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Master's Thesis
Academic Year 2019

Press the Button: A Simple Action
Triggered Narrative Public Experience

Keio University
Graduate School of Media Design

Yue Zhang

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

Yue Zhang

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Abstract of Master's Thesis of Academic Year 2019

Press the Button: A Simple Action Triggered Narrative Public Experience

Category: Design

Summary

It is the most interactive era ever in history. Going to the "fun destinations" becomes a holiday activity where people immerse themselves in an unusual world. On the other hand, the urban we live lost its attractiveness since it is standardized as an immutable public space. Unexpected City aims to make a continuously attractive urban space with narrative public experience and non-verbal guidance.

In this research, button installation is presented in public space, positively intervenes into the pedestrians activity as an external stimulus to connect people and the urban realm, introducing a narrative public experience with a simple action. Overall, it draws curiosity which drives pedestrians to participate in the narrative public experience spontaneously, introducing an alternative experience of triggerable and playful public space.

This research explored an alternative urabn interaction model as well as a missing linkage between pedestrians and public environment. The goal of this research is to investigate how to invite pedestrians to join in urban interaction through the interactive installation which creates unusual scenario and experience in daily scenes.

Keywords:

Urban Interaction Design, Interactive Installation, Public Experience, Button

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Chapter 1
Introduction

With the high-speed development of technology and social media services, the urban experience becomes more entertaining and performing in specific places. In Japan, the high concept combines with technology and art, engages the immersive experience in concerts, museums, restaurants, as well as theme parks. Those " Fun destinations " are always holiday limited, stimulate the multi-sense, flavor our urban life. But, apart from enjoying the immersion and interaction in these certain places, the everyday commit and other scenes have an opposite experience of being boring and immutable. As the urbanist William Whyte (2012) said:"It ' s hard to design a space that will not attract people. What is remarkable is how often this has been accomplished." [1] To boost urban interaction in everyday scenes and increase the outdoor activities, how might we make an ordinary public space playful and ever-changing?

This research goes under the Unexpected City project, which pictures a playful future of public space through designing interaction between citizens and the urban realm. The goal of this project is to make a continuously attractive urban space with narrative public experience and wordless guidance. This research investigates how public interactive installation draws curiosity and facilitates pedestrians activities through urban interaction design. In this research, alternative playful scenarios, triggered by a simple, attractive and spontaneous interface - the button, are introduced into everyday scenes. In addition, the button installation as an external stimulus provides a linkage for pedestrians to aware of the physical environment and an alternative understanding of the urban realm.

1.1. *Ludic* City: From Standardized to Playful

Living in Tokyo is a safe and convenient experience, even more than "pleasant" since many interactions and communications can be taken the place with non-verbal services. Jan Gehl (2011) described "a pleasant place" in his book *Life Between Buildings: Using Public Space(2011, revisited edition)* as an ideal condition for pedestrians stopping and moving in every respect. It partly contingents on protection from danger and physical harm, and relates to climatic conditions which require "good protection against bad weather, good access to good weather" [2].

However, beyond the standard goals of safety and universal access, the design of the built environment could be the "missing link" to encourage pedestrian activities. In the book *Happy City: Transforming our lives through urban design*, Montgomery (2013) described how to design happiness in the city can be "new measures of well-being that include not just how much citizens earn, but how we feel" [3]. Camillo Sitte (1965) produced a connection between the use of the city with the architectural quality and the experiencing of attractions, in his work City Planning According to Artistic Principles [4].

Supported by basic protection principles like connectivity, safety, and shelter, Quentin Stevens (2007) refers to the *ludic* city in the discussion of urban play. The term *ludic* (from the Latin *ludus*, meaning play or playfulness) is often used about playfulness as a broad human quality rather than one reserved for children. This concept of play highlights the distinctive character of urban experience: "the ways people sense urban settings, move through them and act within them" [5].

In this perspective, many previous studies investigated the way that design playful city experience by expanding the pedestrians sensory in urban experience. Donoff (2014) produced a typology of *ludic* ways to increase pedestrian activity through studying on 27 cases of playful urban pedestrian interventions [6]. The process of typology also highlighted what might be missing from standardized processes of designing, creating and evaluating pedestrian space. Besides, a conclusion was drew that the built environment can be modified with elements of "surprise, discovery, physical challenge, mental stimulation, sensory perceptions, and whimsy". Pressman (1996) explains, "visual stimulation through more intense sensory participation will add greater vitality to urban life" [7].

To positively intervene the pedestrian activities with playful urban experience, How might we install unusual scenario and experience into daily scenes?

1.2. To Link People and the Urban Realm

It is the most interactive era ever in history. Nowadays, interaction takes place everywhere from public display to personal devices, from open facility to private space. It can be regarded as a digital landscape overlays our physical world, expanding to offer ever-richer experiences. Instead of being an individual layer, how might interaction systems create a linkage between people and the urban realm?

The UrbanIxD Manifesto

The UrbanIxD Manifesto (2014) is a statement of beliefs about the field of urban interaction design [8]. As a guideline lays the foundations of this field, it pointed out a definition of urban interaction design, and what it should explore, how it can contribute to the making of livable cities. To make an initial understanding of urban interaction design, these points are listed below:

- One of the research topics is The Negotiation of Space - how might interactive technology be used to maximize the use of space within urban areas for positive outcomes, to enhance the experience of city living?

- Goal: understanding problems rather than solving problems.

- Vision to focus on how things might be, rather than on how they are now.

- An attitude of mind: a realization that there is not a prescriptive way of working.

- Using everyday language.

- Planning for sustainability and scalability.

Use Curiosity Principle into Triangulation

William Whyte brought out a concept "triangulation" in his book *The Social Life of Small Urban Space*, with the definition as the process by which some external stimulus provides a linkage to promote interaction [9].

Lugaresi (2018) produced a wearable device that projects a personalized and interactive animation onto the floor, works as an icebreaker reacting to the people in close proximity to the user, taking the burden of making the first move [10]. In this case, the device brings out the projection as the external stimulus provides the linkage between people and prompts strangers to have a conversation.

Compared to the interpersonal interaction, the interaction between people and the physical environment lays more dependence on the physical environment and conditions. To break the one-sided interaction in the physical space, Dekel et al. (2005) presented three interaction projects to study on how to design for curiosity through interactive systems [11]. To overcome interaction blindness in public space, Houben et al. (2013) used curiosity-provoking artifacts to increase the interactivity with the display as well as change the movement in the spaces surrounding the interactive display [12].

A lot of previous studies already investigated how curiosity principle works effectively in designing attraction in a human-centered approach. Curiosity, as one of the driving factors, reflects a human tendency to make sense of the world (Loewenstein, 1994) [13]. People are always curious about things that are unexpected or that they cannot explain. In game design, curiosity is a well-known design element, such as use it as mystery, sensory stimuli and the advance in levels and story line in games [14] [15]. (Garris et al., 2001; Yee, 2007)

Curiosity element, out of instinct, attract people into an initiative scenario to start the experience. With the usage of curiosity principle into urban interaction design, it can promote the pedestrians activity into an exploring experience in public space.

To sum up the three main research questions:

- Q1: How might we make an ordinary public space playful and ever-changing?

- Q2: How might we install unusual scenario and experience into everyday scenes?

- Q3: How might we create a linkage between people and the urban realm?

The following research and design process to address these questions will be described the next.

1.3. Contribution

The final goal of this research is to create narrative public experience with continuous attraction and non-verbal guidance, to stimulate and promote pedestrians activities. With the increasing boring and immutable urban activities, the standardized public space is urgent to be translated into an inviting and playful scenario. With a start point of drawing pedestrian's curiosity, a urban exploration can be carried out with an external stimulus. This research brings out three main questions, makes effort to present a distinct public installation as the address of these questions.

This research explored a new interaction model as well as a missing linkage between pedestrians and public environment. Further more, the strength is that the designs were tested in the field, with which this research received the most direct and constructive revision. With the multiple test both in lab and in the wild, in the hope this research as well as the project are able to deepen the influence of the urban realm.

The Unexpected City project participated in KMD Forum and showcased the button installation in Nov. 2018, and in June,2019, joined the 10-day exhibition called "Future Scape" in Zou-No-Hana Park, Yokohama.

1.4. Thesis Organization

This thesis consists of five chapters.

- In Chapter 1, above, is discussed background, current state-of-the-art and the contribution of this research.

- Chapter 2 mentions the three main elements of this research: design narrative in public, site-specific scenario design, button the simple attractive and spontaneous trigger. Several related works are illustrated.

- Chapter 3 describes the concept of Unexpected City project and the research of this thesis, as well as the design process followed from ideation to prototype.

- Chapter 4 narrates the revision of design and prototype, three prototyping and user tests are mentioned in this chapter. The exhibition validates the proposed design, through the finalized prototypes and an experiment held in an open exhibition in public space.

- Lastly, Chapter 5 analyses and outlines the future development of this research.

Chapter 2
Related Works

In proposing a solution to enhance the experience in city living, this research examines the motivation that people interact with environment on their own initiative. There are three categories of the related works: design narrative in public, site-specific scenario design, and button the simple attractive and spontaneous trigger.

2.1. Design Narrative in Public

This research is related to physical contact with the urban environment, therefore a public experience. Lots of products and services are designed to promote people to participate the outdoor activities, as one of the most famous, Pokemon Go as we all know the narrative experience, gives a reason to go into the public. This smartphone game, by using the GPS technology to place the players in a real-word location allowing them to catch the Pokemon, occurs a global movement of going on the street.

As a player moves the physical location along with the map on the screen, eventually can encounter a nearby Pokemon to catch. With this gaming system, Pokemon Go players always staring down in their phones and running around the public spaces. Motivated by this narrative experience, players are exploring unfamiliar areas of the urban realm. The game, for the players, gives permission to explore the city. It is considered as a growing support a positive for public space use and awareness[1].

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1 Go Pokemon Go!: The Virtual Life of Urban Spaces
   https://www.pps.org/article/go-pokemon-go-the-social-life-of-virtual-urban-spaces/

In addition, in the process of urban exploration, a socializing experience take place between strangers. From this perspective, Pokemon Go plays a role as an external stimulus, as William Whyte describes the "triangulation" concept in his book The Social Life of Small Urban Space, which provides a linkage between strangers and promotes a talk happens. Even though less attention will be paid on the interpersonal communication in this research, it inspires to create a physical linkage to visualize the relationship between people and the urban realm.

From the perspective of urban interaction, Pokemon Go introduces not only how people use the public space but also, how technology has woven itself into the urban realm. With the AR technology based on the smartphone, players immerse themselves in an ambiguous interspace of themselves in the physical environment and their avatar inside the phone. The narrative experience between the interface forms a somatosensory relates the urban realm with a parallel world, which is considered as one of the features of Augmented Reality.

However, Pokemon Go provides is a virtual experience eventually, in which every interaction happens on the personal device makes it unshareable. As a result, the fun and memory will be left on the players' phone instead of on certain physical places.

Overall, the narrative public experience that this research proposes should happen in the urban realm with the shareable feature allows everyone to join in.

2.2. Site-specific Scenario Design

The concept "site-specific" is well-known from the term "site-specific art"[2], which is artwork created in a certain place, created and planned with the artists taking the location into account. This research investigates the principle and experience of site-specific scenario design from two related works, The Fun Theory and Switch Research Institute. With the study on these works, a mindset of creating fun and engagement through urban interaction and performance builds as the fundamental in designing Unexpected City.

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2 Site-specific art is artwork created to exist in a certain place.
   https://en.wikipedia.org/wiki/Site-specific_art

2.2.1 The Fun Theory

Volkswagen, the automotive manufacturing company, came up with the fun theory in 2009. It states "if things are more fun, they are better"[3]. The fun theory proved that human behavior can be changed to better through designing novel and fun into everyday action. Fun design is the keyword of fun theory, as well as the Unexpected City. It is well-known that fun and novelty are so powerful that can turn mundane and boring things into attractive options. In this case, this research put the main issue on how fun theory designs fun and produces engagement in a certain place, where they want people to change the behavior.

Figure 2.1 The Fun Theory - Piano Stairs

First, the behavior fun theory wants to change is a common action that everyone will practice in daily life. Mostly, the fun theory is motivated by serious purposes in the city living, such as using stairs instead of the escalator, putting litter into the bin, recycling glass bottles, over-speed, etc. Out of those purposes, the fun theory designed site-specific fun scenario as an alternative experience in certain places (Figure 2.1[4]). On the stairs, the fun theory designed piano stairs with the

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3 What is Fun Theory
   https://titan-learning.com/what-is-fun-theory/

4 Credits: Piano stairs - TheFunTheory.com

action of climbing stairs, changing citizens ' habit by making the exercises more interesting. In the trash bin, the fun theory designed the " deepest bin " with a falling sound effect on the action of throwing trash.

Second, to promote the alternative practice to take place of the previous behavior, the fun scenario should come out with initiative. In other words, people trigger the scenario and accidentally, with no consciousness. To make up this deficiency, the fun theory designed the appearance with information to attract and guide pedestrians to choose the alternative practice spontaneously. For example, to decorate the stairs with a keyboard pattern, to name the bin as " The World ' s Deepest Bin " with caption (Figure 2.2[5]).

Figure 2.2 The Fun Theory - Piano Stairs

It considers a significance to design alternatives in the everyday scenario, which lowers the threshold for people to understand and immerse themselves into the site-specific experience. In this case, fun as a mildly addictive stimulus to make the alternative experience powerful. But, on the other hands, if the fun becomes the default experience in the certain places, people have no choice to avoid the

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`https://www.youtube.com/watch?v=2lXh2n0aPyw/`

5   Credits: The world's deepest bin - Thefuntheory.com
    `https://www.youtube.com/watch?v=cbEKAwCoCKw`

fun happens, even though they deserve to be rewarded for doing the "better things". Meanwhile, Unexpected City considers spontaneity as a key requirement. Therefore a trigger is in need, with which people have the control and initiative to engage the site-specific scenario.

2.2.2 Switch Research Institute

Switch Research Institute[6] is a drama group from Japan. What makes them unique is that they perform for those people who are no coming to see a drama, and at a place that is not a theater. A short drama of 3-30 seconds in which something happens when the audiences "push the switch". A "switch" can be understood as a certain action upon a certain object. In their mindset, everything can be a switch, a mug cup, a box, sunglasses, etc. In this way, the Switch Research Institute designs the script and performs the drama based on a certain object.

Figure 2.3 Switch Research Institute - Ambulance

If the object is a toy ambulance, the drama will be a conversation between two men when a fire occurs in the midnight (Figure 2.3). If the object is a smartphone, the drama will be a man who is looking for his lost phone. Same as the fun theory,

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6   Switch Research Institute
    https://switch-souken.tumblr.com/

as an experience encounters in the street accidentally, it should be in a context and easy to understand. In this research, generally speaking, it ' s regarded as a site-specific scenario design.

However, since the switch is a certain action upon a certain object, it requires a caption beside the object to tell the password. Such as, please open the box, please ring the bell, please put on the sunglasses, please sit here and clap your hands twice, etc (Figure 2.4[7]). In this way, experiencers can trigger the experience spontaneously but, they are asked to do so.

Figure 2.4 Switch Research Institute - Caption

Unexpected City promotes the spontaneity as experiencers trigger the public experience motivated by their curiosity. Besides, considering a permanent experience rather than a pop-up performance, thus this research requires a non-verbal method as the trigger to open up the narrative public experience.

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7   Credits:
    https://switch-souken.tumblr.com/03whatswitc

2.3. Button The Simple Attractive Spontaneous Trigger

According to the discussion above, it guides the path to a universal, attractive and simple interface - the push button - a ubiquitous interaction has been in daily life for more than a century. Button as the first abstract motion [16] used to call the servants at the beginning simplifies the effort and the process to gratify our wish and desire. As a result of manufacturers and distributors always using buttons in their products, people get used to how the button works after a long-time usage - press it, and gain something. In the book *Power Button: A History of Pleasure, Panic, and the Politics of Push*, Plotnick (Plotnick, 2018) described the ways that button-pushing translates to a "servant out of sight" [17], became a means for digital command, which promised effortless, discreet, and fool-proof control.

In public, especially in Japan, vending machines are everywhere. As manufacturers use buttons in their products, it is available for whoever the kid or the aged, without any mess or effort. Besides, users have the control and initiative on the transaction, but only with a spontaneous one-hand practice. On the other hand, Japan is a country full of subcultures, where game-like services can be found in all places. Gashapon, a typical representative of Japanese street culture, wins a great success as a random toy vending machine which triggers by a hand-cranking action.

Combining the mindset of vending machines and gashapon, an unusual vending machine named "King's Treasure Box" (Figure 2.5) came in sight on the street. With the catchword "1000 yen to achieve your dream", thousands of people buy this joke and want something unexpected. In this case, the buyers pay for a random, fun, and unexpected result. Thus, people who live in Japan have begun to explore the imagination and become acceptable with uncertain feedback in the public experience.

Back to the time before computer, smartphones, and applications, Author W. B. Nesbit wrote a striking poem titled "Push the Button":

"*If you have a lot of questions and are worrying for answers,*
Push the button.
If you want to know the ages of the youthful ballet dancers,

Push the button.
If you want to know the reason for a vexing lot of things,
The worries of the commoners and discontent of kings,
And why you have to coax the youthful wonder ere she sings,
Push the button.
Would you get some information as to stocks or bonds or grain?
Push the button.
Do you want to make a million?
Do you want to catch a train?
Push the button.
Is it something as to fashion ― as to bonnet, gloves or dress?
Does the Christmas problem worry you and fill you with distress?
Do you wonder if the damsel will reject you or say "Yes?"
Push the button.
For the price of lamb or lobster, beef or veal or pork or mutton,
Push the button.
For the work of all the authors, from old Chaucer down to Hutton,
Push the button.
Now the information bureau is a thing of cogs and wheels.
At the shifting of a lever all its knowledge it reveals.
If you'd like to know the outcome of your doings and your deals,
Push the button.
There's a button for your likings, for your longings and your joys ―
Push the button.
And you needn't go to school so long as you've got the strength to shove ―
Push the button.
If you want to ask a question, and the dial don't reply.
If the thing is out of gearing and its works have gone awry.
Do not go to the inventor and in anger ask him why ―
Push the button." (Atlanta Constitution, 1900) [18]

Plotnick (Plotnick, 2018) commended this poem as "The scenario captured an already pervasive fixation with buttons, which glamorized a world where fingers operated effortlessly". [17]

Nesbit integrated the push-button experience a encompassing, described it could satisfy any want - one's "likings", "joys", and "longings", the status of one's relationship, as well as information on any topic — with the one hand practice which only requires to be that "you've got the strength to shove." (Atlanta Constitution, 1904) [19]

Figure 2.5 King's Treasure Box

Hence, from the mindset of both practice and literature, the push button can relate to anything and procure any service. Moreover, we are, deep in our mind, accepted a button product which can accommodate every need and whim. In can be proved from several one-push button products launched these years (figure 2.5[8]): the Amazon Dash Button, the bt.tn Button[9], as well as the World's

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8   Credits:
    https://en.wikipedia.org/wiki/Amazon_Dash\https://bt.tn/category/blog/index.
    html\https://www.youtube.com/watch?v=MDsjBh2xOgQ

9   bttn - the IOT button for businesses

Smartest Button[10]. The former is a well-known consumer goods ordering service which used a proprietary device for ordering goods over the Internet[11]. Both bt.tn Button and the World's Smartest Button are similar to an IoT device to produce a multitude of tasks assigned through the simplest interface - the button.

Figure 2.6 Button Products

2.4. Summary

The goal is to make a continuously attractive urban space with narrative public experience and non-verbal guidance. Designing narrative experience in public

https://bt.tn/

10 FLIC – THE "WORLD'S SMARTEST BUTTON" REVIEWED
https://irishtechnews.ie/flic-the-worlds-smartest-button-reviewed/

11 Amazon Dash-wiki
https://en.wikipedia.org/wiki/Amazon_Dash

gives the initial stimulation and motivation for people to join into the urban activities. A site-specific design strengthens the attractiveness of the experience, highlights the relation with the urban realm. Also, under this design principle, it helps to expand the possibility of installing the urban interaction. In addition, with the usage of the curiosity principle, button, the ubiquitous but abstract object, is designed to play the role as not only a trigger, but also as a symbol. Button installation design explores an alternative urban interaction model as well as a missing linkage between pedestrians and public environment. These three elements built the framework and the initial image of the Unexpected City project.

Chapter 3

Concept

3.1. Design Objective

According to the UrbanIxD Manifesto, the goal of Urban Interaction Design is to place people at the center of design for interactive products and services in the urban environment. In particular, how the application of technologies serve human and societal needs [8].

This research goes under the Unexpected City Project, a sub-project of MO-MENTS, PLAY. Unexpected City pictures a playful future of public space through designing interaction of citizens and the urban realm. The goal of this project is to make a continuously attractive urban space with narrative public experience and non-verbal guidance. In this research, alternative playful scenarios, triggered by a simple, attractive and spontaneous interface - the button, are introduced into everyday scenes.

Unexpected City, the narrative public experience, is performed in the form of public interactive installation. In this research, the design of the installation is aware of the context and the environment. It takes the location and people 's behaviors into account and introduces an alternative scenario into a certain urban place, which is similar to a site-specific artwork. Moreover, it requires a playful and interactive scenario to make the experience joinable.

An interactive button is designed as the trigger to touch off the installation where performs the alternative playful scenario. On top of that, the interactive button as an external stimulus provides a linkage between people and the urban realm. It plays the role as a switch for people, driven by their own curiosity, start the narrative experience spontaneously.

This research designs to draw pedestrians ' curiosity wordlessly and enhance

the experience of city living through performing a narrative scenario.

3.2. Design Process

The methodology followed to address the questions and to prototypes of this research, was established through the utilization of several tools from design thinking process combined with the research approach, Research Through Design. The design process consisted of five main steps, iterated multiple times to reach the final design.

1. Empathize: fieldwork and initial observation led to disclose the decreasing attractiveness of the immutable public space, and inspired to courage urban interaction through spontaneously triggerable installation.

2. Define: research about related works and pertinent studies was carried out. Leading to 3 main elements were defined to achieve the narrative public experience.

3. Ideation: ideation consisted of inspiration from observation, sketching to outline the concept and in creating experience process and defining use case to refine and actualize it.

4. Prototyping: to evaluate the to enhance precision by system analysts and users. Each concept further step was prototyped in order to be tested. Three main prototypes were developed in the different stages of this research.

5. Testing: to evaluate the effectiveness of the design the prototypes were tested, multiple times. Since the installation is aimed to stimulate interaction, it was adopted in situ to observe the spontaneous and impulsive reactions, rather than an in-lab experiment.

Research Through Design

William Gaver (2012) describes the Research Through Design approach as a " design practice" whose ultimate goal can be seen in the designer's manifestation of "possibilities and problems" through the creation of topical and theoretical design [20]. As Zimmerman et al.(2007) proposed a new model for interaction design research within HCI in their study [21]. Three out of the Research Through Design Principles were referenced in this thesis to support the design process.

- Offer a product or a vision on designing which "transforms the world from its current state to a preferred state".

- Thorough and detailed documentate the design process and research.

- Extensibility: documentate the design process in a manner that allows for future reproduction.

This research referred to the principle of Research Through Design into the design process. This can be seen in the initial concept sketching the image of Unexpected City, the constant re-framing of the design guideline, and the potential to build upon and expand the project in future work.

3.3. Ideation

This section describes how to design the installation to attract and guide pedestrians to get close and press the button without using words, and performs a playful scenario in public space. In this research, the installation design including a minimum set of the interactive button and a guideline of scenario design. One prototype is a site-specific installation with using the interactive button as the trigger, provides the experience designed following the guideline of scenario design.

3.3.1 Three Types of Outdoor Activities

Jan Gehl divided the outdoor activities in public space into three categories: necessary activities, optional activities, and social activities. Necessary activities are more or less related to compulsory - going to school or to work, running errands, or even shopping, in which people are required to participate.Optional activities is driven by a personal willing to participate, includes taking a walk to get a breath of fresh air, standing around enjoying life, or sitting and sunbathing. Social activities, which is different, depends on the presence of others in public. Among then, optional activities are especially dependent on exterior physical conditions (Jan Gehl,2011) [**?**], which can be seen from the graphic of the relationship between outdoor activities and quality of outdoor space (figure 3.1).

Unexpecte City as well as this research, focus to enhance the optional activities in public space, through positively intervene the pedestrian activity by interaction design. Thus, to design interaction based on physical conditions becomes approach to provide the urban narrative experience.
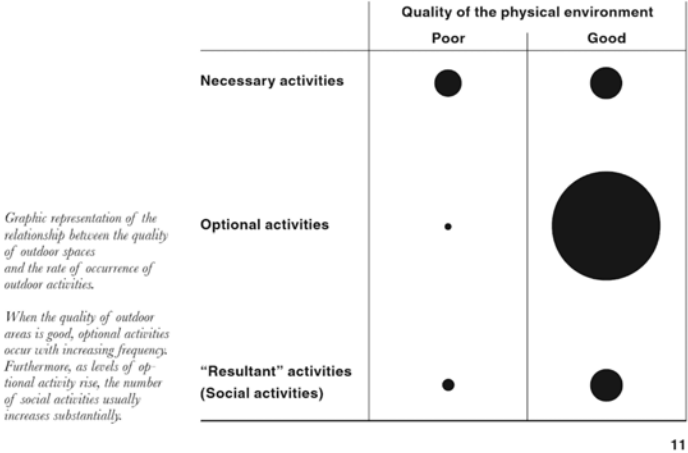
(Source: Jan Gehl *Life between buildings: using public space (Revisited Edition)* [2]

Figure 3.1   Relationship Between Outdoor Activities and Quality of Outdoor Space

3.3.2 Inspiration

This part describes how the main idea came out through the observation of pedestrians, to show a clear inspiration process in fieldwork. Mentioned above, three main research questions guide through from the inspiration to the final prototype.

- Q1: How might we make an ordinary public space playful and ever-changing?

- Q2: How might we install unusual scenario and experience into everyday scenes?

- Q3: How might we create a linkage between people and the urban realm?

Three stories during the fieldwork below address ambiguous answers of these questions, guiding the research to the next step. In this subsection, the first-person narrative will be used to narrate the story. Through the observation, out of a foreigner perspective, how people act and react in their ordinary public space gives me the initial but significant point of view on enhancing the experience in urban living.

Optional touch

In the everyday scenario, I noticed that people have the awareness of trying not to have physical contact with things in public. Same as the necessary activities, mostly they do the necessary touches, train strap, doorknob, elevator button. It seems that everyone knows what can be touched, what can not be touched, following an obscure rule, especially the adults.

To celebrate the 15th anniversary of the opening of Roppongi Hills, textile artist Magda Sayeg decorated the space, both the spider sculpture Maman and the pillars around, with colorful knit graffiti (figure 3.2). People who seem to be visitors gathered around the Maman, and took photos and some of them touched the knitting on the sculpture. While my focus on the pillars, I was standing beside a pillar next to the stairs to the subway, hugging it and caressing the knitting. The time was afternoon commute, dozens of office workers walked by me while nobody touched the knitting, or even slowed down their step by the small change in their ordinary place.

In contrary, looking around the urban, there are limited optional items to offer people optional entertaining activities. Roppongi Art Night [1] create a temporary playful urban space where full of optional activities. I noticed that people spent hours in this public experience with high motivation. Thus, I considered that public artworks can be a breakthrough to enhance public interaction. Physical contact such as touch through a tactile interface is an effective action at the beginning of an interactive experience.

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1   Roppongi Art Night
    `https://www.roppongiartnight.com/2019/en/`

Figure 3.2 Roppongi Hills with knit graffiti

Memorable experience

An unusual experience happens in everyday scenes can be memorable since it changes the ordinary image so far of a certain place. It was inspired by a very simple interaction happened on a pedestrian bridge. When I was about to go down the stairs, a reminder sound came out "mind your step". It surprised me at once since I never expected it will happen. But, the scenario happened naturally in this certain place, because everyone can understand the relation between the reminder and the stairs. This experience is so impressive that every pedestrian bridge reminds me of the sound.

Besides, the unusual experience happens always along with surprise since it breaks the script of a daily scenario. And surprise makes the experience memorable. Considering to enhance the public interaction, a pleasant surprise is required to create a memorable experience.

Trigger and response interface

The reminder on the pedestrian bridge and the fun theory mentioned above, these responses in public are triggered with no conscious. One of the most important ideas of Unexpected City is the experience should happen after spontaneous ac-

Figure 3.3 Bento Documentary inside Bento Box

tion. It was inspired in an exhibition about Bentos [2]. There was a part to show the documentaries of Bento stories taken by high school students. The exhibition zone was decorated as a classroom with a bento box on each desk. What people need to do was to sit down and open the bento box, then the display hidden in the box played the video automatically (Figure 3.3). I consider that experience may be more acceptable when people trigger it spontaneously since they are in a proactive and controller position. Therefore the idea came out as to use a trigger and response interface to link the public experience and the urban realm.

3.3.3 Concept Sketching

Several sketches were draws to visualize the big picture of Unexpected City, an interactive public space with different scenarios happening everywhere and every moment through multiple playful button installations. The first idea was to personate the objects that already exist, such as street lights, signboards, telephone boxes. But, considering the operate limitation and the consistency, the trigger is

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2   BENTO—Design for Eating, Gathering and Communicating
    https://www.tobikan.jp/en/exhibition/2018_obento.html

focused on the button (Figure 3.4).

Figure 3.4 The Image of Button

The concept sketching (Figure 3.5) shows the general draft of the image of Un-expected City, where something unexpected but pleasant will happen by pressing the button. As the world of view of this project, "triggerable city" as a playful layer on the city map, enhancing the urban experience through button installa-tions. Regarding the performance of the installation, one installation consists of a trigger - the button, and a response - a playful scenario. Since the trigger should be understandable and easy to identify, red dome button was used as the basic image. In addition, red, well-known as an alarm color in the button case, is con-sidered to have the contradictory attractiveness in a playful scenario. To show the playful scenario, some initial ideas were drawn. For example, soap bubble comes out when press the button, the wind starts blowing when press the button, etc. Essentially, the response of pressing a button is encompassing.

3.4. Installation Design

A minimum set of the interactive button and a guideline of scenario design are designed in this research. The interactive button as a external stimulus provides a linkage between people and the urban realm. One prototype is a site-specific

Figure 3.5 Unexpected City Concept Sketch

installation with the usage of the interactive button, designed following the guide-
line of scenario design. It attracts and guides pedestrians to get close and press
the button without using words, and performs a playful scenario in public space.
In the design of the minimum set of button, the experience of pressing a button is
decomposed into separate actions, where designs difference interactions performed
by LED lights upon each action. Follow the decomposed action above, three key
parts, Attraction, Guidance, and Performance, are defined to support the scenario
design of the narrative experience in public space.

3.4.1 Interaction Zone

In interaction design there are three zones of interactions are distinguished - the
interaction zone, notification zone and ambient zone, which can be adapted ac-
cording to the surrounding spatial conditions. (Prant, T. et al., 2003) [22] Result-
ing from implemented HCI interfaces, they are generally further divided in five
different zones (Figure 3.6). In interaction zone, information exchanges mainly

occur via hapstic and tactile interfaces where require a physical contact between system and user for a working interaction. Interaction uses the visual information channel in notification zone. In contrast, visual information can not be observed anymore in ambient zone, where only olfactory or acoustic information is perceivable. (Emsenhuber, 2011) [23]

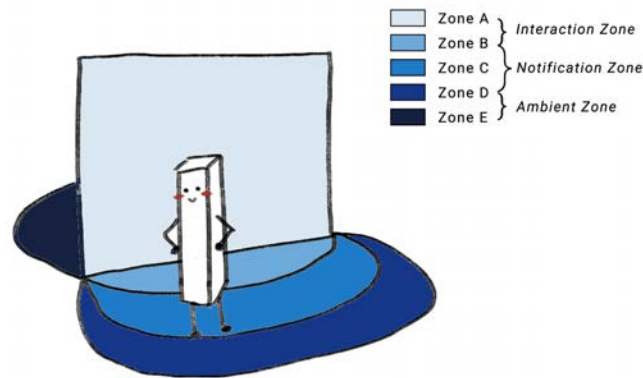This research designs the different interaction in different interaction zones.

Figure 3.6 Interaction Zone

3.4.2 The Interactive Button

The button have revised three times through the iterated design process. At first, several kinds of button were used in prototyping. As the revision of the first testing, people prefer the one hand practice of the red dome push button. Therefor, all the button were in a red dome shape in the second prototyping. During the demonstration, it was found that adults tend to relate an analog red button in plastic texture with danger. Thus, attractive and warm welcome elements are required in the button design.

At first, it was attempted to design the interaction through visual and acoustic channel. For example, using sound effect to show the interactivity, or moving up and down to attract curiosity. Finally, the button was redesigned and fabricated as an interactive one with dome shape and changeable LED colors insides. In
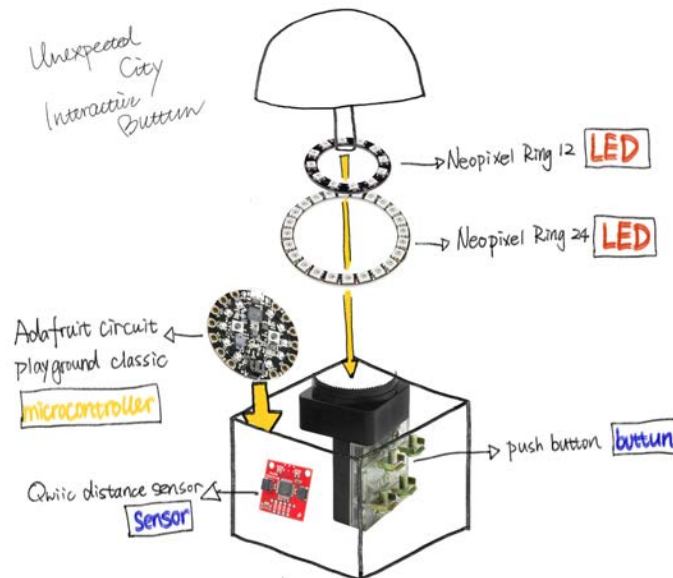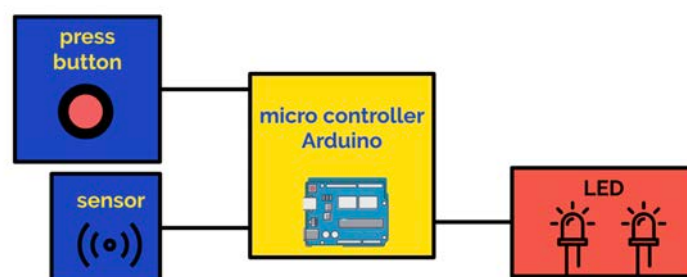
Figure 3.7 Button Constructure

Figure 3.8 Interactive Button Technical System

order to enrich the light performance pattern, two LED rings were used in the button, setting as concentric circles (Figure 3.7). On the basis of the Interaction Zone, the interactive button performs via LED lights and distance sensor. The interactive button is controlled by micro controller Arduino with the technical system in the picture (Figure 3.8).

The experience of pressing a button is decomposed into 5 situations as notice, get close, observe, press and experience. According to the Interaction Zone, they can be distinguished as notice (Zone E and D), get close (Zone C), observe and press (Zone B), experience (Zone A). In this research, these zones are defined with accurate distance (Figure 3.9). With the sensor sensing the distance between experiencers and button, different range of distance occurs different color and performing pattern of LED lights. In Chapter 4, the interaction design through distance sensor and LED lights will be described in details.
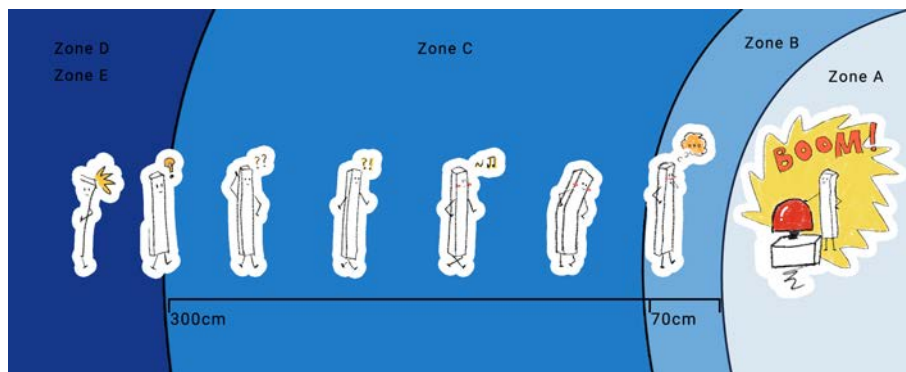

Figure 3.9 Interaction Zone of Button

3.4.3 The Guideline of Scenario Design

Press the button, and trigger a encompassing response. This research creates a guideline to tell how to design the button triggered scenario in Unexpected City. Bearing in mind that the goal is to make a continuously attractive urban space with narrative public experience and non-verbal guidance.

In this research, curiosity principle is used into the interaction design to produce a continuous attractiveness. Tieben et al. (2011) presented an explorative study

and drew three powerful curiosity-evoking principles: (i) novelty, (ii) complexity, (iii) uncertainty, (iv) conflict and (v) partial exposure [24], on how to design for curiosity through interactive systems. Novelty, complexity and uncertainty drive people's curiosity at the encounter moment, while the later two determine the lasting effect of the exploration that resulted from the curiosity.

Following the experience of button installation and the curiosity principle, three key designs - attraction, guidance, performance - support to create the narrative experience in public space.

- Attraction: functions in Ambient Zone and Notification Zone. In order to create the continuous attraction, the elements such as novelty, simplicity, and spontaneity, which are proved in previous prototypes, should be taken consideration in scenario design.

- Guidance: functions in Notification Zone and Interaction Zone. As a public installation, there should be less explanation to start the interaction. Thus, guidance design focuses on how to guide experiencers to act as expected without words. Universal reactions like people's action upon certain physical objects, help to guide experiencers into the effective zone. For example, people will notice and get close to a mirror; people's direction will be guided by stairs. Besides, as the button lights performance changes with the distance, designing interaction based on people's action to create a complex can drive the curiosity and guide experiencers with the perceivable information.

- Performance: able to function in Ambient Zone, Notification Zone and Interaction Zone, depends on the specific scenario design. In this research, the performance design follows these elements: joinable, shareable, pleasant, and site-specific. As they are discussed above, this research designs a site-specific scenario that provides a interactive experience in the urban realm and makes experiencers happy, which can simply summarized as a narrative experience.

Besides, first and foremost,the basic principles in public space like connectivity, safety, and shelter ([6] must be guaranteed as a "pleasant place in every respect".

3.5. Concept Summary

To summarize the concept of this research under Unexpected City project, it is a public installation that enhances the experience of city living through interactive site-specific scenario. In order to create narrative public experience, an interactive button and a guideline of scenario design are presented to make a continuous attraction with and wordless guidance.

Button installation can facilitate to bring the narrative experience to make the public space continuously attractive because:

- It's triggered by people's spontaneous tactile action out of curiosity.

- It provides a linkage to facilitate the interaction between people and the urban realm.

- It provides a playful, joinable and, site-specific scenario.

The design concept is reached after revision and improvement through prototyping and testing. In the next section, all the process of the prototyping procedures are described in details.

Chapter 4
Evaluation

In this research, the evaluation is a trail and error process with three prototypes and testing. Up until up, Unexpected City has carried out three testing in different field, from semi-private space, semi-public space, to public space. In order to clear the revision and improvement process through these three times prototyping and testing, the feedback and revising points are summarized followed the guideline of scenario design, even it was established in the final prototype.

4.1. First Prototype and Experiment Inside KMD

The impact of first introducing the button installation from concept was explored inside KMD. The goal of the first experiment was to investigate whether the button can closer the relation between people and the physical environment. To understand how people interact and think about the button installation, the experiment focused on the acceptance, attractiveness, and participation of the interplay. In this perspective, five rough button installations were assembled and tested with KMD members.

4.1.1 Prototypes

As the first prototype, five simply equipped button installations (Figure 4.1) were presented: 1) a button triggers soap bubble maker; 2) a button triggers objects start to vibrate; 3) a button triggers the illumination set on a chair; 4) a button trigger a inflatable plastic bag monster; 5) buttons trigger different funny sound. In this case, several kinds of buttons were used to trigger the response: red dome push button, arcade push button, buzzer toy button, and on-off toggle switch.

In order to mark an identity of the playful buttons, smiley face stickers were used to recognize them. The main research theme of the first experiment was "relation" - the relation between multiple actions of pressing the button, the relation between multiple experiencers, and the relation between experiencers and the physical environment. With these five prototypes, the experiment was divided into two parts: observation and interview. Through the experiment, to analyze whether the button installation is able to stimulate people start the interaction with physical environment.
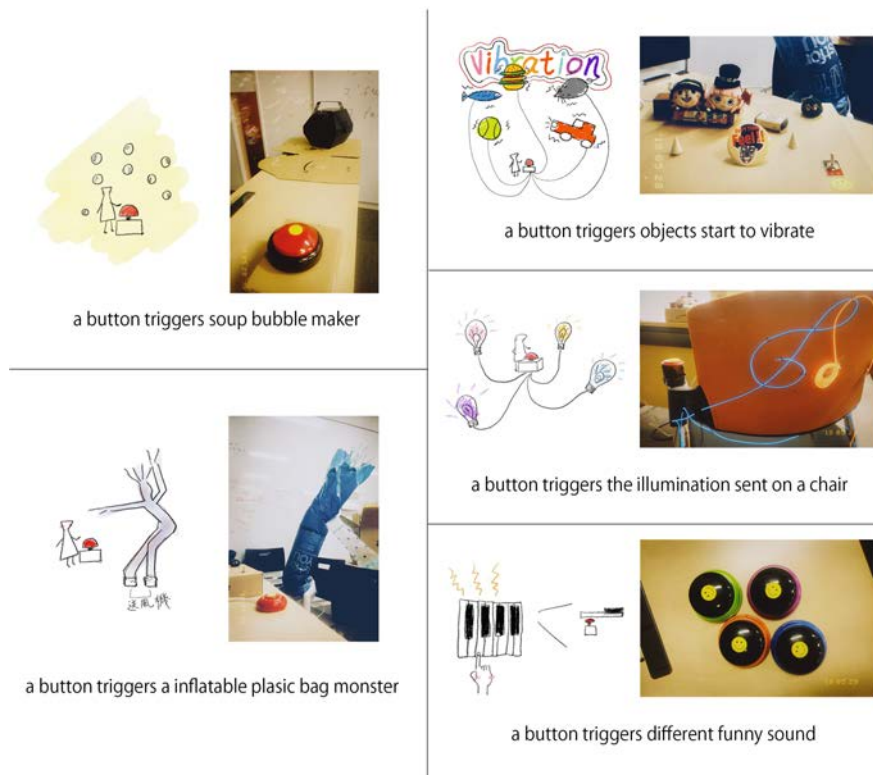

Figure 4.1 First Prototype

Figure 4.2 First Experiment

4.1.2 Testing and Results

The experiment was performed on 28th, May (Figure 4.2), with 10 test experiencers. They were introduced to a space where the prototypes were set, and asked to feel free to trigger the buttons with stickers. During the experiment, the emotional performance (before, during, and after the action of triggering the button), and the interaction between test subjects were observed. To evaluate the sustainability and rationality of the button-pressing action, here are the questionnaires and the evaluation form:

Interview Questionnaire

Q1: Do you feel excited to push the next button?

Q2: Are you willing to introduce the installation to your friends?

Q3: Are you willing to search for other buttons in this room?

Q4: Are you willing to move to a near-by place for playing the button installation?

Q5: Are you willing to move to a place with some distance for playing the button installation?

Q6: After the experience, do you want to design your owe trigger-response installation?

users	Q1	Q2	Q3	Q4	Q5	Q6
A	5	5	5	5	3	5
B	5	5	5	5	3	5
C	5	5	5	5	4	5
D	3	2	3	2	1	3
E	4	5	5	3	2	1
F	4	5	5	4	1	4
G	4	3	5	5	1	2
H	4	4	5	5	2	1
I	5	5	5	5	2	5
J	5	5	5	5	3	5

Table 4.1 Evaluation Form

According to the questionnaires, nearly all the experiencers had a satisfied experience to interact with buttons, and had a wish to join more interactions. After the questionnaires, there had a short interview with each experiencer. Even though some feedbacks showed that the response after pressing the button was too simple to be considered as a playful scenario, more experiencers put their impression on the experience before they pressed the button. The feedbacks were summarized following the guideline of scenario design as:

Attraction

- The button in red, dome shape was most eye-catching and inviting as they were willing to press it.

- Besides the appearance of the button, the installations were difficult to notice and unattractive since most of the materials were everyday objects.

- The action of pressing a button was a kind of pleasure that, after pressed the first button, they wanted to press more and more buttons.

Guidance

- They need a permission allows them to press the button and join the inter-action.

- If the button installation is in public with no description words, they prob-ably will not press the button.

- The button design was ordinary but unnamed that was considered as a button that can not be touched.

Performance

- It was a one-time action since the each response of buttons was a one-off surprise but not inviting to make they want to trigger them a second time.

- They felt themselves separated with the performances as audiences.

4.1.3 Revision for Second Prototype

During the first experiment, the interaction occurred because the experiencers were asked to press the buttons at first. Therefore to invite people to press the buttons without words, the feed backs of observation, questionnaires, and interview pointed out the revising points following the guideline of scenario design.

Attraction

- Unify the trigger as the button in red dome shape.

- Take in account of the visual design in the design of installation.

- Separate the multiple button installations in different places.

Guidance

- Unify the button design with visual appearance and a logo.

- The location to Implement the button installations should be a playful and tolerant environment makes people feel free to have a first try.

Performance

- Design the playful scenario based on everyday action, to narrow the psychological distance with experiencers.

- Introduce storytelling concept into the scenario design to rich the experience.

The first prototyping and experiment led a fundamental direction of the button installation design. With the feed backs and revision, to improve the next prototype.

4.2. Second Prototype and Test in KMD Forum

Three new prototypes and 1 previous work (the soap bubble) were demonstrated on the "KMD FORUM 2018" on November 2th and 3th at Keio University Hiyoshi Campus. About 80 people experienced the interaction with button installations in total. Most of the feedback were positive and further proved that button is an ideal interface to build the interaction in public.

4.2.1 Revision and Prototype

It is worth noting that the second prototype was designed with knowing the testing location out of lab. Thus, compared with the first prototype, city-specific element was taken into the scenario design of button installations. Considering the testing location is KMD Forum, where open showcases various trails of projects, journeys of students and graduates through talks, workshops and interactive exhibits. Therefore, concept of scenario was clearer and more understandable than before since the not only KMD people will present, more important, those ordinary people will visit.

It was the time Unexpected City project showcased in the KMD Forum, considered as a semi-public space, where required the experience should be easy to understand and joinable. In the first experiment it was proved that experiencer had the wish to explore and press more buttons, in order to build the view of

"button world", 4 button installations were separated in different place of the exhibition.

Button Design

As required by the first experiment results, all the buttons were designed in a red dome shape, with a logo on the top. It was to recognize the function as a button as well as the identity of a playful button.

In order to reduce the worry and hesitation on pressing the button, one of the buttons was implemented on human body. The person with hanging the button as the guide who lead the visitors entrance into the "button world".

Scenario Design

In this case, improved from the revision, the elements in designing the scenario are interesting, interactive and understandable. Three button installations, each of them modified at least one revision point:
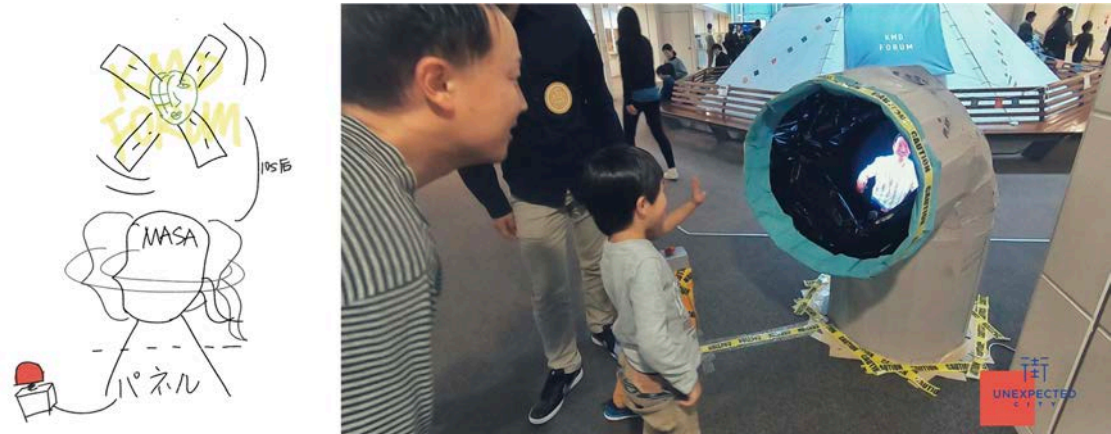
Figure 4.3 Greeting From Masa

Greeting From Masa (Figure 4.3): KMD's dean Mr. Inakage, whose 3D animation would jump out of the wrap pipe and said "Welcome to KMD Forum" if press the button. Considering the button installations showcased in KMD Forum, it was related scenario taking in account the site-specific element. Besides, a wrap pipe was designed as an attractive appearance to draw the curiosity.

Figure 4.4 Contrary Fan Game

Contrary Fan Game (Figure 4.4): the fans would start blowing wind and blew
the colorful tapes if press the button, with a vibrating voice coming out. The
scenario was designed on a daily action that the kids always tend to say to the
turning fan for hearing their vibrating voice. This time the fans said in a vibrating
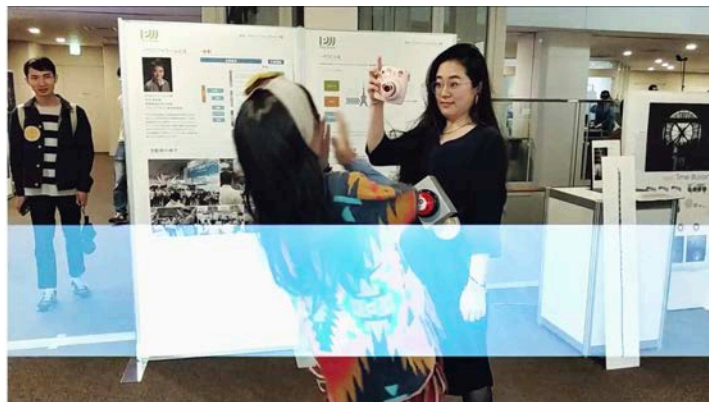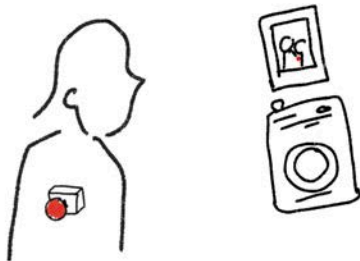voice in reverse.

Figure 4.5 Contrary Fan Game

Surprise Shutter (Figure 4.5): the experiencer will be taken a photo by an in-
stant camera with a surprising face if press the button which attaches on someone'
s body. The installation was worked manually to reduce the emotion of untrust-
worthy when people thinking about an unnamed button in front of them. In

addition, even though worked manually, interaction with experiencers happened in the experience.

4.2.2 Testing and Results

KMD Forum lasted two days in a open space inside the Kyoseikan building. In the showcase, about 80 experiencers including kids and adults had the interaction with at least one button installation. The main evaluation tools were observation and interview, with every action and reaction during the experience were summarized followed the guideline of scenario design.

Attraction

- The appearance, especially the wrap pipe drew a lot curiosity.

- Kids loves the action pressing buttons, played with buttons openly while careless about the purpose and the response.

- It was showed that Adults rarely press the button since they consider the red as an alarm color, doubted the purpose and felt afraid of the response.

Guidance

- A family looked around the event hall in order to find all the red dome button installations with logo, after they pressed the button once.

- KMD Forum is a tolerant environment where magic will happen. It offered a wordless permission with phenomenon that people were willing to do the first try.

- But, most of the experiencers won't press the button unless they were guided. There were two reasons: they didn't realize it as a triggerable button; and they felt afraid to press an unnamed button.

Performance

- Most of the experiencers can understand the scenario and concept of the button installations.

- Many of them repeated to press the buttons to experience the playful scenario one more time.

- Performance can start before the button is pressed to create an entire experience.

Imagination Test: If there is a button can do anything, what do you want to do with it?

Beside observation and interview, an imagination test was carried out during the showcase. To evaluate the effect on their curiosity and imagination through the button-pressing experience, the experiencers were required to design their own button, with the question - "If there is a button can do anything, what do you want to do with it?" The answers shows that most of them, 9 out of 10 experiencers, had a rare effect and inspiration after the experience. Their answers remains was a direct desire as certain needs like dress, snack, money, ramen, or finished homework.

Figure 4.6 Imagination Test-1

4.2.3 Revision for the Third Prototype

It is found that kids will press the button anyway but adults are not. The direction is to design a button encourage adults to have the interaction. The first step is to lead their curiosity. The second work is to design the interaction between people and button.

Attraction

- To design an interactive button to attract adults ' trust and curiosity.

- The identity of playful should be designed on button itself rather than a logo, since logo can identify the playful button only from the second time.

- Take in account of interaction design into attraction rather than depends on the appearance.

Guidance

- Design interaction to guide experiencers to press the button wordlessly.

- Guide people to get close and remind them a playful installation by using universal reaction.

Performance

- Bring alternative story into everyday scenario, to make the experience understandable and inviting.

- Simple and direct response is powerful, such as blowing wind.

- Use narrative design to build a whole story in the experience.

- One button can provide divers performances.

Previous described the concept of this research and the process followed to design it. The intent is to test the effectiveness of pressing the button as a satisfying interactive experience brought to the experiencers. In the following section, it will

describe the process of revising, design, prototyping, implement and evaluation of the final prototype, which tested in a real public space.

4.3. Third Prototype and Exhibition in Zou-No-Hana Park

The third prototype, which is the final prototype of this research including two button installations, participated the 10-day exhibition "Future Scape"[1] in Zou-No-Hana Park in Yokohama. The Future Scape Project was formed as an experimental public space project with the aim of creating an even more relaxing and comfortable place by art. Artists and non-artists alike were asked to imagine how the park could change in the future. They were given time spans of 1 year, 10 years or 100 years in the future, and the resulting ideas, full of dreams, will be presented at the exhibition.

Zou-No-Hana Park is a public space with a open view of Yokohama Port. In this case, a title of these two button installation is named as "Or maybe it is a button that connects you to a moment that might have happened in a parallel universe" (Figure 4.7). The design of these installations reflects to the daily behaviours that citizens perform in the public space. With the interactive button, an alternative seaside scenarios were designed to perform another possibility of behaviours in public space.

To accomplish the prototype and manufacture in high quality, these two button installations were carried out through a team work. Author was responsible as the design director, shouldered the visual design, project management, contents editing, and a part of fabrication.

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1   Zou-No-Hana 10th Anniversary Futruescape Project
    https://www.10thzounohana.yokohama/

Figure 4.7 Image Sketch

4.3.1 Revising Interactive Button

As mentioned in Chapter 3, the experience of pressing a button is decomposed into 5 situations and distinguished depending on the Interaction Zone (Figure). The LED lights inside the button will change with distance between experiencers and installation, where different range of distance occurs different color and performing pattern. The interaction performance is described in details as:

Figure 4.8 Button Led - Notice

1. Decomposition: notice

Distance: more than 300 cm from the interactive button

Status: out of the interaction range of button, while interaction can happen between people and the installation.

Lights Performance: breathing in red.

Purpose: red is the default color of a button, so as to it can be recognized as a push button even at a distance. In addition, in order to weaken the visual information as an emergency button, a breathing effect was performed by the LED lights.
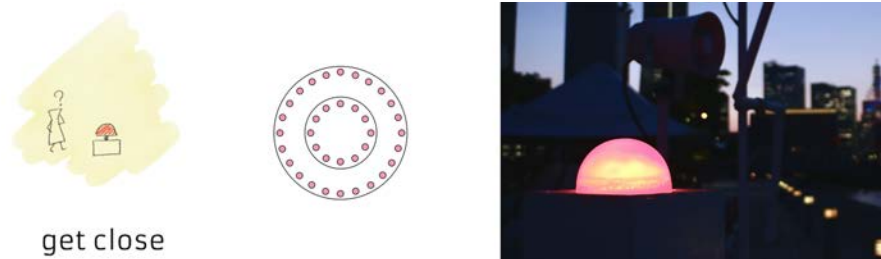
Figure 4.9 Button Led - Get Close

2. Decomposition: get close

Distance: between 300 cm and 70cm

Status: experiencer is getting close to the button.

Lights Performance: as the distance reduces, red color fades and turns into white eventually.

Purpose: the interaction happens in Zone C where using the visual information channel. This performance visualizes the decreasing alarm, sending a warm welcome message.

3. Decomposition: observe

Distance: less than 70 cm

Status: experiencer standing at the right front of the interactive button, where close enough to press the button.
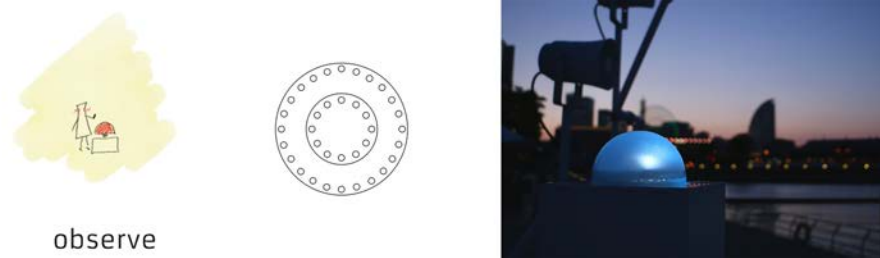
Figure 4.10 Button Led - Observe

Lights Performance: the outside LED ring and inside LED ring chasing each other in white.

Purpose: sends a joyful message in invite the experiencer to press the button.

Figure 4.11 Button Led - Press

4. Decomposition: press

Distance: less than 70 cm

  Status: experiencer presses the interactive button

  Lights Performance: the color changes from white to colorful

  Purpose: visualizes the switch of the scenario and indicates the start of the following happening.

5. Decomposition: experience

Distance: less than 70 cm

  Status: the installation begins to interact with the experiencer.

Figure 4.12 Button Led - Experience

Lights Performance: the colorful lights start to twinkle until the scenario ends.
Purpose: shows the installation is working.

4.3.2 Scenario Design 1: Strong Wind Blowing

Figure 4.13 Strong Wind Blowing Sketching

The button installations were decided to exhibit at a citizen park beside the
Yokohama Port. Seaside experience became the theme of scenario design. Follow-
ing the guideline of Unexpected City scenario design, two situations - shouting to
the sea and strong wind blowing were the initial idea of the scenario.

Scenario

When you' re blown by the wind at the seaside, you might find yourself a noble beauty that you were not aware before if looking at yourself in a mirror, or maybe it is a button that connects you to a moment that might have happened in a parallel universe.(Figure 4.13)

Action and Design

Standing on the scenario, the user process can be decompsited as these action: notice; get close; press the button; blown by wind and look into the mirror.

According to the separated action, the reaction and performance are designed so as to interact with experiencers as:

1. When there is nobody notice the installation, the mirror LED performs blinky in white for catching someone's notice, similar with the situation in Statues Game [2] when the Curator turns back to the field.

2. When somebody aware the installation, the mirror LED discharges and disappear, similar with the situation when the Curator turns around and Statues must freeze in their positions.

3. When people's attention distract from the installation, the led blinky again.

4. When the distance between installation and experiencers is less than 3 meter, the interaction occurs from the button set (mentioned in Chapter 3) to remind people notice it.

5. If experiencers press the button, the wind blowing, and the mirror LED and button LED become colorful and blinky.

Follow the guideline of scenario design, the interaction design can analysed as:

- Attraction: blinking mirror; blinking button

- Guidance: mirror led performs based on people' s awareness; button led performs based on the distance.

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2   Statues(game)-Wikipedia
    https://en.wikipedia.org/wiki/Statues_(game)

- Performance: after pressing the button, blower blows wind, mirror led and button led become colorful and blinking.
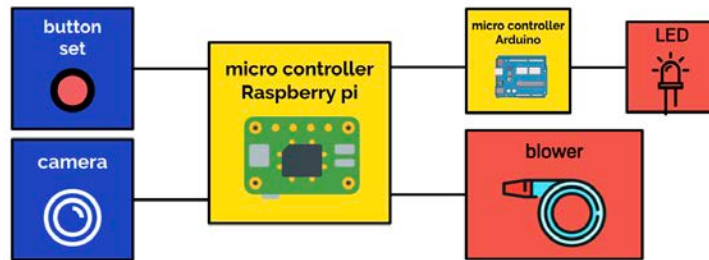
Technical System

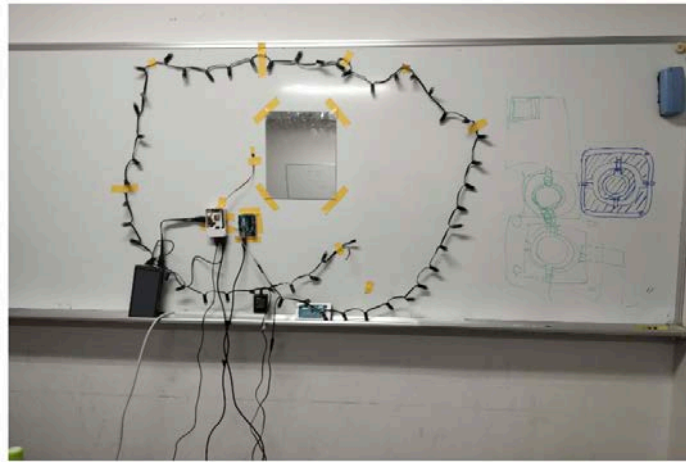Figure 4.14 Technical System - Strong Wind Blowing

Figure 4.15 Rough Prototype - Strong Wind Blowing

To implement the interactive scenario, a technical system(Figure 4.14) is built and assembled, including button(input), camera(input), Raspberry Pi(micro controller), Arduino(micro controller), mirror LED(output), and blower(output). The

camera works for the face detection, to implement the interaction of people's awareness and the mirror LED performance. Raspberry Pi as a centre controller, processing the face detection data and transport the signal between button set and blower.

During the iterate coding-debugging phrase, a rough prototype (Figure 4.15) was built to test the system in adjustment. In addition, through modeling the rough prototype, serves to build up the fabrication sketching after.

4.3.3 Scenario Design 2: Shouting to the Sea
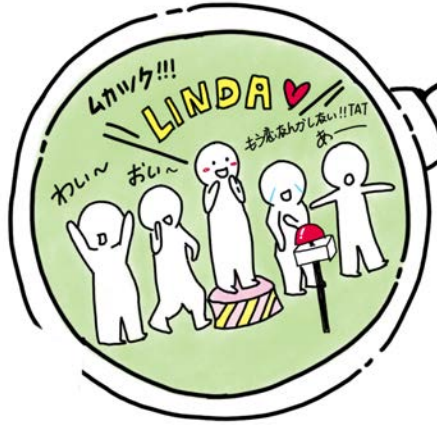
Figure 4.16 Shouting to the Sea Sketching

Scenario

When you are looking at the sunset over the sea, you may be standing in the middle of a group of people shouting towards the sunset, and yelling something loudly together, or maybe it is a button that connects you to a moment that might have happened in a parallel universe.(Figure 4.16)

Figure 4.17 Shouting Contents

Shouting Contents

In this scenario, sound contents, conversation between 4 characters, work to tell the story through the experience. Each conversation is divided into 3 parts: waiting scenario, shouting scenario and laughing scenario(Figure 4.17). The waiting scenario builds the picture of waiting for somebody, with the lines "come here", "harry up", "it's so beautiful here". As for the shouting scenario, in which explains the story that the characters are going to shout to the sea and invite the experiencer to join them. At last is the shouting scenario, which ends the story with laughing. Three versions of the conversation are designed the scenarios between family, high school boys and office ladies. In the experience of this installation, three conversations play randomly to create a diverse performance.

Action and Design

Standing on the scenario, the user process can be decompsited as these action: notice; step on the stage; press the button; hear the invitation and shout to the sea.

According to the separated action, the reaction and performance are designed so as to interact with experiencers as:

1. Before the button is pressed, as a default performance, the speakers circulate

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the waiting scenario.

2. When somebody is attracted to get close to the installation, and step on the stage, the interaction occurs from the button set (mentioned in Chapter 3) to remind people notice it.

3. If experiencers press the button, the sound contents change into shouting and laughing scenario.

Follow the guideline of scenario design, the interaction design can analysed as:

- Attraction: pipe men (appearance); sound (waiting scenario); blinking button.

- Guidance: sound (waiting scenario); stairs to the stage; when step on the stage, the button led changes.

- Performance: after pressing the button, conversation changes to shouting and laughing scenario, the button led becomes colorful and blinking.
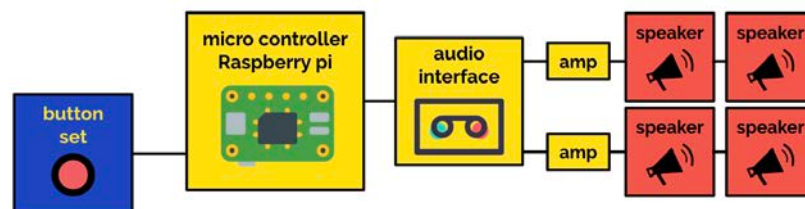
Technical System

Figure 4.18 Technical System - Shouting to the Sea

To implement the interactive scenario, a technical system(Figure 4.18) is built and assembled, including button(input), Raspberry Pi(micro controller), audio interface, two amps, and four speakers(output).

Each speaker is one audio channel represents one character(Figure 4.19). The audio interface and amps function to play the audio contents in 4 channels as 4

(Software: Garage Band, Audacity)

Figure 4.19 Sound Contents Editing

characters. Raspberry Pi is the micro controller to play the audio and transport signal from button to audio interface.

Rough prototype(Figure 4.20) is the step before fabrication. With the irritate rough prototyping, modeling and fabrication will be described in the next section.

4.3.4 Modeling and Fabrication

As an important part of attraction, modeling design shapes an inviting appearance to attract pedestrians to get close to the installation. Modeling starts from sketching, then address the final plan through repeated improvement, and fabricate with many tools eventually.

The Interactive Button

Bearing in mind the design sketch mentioned above(Figure 3.7), it took several times of rough prototyping to address the design. As for the fabrication of the button set, beside the soldering of the electric parts, 3D print and laser cut were used to build the case(Figure 4.21). Following sketch, team members Charlotte and Nakano took charge of this part.

Figure 4.20 Rough Prototype - Shouting to the Sea

Figure 4.21 Modeling and Fabrication - Interactive Button
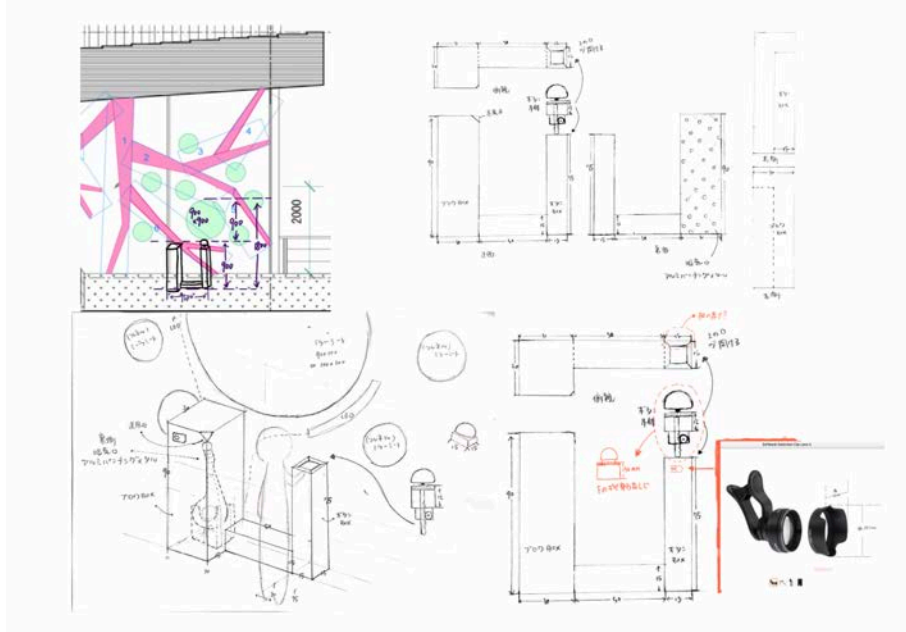
Installation 1: Strong Wind Blowing

Figure 4.22 Modeling and Fabrication - Strong Wind Blowing

For this installation, height is a key point considering the average height of the experiencers as included both kids and adults. From the same reason, the height and size of the mirror also should be taken in account. Besides, how to control the wind blows powerfully but not annoy the experiencers is another difficult point. Thus, the modeling sketch(Figure 4.22) as below came out after multiple times of test:

- Interactive button: the height is 90 cm, with the position at the right side of the installation.

- Pipe men: with difference heights to imitate a family. The arms was designed with the reference of bicycle handles.

- Blower nozzle: with the 90 cm height and a certain angle to blow the wind.

- Mirror: with 90 cm in diameter and 90 cm height from the ground.
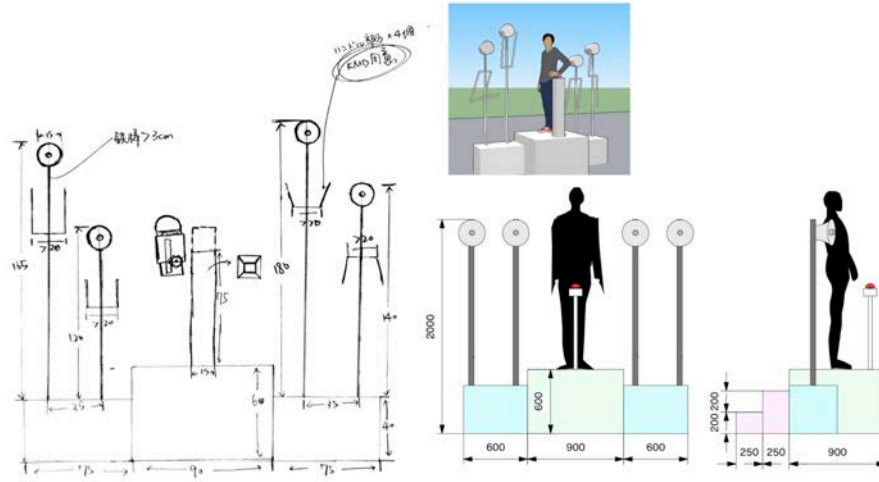
Installation 2: Shouting to the Sea

Figure 4.23 Modeling and Fabrication - Shouting to the Sea

Four speakers were decided into human shapes made of pipes,with the speakers as their heads. The stage with the interaction button and the position of "pipe men" designed below (Figure 4.23). The experiencers can stand in the middle of "pipe men" in a line, and hear their sound come from both sides.

- Stage: consisted of a main stage for experiencer, and two side stage for pipe men. The volume of the main stage was 90x90x60 cm after the fieldwork.

- Pipe men: with difference heights to imitate a family. The arms was designed with the reference of bicycle handles.

- Use narrative design to build a whole story in the experience.

4.3.5 Exhibition

The exhibition was held from June 7th to 16th in Zou-No-Hana Park, Yokohama (Figure 4.24). A wide and spacious square was built on a green hill with a view of the sea and port. It is frequented by many people of the city, such as office workers during their lunch break on weekdays, and also couples as well as families

Figure 4.24 Exhibition Website

on the weekends. Nearly 100 programs joined the exhibition, creating a form of art and experimenting the ideal state of public space. With the project name Unexpected City, two button installations join the exhibition and showcased from 15:00 to 19:00 everyday(Figure 4.25).

Figure 4.25 Exhibition Implementation

Public Setting Operation

To set up a 10-day installation in public space, conditions in every respect should be taken in account (Figure 4.26). Through the setting up before the exhibition, it summarized a public setting operation.

1. Waterproof

- Every electronic parts should be protected in waterproof case and withdraw it when necessary.

- The exhibition should be stopped if rains heavily.

- Wrap the button set when raining.

2. Volume in Public

- It's forbidden to make loud sound after 20:00.

- Adjust the volume with the event staffs.

3. Electric Power

- List all the electronic equipment's and apply for the permission of using power.

- Make sure that the power is turned off when knock off.

4. Staff

- Make sure at least one staff for each installation.

5. Safety

- The installation should be placed away from the sea more than 2 meter.

- Make sure the installation will not fall down (windproof).

6. Security

- All the valuable objects should be brought back when knock off.

- Set the barrier when the installation is not working.

4.3.6 Pre-test and Revision

Owing to it was the first time that button installations introduced into a real public. At the beginning of the 10-day exhibition, it spent several days to do a pre-test. According to the results in pre-test, three main feed backs and revision were pointed out.
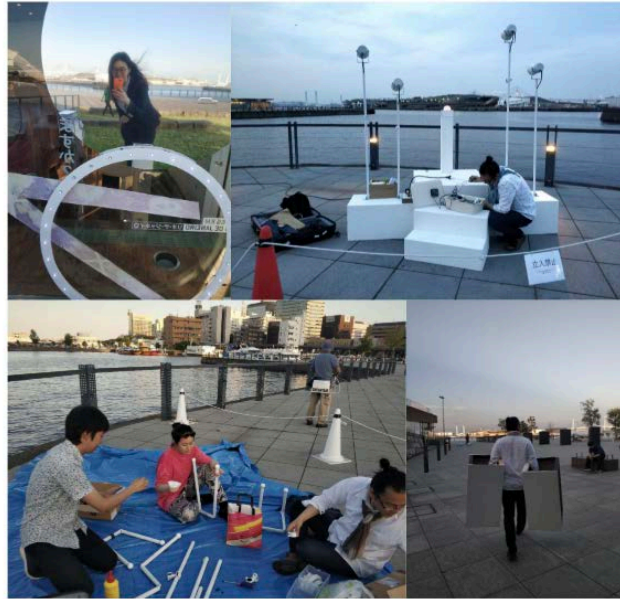
Figure 4.26 Public Setting

Experience first

The staff tried to introduce the installation when the pedestrians got close, and ask them to press the button. However, compared with offer they a space to grope around, the introduce cause people lose their curiosity and leave the button-pressing action an intentional image, which was self-defeating. Therefore, the experience should be placed the first to promote the spontaneous action rather than information first.

Light performance in daytime

The LED light performance was difficult to difficult to recognize under intense light during the daytime. Moreover, especially the statues game like performance of the mirror LED lights was rarely noticed since it was a small change in a huge scale, the Zou-No-Hana Park. Other interaction method should be considered in the future work.

Switch of conversation

In the shouting installation, it was found that many experiencers could not understand the shouting scenario. Thus they didn ' t hear the whole conversation and stepped away with confusion. Besides, the lights changes inside the button was difficult to recognize. In order to highlight the switch moment when press the button, a magic sound effect was added into the conversation to indicate the changing of the scenario.

4.3.7 Test and Feedback

In all, buttons are triggered for more than 300 times. Over 800 people experienced the narrative scenario with the interactive installation, most of them gave a very positive feedback.(Figure 4.27) The main visitors are residents in neighborhood, who regard the park as a everyday place. They are the target user for button installation scenario designed to bring narrative experience into ordinary place. With the observation, questionnaires and interview, the feedbacks were sorted out followed the guideline of scenario design.

Feedback 1: Strong Wind Blowing

- Attraction: attracted by the blinking mirror; get close for selfie; see others playing; hear the blower sound etc.

- Guidance: notice the button led changing; press the button out of instinct; the inviting shape of button; hard to notice the change of mirror led etc.

- Performance: more understandable for girls; kids really enjoy the wind; repeated etc.

Figure 4.27 Exhibition and Experience

Feedback 2: Shouting to the Sea

- Attraction: the inviting appearance; attracted by the big sound; hard to notice the button led in the sun; see people gathering etc.

- Guidance: step on stairs but off the stage soon; feel embarrassed about standing on the stage; notice the button and press it without hesitation; a playful and tolerant atmosphere etc.

- Performance: thankful for installation allows them enjoy the shouting; enjoy watching what others playing and reacting; feel confused about what to do; want to hear all the 3 versions of the scenario; hard to shout in front of friends didn't realize they can join to shout together etc.

Figure 4.28 Imagination Test-2

Figure 4.29 Questionnaire

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Imagination Test: If you are the public button installation designer, what button do you want?

During the exhibition, another imagination test was carried out (Figure 4.28 4.29). This time, it came a conclusion that, after the button experience, most of the experiencers (11 out of 13) changed their understanding to this certain place to a playful, satisfied and inviting perspective. For example, an American girl wanted a blinking bike when press the button; a ladies wanted the flower blossom when press the button; a couple they wanted a button can trigger good smells etc.

From the result of this test, it can be proved that the narrative public experience not only changes the movement that people act in public space, but also, stimulates a translate of the mindset of how they understand their everyday scenario.

4.3.8 Results Summary

Out of a huge data of observation and interview, the Results of this exhibition was summarized with key words as below,

- Embarrassing: Lots of people discontinue the experience because they feel embarrassed.

- Joinable: People think it a remarkable characteristic comparing Unexpected City and other art works; While most of them didn't realize that they can join the shouting.

- Understanding: People somehow understand the story and most of them ask for further explanation; Mirror, stairs, the universal reaction elements are proved effective in the guidance.

- Instinct: Button is proved to be a great interface to trigger an experience in public since most of the experiencers felt no conflict about its being and press it out of instinct.

- Repeated: Quite a lot of people press the button in multiple times, and almost press the other button.

- Satisfying: Most of the people feel happy and laugh to each other after the experience.

- Shareable: People can join the experience as any role they want.

- Site-specific: Most of the people explore their imagination of this certain place.

Chapter 5
Introduction

From the results of the last evaluation came to light more insight and deep more factors that influence pedestrians activities in public. This research prototypes the button installation and tested in the wild, which believed as a great start-up of the Unexpected City project as well as makes a contribution to the research in urban interaction design.

To achieve the goal, make a continuously attractive urban space with narrative public experience and wordless guidance. Here list three limitation points, with improved which this project step over to the next significant stage. Essentially, with improvement and development, Unexpected City has the potential to deepen itself into the urban realm with creating a form of urban interaction, introduces the interactive button as the linkage to connect people and the urban realm. Finally, to bring out a pedestrians movement of pressing a button and build an experiential layer of city living. Apart from revising the limitations and keeping on research and prototyping, three main steps will be detailed to advance the development and positioning itself in urban life.

5.1. Limitations

The Light Performance During Daytime

An easy to ignore but important limitation since the interactive button was pushed out of the lab and tested in the context. According to the observation and feedback, in the daytime, especially the sunny day, the light performance is almost invisible. Even though the dome shape recognizes the button, the interaction design behind does not function to elicit pedestrians' curiosity. Thus, further study

should make up the limitation with an alternative or extra stimulus.

The Invitation of Engagement

For the shouting scenario, some experiencers was at a loss when the conversation inviting them to shout together. Most of them preferred only to hear or to leave with confusion. As for the blowing scenario, since it was a one-side interaction - the wind will come out without option - as well as intuitive feedback after pressing the button, therefore there was more engagement in this case. To improve this limitation, the threshold of complexity principle in the scenario design should be examined.

The Social Environment and Conditions in Pubic

An influencing factor that was insufficiently taken into account during the design. During designing the scenario, according to the Japanese team member - react depends on both the physical and social circumstance - the context of Tokyo was one of the place-specific features. However, the power that this factor effects on human behavior were still looked down. Besides the invitation system discussed above, the lack of engagement caused by this influence factor. For example, parts of the Japanese are not willing to stand on a stage to highlight themselves out of other people; or they are not willing to be watched for making a loud sound.

5.2. Future Work

Long-term Public Installation

In the last evaluation, the button installations were set up in public space for 10 days as an exhibition. It is reasonable and convincing to draw a future work of a long-term installation like the physical installation in streets at present. A long-term setting helps depth research on the effectiveness of boosting urban interaction through button installation. In addition, bearing the public setting operation which summarized above, more limitation and improvement will be unearthed in this perspective. On the way to perfect the design and launch into everyday life, it is a very important stop.

Sense of Belongings

Along with a long-term setting, people in everyday scenario will gradually build their sense of belongings into the installation. As the process that they get used to the environment through daily interaction. Unexpected City images a future of the urban realm with multiple button installations set at multiple public places. It makes it possible and excited that people can find the familiar object - the interactive button produced by Unexpected City - wherever they go to the unfamiliar area. As the button plays the role as a linkage to relate people and the urban realm, the expansion of button installation can be considered as the expansion of the sense of belongings.

Open Platform

The pen platform process aims to promote this pedestrians movement for its recognition as a widespread identity as well as a designable format, which will invite people to co-create the button installation. As Brynskov [25] described in their books Urban interaction design: Towards city-making that "urban interaction design demands that we emphasize the DIY impact of city making" (Martin Brynskov, 2014). Based on the accomplishment of the previous two points, Unexpected City set the goal that more city dwellers can discover and moreover, participate to design the city. Open the scenario design to gather the ideas from the public, to implement them and to install into urban. Unexpected City is believed that a great platform for everyone to co-create the playful scenario based on button installation, to enrich the pedestrians experience in the urban city.

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