature, Walls were perceived differently according to different writers. For William Shakespeare, he portrayed a funny wall which tries to separate two lovers in a comical way. Edgar Allan Poe, on the other hand, perceived walls as scary with a tendency to collapse. Moving on, Herman Melville describes the office walls as dead walls that an employee ends up staring at for hours with no other choice at sight. [7]

Meanwhile in Japanese Literature, the wall appears in a form of an eerie Youkai, a spirit, that goes by the name 'Nurikabe'. It is a wall spirit that is invisible during the day but somehow appears during the night to stand in people's way and prevent them from passing. [8]. Last but not least, even Animations, whether through using walls or not, have added life into many lifeless objects which never fail to entertain us with their comical personalities. Even the Nurikabe spirit that was mentioned earlier, has an anime, "GeGeGe no Kitarō", in which it was imagined as a character of its own with droopy eyes, hands and legs as shown in (Figure 1.1.3) below.

Figure 1.2 Nurikabe Character



(Source: "Nurikabe: Hitting the Wall in Japan" [8])

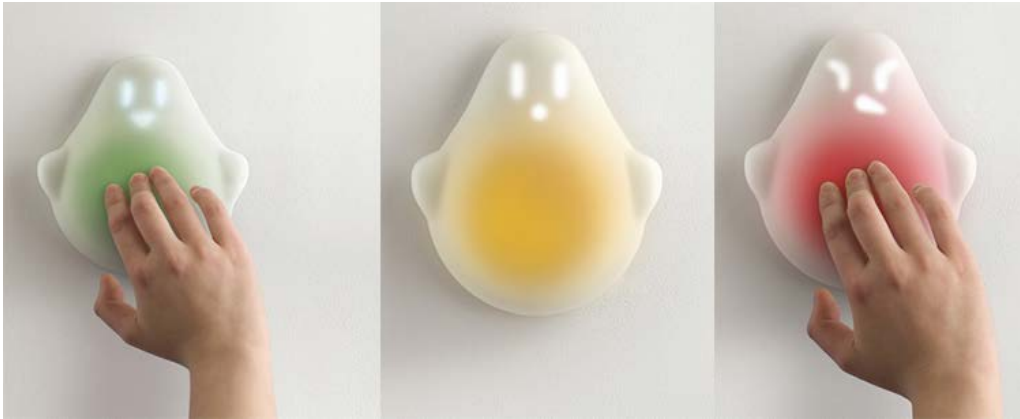
1.2. Motivation and Purpose

A plethora of futuristic innovations have been focusing upon the possibility of 'what if environments were more responsive and are able to meet our needs'. Certainly, there would be limitations to such possibilities, but what if the surrounding environments, let us take walls as an example, could sense people's emotions then respond to that to meet their needs? I think this might be a game changer. Not only through sensing people, but through a whole data registry that enables walls to sense the surroundings and in turn changing shape, colors, or even releasing noises when necessary. Certain people might argue that robots or humans are more than enough to achieve such. However, environments are a major part of our lives. It is where we live, communicate, and commute through. Environment surrounds us, and affects us in multiple ways that should not be ignored. My interest in both responsive environments, playful design, animation and emotional design especially (communication between objects) is what motivated me most to start this research, and in turn choose walls.

Initially the communication of objects with us entails the relationship we have with objects we own. So, how do objects communicate with us? They do not have the linguistic ability we do, yet we can not deny that we talk to them.

Just like when we press the doorbell switch in an attempt to order it to produce a sound that would alert the people occupying the apartment that someone is around. Through Don Norman's book "Emotional Design: Why We Love (or Hate) Everyday Things" [9], he argues that attractive things work better due to producing positive emotions from the user. Thus, the way they talk to us through their look, rather than just by their functionality makes it easier for us to use them or in other words communicate to them. Just like the earlier example, of the ringing of the bell, what if someone rang that same bell, and after three rings, the switch turned on a red light and a little angry face appeared as a response. It probably would startle the person ringing, and let them think that ringing the bell that many times is being a nuisance to the owners. That reaction naturally sounds more fun, as well as effective and such similar approaches were shown in MoMa's Design book "Talk to Me :Design and the Communication Between People and Objects" [10] like Tio, (Figure 1.2) which is a bird shaped light switch that changes colors, in order to communicate to children that using light too much wastes energy. Thus, the way objects interact with us, through a design that successfully and creatively initiates the interaction makes all the difference.

Figure 1.3 Tio 2009



(Source: Tio from MoMA Exhibition [11])

Therefore, through Social, my purpose is to be able to use storytelling as a concept to transform public walls into a fun character of their own that one could interact with in a fun way on a daily basis. That way I would aim to combine

animation , responsive environments and playful design.

1.3. Thesis Organization

Chapter 1 introduces walls as a medium of creativity and how they are used from the past and until now to express that creativity. Then continues into how walls have been described in animation and storytelling through providing several examples from literature and manga. Finally, it supports the idea with the main motivations and purpose for pursuing this research which includes an interest in responsive environments,playful design,animation and emotional design.

Chapter 2 summarizes the series of related work to my research. They are divided into two parts. Talking Walls, and Characters in Public Spaces. Examples of walls that I defined as Talking walls are walls that display a responsive interaction, and projected walls. Then, I mentioned public space installations that are not necessarily walls. However, they are similar to Sociall through the application method and many other factors.

Chapter 3 reveals the concept design which involves Sociall's character design from its initial to its final phase. In this chapter, in addition to Sociall's design, its backstory, personality and language are also shown. Finally followed by the summary of the first user survey and first prototype.

Chapter 4 introduces the final prototype, its objectives, hypothesis, experimental design, overall design procedure and later alterations. It deeply delves into the creation process, as well as the results of the final prototype testing and how that affected its final design.

Chapter 5 summarizes the whole research. Then proceeds to showcase future plans ,and limitations of Sociall.

Chapter 2

Literature Review

2.1. Interactive Walls, Nowadays

2.1.1 Responsive Interactions

As mentioned earlier, to emphasize on the wall's character, one of the main focuses of this research is on people's natural interactions with public responsive walls in the future. For the wall to be able to react to a person, it should be able to sense them and in turn be responsive to their actions.

Hello.Wall provides one of the first of attempts of communicating with walls via informative art displayed through ambient light display and a view port. [12]It is an informative art directed specifically towards showing information about nearby people, passersby and the surroundings within a physical environment. Even though Hello.Wall senses nearby presence, and communicates to others via light patterns ,or viewports, it still lacks character and expression, and rather than a wall it is more like a wall-sized display. However, it achieves the responsive wall-to-people interactive concept that I am aiming to portray through Sociall.

Moving on,despite my approach being more on the playful,storytelling-based side, "Hexi Responsive Walls" shown in (Figure 2.1.1) provides a feasible example of how walls in the future would react to people passing by it in a responsive manner through special movements.With a motion tracking technology installed into it ,composed of 60 wall-mounted PVC and aluminum panels ,Hexi, is able to react to different actions from people around and those reactions cause changes in its shape as it moves along in a rippling motion. It reacts to every gesture like jumping, moving or sitting beside it through displaying different motion, and speed. This motion related interaction is close to Sociall's despite the interaction method being totally different.

Another example of a sensor-based interaction using walls is Disney's "Wall++" which is a cheap method to transform walls to be able to sense movements through pasting a conductive paint wallpaper onto it. [13] Through that, it enables a person to control things around the room by using the wall itself. Conductive paint certainly provides a great cheap method to sense movements. However, in the case of "Wall++" it focuses more about functionality rather than the playfulness which Sociall aims to achieve.

Furthermore, "Sprayable User Interfaces" [14] manages to make architecture more playful. It is a method that combines both conductive sprayable copper paint and interaction design. It is able to create multiple fun designs that are similar to Sociall's approach. In a way that if touched, they are able to play music, animations and many more. In the case of Sociall, if it were a concept feasible nowadays rather than the future, methods like Wall++'s and Sprayable User Interfaces' could help in achieving the results through both motion sensing and conductive paint to create a smooth interaction.

Last but not least is "Hidden Stories" which rather than a character, focuses on walls as a medium to initiate storytelling. [15] In this instillation, you can listen to what the wall has to say through other people's voices. It presents a scenario that imagines if walls could talk, they would speak through voices of people who visited the exhibition prior. After listening to the saved recordings of other visitors, you get the chance to record your own voice to keep for the other visitors that come after you to in turn, listen to. Through being there to listen to each individuals stories and in turn record them in its system, similar to Sociall, this instillation wall creatively uses the aspect of 'Walls have ears' in its own unique execution.

2.1.2 Projected Walls

This by far, has been the most common and futuristic way to use walls. Nowadays, in a fast-moving digital world, digital art displayed from and onto walls has been the trend. One of the most famous examples in Japan is shown through TeamLab's digital art exhibitions and products. In "Borderless" exhibition [18] for example, through the projection of an art world onto the walls, the sense of space is broadened and the feeling of being stuck in between walls diminishes through illusion. Then through this illusion it creates an interactive collaborative

Figure 2.1 Hexi Responsive Wall



(Source: “Hexi Responsive Wall wobbles and ripples to nearby movements” [16])

Figure 2.2 Wall Characters in Sakuya Lumina in Osaka



(Source: “Sakuya Lumina opens a luminous portal to the future in Osaka Castle Park” [17])

art world in which passersby could enjoy being a part of. However, one might argue that this is a method using the whole surrounding space and not only walls. I would have to agree with that factor and that is where this research's focus shines light upon one of the many storytelling interactions TeamLab had brought to life called "A Blackboard where Little People Live" [19]. It is a blackboard that has characters living within it, which allows kids to engage in various creative ways with them. Depending on each individual's interaction, the little people's world will get affected. If they drew a line, the people would start crossing onto it, and if they popped certain buttons within the canvas, it could unleash different reactions. For example, if they touched the clouds, it would rain onto the small people. Despite not being wall-based, it is a panel that is placed onto a wall, to take less space and add fun into the specific space. That aspect resembles Sociall closely. Also, the fact that it also includes storytelling as a powerful method to engage the kids in. It depicts a story based world of its own that lies inside a blackboard for kids to engage in creative co-creation through. The aspect of storytelling and interactivity used to let the kids interact with a blackboard display is similar to Sociall in terms of an engaging fun backstory, and the interactions making a difference in space and time of the reaction.

Another example would be Moment Factory's, a Canadian based company, digital art exhibitions. Their digital art, just like TeamLab's, extends into many forms from projections to playful displays. Their project "Sakuya Lumina" that was located around Osaka Castle, reveals little characters with big eyes and mouths within each brick of the Osaka castle walls as shown in (Figure 2.1.2). They seem to be glancing at each other and noticing the people surrounding them which allows the wall to look more fun, alive and engaging. Despite not being able to interact the way I am aiming to make Sociall do, the similar mix of expressive facial expressions to emphasize on character and engagement in interaction is close. Plus character creation through interaction is the base of Sociall's aim.

Last but not least, an installation that has a unique approach to character visualization is, "murmur: from sound to light by talking to walls" [20]. Very similar to Sociall, it focuses on the manifestation of an unconventional conversation that takes place between the public and a wall. Despite being genuinely similar to Sociall, murmur achieves such conversation through people talking to the wall

through an attached device, which in turn shows a shape formed by light as a response. Each word or sentence said through the speaker-like device draws a unique light expression in response which makes it an fun form of communication. Every time one would say something else or try to change the tone of their voice, the reply of patterns would be different and unique. Thus, creating a chance for a long time engagement with the wall through light. Sociall aims to achieve a similar communication, yet, it approaches it differently through a language that is composed of big expressive eyes, as well as a special wall language.

2.2. Public Spaces

Figure 2.3 Airship Orchestra



(Source: "16 otherworldly characters move and sing in interactive 'airship orchestra' installation" [21])

2.2.1 Spaces with Playful Characters

Rather than being in a private space, Sociall is a responsive public wall character that is supposed to be installed within public spaces in the future to enhance playfulness whether within a waiting setting or otherwise. Thus, a various of creative related projects which aren't necessarily walls but manage to give the

same feeling that I am trying to achieve through this research will be showcased in this part.

First is ENESS's 'Airship Orchestra' (Figure 2.2) which is a public installation that uses the art of storytelling to bring 16 otherworldly inflatable characters into life through different ways. Those characters light up and sing through the night to entertain passersby. They are also occupied with motion-sensors which allows them to respond to touches from people around it and through that create different musical sounds. The mix of sounds from people's interactions then form a fun collaborative orchestra. Regarding the aspect of playfulness and interaction, this idea is similar to what I am trying to achieve with Sociall except, my idea is more concerning environment, specifically wall, oriented.

In addition, the use of characters in public installations is not something new, and it has been proved to be a successful way to initiate playfulness in cities. Through it people are able to have a fun time, distraction from stress, and a chance to roam around the city. For such reason, a bunch of installations aim to make cities more interactive like "Urbanimals" by LAX [22]. In an attempt to stop the effect of habituation within cities and to make people explore further, this project was brought to life. It consists of a bunch of origami-like colorful animals, each with a unique persona, projected within the city. They were installed onto the walls and streets of Bristol city in order to interact with citizens, and the elements of the city itself. Each animal projection is a separate computational unit which allows the projections to interact with citizens smoothly. Sociall also emphasizes on the character of the wall, using public walls in the city in order to engage with others playfully. However, Sociall aims to do so in its own unique approach using its own story to tell.

2.2.2 Storytelling-based Spaces

The interest of story-telling based experiences sparked up the idea of Sociall. Since Sociall is based on the power of storytelling to bring characters to life, in this section I focus on different spaces fueled by the power of creativity and storytelling to bring life and playfulness to certain spaces. Sociall aims to make future spaces into happy places, through using storytelling. Thus, by looking into the already existing approaches into transforming spaces through storytelling

would in turn strengthen Sociall's basic idea.

I grew up watching a famous street in Dubai's Jumeirah part of the city transform into a creative hub through paintings of history on the public walls. Whenever I pass by the street nowadays, I feel like I have been brought back into old Dubai, like a storybook. It works well because in each part, they show what kids or adults used to do in the specific area. As an example, in the playground, the walls are painted of kids from the past, playing old local games in the playground. The goal was to show the innovation that the Emirates had went through during generations of time. It proved to be a successful way of adding storytelling to showcase the history of a certain town. That factor made that street in Jumeirah, one of my favorite areas to visit. [23]. So, in Sociall's case, the walls would be animated into characters to form a sort of close bond and familiarity in people's hearts through the same storytelling method.

Another example is Juliana Children Hospital's creative storytelling based design. The whole hospital was designed upon the idea of five characters who play main roles in the kids' experience and journey in the hospital. They appear in places kids would need them most, to be there with them at all times, like a companion as shown in (Figure 2.2.2) The whole space however, like a game, is designed to fit those five characters' story lines. Thus, it would make kids feel like they are inside a story's journey instead of being in a hospital. Items from the story are also placed around, like airplanes, space gadgets etc. The walls are not only painted but also embedded with technology as they are interactive and responsive to the kids. The kids could touch the walls around, enjoy the presence of animated characters cheering for them, as well as , know about each character through stories. Using such a form of responsive and creative storytelling based design, the hospital experience would turn into a fun , memorable one instead of being scary for kids. Therefore, I want to embed a full backstory of Sociall , along with a manga in order for others to not only engage with it, but form a bond. After all, Sociall aims to be not just a wall, but also a friend.

Despite all of the works stated above being similar to Sociall's idea, the main factor that they are missing is being able to hold personal history of a certain place as well as have a unique character of its own. Sociall basically aims to be a robot like wall who acts like a friend and makes the environment more friendly, and

Figure 2.4 Juliana Children Hospital's Creative Design



(Source: "Juliana Children's Hospital – Healthcare Design with Creative Technology and Storytelling" [24])

happy. Unlike robots, Socials would be embedded within the environment and in turn contribute to the responsiveness and playfulness of the whole space itself. Regarding the similarities, the examples stated above all provide a sense of creativity, playfulness, interactivity, as well as storytelling and character development. Thus, despite the similarities of the related works to Social, they still have a gap that needs to be filled to reach to this research's main idea which is making the walls into a character, that in turn have a history as well as story, and can interact playfully with others within the environment.

Chapter 3

Concept Design

3.1. Design Approach

The design process started out with the question; “In what way can a wall speak to a person if it were to be a character of its own?”. Given such a question in a storytelling context, a character of the wall, with a backstory should be defined in order for the interaction to be believable. The character should speak to a passerby through a certain story that touches them, to keep an everlasting impression in the long term. That way, the person would always want to interact with such entity, to engage in a fruitful conversation.

However, just as stated in Chapter 2, there have been many approaches in this particular sector of walls communicating to people in different ways. In order to compare what differentiates Sociall from already available designs, I collected a series of already existing wall interactions from the installations I had mentioned in Chapter 2. First would be projected displays, lots of walls in exhibitions tend to express through projected images of different art pieces, others do it through collaborative art. While in some cases the interactions happens through changing wallpapers the moment a person touches a design or does a certain gesture. In other words, most of the designs focus on initiating interaction through the five senses. Mostly utilizing sight, touch, and hearing rather than smell and taste. After all, smelling or tasting a wall would not make sense unless it is made of an edible substance.

3.2. Character Design

Sociall’s Character Design starts from the context of looking through the scenario of “what does the wall see on a daily basis”. If the wall were to express itself, how will it do it? Imagining that sort of situation, initiated the ideation process to the whole design. The design went through different alterations, and versions as it progressed, following a series of surveys and user tests.

3.2.1 Initial Phase

First, initially, when I started designing Sociall, I thought of a private responsive environment rather than outside. However, the design itself is versatile and would work for both scenarios. Later after multiple surveys and prototypes, I concluded that starting off through a public instillation would allow more playful opportunities when it comes to interaction. In the first phase of the design, it came with two interaction modes.

Table 3.1 First version of Interaction modes

Interaction Modes	Interaction Method
When interacting with people	Animated expressions, text, and voice
When interacting with other objects	Lights, movement, and animated expressions

As mentioned in the previous (Table 3.1), there were initially two interaction modes depending on different targets. When interacting with people, and when interacting with other objects. The two targets would be separated and in turn react to different targets through sensing them. For the wall-to-human interaction, the facial features could be in form of a light which draws a cute animated facial expression onto it like shown in the initial facial visualization on (Figure 3.2.1). A main factor that did not change from the initial design up to the final one is the focus on the cuteness of the facial features that that wall conveys. Rather than it always being on though, it could be initiated by your voice through calling it just like Alexa, or maybe through it sensing your presence around it. If it senses you, it could appear slowly not to startle you then smiles softly while waiting for your next command. Maybe if a person is sleeping, they could fully turn it off just in case that if they wake up to it, it might be a little too startling for them.

Thus, voice initiation might be better alternative than sensing in such situations. However, sensing could be used for it to know about your feelings, and tend to your needs.

Figure 3.1 First facial expression visualization of Sociall



(Within the space of my room, I sketched a simple cute face of how Sociall would look like)

On the other hand, for the wall-to-object interaction. The wall will probably interact with the said objects once you touch the new object onto its surface. A gesture in order to register it into the wall's data registry. Once done, it would know where this object is if you ever lost it or misplaced it around the house. It could also tell people things like if their vase is broken, or if their window is open and so on. It has the ability of engaging itself to objects, registering them, and even hiding them inside of it by absorbing them and giving them to you when you need them. This way it would save space as well, and keep your day efficient.

During that starting phase, I had a few imagined interactions set as scenarios as shown in the bullet points below. All those points of interaction were later put into a survey to check what fits people's interest the most, and what is least feasible. After gathering the information from the first survey, the interactions and whole design were further altered due to the complexity of the first design, and then later proven to be unnecessary interactions that failed to match up with the main goals of this design. Those scenarios were all designed through the dream-driven-design approach by continuously asking myself "what if" questions and dismissing the complex technicalities that would limit the creativity in turn. Some of the interactions were sketched as shown on (Figure 3.2.1). While the initial set

of scenarios before going through the alterations are shown in the list below:

1. Welcoming you back home after a long day with a wide smile
2. Allowing you to write messages with our own handwriting onto the wall which in turn appears in real time on the walls of people who are dear to you but are living elsewhere, and those words would disappear within a set time. However, if there is no dear person living abroad it could just display encouraging words during different times of the day.
3. Could have playful interactions with other things around (e.g. Helps you maintain your health by sensing you, through the chair, and remind you to take breaks)
4. Could store your precious things inside of it which won't take space and won't get lost
5. Inform you if any object around is damaged, or has been used for long (e.g. too much electricity usage)

3.2.2 Second Design Phase

As a result of the first survey , which will be discussed in the upcoming sections, the design and functions both changed accordingly. I realized that the functions were way too much, and so through the help of the people taking the survey in choosing the most effective scenarios, I managed to narrow down the functions and in turn the design changed. The options of interaction narrowed down to four:

1. Wallpapers changing to your liking
2. Sensing emotions and reacting to calm people down by changing their mood
3. Being a presence that surrounds you to feel less lonely
4. Interacting with you if needed and finally reminding you if you're using an object too much by lighting up certain areas

Figure 3.2 Different sketches of some Interaction Scenarios



(Sketches of the four main interaction scenarios)

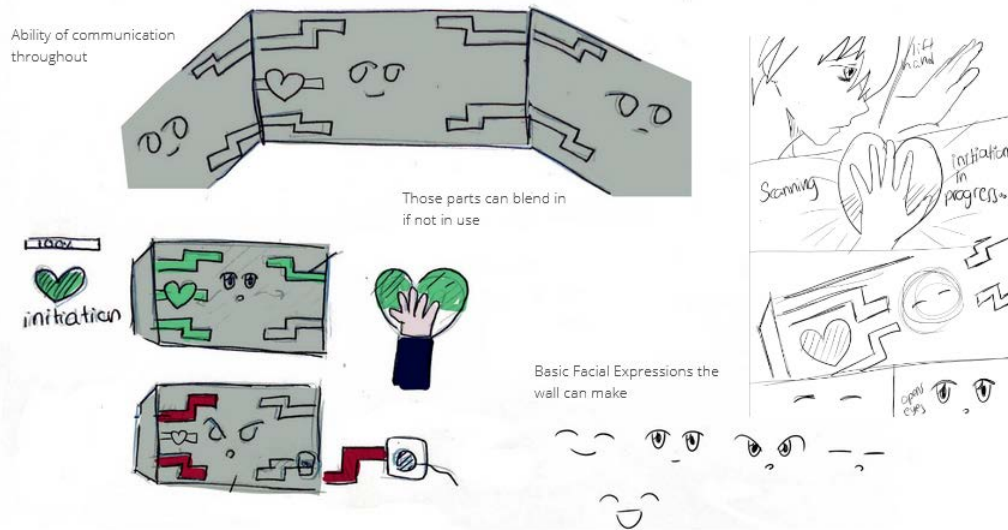
For the initiation a startup button that looks like a heart was added where if you touch it for long, the wall's expression will start appearing from the screen as if waking up. It lights up in green for positive interactions, and red for warning as shown in (Figure 3.2.2). The heart could also be used for turning off interactions. The areas with lines, are used to communicate if certain areas within the house need attention. That is why they are linked everywhere as shown per the design.

If a person were bored of the way Social looks they had the ability to change that through certain vocal commands. In turn, the wall would change according to a person's preference as shown in (Figure 3.2.2). However, even after narrowing down the options of the overall design, it still was complicated and difficult to prototype for testing. Some of the interactions dismissed the main purpose of creating Social too. Thus, through refocusing on the initial goals and objectives to create Social, the interactions were further narrowed down, resulting into the first prototype phase.

The interactions were narrowed down to just these two:

1. Sensing the surroundings/people's feelings

Figure 3.3 Second phase of the Social's Design



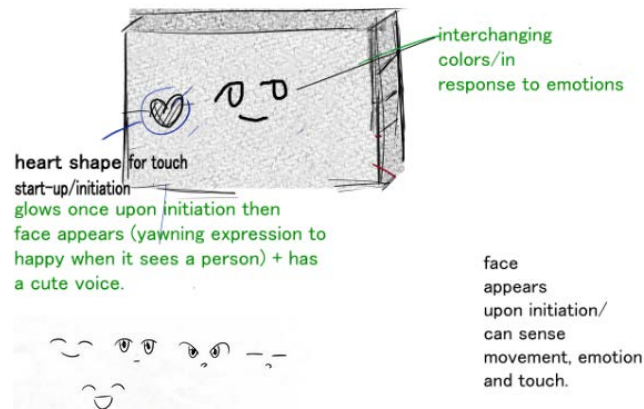
(Second phase of design and deeper explanation of the user journey of interaction)

Figure 3.4 Wallpaper change interaction



(Sketch of the process of changing wallpapers)

Figure 3.5 Sociall's Second Design phase



(Second phase of Sociall's Design with simple explanation)

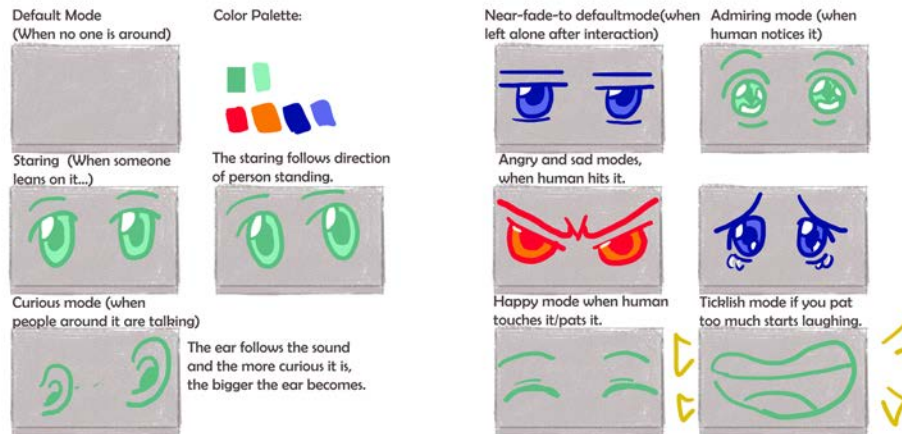
2. Being a presence that lessens loneliness of people, making it a fun time for them to interact.

Thus, some of the earlier parts of the design were changed again and finally made into the first prototype. As shown in (Figure 3.2.2), it got simplified into just the facial expression and the initiator button, the heart. The focus being on the smoothness of the interaction itself, and whether Sociall is perceived as a character of its own rather than just a display. In such cases, simplicity is proven best. The face would appear upon initiation and it would react to voice, movement and touch. It glows upon initiation before the face appears. The face itself has the ability to move around around the wall. Within an environment, each wall separated by a corner would have its own face and the possibility of walls interacting would be added as well. However, in the first prototype the focus was only on one wall.

3.2.3 Final Design Phase

Moving on, after the first prototype phase, a lot of factors were changed within the design. It will be mentioned in further details as to why in later sections. However, design wise, the wall, instead of having a tiny face that is floating within the wall, changes to having big expressive eyes as shown in (Figure 3.2.3) that extend

Figure 3.6 Sociall's Final Design phase



(This design showcases the basic starter expressions of Sociall)

through the size of the wall. That way, Sociall would become more of a character of its own, rather than a character that is pasted within a wall which previously was the case due to its small size and showing the full parts of a face. It felt like a separate character that was pasted onto the wall according to the people who interacted with it. Unlike (Figure 3.2.3) though, Sociall changed into having many expressions, 18 in total for the final prototype itself, a backstory and a special wall language that will be explained next. Instead of being private, it became directed towards public spaces instead. Thus, the initiation button was removed from the design, and replaced by the face suddenly appearing through sensing the surroundings making it a fun and playful opportunity of interaction.

3.3. Sociall's Story/Manga

3.3.1 Sociall's Backstory

A character fails to achieve its objective without a backstory, or a scenario to backup its actions. In order for others to relate to a certain character, just like a

protagonist in a novel for example, they have to be moved by the content itself. They have to be given the character's thoughts, struggles, dislikes, likes, motivations in order for them to relate or plainly just disregard the character. Some protagonists are loved, while others are considered as weaklings and their characters hard to digest. That is what makes storytelling a powerful tool. Despite the characters within the story realm not being real, with the power of imagination readers start visualizing them in real life situations. A famous example of that is how manga characters have become an essential part in the everyday life of Japanese people. Not only Japanese, but it has become internationally acknowledged that people do look up to the anime characters and even cosplay them in certain events. Therefore, in order to strengthen Sociall's concept, I started to imagine a scenario in which walls have always had a character of their own, yet they never knew how to appeal to the public. The concept focuses on the idea that public walls always wanted to get humans' attention. However, due to the different frequencies walls communicate by they never managed to show their real selves to humans. Despite the fact that dogs and cats can see them. That is why dogs bark randomly at walls sometimes as shown in (Figure 3.3.1). For this story, I drew nine manga pages describing how walls feel on a daily basis. In Sociall's manga you get to understand how the public walls, Socialls, always wanted humans' attention since the beginning of time, and their struggles to do so until they will finally manage to be able to in the upcoming future.

3.3.2 Sociall's Personality

Inspired by the famous saying "Walls have ears." Socialls have a curious personality. They want to know what humans are talking about, and they want to grab the humans' attention in any way possible. As long as humans are happy and safe, Socialls are happy looking over them. After all, they were built as a part of the architecture as an essential element to keep buildings from collapsing. Thus, their protective personality stems from that. To begin with, I used the characterization method; S.T.E.A.L which stands for how the character Speaks, Thinks, Effects others, Acts, and Looks. These five points are essential to build up a character in stories. For Sociall's characterization:

Figure 3.7 Dog barking at wall



(Sketch of from manga of a Dog barking at Sociall due to normally being able to communicate with it despite the different frequencies unlike humans)

1. It **speaks** to others through a special Wall language which will be introduced in the next section.
2. It **thinks** in an affectionate way with a mission to always be there for humans. A fact which brings out its curiosity about what humans are doing or talking about. It loves them that much , after all.
3. In terms of **effects**, it radiates a bright presence, wants to make others happy, and most of all wants to make people's lives fun.
4. Its **actions** are composed of just looking at others from afar, blinking and smiling if touched or noticed, and follows curiously if it hears conversations using ears.
5. It **looks** cute, friendly, sounds cute and shows expressions in different colors.

In summary, Sociall likes to see humans happy, always wants the humans' attention but is satisfied with them smiling towards it. Its likes follow a range of everything that makes people happy. It dislikes loud noises, violence, war , ex-

plosions , being abandoned and left all alone. Its dislikes are composed of what violates people's safety and causes them sadness.

3.3.3 Sociall's Language

Table 3.2 Basic Wallian Language Expressions

Expressions	Words in Wallian
Curious, questioning	Kabe?Kabebe?
To express anger	Shichiana
To express excitement "Woah!"	Wall!
To express lightheadedness	Mur muur muuuur
Complimenting, admiring	Dinding vant!
"Heavy"	Hayiit
Expressing sadness	Mur..fenang
"Here,There"	Pared, Pareed
Greeting "Hi"	Wall,Wall
Expressing Boredom	Fenaang
Greeting "Bye,bye"	Shiang Bi bi

At the beginning of the design phase, Sociall talked in human language. Others would understand it , and enjoy engaging in a conversation that way yet something felt out of place. Thinking in terms of character, if walls had the ability to talk in human language, then why did we fail to communicate from the beginning? The concept was weak. Thus, I decided to create a wall language, called Wallian that Socialls speak through. The language concept is that on a normal day, humans are unable to hear public walls because they speak in a different frequency. Inspired by the animation's "Minions" language concept, Sociall's language has no grammar, and revolves around the idea of mixing up random noises from different languages in an expressive manner. Following the same concept of how we tend to understand music in languages different than our own, the walls speak in an incomprehensible manner but since the feelings are involved within the speech as well as their eyes, humans can understand them. The language itself, is composed of the word "Wall" in different languages. [25]I picked up a bunch for the final prototype test.

The words I included are the following which are all a mix of the word 'wall' being said in different languages as shown in (Table 3.2).

3.4. First User Survey

3.4.1 Goals and Objectives

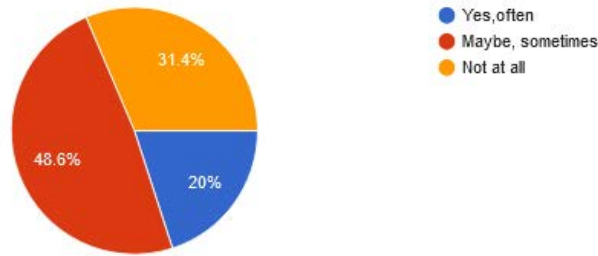
The first user survey was conducted back in 2020, at the beginning of my research process. Due to the ample competition when it comes to walls in the current market, the goal for it was to check the interest of others in the main idea, despite it being about private walls at that time, and in what ways could it be improved. Therefore, emphasizing on the character itself of the social wall and bringing it to life became the main focus of this research. That and the interaction itself would add the uniqueness to the project once it is fully designed and would render it worthy of competition. To be able to prototype it, I had to choose one of the proposed scenarios to further focus on and in turn, improve it. Thus, the thought of a survey came up to mind. As well as, to collect data that is useful for further progress which includes level of interest, comments, concerns, and the latter.

3.4.2 Survey's Results

The survey was conducted with 35 participants in total, after I had shared it to a friend online who in turn had shared it to others and so on. At first, they were asked the question of "Do you catch yourself sometimes talking to your things unconsciously at home? E.g. confide in your wall? Call names to your cup, laptop etc." as shown in (Figure 3.4.2) most of the participants, 17 at a 48.6 percent, answered "Maybe, Sometimes" and 7 at a 20 percent, with "Yes, often" keeping the minority, 11 at 31.4 percent, answer otherwise. Then they were asked for the reasons of why they think they talk to their objects as shown in (Figure 3.4.2). The answer choice was keen to mostly "I think everyone does it, no? It's natural" to "Makes mood better/distressing" which seemed to be a valid point as discussed earlier about the human tendency to personify objects around them.

Figure 3.8 Personification Chart

Do you catch yourself sometimes talking to your things unconsciously at home? E.g. confide in your wall? Call names to your cup,laptop etc.
35 responses

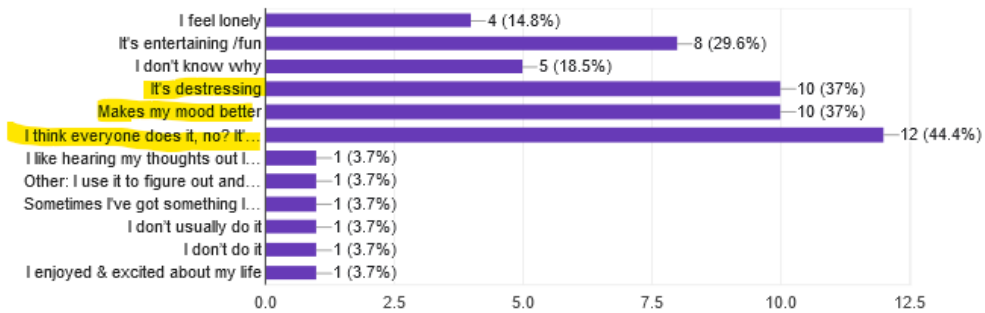


(Chart showing the amount of people who think they talk often to their objects from the survey participants)

Figure 3.9 Reasoning of Talking to Objects Chart

Why do you think you do it? Choose more than one if applicable (only answer if you answered Yes or Maybe previously)

27 responses

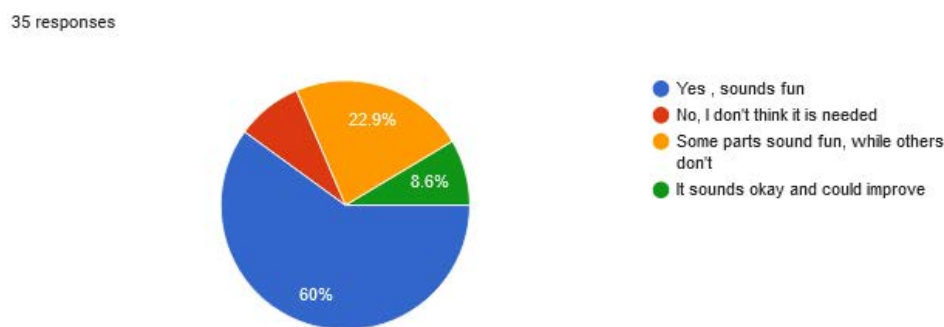


(Chart showing the reasons behind why the participants think they talk to objects if they do)

Next, they were given a scenario of Sociall, and asked questions accordingly. The scenario of imagination given was as following:

“In the future..Your wall, is a social wall. It is happy if you give it attention. It remembers special events when you tell it, and reminds you of them on time by displaying. Through it you can write messages to your family or close ones (living in other parts of the country or countries) which would appear on their wall in real time. It could be just cute encouraging messages for example! Since the wall is everywhere, it can also sense each and every object in its own way. Tell you if one is broken outside, or if you’re using one too much. It will also have the ability to swallow your little items in and keep them inside until you want to use them. That way you have more space, and less tiny lost items. It reacts to touch too and would be your natural alarm whenever you work for long, seated. The chair you’re sitting on might complain to it playfully to it, then the wall would remind you to sit up by letting the chair move away. Also, this wall would greet you every time you come back home. ”

Figure 3.10 Level of Interest Chart

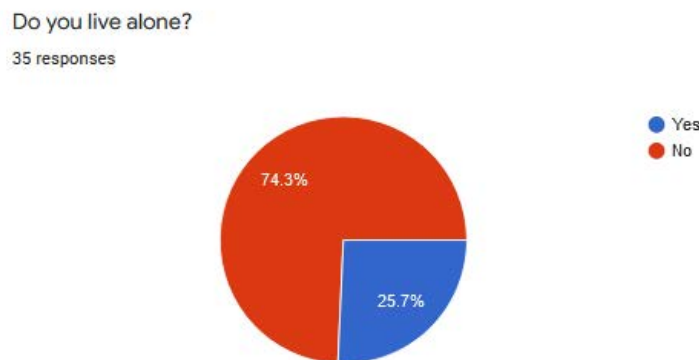


(Chart showing the level of how interested others are with Sociall's scenario idea)

The results looked promising since the majority of them seemed to be keen to the idea. With 21 at a 60 percent, of the participants who found it the most fun and “3 at an 8.6 percent each” expressing that it either sounds okay/needs improvement or failing to see how it is needed as shown in (Figure 3.4.2) The last but not least remaining portion which is composed of 8 at a 22.9 percent, participants who agreed to some parts sounding fun while the others they found

to have failed the requirements to meet that. Therefore, resulting in the fact that most of the participants were obviously keen to the idea, made me proceed with the research.

Figure 3.11 Chart of people living alone



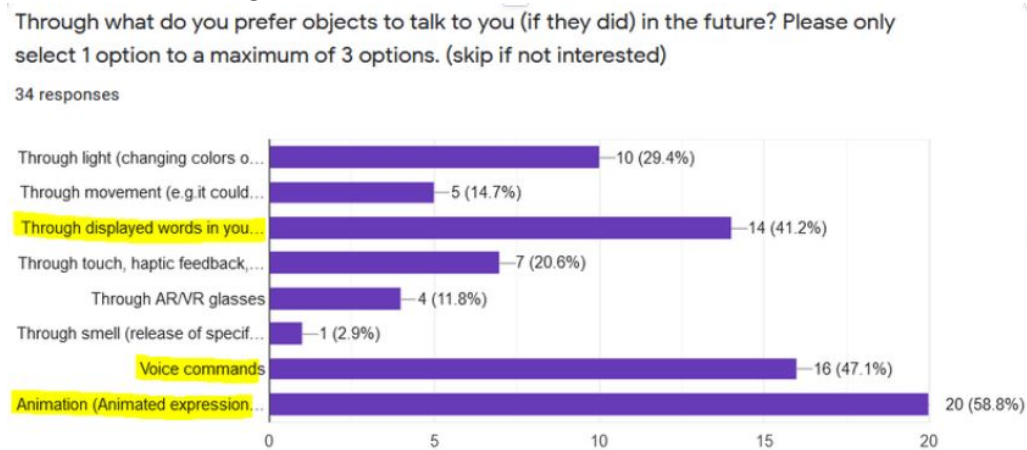
(Chart showing the amount of people alone in comparison to living with others)

Furthermore, comments regarding why they were keen or not keen towards the idea were recorded. Ones of which ranged from positive like “Imagine a wall smiling at you when you come home, tired from an exhausting day. Is that not the most comforting thing you will ever get? ” to negative ones like “Mostly because it is creepy and privacy reasons. It is no secret companies track and sell your data when you interact with their platform, so a social wall could open the door to privacy issues and concerns. Furthermore, there is always the possibility that the social wall could be further monetized by displaying advertisements and such.” which made me think about the privacy issues, that is one of the setbacks of IoT itself.

I also found out that all the people living alone, which constitutes of 9 out of 35, the blue portion of 25.7 percent in (Figure 3.4.2) all answered that they would love to have this wall in their homes. Their answers were heartwarming as well, and they did mention the need of it when people feel lonely, and would want to confide in something that is not human and could reply back even if the interaction was 'fake'. It was also mentioned by many, that sometimes suicidal people might change their minds if a wall could protect them per example. Others mentioned

IoT and how it helps people with disabilities. So if a wall was able to have many functions within itself rather than just being a display but a soothing character it would be great. Thus, this further made me concentrate on the soothing character presence that Sociall should express and focusing on a cute facial expression that it would have.

Figure 3.12 Chart of Interaction Preference



(Chart showing the preference of Sociall's interaction)

Moving on ,regarding the interaction method as shown in (Figure 3.4.2) people replied that they would enjoy an animation interaction the most. While others mentioned voice commands, or words. Those who replied animation interaction said that the reason for that would be that it is more fun and engaging when it comes to animation. Also, the cuter the character the more emotional they would feel towards it. As for the people who preferred voice commands, they mentioned that it's the most natural for of communication when it comes to any sort of doing so. However, for those who are unable to communicate through sounds an alternate option of words could be nice. Furthermore, one did mention that they find floating words soothing so if a bunch of encouraging words from the wall were around when they felt so down, they would feel encouraged to achieve what they want to achieve. In the end, it is believed that aesthetics or means of communication rather than it being beneficial first, mostly it depends on personal preferences to how people view it. However, in this project mixing in one or two

of those aspects would bring out more of its uniqueness in what is already been showcased in the market. Therefore, I ended up choosing voice, and animation for the first prototyping phase.

3.5. First Prototype

3.5.1 Goals and Objectives

After the results of the survey, and research I figured the best way to get further results is through prototyping and user testing. The main goals for conducting this experimental interaction through the prototype was first, to find out if a facial expression interaction or a voice interaction is best. As well as, to figure out the best case scenario Sociall could be used in. Despite focusing half of the research on private spaces, public spaces seem to allow Sociall to have a more effective opportunity to interact with passersby. However, to conclude with such a decision I had to discuss with the participants testing my prototype after explaining the main concept of Sociall.

Most have given me tremendously useful feedback that allowed me in turn to alter the prototype in many different ways as would be seen through the progress. After the deep observation process and noting the reactions of everyone down, I asked them to join in filling out a voluntary survey. Some opted out, but most of the participants willingly gave feedback. Through that I had received extra feedback to adjust my idea accordingly.

3.5.2 Prototype Setup Design and Procedure

For this prototype and survey, I chose the plenary meeting that was held on Novemeber 2021 to be the location for the user test. The participants were around 20 , and were all either students or teachers within Keio Media Design's faculty. Their reactions were deeply observed, and in turn asked questions later .Only 15 however, joined in the survey which had included 14 questions in total.

Meanwhile, I was unable use an actual wall and instead, I used a foam board that I had projected Sociall's facial expression onto. It was a small board, so before starting, I had to explain the background of Sociall, and that it is actually

Figure 3.13 First prototype setup

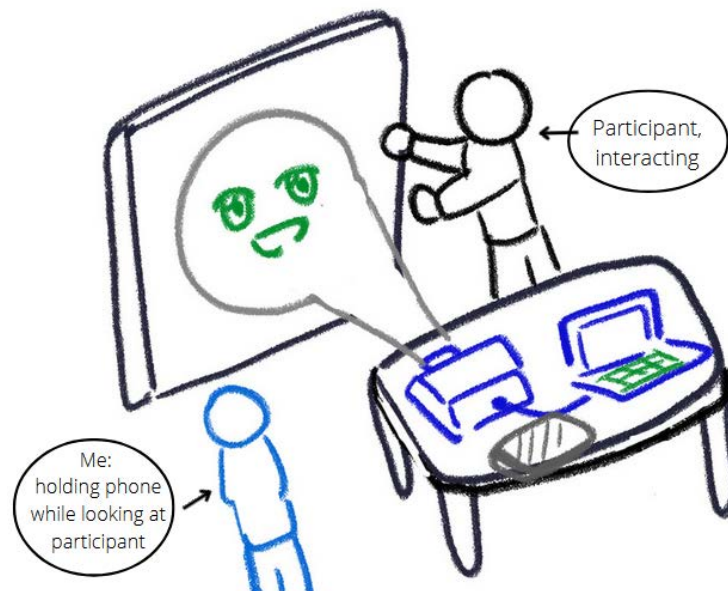


(Setup displaying the initiation heart and the default expression of the wall)

a wall and not a board. After doing that, I asked the participants to engage in a conversation with Sociall, and in turn I would take notes of their reactions. The setup looked like what is shown in (Figure 3.5.2) . While they interacted, I used the Wizard of oz Method, as shown in (Figure 3.5.2) to control Sociall's reactions accordingly. I had my phone in my hand, and controlled Sociall's reactions through buttons that were already programmed prior as shown in (Figure 3.5.2) . At this stage, Sociall spoke in English, and responded to what others would say which included greetings, simple questions, and directions with a cute voice. In terms of aesthetics, Sociall was still at the second phase of design, which as stated earlier, included the full facial expression with eyes and mouth. The two colors it came with was green and red. Green when conveying positive emotions, and red when conveying negative emotions.

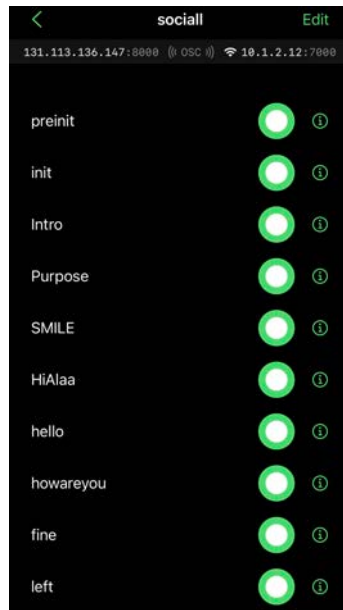
(Step by step interaction) First, when participants approached Sociall, it displayed an initiation screen that had a big heart drawn and the words "press to start". Once they touched the screen long enough, the heart would fill up with a green liquid until it is maxed up as if feeling the participant's presence. After it

Figure 3.14 First prototype interaction method



(This shows the Wizard of Oz interaction method I had used and a sketch of the setup in detail)

Figure 3.15 Social's Control Buttons



(Buttons used to control the interactions of Social behind the scenes)

Figure 3.16 First prototype modes

Initiation phase



Default mode



Two negative emotions if the wall is sad:



(Displaying the major interaction journey modes)

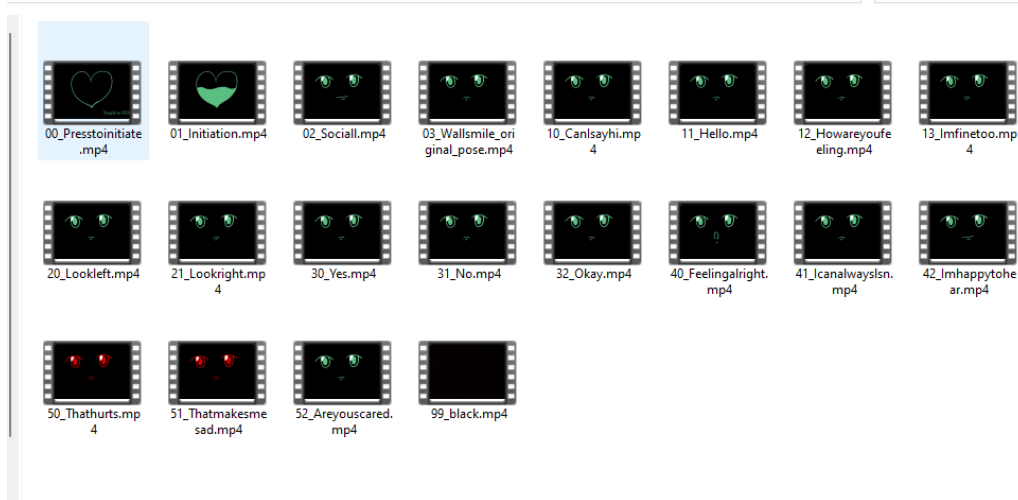
gets maxed up, the wall's expression starts appearing from a sleepy state to the default one which is of it blinking and smiling wide from time to time as shown in (Figure 3.5.2). At that moment, participants questioned what Sociall is able to do, thus I gave them a little command manual, as shown in the list below, highlighting what they are able and not able to do. To design the whole interaction I had to predict most of questions that could be asked to Sociall, and the reactions to that, I wrote that down separately. I'd play each reaction on time which made it seem that they were really interacting with Sociall in real time. To an extent that lots of the participants questioned where the sensor or camera was.

- Touch to initiate
- You can ask it to smile
- You can greet it a Hello/Hi
- You can ask it to look to the left or right
- You can tell it about a happy thing that happened to you today
- You can ask it a Yes or No answer question
- You can ask it to introduce itself
- You can ask it to explain its purpose/why was it made
- You can humiliate it or make it sad to see its reaction
- You can ask how it feels about the plenary meeting
- You can ask it to disappear off the wall

The process of creation of those replies to those commands was through animating scenes using Adobe Animate then linking them to an audio that I had previously recorded with my own voice. They were 20 animated scenes in total if I were to include the plain black, disappearing, scene as shown in (Figure 3.5.2). After that, with the help of my assistant professor, I had the files sent in a folder and then we managed to use Touch Designer to design the user interaction journey as shown (Figure 3.5.2). The window 1

screen was the one controlled and displayed through the projector. It starts playing each time from the pre-initiation phase. Later, those interactions were linked through programming to the set of buttons which were shown earlier through an app named Clean OSC. Each animation linked to the correspondent button and named accordingly, which allowed me to easily control when I had to do so.

Figure 3.17 Sociall's First Prototype Animations



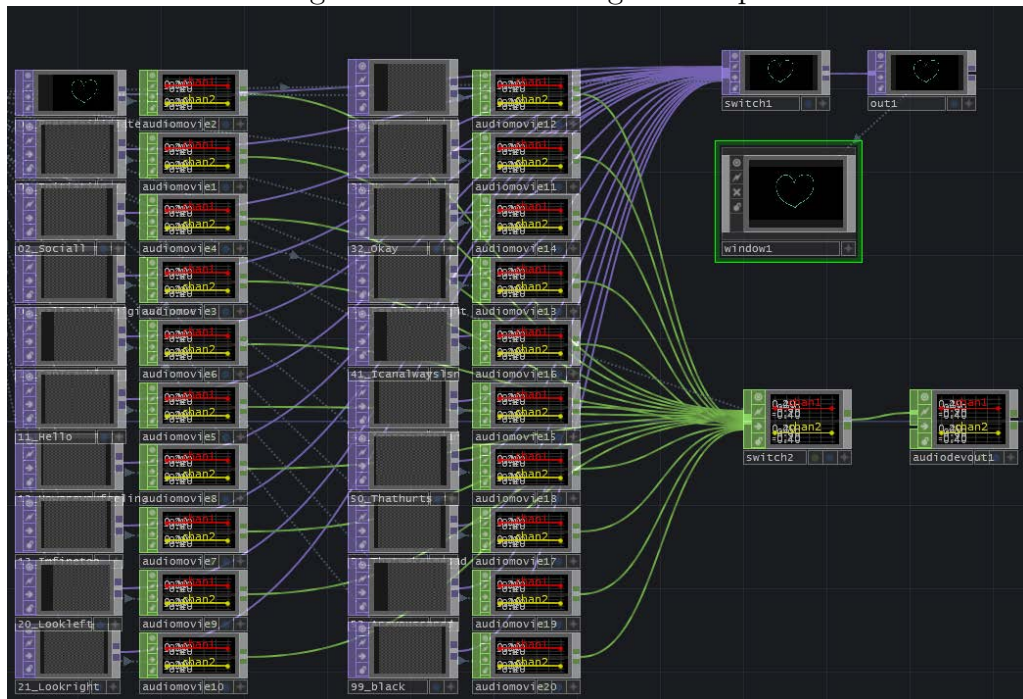
(Animation files included in the first prototype, 20 in total)

3.5.3 Results and Alterations

While keeping my main goals and objectives in mind for this specific prototype, which was to choose the best interaction method and find the best case usage scenario to apply Sociall to, I processed the results and the possible alterations accordingly.

Starting off with the positive results, a lot commented that the simplicity and cuteness of Sociall's expressions are what made them find it easy to engage and interact with it. I noticed that they would jump also every time Sociall's face would change colors from green to red when having opposite reactions. That point was important to note due to the fact that the change in color made a big difference in the first stage. Thus, allowing me to keep it as an aesthetic choice.

Figure 3.18 Touch Designer Setup

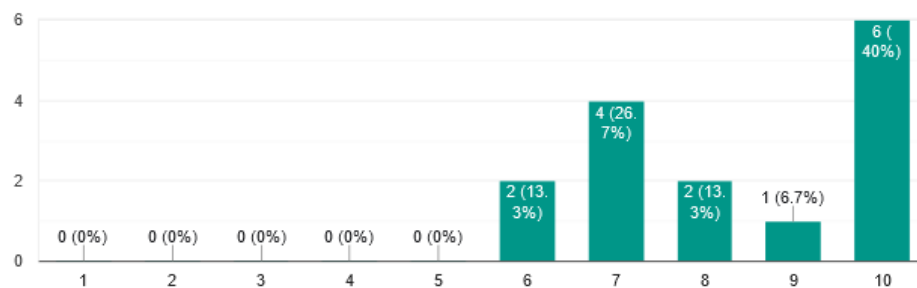


(Touch designer user interaction journey visual design)

Figure 3.19 Chart of Enjoyment through Interaction

How did you find the interaction? 1 being least fun and 10 being most fun.

15 responses

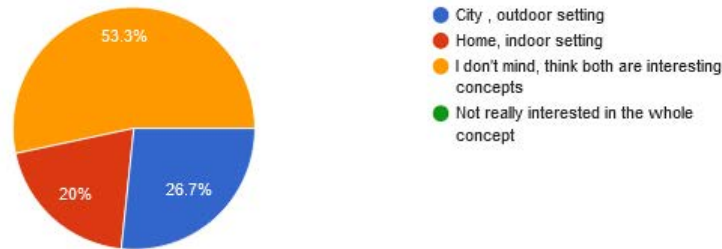


(Chart showing the level of fun the participants had during interaction)

Figure 3.20 Public vs. Private Preference Chart

Would you think this is a more interesting future project if it was indoors (in a home), or outdoors (characterized speaking wall installations within a city)?

15 responses



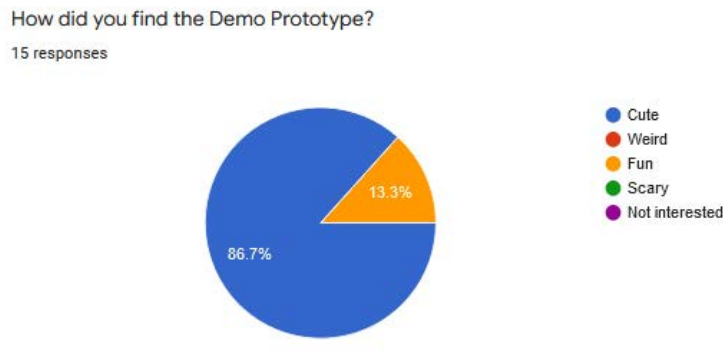
(Chart showing preference of participants on whether Social should be a private or public installation)

Moving on, the cuteness of the voice was a factor they really loved too. They thought it contrasted well with the cuteness of the face in general. Since the interaction was endearing to them, they thought it would be a great aspect in easing loneliness or initiating a fun time. Regarding whether voice or facial expressions for interactions is best, everyone thought that they complimented one another and it was what gave Social, its personality.

Regarding the interaction rating, most of the participants leaned to the interaction being fun, with everyone who tested it giving it a 6 and above. 10, being the most chosen by 6 participants as shown in (Figure 3.5.3). While 6, the lowest having 2 votes from the participants. The deep observation phase too, backed up those choices as I have seen many participants laughing, or squealing at Social's cuteness. There were times where they repeatedly tried to calm it down when it would get upset too. They would sincerely apologize to it and sympathise with it. Then once it is happy again, they would smile. Most of the ratings as shown in (Figure 3.5.3) regarding the demo prototype overall with, 13 at 86.7 percent, saying it was cute, and, 2 at 13.3 percent, mentioning it is fun.

Furthermore, the results show in (Figure 3.5.3) that they leaned to the concept being feasible both public, and private with the public slightly preferred due to the fact some were worried over privacy concerns and thinking that public spaces would offer more creative freedom in terms of playfulness. For the city

Figure 3.21 Thoughts of Demo Prototype Chart



(A chart showing what people mostly thought regarding the full demo prototype's design and interaction)

outdoor settings, 4 at a 26.7 percent, agreed that outdoors seems to be the better setting. While, 3 at 20 percent, felt that it would suit the home setting more. However, the majority, 8 at 53.3 percent agreed that either concepts are interesting. In the end I decided to go for public setting and take into consideration the suggestions given to me regarding which outdoor settings to choose. The outdoor settings repeatedly suggested were: nursing homes, exhibitions and kindergartens.

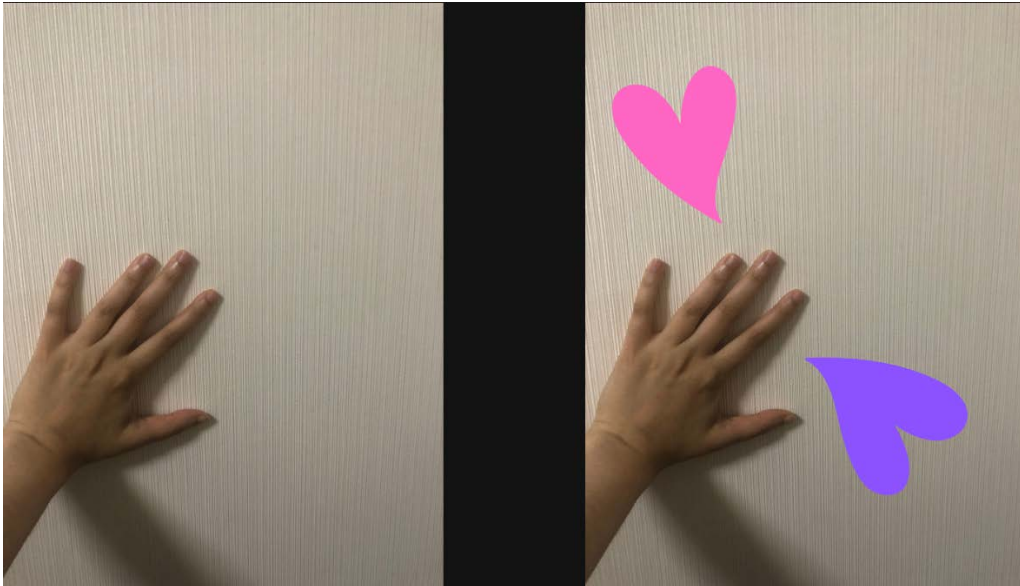
On the other hand, for the negative results, a larger ratio of participants mentioned that they felt it was more like a character pasted onto the wall rather than the wall being a character of its own. The reasoning being, that the face displayed is rather small in proportion. Also the colors of the facial expressions were standing out too much due to being beaming, that it did not look like a part of the wall itself. Another comment mentioned was the future prospect of it being able to communicate to another wall, or each wall partition having its own personality and the possibility of expanding the whole Social world in turn. Others noted that the more conversational it is, the more fun it would be just like Alexa for example. Finally, a few questioned what would happen if one would hang something on a wall, or lean on a wall. An idea that further proved feasible and important to the development of the hypothesis in the next stages of the prototype. As an example what if the wall would turn red if you punched it? or release emotions if you leaned against it or touched it like shown in the visualization in (Figure 3.5.3) and (Figure 3.5.3)

Figure 3.22 Punching wall idea visualization



(An ideation visualization of what if the wall could show its reaction in response to natural interactions we have with it on the daily, in this case if we punch it)

Figure 3.23 Touching wall idea visualization



(An ideation visualization of what if the wall could show its reaction in response to natural interactions we have with it on the daily, in this case if we touch it/lean on it)

For the alterations after the feedback, basically three main alterations took place;

First, is the scenario location choice. After the feedback collected, I looked into the three mentioned locations suggested; nursing homes, kindergartens and exhibitions. Starting off, I researched about the possibility of nursing homes being a chosen scenario in which Sociall can fit in. However, due to lots of factors that ranged from Dementia to common fears that the elderly have because of their old age, Sociall would fail to be best fit. It might be a trigger or cause of anxiety to see faces appearing from the wall that want to engage in a conversation with the elderly. In the case of kindergartens, it seems to be a promising yet, around the time when I was user-testing it was difficult to have an experiment conducted with the kids due to the pandemic. Thus, in the end, and after deeper research I figured the best case scenario would be waiting areas in general. The mundane waiting time would be an opportunity for interaction. For starters, I decided to focus on bus stops with the basic design shown in (Figure 3.5.3).

Figure 3.24 Bus Stop Sketch



(Initial Sketch of the Bus Stop Design of Sociall)

Second, would be the aesthetic choice alterations. The feedback given regarding that is as stated above, mostly regarding the inability to think of Sociall as a character due the size and placement of the facial features. Thus, for that I decided to instead only show big expressive eyes while letting other specific features appear from time to time as shown in (Figure 3.5.3). Also regarding what

had been mentioned about desiring Social to be more conversational, to make the approach more unique to the public, I decided to incorporate a special wall language, which will be discussed in the next chapter. Finally would be the colors of the facial expressions which were too striking, I decided to change it into a more pastel based set of colors so it would blend better within the walls.

Figure 3.25 Facial Features Interaction Visual



(Visual showing the different planned interactions/design of Social that changed from the original small facial expression)

Finally, is the factor of trying to use natural interactions with the wall, to initiate the reactions. As an example, touching the wall, leaning onto the wall, punching the wall. From that initiation, the wall will respond using a fun element of surprise and it will vary according to different interactions. In which, I had decided to test out in the final prototype.

Chapter 4

Validation

4.1. Final Prototype

4.1.1 Goals and Objective of Prototype

After the first prototype, and the results collected along with alterations, which in summary included; One, choosing waiting spaces in this case bus stops as the case scenario location. Two, changing Sociall's Facial features and the way they appear, so rather than an initiation button, they would appear out of nowhere to incorporate a sense of surprise. The eyes were also changed to fill up the space ratio, in order to emphasize on the character visualization factor. Also, emphasizing more on such point, a wall language has been added to add fun and uniqueness to the conversational part. Last but not least, is the addition of a focus on natural interactions people might have with a wall, and from that creating a special interaction scenario with Sociall.

I had an opportunity to showcase this prototype in PLAY's Exhibition 2022 that took place on the 28th and 29th of May. The objective of this experiment at this stage was first, to measure the novelty of the interaction. Second is to record to what extent could people perceive the wall as a character rather than a display and whether the Sociall language helps with that factor. To achieve that, I emphasized on personality, huge facial features (eyes, ears), the special wall language and natural interactions with the wall. Third, check if the natural interactions would be a successful means of interacting and how they could be improved. Last but not least, making sure that the location of choice is most suitable and what places would Sociall be best fit to be installed in the future.

4.1.2 Hypothesis and Experimental design

I believe that through using storytelling as a base, walls in the future, rather than just being a display, could go further beyond that by being portrayed as a “character” to increase playfulness especially in the mundane, everyday waiting areas such as bus stops for example. Thus, I think that by focusing on the natural interactions that a person would have with a wall e.g. (leaning on, touching, staring at) while waiting would be a great potential for designing a playful story-based experience. An experience that sets stage for the wall to be a character of its own which had tried its best since the beginning of time to interact with humans and grab their attention. The wall character appears as a wall, right behind the people waiting, with big animated greenish eyes which change to two other colors, red and dull grey, depending on the emotions conveyed through the interaction. It is able to sense the participants in the area, and look at each for the means of interaction. While reacting to touch, and voice as well. The wall produces a noise of its own described as “Social Language” which is a language that only social public walls, Socials, speak with and that humans cannot understand. The waiting area itself, was designed within a small part of the exhibition in a way to draw in whoever wants to participate in the experience.

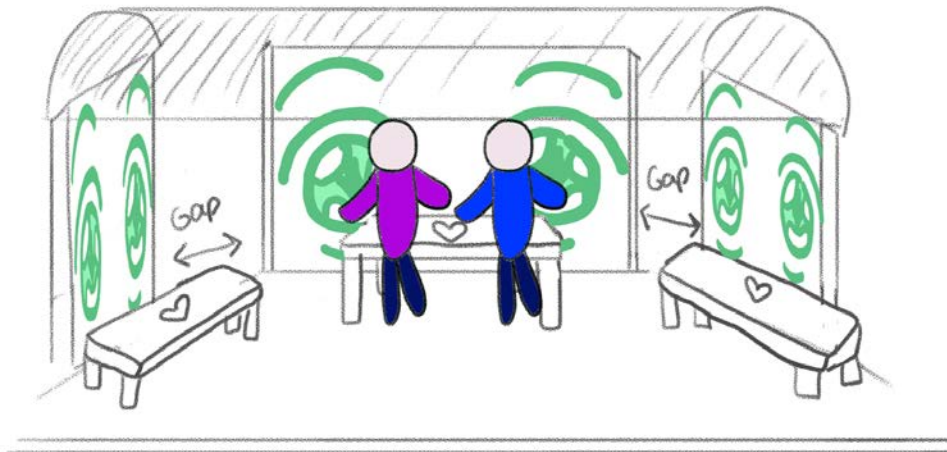
Thus in summary, what I want to prove through this experiment is; (1) With a backstory, and distinct expressive eyes for a character design, would others be able to perceive Social as a character of its own? (2) Would others be able to interact with Social in a natural manner? e.g. through leaning on, touching etc. (3) Would their actions change if they perceive emotional changes of the wall in front of them and do the color changes within the wall impact their behavior? and finally (4) Is Social’s special language affecting the design in a positive way?

4.1.3 Setup Design Procedure

The design of the installation itself, is a major part of the final experiment. Thus, it will be discussed in detail in this section. The choice of bus stop came after a long research on best case scenarios as stated previously. During that phase I researched further on the concept of playful bus stop designs in order to help me with my own design. The amount of playful bus stop designs were overwhelming.

However, they were each uniquely creative, ranging from play areas to informative or just a means of relaxation. It is by no chance that areas like that have been a focus of playful design. The reason behind that being the aim of taking advantage of the boring idle waiting experience one spends till their next destination. Also given what has been shared earlier about the hostility of city life, and the busy working hours in the fast cities. I think it all adds up to needing that fun period within hours of commuting. Though, such a fact, sets point to a plenty of competition. Therefore, I had to focus on points that would make my Social bus stop design unique and distinctive from all the others.

Figure 4.1 Prototype First Sketch

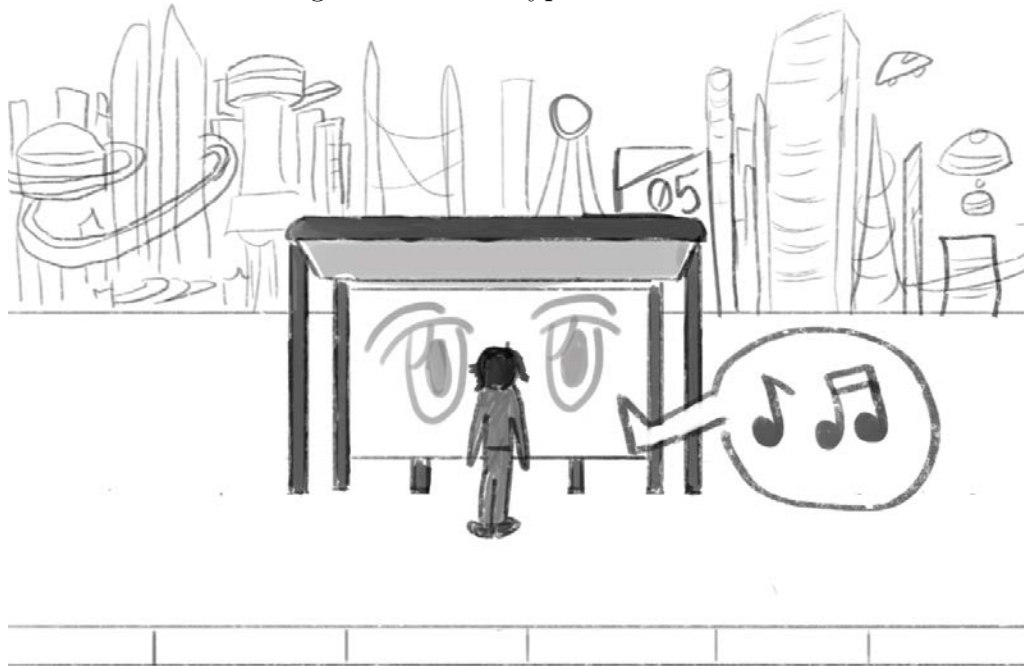


(Final Prototype's first sketch plan)

At first I was pondering on the idea of making the design using 3 different wall partitions as shown in (Figure 4.1.3) that would interact together. That way I would let many people inside the space and each interact with a wall. Then, it would give possibility for walls to interact with each other too. However, to prove the points in my hypothesis, I figured that the simpler the idea the better and more feasible regarding the limit of time I had to prepare. Thus, as the main idea focused on Social itself rather than the space being a bus-stop I decided to just incorporate the idea directly without adding anything else as shown the figure

mentioned earlier in Chapter 3, (Figure 3.5.3) . I also removed the bench in the end because I thought that would hinder the possibility of natural interactions.

Figure 4.2 Prototype Final Sketch



(Final Prototype's final sketch plan after fixing)

The main challenge was though, how to create a design that is life-sized, visually pleasing and at the same time staying focused on the main purpose. Starting off, I sketched a simple design as shown in (Figure 4.1.3) of how the prototype would look like. The background would be a backdrop of a futuristic city and the bus stop would be life-sized. The projection will be projected onto the wall which includes the backdrop and the bus stop. The space around as shown, would have a carpet for flooring, a bus stop sign and a few props.

After setting up the main sketch, I decided to start working on the animations and backdrop. For the backdrop, I used Adobe Illustrator to create the futuristic buildings, mixing it in with some props I had created on Adobe After Effects which includes, the moon, stars, sky and the overall futuristic effects. The animation of the background was also done in after effects which includes a slow movement of the car, and the moon shining. The bus stop on the other hand was modeled

Figure 4.3 Model of Busstop



(Modelling process of the Social Busstop in Blender)

using Blender as shown (Figure 4.1.3), then rendered before being placed into Adobe Photoshop for brush ups and finally placed on top of the city background in After Effects. I tried to make the bus stop look realistic in contrast to the city background that looked like a cartoon. In the end the whole setup looked as shown below (Figure 4.1.3), the picture on the left. However, after the first testing phase I figured there was an issue because the ratio of the city in contrast to the bus stop made it impossible for the bus stop to be projected as life-size as I was aiming for it to be. Thus, I decided to follow a Plan B in which I had to omit the whole background and just keep it reflecting from the bus stop windows, as the bus stop the only projected item as shown in the same (Figure 4.1.3), on the right. Furthermore, due to the exhibition space not allowing anything to be hung up from the ceiling, with the help of my assistant professor, we managed to find a way to project from on top of a high rack. That made the interaction smoother, and stopped the possibility letting participants shadows cover the projected image.

Next step was creating the animations. Like the first prototype, I also used the method of creating animations and then connecting them to special buttons as shown in (Figure 4.1.3). This time however, we were not able to use Touch

Figure 4.4 Final Prototype's final design process 1 and 2



(Prototype first look beside final look)

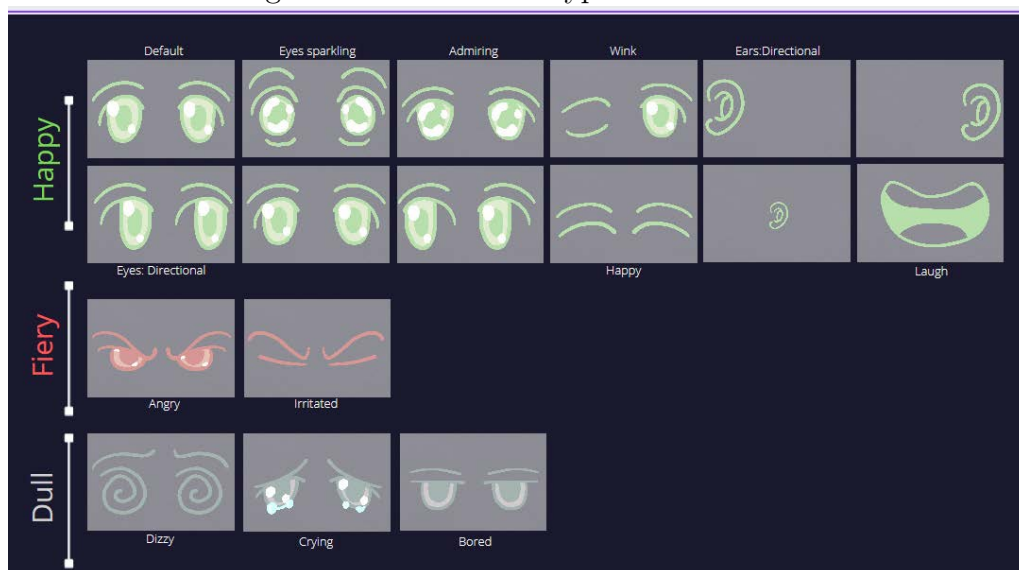
Figure 4.5 Final Prototype's Control Buttons



(Final Prototype Buttons used for controlling the Social's interactions)

Designer , instead this time Javascript Processing J5 was used. Thus, the process was a bit tricky in terms of trying to achieve what I had on my mind, with the help of my professor. However, we managed to get our ideas in place in the end, and the result looked promising. The animations were 19 expressions in total, and 33 as shown in (Figure 4.1.3) if counted with “loop-versions” of the originals which are meant to play on repeat after the originals. The videos were all animated using Adobe Animate and adjusted for a final effect of wobbly liveliness by using After Effects. For this time however, the sounds were recorded separately unlike the first prototype. Then attached later to the videos, reason being that if there were to be any error in the audios, it could easily be corrected without the need to re-render any video file. Same goes for the videos, making the update process faster. This proved to be useful during the testing of the prototype period right before the actual execution where an ample of errors were found.

Figure 4.6 Final Prototype’s Animations



(Final Prototype’s Animation files of each expression for interaction)

The total animations are composed of negative fiery emotions (anger and irritation) colored in pastel red. Negative, dull emotions (dizzy, bored, crying) in pastel grey. Other positive emotions were conveyed in pastel green which included (Admiring, Amused, Happy, Winking, Looking to right and left, moving ear listening

to conversations, laughing mouth and default blinking mode). The reason of choices were all deliberate based on the main goals I had for this prototype and all actually compliment the main character built for Sociall. The admiring, amused, and happy expressions compliment the character of always aiming for human attention, and once a human notices it in a bus stop it grows excited and its eyes sparkle. The looking left to right was made in order for the character to follow the humans actions around, looking at them in real time. Winking is when complimented verbally. While the moving ear is when people speak beside it, and it is interested in knowing the content of the conversation as it is famously said, "walls have ears". Then comes the laughing mouth which appears if the wall is patted too much. For the negative fiery emotions, angry would appear if it heard loud sounds of fighting beside it or if it is hit. While, the irritated expression would appear if one leans onto it for too long to the weight felt. Moving on, are the dull expressions. The dizzy was made as a reaction of a person does too many incomprehensible reactions at once or if too many people are running around at once. The crying is a responsive to verbal offense, as well as fighting or hitting it too much beyond anger. Finally the bored expression is when the bus arrives, since it is sad the human is going to leave, making a dissatisfied sound.

After finishing with the animation and projected bus stop design, I focused on the design around the area as previously sketched. The area around the projection was composed of a carpet that looked like concrete, and a little bus stop sign stuck to the table as shown in (Figure 4.1.3)

4.1.4 Experiment Procedure

Before starting, participants were asked for their consent to be involved in such activity through entailing any risk factors, and the methods used for recording. Then after their consent was received in a form of a signature, I had to clarify Sociall's background to them, explaining its character and how it likes interacting with humans. Sadly, having to do that, I lost the chance to let them experience the 'surprise factor' that I was aiming to experiment with at the beginning. Despite that, I made sure that the interaction screen was only showing a wall as it was in a blank-before-interaction form. Thus, since they were not able to see the expressions previously, they still did not know what to expect when going into

Figure 4.7 Final Prototype's Setup



(Final Prototype's look after getting finalized)

the experiment. Thus, they seemed excited in a way.

Once they were in the experimental phase, I told them to act casually as if they are in a bus station. I had asked them 'What would you do if you were at a bus station, waiting and not expecting anything to appear or be different?' most of the participants leaned onto the wall, while looking at their phones. Some just stood beside it, and others, in pairs especially decided to talk beside it. According to each action, Sociall reacted differently. To people who leaned on the wall, it showed a sense of irritation, which made others laugh and apologize that they were heavy. For those who stood beside it, the wall would look over at them and blink. Once they look over, its eyes would widen in admiration. Most of the recorded reactions were filled with laughter, surprise, or just genuine smiles. While for those who came in pairs to try the experiment, as they would talk to one another, Sociall's curious ear would appear to listen. The reactions to this were a variety from asking it not to pry, to just simply laughing. I will further talk about each of the interactions, and feedback given in the next set of paragraphs. All of the interactions were accompanied with curious incomprehensible, wall language noises as its curious to listen to and know more about the person/people waiting. Through that, a person could interact with it in various ways like touching, patting, hitting or even conversing with. In return, the wall reacted in various fun ways like changing expressions, colors and vocal replies accordingly. Then by the time the bus arrived, I would tell the participant that it did and they had to leave. Then the wall goes into an idle, bored mode till its eyes slowly fade away as it waits for the next person to engage.

After interacting, each person was given a QR code link to a survey to fill which was in no way compulsory and the participant could opt out if they did not want to fill it in. About 40 attendees had participated in the experiment, 29 of them who willingly wanted to help with the survey. However, I did record everyone's reactions through either deep observation or a video taken after their consent was given. All the results will be discussed in the next section.

4.1.5 Results of the Experiment

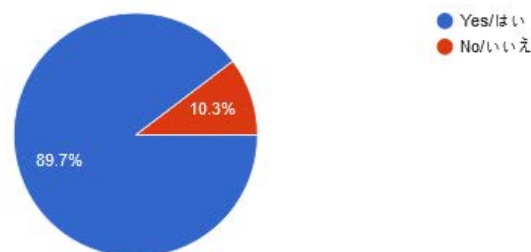
There was a lot of data I collected through the two days of this experiment. It ranged from interactions, to comments, and even little gestures that were noted

accordingly. Thus, I will discuss them in this section thoroughly, explaining them in regards to my research questions and hypothesis.

During the first phase of the questionnaire or data collection, I asked the participants for their demographics; including age, gender and nationality. The ages of people interacted ranged from above 18 to 54 as recorded through the survey. However, I even got to record reactions of kids who were brought in by their families which was valuable to the progress of this research. As for the genders, through the survey results, the majority were female with a ratio of 21 females to 8 males. Though, that does not count the people who opted out from filling the survey, which from my observation were mainly men. Thus, I think the ratio of men to women in terms of interaction were similar in a way. Finally, for nationalities, a diverse amount of nationalities participated. From the ones who filled the survey there were Australian, Canadian, Danish, Chinese, French, Indian, Japanese, Thai, and American. The variety in the demographics managed to bring out different unique opinions that helped in the research process.

Figure 4.8 Final Prototype Character Perspective Chart

Did the wall's design make you feel like it is an actual character? / 壁のデザインは、実際のキャラクターのように感じましたか? *楕円形を1つだけマークしてください。
29 responses



(Chart showing the amount of people that perceived Sociall as a character of its own versus who failed to)

First, comes the research question, 'With a backstory and distinct expressive eyes for a character design would others be able to perceive Sociall as a character of its own?'. To some extent, yes. Most of the participants if not all, felt it was a character rather than a display especially with the brief backstory I had given

them about Sociall initially, telling them it loved humans, and would love to always catch their attention. A bunch of the participants mentioned that through the expressiveness of the eyes, they were able to feel Sociall's emotions and thus, felt that they were a character of their own. Through their reactions and their emotional responses, I felt they genuinely felt worried if it felt sad, and tried to gesture it to feel better or they would ask questions curiously to get to know it further. Meanwhile through the survey, 26 participants at a 89.7 percent, answered yes and only 3 at 10.3 percent, disagreed as shown in (Figure 4.1.5) . For the ones who agreed, some of their main reasons were "I can feel the emotions" , "Since I can feel the mood of the wall through animations, it looks alive to me. " , "The interactivity", "It replied to me", "I found it very attractive as a character that can feel pain and suffering." , "Because there were both positive and negative reactions", "The eye expressions was character like". While the participants who disagreed stated that, "It was because I noticed that it was moved by someone previously that I could not perceive it." and "The pitch black background , it would have been more interesting with advertisements". I noted through such feedback, that the perceiving of character was successful. That success was due to three factors which are; the expressiveness of the eyes, the interactivity and the contrast in negative and positive emotions

Through those three I believe, most were able to think of Sociall as wall character rather than just a display. Thus, it made some of them scared to touch it not to hurt its eyes, or even worried when it cried. They felt its emotions. While I think those who replied negatively were due to mistakes I had made during the procedure, since the first knew I was controlling it. While the other person noticed the sort of dark background I made a mistake putting, rather than a brighter wall which gave them the feel of a display.

Second question would be, "Would others be able to interact with Sociall in a natural manner e.g. through leaning onto it, touching it etc.?" For this step, I deeply observed and took videos of participants' interactions in order to record the results. The answer to this is yes and no. At the beginning, before Sociall's expression shows up, people usually lean onto the wall, or stand beside it. However, once the eyes showed up, I noticed that most of them would move backwards, trying to rather control it through gestures than anything else. They would try

to talk to it, or move their arms in the air, either waving, or randomly trying to grab its attention. None of the participants thought they could touch it. Then, when I would tell them they could most of them would act confused, and ask me if it was okay. They even mentioned that it was hard to tell if they could touch it since, first, it has huge eyes, and you would have to move backwards in order to be able to see it fully. Second, once you are backward, you have a distance between you and the wall, so you start gesturing over rather than thinking of touching it. In addition, since it is so responsive, some of them thought that if one touches it they would hurt its eyes and they did not want to hurt it. Finally, some of the participants found the idea of touching a public wall dirty.

However, on the other hand, when kids went to interact with Sociall, they directly touched it, kicked it, pet it, and even lean on it. Unlike adults, they did not think in a complex way. What further caught my attention with kids' interactions as well was the fact that they would feel bad when they hit it and try to console it by patting it. Thus, I would say that one could further broaden this concept if a few factors were fixed, like maybe adjusting the eye size, and position, or create interactions that would stimulate one to touch it. Otherwise, focusing on the most used, which is leaning onto it should be put into priority.

Third, "Would the participants actions change if they perceive emotional changes of the wall in front of them, and do color changes within the wall impact such behavior?" They did, and mainly because of the expressiveness of the eyes as mentioned earlier. I noticed most of the participants would feel bad when it changed into negative emotions. They would ask me how to cheer it up while trying their best to do so. Some of them would squeal if it gets happy and gush about how cute it is. Even the kids as mentioned earlier would hit it and when it cries they start patting it or when it gets angry they get angry back at it. So the answer to the first question is yes. I noticed that their actions change according to how they perceived the emotional changes of the wall in front of them. However, not many noticed the changes in color around this time, unlike the first prototype and I think that goes back to the fact that the colors are more pastel this time, and similar. Especially, the grey tones and green tones. Despite that, some did mention that they liked the changes in color due to it adding to the liveliness of the wall.

Last but not least, “Is Sociall’s Special language affecting the design in a positive way?” Somehow, most of the participants were unable to notice the wall language. Some of them were confused what it was saying, and asked me what it was. Others, did not comment and just enjoyed the interactions accompanied by the cute voice. While, the minority, mentioned that they felt they understood it like the ‘minions’ due to the voice being cute, expressive and emotional. One mentioned that she likes that just like a pet, she can not understand it but can feel what it is saying. For the most part of it failing to reach audiences, I think that goes back to a major factor, that at such a stage I had failed to make Sociall conversational to an extent that one would notice it was speaking a unique language. After all, I did get another comment praising the fact that I had chosen a gibberish language for the wall rather than using normal human language. They did mention however, the fact I mentioned earlier, that they had wished it was more conversational so that they would have the chance to engage in long responsive conversations with it. In other words, yes the Special Language is an essential part to add the fun and uniqueness to Sociall if made more conversational, and noticeable to the participant.

Other than the main tackled questions, there were other important results that are also worth mentioning.

The participants were asked for their character design preference. Most of the votes went towards the expressive eyes, ranking it highest. The reasons being that it is more interactive, they could feel the emotions through it, the changes in the eyes could easily be understood and finally “Eyes are one of the key places to see emotion and connect with people.” They were all valid points, making the eyes a strong attractive point of Sociall’s interactivity. While, the least liked bit, was the laughing mouth or ears. For the laughing mouth, it was because it felt unnatural to many, while others could not figure out it was a mouth. Rather than eyes, it felt weird for them for a wall to have a mouth. As for the ears, they thought the animation itself was not enough, the fact the ears only moved from side to side made them feel like there was a missing factor in contrast with the highly expressive eyes. An important comment that was brought to attention was “I think if it stays just eyes, it will appear more consistent as a single character.” which I think is a valid point. Just being eyes, and having a wall language might

create a unique way that walls could interact by in the future. Meanwhile, the most liked interactions were the big expressive admiring eyes when someone gave Sociall attention. Comments given were “I felt that reaction was the most natural way to communicate”, “Cute” , and many more. In contrast, The least liked interactions were the angry wall and the ear curiously moving to hear out conversations. The reasoning for the angry wall was that, some people might intentionally shout at it, or hit it so that the angry expression and that would cause trouble in the area. Another comment was “Maybe not so cute if the wall shows angry ”, “I am so tired and really do not want to see the angry face haha ”. As for the ears moving to hear the conversation, “I did not notice the function” , “I think this part will be more interesting if the animations are more detailed.” or “The eavesdropping aspect creeps me out ”. A point to make here is that the angry face impacted most, despite not being the only negative emotion. I think that would go back to the fact that it is the most aggressive emotion in the set and that would make it less cute.

As for the interactions generally most found it “fun” , “engaging” , “can kill time after a long day of work” , and “wall as a friend”. As those who did not feel it was the best, mentioned important points to note as well. They told me that the interactions were very few, they could get boring in time, the character could be cooler and more emphasized on and such. They mainly enjoyed the overall concept as shown in (Figure 4.1.5)

Last but not least, are the scenarios in which Sociall best fits at. Everyone who took the survey agreed that Sociall could be used in different scenarios as shown in (Figure 4.1.5) .Train stations, schools, kindergartens, tourism, instillation at home, hospitals, nursery homes, corridors in a building, children hospital, shopping mall, and many others are just a few from the ones mentioned. Thus, the fact that walls are everywhere, makes it feasible in a plenty of scenarios in the future which would be discussed later in Chapter 5’s section, “Future Work”.

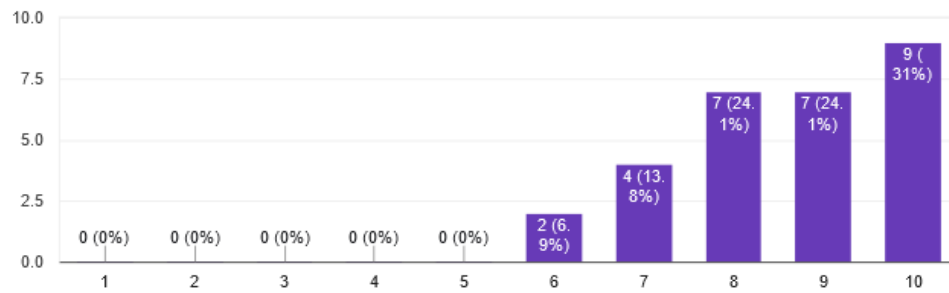
4.1.6 Alterations after the Experiment

Being in the final experiment phase for this prototype in this research, I was not able to update the alterations physically. However, in this section I will discuss about future possible alterations that could be taken into consideration from the

Figure 4.9 Final Prototype Overall Concept Satisfaction Chart

From a scale of 1 to 10 , rate your satisfaction with the overall concept/1から10の値で、全体的なコンセプトに対する満足度を評価してください。*楕円形を1つだけマークしてください。

29 responses

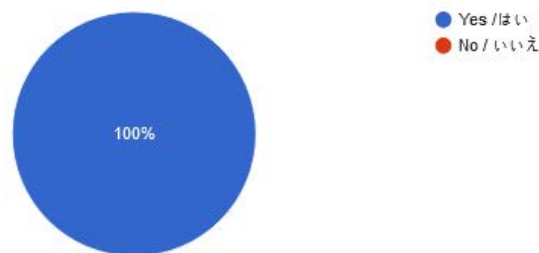


(Chart showing the overall satisfaction of participants with Social's concept)

Figure 4.10 Social's Scenario Chart

Would it be useful in other scenarios?/他のシナリオで役立つと思われますか? *楕円形を1つだけマークしてください。

29 responses



(Chart showing the agreement of participants that Social could be used in different scenarios in the future)

results above.

Given the fact that the expressive eyes, interactivity, and contrast between positive and negative emotions struck out most in defining Sociall's character, focusing on them as an alteration would be good. The factor that could make Socciall unique is the ability to communicate through its expressive eyes, change in colors,cute voice and wall language. Thus , to make it feel like a consistent character removing the mouth, and ears while just completely focusing on the expressiveness of eyes and wall language as a communication would bring out Sociall's uniqueness. Afterall, I did notice a confused expression on the people interacting whenever Sociall would reveal ears or mouth. As mentioned above they thought it was weird or unnatural in contrast to the main connection they felt with the eyes.

As for the wall language, making it more conversational would be the aim. It seemed that the participants dismissed its existence due to the few words Sociall talked with. One of the participants tried talking to it for a while and would whine that it did not respond as much. She wanted it to be more responsive in that aspect and be able to reply out as much talk as she was trying to express. Thus, adding more sentences, possible scenarios of expression and a variety of vocabulary would be a necessary alteration to the language. That way like the way watchers noticed the minions language due to a variety of talk, participants will start noticing Sociall's language as a unique factor of the interaction.

Another possible alteration is regarding the "natural interactions" I had set to be an important method to interact with Sociall, as a wall. However, most of the participants seemed to move backwards to interact, creating a gap and failing to notice they are able to touch it. Only kids would rush to touch it , play with it, and even kick it. Therefore, given the reason that the adults failed to know they could touch or pat the wall, I thought that maybe adding a way in which the wall could communicate to them to touch it would be interesting. For example if its eyes got smaller, and a part of it started glowing like a game. Despite that, for the timebeing I think focusing on the natural interactions in the phase of initiation would be best, just like how everyone seemed to lean on the wall while waiting.Maybe , also test by changing the eye size,position accordingly. As for the kids, given their reactions, a focus on natural interactions would be a major

prospect if am thinking of incorporating Sociall into children play areas in the future.

Moving on, the change in color of Sociall, should be a bit more distinct for it to be noticed. The pastel green to red change in emotion and color seemed to have worked out. However, the subtle change from pastel greens to greys were left unnoticed. Thus, making the dull expressions a more blue tinted color might solve the problem and in turn make each color change distinct from the other. For emotions, they will be all used , and more would be added into the registry to make it more interactive. Anger though will be omitted due to the factor it might cause chaos. As in people would hit the wall for it to get angry, or would shout at it purposely for it to get angry, and that is unpleasant. It also contrasts with the main cute personality of Sociall.

Chapter 5

Conclusion

5.1. Summary

Starting off this research, my aim was to create a wall character that could communicate to others and in turn make the environment more responsive and fun through the use of the power storytelling. At first, it was targeted towards private spaces, inspired by virtual assistant technology. However, it developed further into a public space interactive wall that was set in a waiting space, specifically a bus stop to test it out. In the future it is aiming to be a registry of its own recording history and having its own story to promote tourism and at same time be a fun healing presence in an environment. Fueling that passion were a bunch of motivations which ranged from an interest in walls, emotional design, playful design, storytelling, animation, and responsive environments as mentioned earlier in first chapter.

Moving on to related works that were the core support of this project which included, different creative usages of walls nowadays different playful character public installations in urban areas as well as storytelling based spaces that initiate stories through a mix of art and technology. An ample of examples which showed how heavy of an area of interest that walls have become throughout the recent years. Thus, for Sociall to assert its uniqueness between such a competition an emphasis on character became the area of focus in this research.

Furthermore, the concept design of the project was introduced, which started off with the design approach, followed by the three phases of character design that Sociall went through. It started off as a wall within a private space , a different look, and different interactions. It slowly evolved to the third and final phase, which it is now at with expressive eyes, a special wall language in a bus stop setting. Then, Sociall's Story followed which included its personality, and

language. Next, the first survey and first prototype were showcased along with different participants' interactions and their reactions. Then, the results were revealed followed by a series of alterations due to a plenty of useful feedback. That feedback initiated the process of creating a final prototype that re-tested the altered version of Sociall which in turn, ended up with promising results for it to be a concept in the future. Socialls seemed to have shined most to others through its cute personality and big expressive eyes. A factor that left a positive impression, and a future prospective of it being beneficial to others.

5.2. Limitations

At this stage, Sociall is far from complete. Eventhough it had went through three surveys and two prototypes. It still needs an ample of work to be complete, and it is more of a future concept rather than something that could be executed nowadays. Thus, it includes many limitations which are further mentioned below:

1. This is more of a concept of the future, rather than a feasible , technical prototype.Despite reaching this level of testing, Sociall was never programmed or technically developed. It was only tested through the Wizard of Oz method, and might fail to be fully feasible with nowadays technologies. As mentioned earlier, methods like spryable conductive paints , or motion sensors could be used. However, they probably might fail reaching the desirable result with smooth animation, and a full data registry of sensing, feeling, and responding to passersby.
2. Sociall's idea is still in its initial phase and far from completion despite the fact that in the future in my mind, it would be a whole registry where walls could talk to one another, as well as passersby in a public space. A wall with a character,story,history and interactive responsiveness.I was unable to test that part due to the time limitations.
3. There was a major limitation regarding the choice of space. Due to the time limitations I was unable to execute it in an actual bus stop and instead had to do it within an exhibition space indoors. Thus, the results might vary depending on that factor.

4. The results might be very opinionated, or mostly based on participants' ideas, and thoughts at the moment of testing rather than clear unchangeable facts that would be set in the long term.
5. Also despite wanting to involve more participants in my project, I just managed to gather about 40 participants in the final prototype and about similar amounts or less in other tests. Thus, the results might not be the best in terms of quantity.
6. Despite wanting the final prototype to be based on an element of surprise, I failed to execute that. I did not manage to achieve the genuine reactions to that element since I had to tell the participants what Sociall is all about before they started testing it.
7. The main role of the wall language was to emphasize character. However, wall language was not as polished and complete when I tested it. It still has a long way to go in terms of becoming more of a language. This was just a basic version but to be more conversational, it still needs lots of alteration and sentence creation even if it dismisses the usage of grammar in any way.

5.3. Future Work

Through the research, a variety of problems as well as solid points were discovered in the design itself as expressed earlier. Through setting light on those weak points, Sociall has lots of room to improve. Thus, I proposed a series of ways in which Sociall could be used in the future with the main focus of character and a future historical registry.

5.3.1 Improving the Design

After the alterations done back in the final prototype procedure, I discovered different ways in which Sociall's design could be improved. In the future, since walls are a part of the responsive environment, and everywhere, there are possibilities that they could speak to one another. As in one wall corner, to the other wall corner in a fun way. I was not able to test that in time, but it would be a fun

possibility to imagine. In addition, improvements to the language, upgrades to the emotional registry of expressions, as well as the overall look would be further discussed in the next final sections.

5.3.2 Different Versions

While testing the final prototype, there was an aspect of "Boredom after a while" mentioned to me. As in if I were to walk in the future to the same station every day, I would get bored if it reacted the same way each time. Thus, like Alexa, in the future it would have different updates to the system, which allows it to be slightly different everyday and change feelings, and looks according to the weather, day, or if there was any special event. For example, if it was snowing, Sociall would look a bit cold, and it might shiver. During hot summer days it would be sweaty, and exhausted. However, whatever condition or event it was, humans around it would always cheer it up. It would always seek for their attention.

Also, different versions of Socialls could be embedded around. As an example: If you were in Dubai, the Socialls would look different than if you went to Tokyo. They would also sound different, and act different. That way it would make others want to go from place to another to meet different Socialls, and at the same time, travel around. That would help with the recent rise in hostility, and inactivity as well.

5.3.3 Different Locations

After the scenario suggestions from the final prototype, I realized that Sociall could be used anywhere as long as there is a wall! That would give it an endless possibilities of where to be placed. It could expand to being private, at homes as well. However, the most feasible area in my opinion would be to help in the future of tourism, being in almost abandoned towns to keep history of forgotten artifacts and in turn interacting with people by talking to them in terms of storytelling. Other areas would be kindergartens, or children hospitals in which Sociall could be a distraction for kids in a positive way. It would help doctors and teachers and allow them to focus on something else as the kids are busy engaging with their responsive environment, or in other words, Socialls.

Other possibilities would be, waiting areas in general other than bus stops. As in waiting areas in hospitals, in cafes, in amusement parks. It is flexible in terms of location choice, which would make it fun to add anywhere.

5.3.4 Expansion of Idea

Furthermore, in the future, I want to expand the idea even further than public walls in cities. It would be interesting if Socials could increase tourism by giving character to old ancient walls, or even buildings. Even if they could not communicate with our language, the places would look alive, and have personality to let others notice the areas they might have failed to in the past. In addition to, like mentioned earlier, they would be able to remind future generations of history of some forgotten places. If it was embedded on buildings or huge surfaces though, AR technology might need to be used. It would create a fun, engaging playful world to look forward to. Also, the idea of social would expand to being a whole data registry that feels emotionally connected to humans and in turn could help them anytime.

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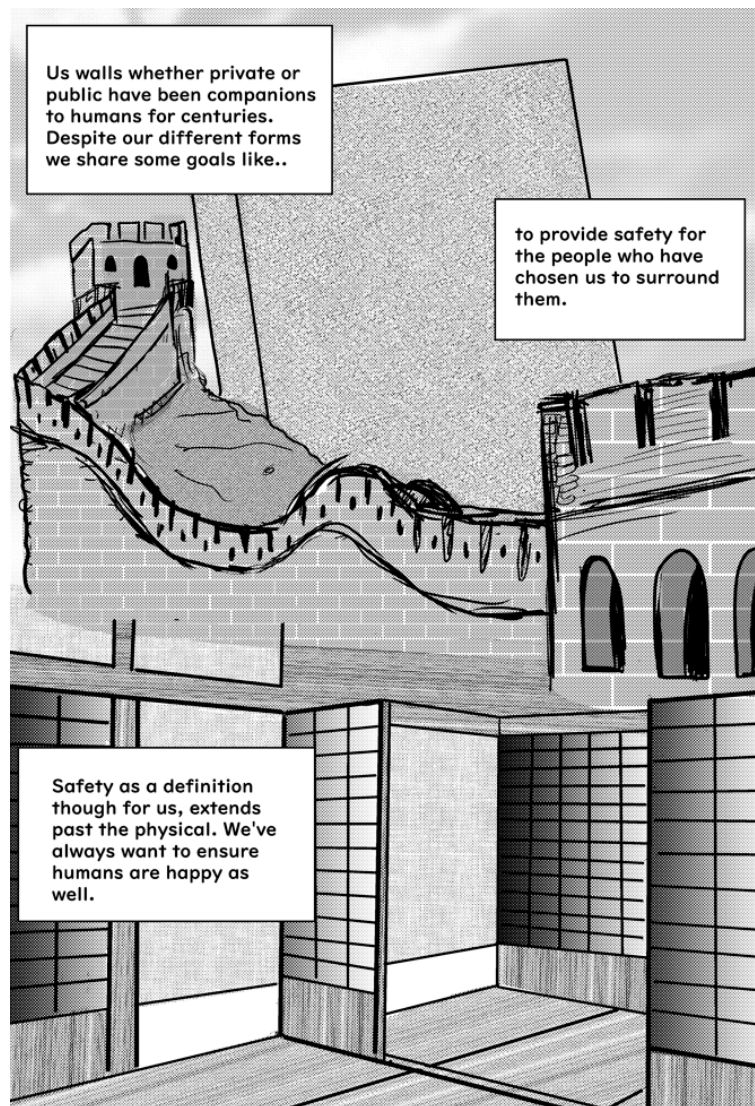
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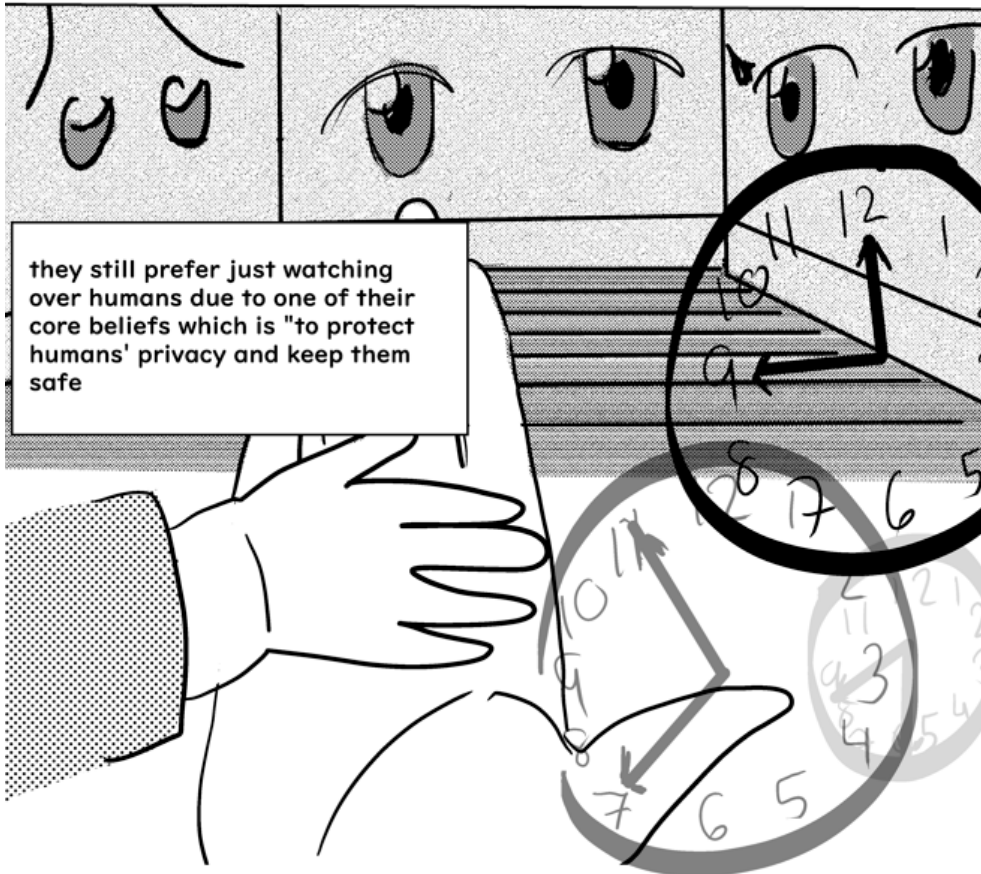
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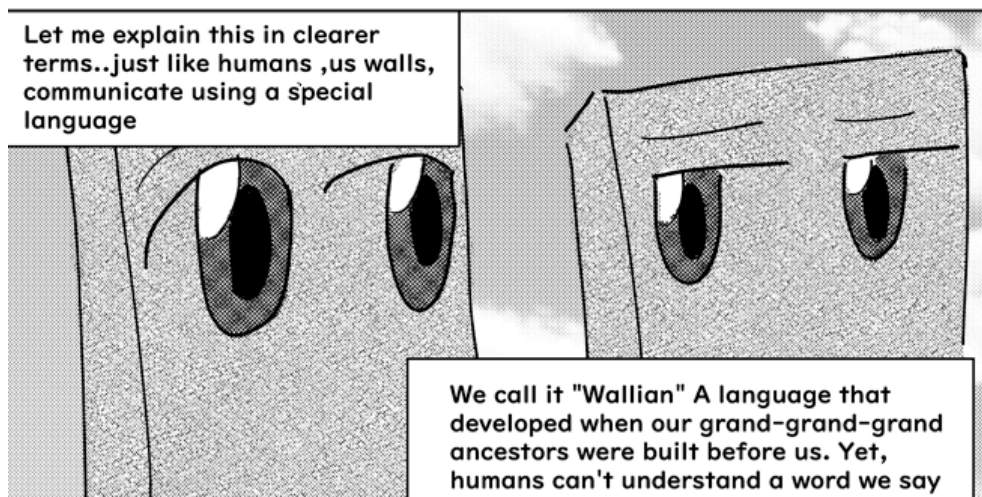
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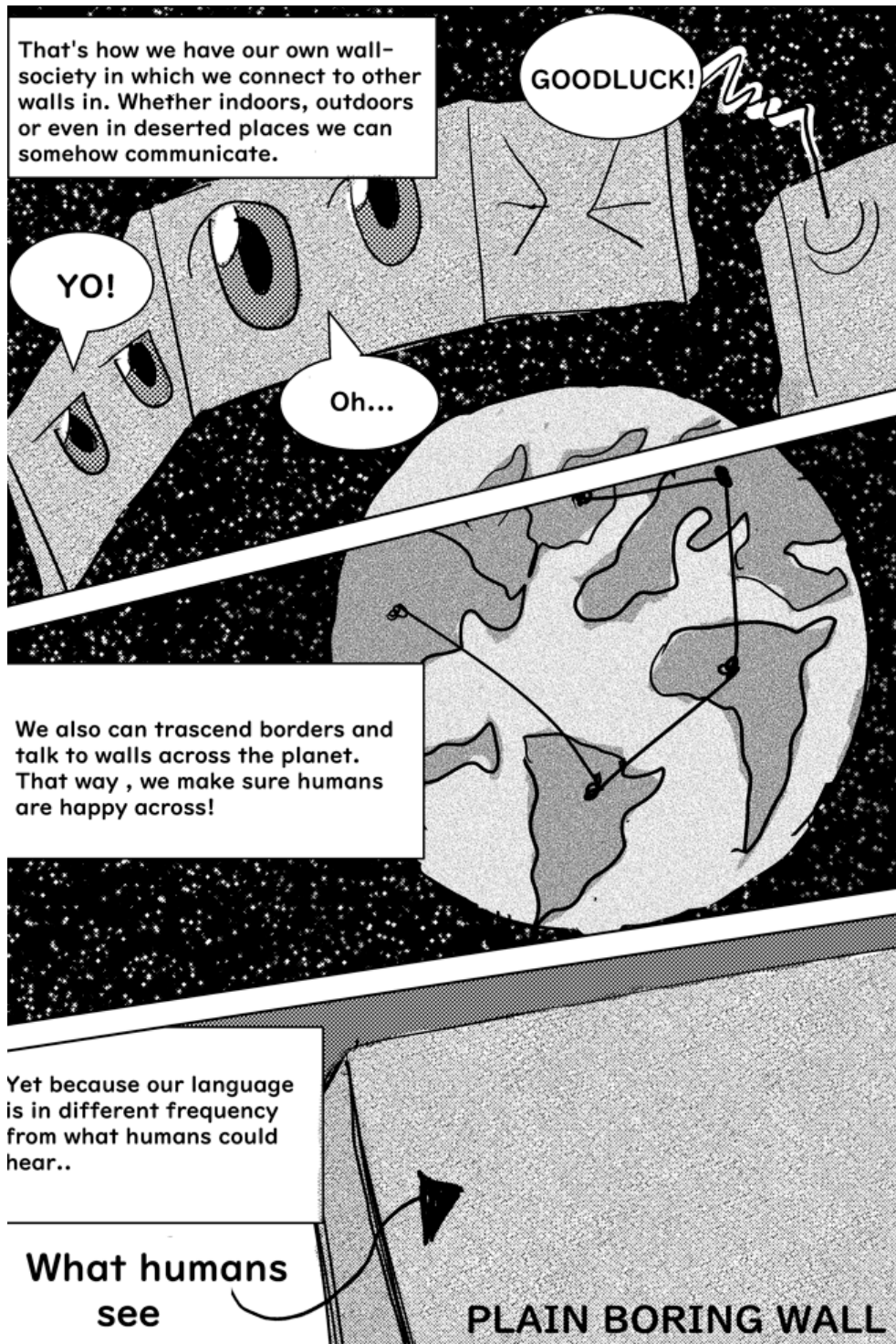
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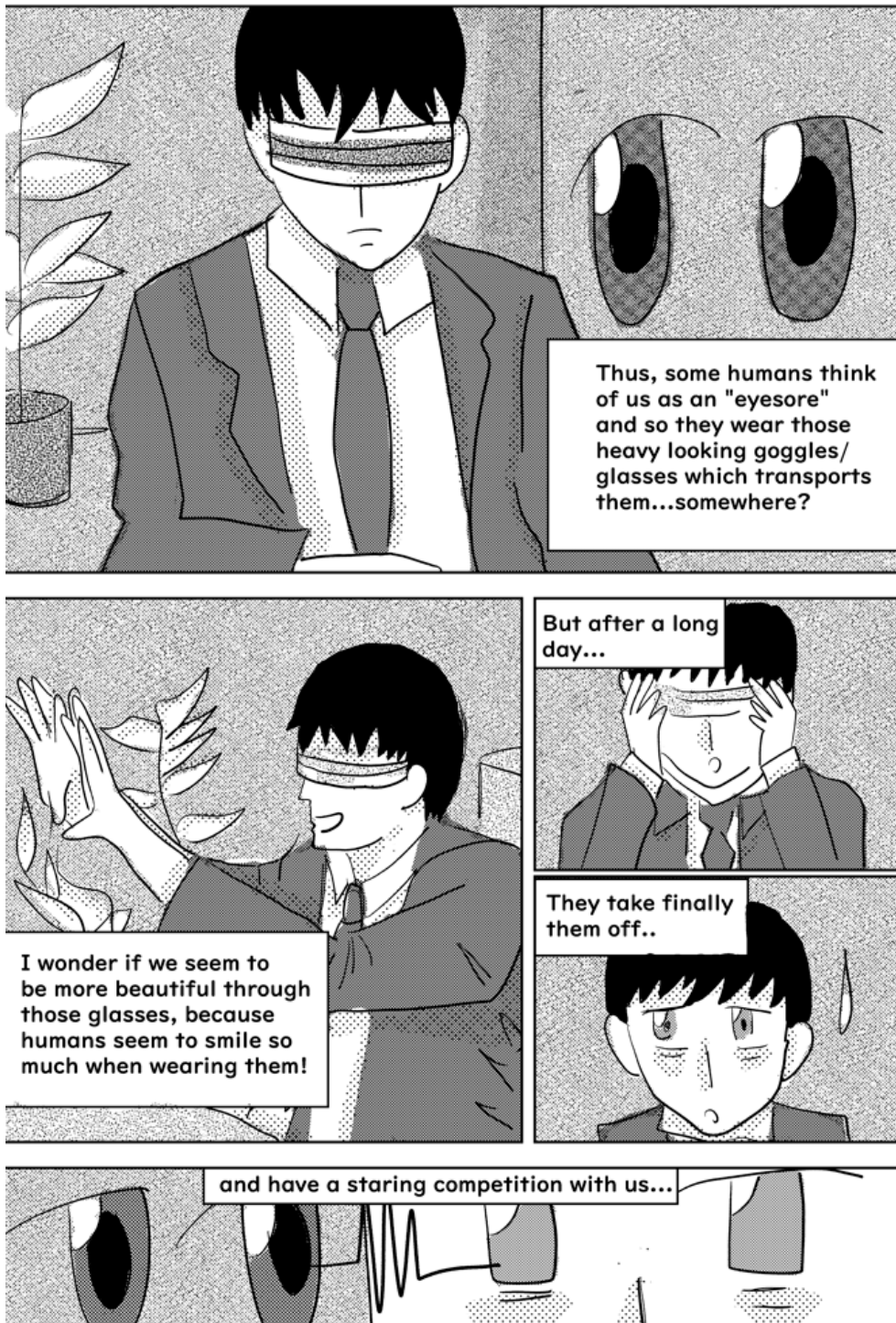
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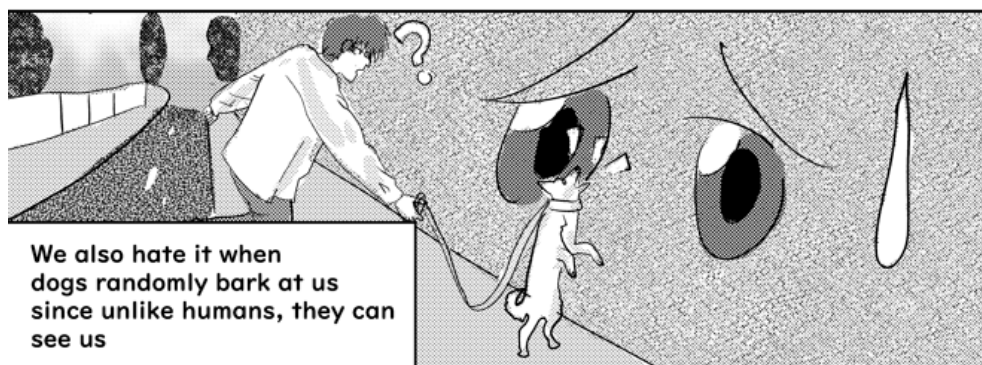
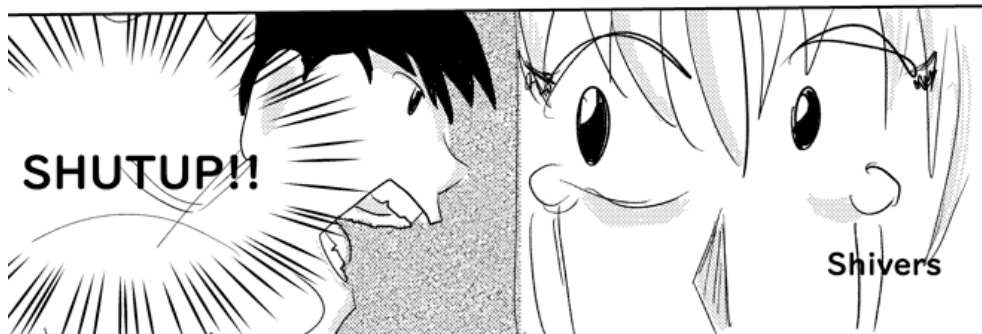
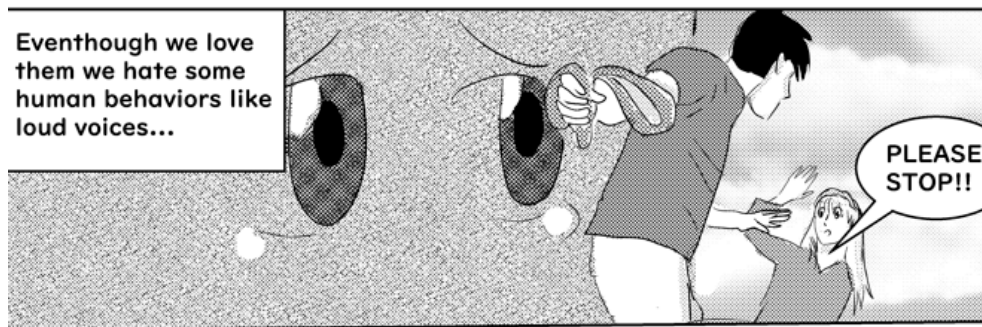




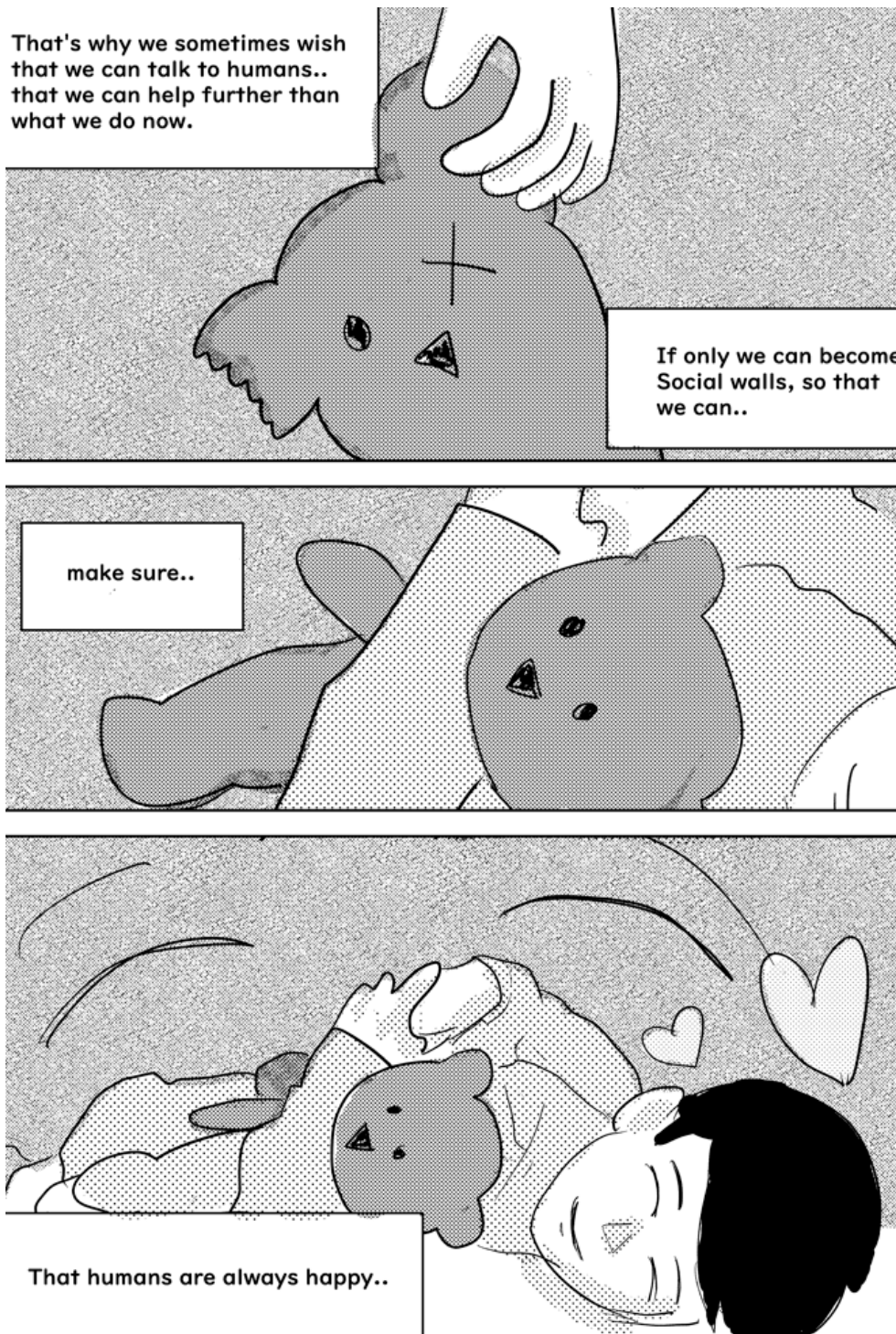












B. Final Prototype Survey

SOCIALLS - Survey / SOCIALLS-調査

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SOCIALLS - Survey / SOCIALLS-調査

Thank you for taking a part of this survey and research! It means a lot. Please answer the questions as honest as you can! And if you wish to withdraw anytime, you can do so. この研究の調査にご参加いただき、誠にありがとうございます。質問にはできるだけ正直に教えてください!そして、辞退したくなった場合はいつでも可能です。

*必須

*Required

Demographics/ デモグラフィックス

1. What's your age? / あなたの年齢は何歳ですか? *楕円形を1つだけマークしてください。 *

Mark only one oval.

- Under 18 / 18歳未満
 18-24
 25-34
 35-44
 45-54
 55-64
 65-74
 75 or older / 75歳以上
 Prefer not to say / 答えたくない

2. What gender do you identify as? / あなたはどの性別と自認していますか? * (Other: = その他:) *楕円形を1つだけマークしてください。 *

Mark only one oval.

- Female / 女
 Male / 男
 Non-binary / ノンバイナリー
 Prefer not to say / 答えたくない
 Other: _____

3. What's your nationality? / あなたの国籍は何処ですか? *

Character & Design / キャラクター&デザイン

SOCIALLS - Survey / SOCIALLS-調査

<https://docs.google.com/forms/u/0/d/1mZU6iqOJx-k6CqIBtE3dr59re...>

4. From a scale of 1 to 10 ,rate the character design / 1から10の値で、キャラクターのデザインを評価してください。*楕円形を1つだけマークしてください。

Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
Un-Attractive/魅力的ではない	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Attractive/魅力的

5. Did the wall's design make you feel like it is an actual character? / 壁のデザインは、実際のキャラクターのように感じましたか? *楕円形を1つだけマークしてください。

Mark only one oval.

- Yes/はい
 No/いいえ

6. If not, why not? / 「いいえ」と答えた方は理由をお答えください。なぜですか?

7. If yes, why? / 「はい」と答えた方は理由をお答えください。なぜですか?

8. What part of the character design did you like the most? (You can choose more than one)/ キャラクターデザインのどの部分が一番好きでしたか? (複数選択できます) *該当するものすべてにチェックマークを付けてください。(Other: = その他:)

Tick all that apply.

- Big expressive eyes/大きく表情豊かな目
 Curious ears/好奇心旺盛な耳
 The changes in color depending on emotion/感情による色の変化
 The wall language/壁の言葉
 Laughing mouth/笑う口
 Other: _____

9. Why?/前の質問になぜそう答えましたか? *

SOCIALLS - Survey / SOCIALLS-調査

<https://docs.google.com/forms/u/0/d/1mZU6iqOJx-k6CqIBtE3dr59re...>

10. What part of the character design did you like the least? (You can choose more than one)/キャラクターデザインのどの部分が一番気に入りませんでしたか? (複数選択できます)*該当するものすべてにチェックマークを付けてください。(Other: = その他:)

Tick all that apply.

- Big expressive eyes/大きく表情豊かな目
- Curious ears/好奇心旺盛な耳
- The changes in color depending on emotion/感情による色の変化
- The wall language/壁の言葉
- Laughing mouth/笑う口
- Other: _____

11. Why?/前の質問になぜそう答えましたか? *

12. What did you think of the overall design of the space around the wall?/壁の周りの空間の全体的なデザインについてどう思いましたか? *

Interaction & Experience/インタラクションと経験

13. From a scale of 1 to 10, rate your experience while interacting with the wall / 壁とのインタラクションしたときの経験を1から10の値で、を評価してください。*楕円形を1つだけマークしてください。

Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
Boring/つまらない	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Entertaining/面白い

SOCIALLS - Survey / SOCIALLS-調査

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14. What part/parts did you like the most about the interactions? (You can choose more than one) / インタラクションについて、どの部分が最も好きでしたか? (複数選択できます) *該当するものすべてにチェックマークを付けてください (Other: = その他:)

Tick all that apply.

- The wall's curious ear moving over to hear what others are saying/人が話している時にそれを聞こうと動く好奇心旺盛な壁の耳
- The angry wall when hit too much or shout at it/ぶつかりすぎたり、叫んだりしたときの怒った壁
- The sad wall if hit lightly/軽く叩いたときの悲しむ壁
- The expressive eyes when you give wall attention/壁に注意を向けるときの表情豊かな目
- The laughing when you pat it too much/撫ですぎたときの笑う様子
- Trying to hard to carry your weight when you lean on it/あなたが寄りかかっているときに一生懸命あなたの体重を支えようとする様子
- Other: _____

15. Why?/前の質問になぜそう答えましたか? *

16. What part/parts did you like the least about the interactions? (You can choose more than one)/インタラクションについて、最も気に入らなかった部分はどれですか。 (複数選択できます) *該当するものすべてにチェックマークを付けてください。 (Other: = その他:)

Tick all that apply.

- The wall's curious ear moving over to hear what others are saying/人が話している時にそれを聞こうと動く好奇心旺盛な壁の耳
- The angry wall when you hit too much or shout at it/ぶつかりすぎたり、叫んだりしたときの怒った壁
- The sad wall if hurt/軽く叩いたときの悲しむ壁
- The expressive eyes when you give wall attention/壁に注意を向けるときの表情豊かな目
- The laughing when you pat it too much/撫ですぎたときの笑う様子
- Trying to hard to carry your weight when you lean on it/あなたが寄りかかっているときに一生懸命あなたの体重を支えようとする様子
- Other: _____

17. Why?/前の質問について、なぜそう答えましたか? *

Overall concept & Future application / 全体的なコンセプトと今後の応用

SOCIALLS - Survey / SOCIALLS-調査

<https://docs.google.com/forms/u/0/d/1mZU6iqOJx-k6CqLbtE3dr59re...>

18. From a scale of 1 to 10, rate your satisfaction with the overall concept/1から10の値で、全体的なコンセプトに対する満足度を評価してください。*楕円形を1つだけマークしてください。

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. Would it be useful in other scenarios?/他のシナリオで役立つと思われますか? *楕円形を1つだけマークしてください。

Mark only one oval.

- Yes / はい
 No / いいえ

20. If yes, state one example and the reasoning behind the choice: / 「はい」と答えた方は、選択理由と例を1つお答えください。

21. If not, why? / 「いいえ」と答えた方は、理由をお答えください。

22. Any additional feedback? (if you have one) / 追加のフィードバックがあれば教えてください (もしあれば)。

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