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Master's Thesis

Academic Year 2016

Enhanced Tradition

Graduate School of Media Design,
Keio University

Wilhelmine Edna Sokol

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

Wilhelmine Edna Sokol

Thesis Committee:

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Abstract of Master's Thesis of Academic Year 2016

Enhanced Tradition

Category: Design

Summary

Nowadays, people of this generation seem to be slowly loosing interest in traditional culture of their own country. By focusing on future and possibilities offered by technological advancements and following popular culture is how most people connect with each other. Tradition, expressed by both customs and objects is not something people put much thought in their everyday lives. When unification of everyday culture seems to be the leading trend, by forgetting about traditions countries, ethnic groups, etc. face the real danger of loosing their cultural identity and uniqueness. While museums and galleries do wonderful job of preserving tradition, the best way to preserve it is to find a way to make it again interesting and valuable for younger generations and functional in everyday life.

The purpose of this research is to establish a new path in design that combines modern interactive design with traditional wearable artifacts in a natural way. The goal is to present an interconnected symbiosis of the two could lead to the creation of new kinds of products that will have the ability to connect with the consumer in new ways and show how technology can improve our way of living, while maintaining cultural and traditional qualities rooted within our culture and everyday life. Augmenting traditional garments and accessories with wearable technology while preserving and promoting their traditional aspects enhancing their usability and expressiveness using interactive design towards a new and exciting future.

Keywords:

Wearable Technology, Kimono, Enhanced Tradition, Obi

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Chapter 1

Introduction

1.1 Motivation

One could define design as a field dedicated to improving the product and accessibility to the market. The author of this thesis has continuously witnessed and practiced the way under which design investigates function, form and the interdisciplinary connection between a product, an end user and the environment in a modern ecosystem.

Design has the power to change the world, moreover it is author's opinion that designers have a responsibility for the community. The products create by designers, products that decorate our homes, the architecture we spend our time in, the vehicles we use to get from one place to another or the clothes we wear they all are parts of urban landscape. Designers create a scenery that we see every day. Scenery that is more than trees and flowers. A visual surrounding that influences our moods, that can make us happy or sad, productive or lazy and most important - our surroundings can be a motivator and an inspiring artifact that can teach us about our roots and lead us to the future.

These days commodity culture tends towards themes of anonymous products, blurring sense of origin or uniqueness, and eliminating the presence of tradition. Japan is a country that has a long history and great traditional heritage. It's customs and traditions can and do benefit Japan and it's image in the world, but not only in an economical way such as tourism, exporting of Japanese traditional artifacts etc. Even more important is the effect traditions and customs have on Japanese society, and everyone fascinated with the country. Tradition is the soul of Japan, but like many other countries in the world it seems that the young generation is gradually loosing their interest in this side of the culture. Instead, the popular culture is dominating the media and young people's lifestyles, and the traditional side gets brushed aside as "old", "unfashionable" and "not interesting".

Trends of combining interactive technology in product design open a new path

Figure 1.1: Drinking Fountain

Figure 1.2: Objects

in modern design approaches. Using traditional aesthetics within modern design techniques will contribute to the preservation of traditional artifacts. Moreover, the act of "preservation" will improve creativity in modern design. By combining traditional artifacts and modern interactive design, there is potential to create new kinds of products, ones that will reach those who value modern designs, and well as fans of traditional solutions. It will create a bridge between the two sides and make a common path for them.

The progress of technology will not stop. We as designers should not fight it but find the way to use it to our advantage.

1.2   Research Background

To fully understand the background of this research it is important to explain where in traditional Japanese culture its roots lie. The following concepts are presented in order to explain and underline the deeper meaning of the design discussed in this thesis.

"Wabi sabi" is a Japanese concept that is close to impossible to translate and quite difficult for Westerners to understand. Derived from principles of art and philosophy practised by Zen monks in as early as thirteenth century, it's an aesthetic ideal that by reminding viewers of mortality and ephemeral, transient beauty that can be found in everything impermanent. It suggests qualities like humility, asymmetry, and imperfection and turns towards nature for inspiration

and lessons of the unadorned truths about the surrounding world. Nature, asymmetrical, randomly imperfect, ruled by the always changing, always in a transit seasons, is the most favoured medium for expression of wabi sabi concept[1]. Wabi sabi can be found in every branch of traditional Japanese arts - tea ceremony, calligraphy, flower arrangement (ikebana), pottery, poetry, just to name a few, as well as in everyday activities and architecture.

Figure 1.3: Tea House representing the concept of wabi sabi.

In calligraphy, wabi sabi leads to appreciation of imperfect lines made by the brush - it shows the piece's uniqueness and therefore, such piece is to be treasured. Pottery is another good example where wabi sabi and it's celebration of imperfectness is seen as a value rather than a fault.

Toshogu Shrine complex in Nikko, a small mountain city North of Tokyo, that is well-known for it's abundance of colours, patterns and forms in mural decorations may be as far from the simplicity of Zen as possible, and yet, even there wabi sabi concept can be found. Designs created 400 years ago are intentionally left "unfinished", lacking tiny almost unnoticeable details to prevent the shrine complex reaching the ideal state and falling into ruin. It is believed that after becoming perfect the only remaining path is to crumble, as after perfectness nothing

Figure 1.4: Toshogu Shrine complex. Yomeimon Gate.

better awaits. As it is impossible to remain in perfect state forever because of the unstoppable flow of time, the intentional action of not completing designs makes it impossible for the building to become perfect and therefore, they can never cease to exist but remain for eternity appreciated for what they are.

Appreciation of the passage of time can be found in natural events, for example in Hanami festivals - typical for Spring season cherry blossoms (sakura) viewing celebrations. During the approximately two weeks when sakura trees bloom, the beauty can be found not only in the blooms decorating trees, but close to the end of the season in almost bare tree branches and cherry blossom's petals scattered on the ground, on the streets, being pushed by wind. The inevitability of mortality is expressed by the ephemeral passing of the tree's beauty, and yet, according to the wabi sabi principles, every stage from the birth till passing away carries certain beauty and is worth contemplation.

Seasons in Japanese culture are especially omnipresent. In arts, literature, poetry, fashion, cuisine - they are deeply rooted in Japanese tradition and their importance - though symbols and characteristic for each season objects - is unparalleled in conveying certain meanings. Japanese affinity with nature is one of

the most prominent characteristics of Japanese culture, in all of its shapes and forms.

In Japanese high school textbooks for literature and poetry students learn that because Japan is an agricultural country, it is predominately ruled by the change of seasons and the rhythm of the nature. Where in Western countries nature is something to overcome, to conquer, the Japanese philosophy urges to live in harmony with the nature[2]. Fast forward to modern times, nature depicted in Arts is continuously perceived as an extension of human world rather than an opposing force. Art showing nature in all seasons is up to the present day perceived as a way of not only preserving its fleeting beauty, but also a way to celebrate and appreciate it. Becoming one with the nature and living with it in harmony have even more significance when nature and its elements are printed on clothes.

Garments, when worn, become a natural extension of human body. Decorating it with nature inspired prints and patterns for seasonal celebrations serves as a direct transplant and a bridge between human and surrounding nature.

Specific patterns and prints are representative for four seasons. Like cherry blossoms immediately bring Spring to mind, the same way sunflowers and cicadas indicate Summer, red maple leaves and moon mean Autumn and camellia is typically associated with Winter. Season words - kigo in Japanese - are not only for flora and fauna. These words, used in Japanese poetry, refer to any part of the world that surrounds people and through familiarity convey feelings and thoughts allowing characteristic economy of words. For example, there is no need to explain the sound of cicadas in the summer, when the author assumes the reader is well aware of it and can draw from his or her own feelings and memories the feeling important for understanding of the poem. For clothes, kimonos and obis and associated accessories, while wearing pink kimono with cherry blossom pattern for a cherry blossom festival surrounded by cherry trees blooming, may sound like too much (as there is no way to stand out, which is the Western mentality), for Japanese it is the way of belonging in the place, in the scene.

The traditional Japanese clothes are another important point of this research that needs to be explained.

Kimono is a word internationally known. Majority of people have heard the term and probably can successfully match the name to a picture of the outfit. What is not so widely known and not understood is that while largely remaining similar looking, kimono and its accessories have changed in time and nowadays, there are few types that are being used and worn, depending on several factors.

It is also important to mention that this research largely focuses on solution for a kimono for women. Male garments therefore will not be referenced.

Age is one important factor that determines type of kimono for a woman/girl. Typically, for special occasions girls and young women up to age of 21 years old[3] can wear kimono called furisode - easily recognised by its flowing and long sleeves. Short sleeves are reserved for work and mature women. Fabrics used generally indicate social status of the person wearing the garment and, depending on number of layers and thickness of the fabric - season. More visible and obvious way to know for which season a kimono is designated to be worn is the pattern and colours.

1.3   Contribution

In this research the author proposes an innovative and functional way of merging the traditional Japanese garment - kimono and modern technology, while preserving unique characteristics of both disciplines. The proposed design, apart from contributing to the design research field, solves some of existing problems emerging from the clash of tradition and technology. The contribution points are as follows:

1. New way of carrying a smart phone while wearing kimono that is not disruptive to traditional functionality and cultural meaning of the garment.

2. Smart phone becoming an interactive extension of the obi sash, that adds new ways of how an attended event can be enjoyed.

3. Social function - i-obi is designed to draw attention of other event attendees and initiate social interactions.

4. Device that can help small children enjoy Japanese festivals.

As it will be explained in further chapters, one of the leading themes for this research have been finding a way to accommodate a smart phone with kimono. The author observed on multiple occasions how Japanese women struggle with having no place to put the phone when they are wearing kimono. This research proposes an innovative and potentially interactive way of storing the phone when it's not being used. A solution that doesn't interfere with design of the neither kimono nor obi belt, but rather becomes an interactive extension of it.

While the target group are women, the target occasion this design is addressing are Japanese festivals, Matsuri - celebrations held outside, often on shrine or temple grounds and in parks, for which it is a common practice among Japanese people to dress in kimono or, depending on the season, a yukata. This research proposes a new way in which these events can be enjoyed. Especially worth mentioning is the social function of the proposed design - it works as magnet that pulls attention of the crowd, serves as an "ice-breaker" in social interactions with strangers. In times when most wearable technology is directed inwards to the person wearing and using it, displaying information and data for his or her eyes only, the Enhanced Tradition designs proposed in this research serve as a display for others' entertainment.

Japanese festivals attract a lot of attention and simultaneously, considerable to unbearable crowds. In such environments, it is very difficult, to not say impossible, for younger children enjoy the events fully. Animated and colourful display in mother's obi belt, or real time streaming from above the crowds showing everything that is happening out of sight of a small child, have been proven to keep their usually fleeting interest and make it possible for adults to enjoy the event more.

The proposed design have been presented during the 19th International Symposium on Wearable Computers that took place on September 7-11, 2015 in Osaka. It received the 2015 Design Exhibition Jury Award in Functional Design category, and overall positive comments and feedback from audience (Figure 1.5).

1.4   Thesis Overview

This thesis consists of five chapters.

First chapter, as it's name suggests, serves as an introductory platform for this research and this thesis. From introducing the author and their motivation for undertaking this research, through research background to contribution to the science that this research provides, the foundations of this research is presented.

Second chapter presents works that in some way relate to this research. Separated into two main groups, chapter Tradition and Technology offers and overview of innovative designs that in a smart way merge traditional concepts with technological advancements. Solutions and designs for traditional Japanese garments - kimonos are presented in depth. Interactive Clothes chapter offers broaden view on wearable technologies, from haute-couture designs, through research on the

Figure 1.5: ISWC 2015 Enhanced Tradition Booth.

textiles and fibres and functional apparel designs.

Third chapter introduces the concept of this research, it's philosophy and vision, deep ethnography conducted for the purpose of in-depth understanding of the undertaken field and target persona.

Fourth chapter continues the research story - presents in season related chapters the evolution of prototype and field work done for testing and improving the designs.

Chapter five offers results of the research, discusses it's limitations as well as possible future works.

1.5   Key Terms

Key terms used in this thesis:

Obi Umbrella term for a sash for traditional Japanese garment used in martial arts and kimono. Varies in textiles, length and width, and pattern depending on whether is worn by man or woman, season or occasion. Are typically categorised by their design, formality of the event, material, and use.

Fashion

Wearable technology "Generic term that is used to refer to a number of methods of delivering CBT via an interactive computer interface. It can be delivered on a personal computer, over the Internet or via the telephone using interactive voice response (IVR) systems." [4]

Smart phone

Tradition

Notes

1   (Juniper 2003)

2   (Shirane 2012)

3   Traditionally, 21st birthdays indicate entrance into adulthood and becoming a full member of the society. From this age onwards, young Japanese people are expected to start contributing to the society - find job, marry, etc. Frivolous and eye catching colours of furisode kimono are therefore considered too childish for adult women.

4   Definition by NICE - National institute for Health and Care Excellence (http://www.nice.org.uk/guidance/ta97)

Chapter 2
Related Works

It is this research author's belief that tradition and technology do not necessary need to be places on the opposite sides of the spectrum. On one hand, the author firmly believes that tradition, history and traditional artifacts are our national treasure - an important key for our future that should be preserved and celebrated. Unfortunately these days commodity culture tends to progress towards themes of anonymous products, blurring sense of origin or uniqueness, and eliminating the presence of traditional crafts from our lives. On the other hand, as a designer and design researcher herself, the author continuously witnessed and practiced the way under which design investigates function, form and the interdisciplinary connection of product, end user and environment in a modern ecosystem. The author have always had a great interest in the combination of technology and tradition, with technology being the tool to preserve tradition rather than an opposing force. This research, too, undertakes the subject of a possibility of a merge between tradition and technology, and the research done on the subject is presented in the following chapters.

2.1 Tradition and Technology

The merge of tradition and technology is one of the themes that recurs in nowadays research. From museums and art galleries that implement digital, sometimes even augmented reality-based solutions for improving the experience of viewing art pieces and change the traditional way of thinking about exhibitions to probably the most successful merge of traditional way and technological solutions - online shopping. It is possible to assume that the mix of traditional ways, behaviours and artifacts with technology-based improvements are, in some way, one of the marks of our times.

From the aforementioned shopping and culture-related activities to the recent

buzz word "Internet of things", digitalisation slowly takes over all the aspects of our lives, and by doing so tries to give them deeper, more fulfilling meaning. Expanding our experiences and giving more functionality to everyday actions and objects.

2.1.1   Digital Shrine

Perhaps nothing speaks in a clearer and more relatable way across generations and cultures of traditional practices like the cult of ancestors. Remembering those who passed away is a practice that can be found across the globe, in all corners of the world. While the practical way of honoring the deceased members of a community varies greatly, the idea and the concept of doing so is deeply rooted in many cultures.

It therefore stands to reason that this practice has also found it's way to be digitalized.

Named after Ancient Egyptian tombs, MASTABA[1] is a project Daisuke Uriu[2] (et al.) created for that purpose. The concept of a futuristic digital shrine for ancestors have been designed as a futuristic way of preserving the memories of deceased members of a family. By storing digital pictures of family members over the years with corresponding ages MASTABA allows family members to access pictures of their ancestors at any previously stored period of time. Designed as a separate, octagon shaped building, with 100 steps leading upwards to a room where said pictures can be projected on a table, MASTABA is a digital shrine for family where ancestors' photos taken when they were the same age can be viewed. By selecting an age from 0 to 99, ancestors pictures taken when they were the chosen age will be displayed.

For memorial rituals and of remembering the deceased with digital remains a tool called "Fenestra"[3] has been designed by Uriu. Consisting of a round mirror, a photo frame, and a candle holder Fenestra shows various photos of deceased person and his/her life. It responds to two types of actions: "looking at the mirror" and "lighting the candle" and therefore creates a new way of remembering the deceased and memorial services.

2.1.2   Variations on Kimono Theme

Modern kimono in most examples retains the exact shape of its traditional forms.
Whether its the kosode with relatively short sleeves that is most commonly seen
being worn by women of all ages or furisode, with long flowing sleeves worn on
special occasions, difference between a modern kimono and a traditional one lies
mostly in details and these differencing details are not so easily spotted by some-
one unfamiliar with Japanese culture or textiles. Fabric used in production is
one factor that distinguishes traditional kimonos from their modern counterparts.
With the development of textile business and large availability of fabrics much
cheaper than pure silk, most of the kimonos seen on streets in todays Japan have
very little in common with the pieces of art and craft that traditional kimonos
were. Cotton instead of silk is used, with varying amount of polyester added to
the mix.

Patterns on the fabric have undergone changes as well. And the difference
between modern and traditional design is probably the most visible and most
easily understood in this aspect. While traditional patterns, motifs and colours are
still used, not uncommon are distinguishably Western inspirations. From Scottish
plaid and British Union Jack, through loud and eye catching pop-art prints taken
from 70s aesthetics, geometric mosaics in neon colours to even punk and modern
pop-culture related elements - anything goes and everything is possible. To reach
young audience kimono designs are reflecting modern era as much as possible and
through this trying to catch attention of those who look for something different
and refreshing, showing their personality and interests. Modern Antenna[4] is a
company that focuses and is known for their modern, fun and fresh designs for
kimonos and all related accessories. They offer products for women of all age
groups and cater to all occasions that their clients might need a kimono for -
official ones and casual. Their designs are well-known not only in Japan but also
thanks to Internet shop, also overseas.

Popular Japanese Pop group SCANDAL have been modelling one of Modern
Antenna's design lines, action that even more emphasised the openness Japan has
to redesigning and renovating kimono.

Every day occasions are not the only times when modern vision of kimono
have been used. Composer Miya Masaoka created LED Kimono[5] - an installation-
based media and performance piece for her shows. Inspired by pre-World War II
customs, when kimonos - their patterns, colours and fabrics presented information
about their wearer (gender, caste, age, martial and social status, etc.), Masaokas

piece serves as an innovative light and sound instrument that, when worn by the performer/musician, responds to music, motion and sounds of not only the performer his- or herself but also those of people in the vicinity, going as far as to give the garment ability to "listen", make decisions and adjust to current situation. Physically, LED Kimono is what its name suggests - a kimono that has 444 LEDs embroidered into one of its long sleeves. Diodes, stitched in as tightly as one inch apart, are individually controlled by small Arduino processors and powered with at least eight 9 volt batteries. This design creates a low resolution monitor that responds to movement and to the music. Miya Masaoka the kimono is a natural part and extension of the instrument she plays and composes for - traditional Japanese string instrument koto.

In-between the stage and daily life is where YOSHIKIMONO[6] could be placed. Yoshiki, member of the legendary rock band X-Japan have recently released his own line of kimonos, with a distinct modern - and Rock'n'Roll/Punk - spin. Permanently residing in Los Angeles, the artist noticed the popularity of kimono as well as lack of anything traditional in where he lives. The concept in his designs is to connect the classical tradition of kimono in a moment of Rock'n'Roll. Make the traditional kimono into a garment that could be worn for a classical music concert in a philharmony and rock concert in a stadium. For this project, Yoshiki collaborated with designer Jotaro Saito. Sati's words about kimono in modern world definitely align with the concept of this research: "What we need to do now is evolve the kimono. We cannot just do what previous generations have already done. We need to respond to the street ... to alter traditional designs and make something which suits women's lives today without losing the traditional appeal."[7] Fabrics used for this collection ranges from light fabrics like jersey, wool or denim, while accessories include leather collars, high-heeled boots and stilettos, fishnet stockings, biker masks. Kimonos are not the only element that has been reinvented - kanzashi - traditional Japanese hair piece for women has been interestingly warped for the purpose of this collection as well. Obi belt - centrepiece for kimono outfit - has been tied in interesting ways, going as far as forgoing the easily recognisable "backpack" and instead, freely flowing on models side. All costumes are completely hand-made, and while the price is out of range for most, the ideal goes is to incorporate these designs into fashion available for everyone. The collection debuted on October 17 2015 during Tokyo Fashion Week and since then has created positive buzz in media from all over the world.

2.2   Interactive Clothes

Interactive cloth is a direction in current research and design trends that in recent years gathers a lot of attention and interest. With the emergence of wearable technologies, it has been only matter of time until researches started looking of other, more creative, more innovative ways of adding data capabilities to what we wear. After all, clothes are something we very rarely go without, making them the ideal tools for data mining, gathering and processing. Below there are some interesting solutions of how the problem can be addressed.

Studio Roosegaarde is a social design lab that explores dynamic relation between people, technology and space. The Studio creates interactive designs and in projects uses their own innovations. While not strictly committed to fashion and wearable designs, presented quite daring idea. As it can be read on the projects website, INTIMACY is a high-end fashion project that explores the relationship between body, intimacy and technology. INTIMACY is the name of line of dresses that become transparent when their wearer becomes aroused. Smart "e-foils used to create the dresses become increasingly transparent based on close and personal interactions of its wearer with other people. Intimacy 1.0, white and black versions, were made from these materials only, while version 2.0 includes leather which - while allowing the design and concept to remain within the haute couture end of fashion industry, could be actually worn in public[8].

Joanna Berzowska, founder and research director of XS Labs, proposes different approach. Her focus is development of methods and applications in electronic textiles and responsive garments. In her lab, XS Labs research is oriented on innovation in the field of electronic textiles and wearable computing. Materials with various electro-mechanical properties are used to construct more complex systems that can break down the traditional boundaries between disciplines and enable computationally-mediated interaction with environment and an individual. In XS Labs project Karma Chameleon[9] main focus is put on creation interactive electronic garments constructed from new generation of composite fibres - fibres that are capable of harnessing power directly from human body, storing it and using it to change their own visual properties - colour, and illuminate wearers body in response to physical movement or when illuminated with ambient or transmitted white light. These textile prototypes, woven into complex patterns on a Jacquard loom with a double weave structure, use photonic bondgap fibres thanks to which the course and patterns can be modulated.

Lucy Dunnes research combines science, engineering and apparel design in

order to create Smart Clothes - garments that integrate electronics into clothing for functional use. This led to coining term - functional design apparel - one that can be best described by borrowing Dunnes words "Clothing can form a barrier between the body and the environment, it can mediate the interaction between the body and the environment, and it can increase the ability of the body to function in a variety of environments. Although all clothing is functional, the functional clothing design approach focuses on what clothing does before considering how it looks.[10]". This approach to wearable technology focuses on finding new ways of helping people who might gain from additional body monitoring options - those needing physical therapy, firefighters, etc.

Notes

1   http://uriuri.org/DAisukeURiu/MASTABA/

2   (Uriu, Ogasawara, Shimizu and Okude 2006)

3   (Uriu 2013)

4   (ModernAntenna 2015)

5   (Masaoka 2009)

6   (Yoshiki 2015b)

7   (Yos 2015a)

8   (Rooseegarde, Dijkstra, Wipprecht and Rooseegarde 2011)

9   (Berzowska and Skorobogatiy 2010)

10   (Watkins and Dunne 2015)

Chapter 3

Design Concept

3.1 Philosophy, Vision, Concept

When a foreigner attends a Japanese festival (a matsuri) there are some things that never fail to pull their attention. People wearing kimonos are obviously one of those things. The more the foreigner observes those people, the more things come to their attention. Like the way the kimono, although undoubtedly gorgeous, restricts body movements, especially for women. How difficult it is to reach for something. How everyone are forced to carry additional small handbags filled with items necessary for a modern person - from wallets to smart phones. The later especially in recent times became a permanent fixture in hands of everyone - men and women, elderly people and small children, and of course teenagers and young adults. Everyone has at least one, and when dressed in a kimono, everyone struggle what to do with it. Where to put it when it's not being used.

Sleeves in kimono can act as a pocket for small and light items, but smart phones are neither small not light. Most popular placement place seems to be between the obi sash and kimono textile - but with phones being still relatively thick and simply big in size, and the indicated space is pretty tight, pushing the phone in leaves the person uncomfortable, often disrupting their carefully arranged outfit.

When various aspects and characteristics of kimono have changed with time - it's most basic shape has not, and the shape not allowing any pockets not safe for items folds proves to be challenging to agree with modern technology items.

In this thesis the author wants to challenge this situation, and while preserving the tradition make the culturally important objects receptive to technological enhancements. Belief that tradition and technology can be successfully merged is the philosophy that drives this research. That updated and upgraded traditional designs can fit into our times and lifestyles. Finding solutions that will serve not

only the wearer but also allow to connect to the surroundings and the people around in close proximity (social function). Vision for this research is a dress that will look traditional but be enhanced with technology-based functionality. By merging technology and tradition new design experience will be created. It is authors belief that while for this research the theme and main subject is kimono and obi - internationally known Japanese garments, this vision of tradition-based artifact enhanced with technology in further research may be applied to different, culturally important, objects.

The concept to fulfil the vision and follow author's philosophy is a pocket in obi. Sewn in-between folds of the obi on the front left side the pocket will serve as a holder for a smart phone. When the phone is placed in the pocket screen out thanks to the cut out portion of the obi material of the size of phone's screen, the phone's screen will be visible and an animation will be seen. The concept for the animation displayed on the screen is for it to be an extension of the obi pattern. Cutting out portion of the obi material creates an obvious disruption of the pattern. Animation displayed on smart phone's screen placed directly behind the hole fills out the break in obi's pattern, and thanks to the animated properties of the display, adds an opportunity for not only refreshing classic Japanese patterns but also thank to versatile functions of smart phone display opens possibilities for further innovations.

The goal for the product as a whole for a potential customer to be able to buy an obi with a pocket for their phone. Fitting animation to display would be acquired by scanning a QR code provided with obi. It would download the animation onto customer's phone and could be displayed on the phone's screen while the obi was being worn.

3.2   Ethnography

The subject of "enhanced tradition", by default requires a two-fold approach and preparations. It is necessary to not only be well-versed and knowledgeable about enhancements that could be made to traditional designs, but also posses a strong understanding about the tradition itself. The philosophy for this research from the very beginning has been about mixing the technology and tradition, without causing disruptions to the cultural functions of the undertaken subject - here, a kimono and the social and cultural implications of the act of wearing this garment. To achieve that, and ensure the enhancements made are functional and in

accord with kimono's traditional role, an in-depth and throughout understanding of kimono itself, as well as it's functionality and cultural meaning is necessary. And while literature is undoubtedly helpful, personal experience for the author of this thesis has been indispensable.

3.2.1   Kimono Kitsuke

Kimono kitsuke (jap. dressing in kimono) as the name suggests, is the act of dressing and fitting a kimono. While the social and artistic background of kimono could been found on literature, and has been explained in previous chapters, first-person experience enriched by explanations from a professional in the field of traditional Japanese culture proud to be crucial and ground-breaking for the early development of the i-obi design.

Ethnography research have been conducted in "Koomon" - Japanese Culture Experience House, located in central Tokyo. It is a place where guests can experience and study various Japanese traditional arts, ranging from Tea Ceremony, through Calligraphy to Lacquer ware painting, and obviously - kimono wearing. In modern Japan traditional arts are open for everyone, despite their sex, age, social status or nationality, and salons like "Koomon" are welcoming and open for those who wish to depend their knowledge about Japanese culture.

After introductions with the owner of the House, Ms. Fukaumi who was also the guide and teacher explaining about the art of wearing kimono, the preliminary concept of the design have been explained. Giving the sense of what the main goal of the research is helped to narrow the research field (excluding male kimono), as well as tailor the following experience and explanations from the most useful for the research angle. While kimono has been discussed, most of the focus have been given to obi - the decorative sash that holds the garment together.

The process of dressing in a kimono have been observed two times. First time from a 3rd person perspective - the author observed a model being step by step dressed, with explanations about the importance of certain steps and different techniques depending whether person is being dressed or dresses by themselves. (Figure 3.1) Next, the author was to dress themselves with only verbally delivered guidance from the specialist. The author had a significant period of time to spend in kimono, freedom to move around the dressing room as well as "Koomon" House to discover limitations and strong points of the garment.

Figure 3.1: Ethnography at Koomon.

3.2.2   Interviews

Interviews have been conducted after the kimono wearing lesson. Questions about opinion about the research and traditional kimono design enhancements have been asked. Ms. Fukaumi have been interviewed as a group representative for mature Japanese women, also those who care for Japanese traditions. Ms. Marta, the Master of this ethnography, have been the representative for younger generation of possible customers for i-obi, those interested in Japanese culture, but not necessary of Japanese nationality, who are interested in emerging technologies and open for innovation.

Results of the interview and gathered feedback have been favourable.

Ms. Fukaumi is a 56 years old owner of "Koomon" House. She also is knowledgeable about traditional Japanese arts, both in theory and in practice. After hearing the explanation of the purpose of i-obi and hearing about it's philosophy, Ms. Fukaumi have been very open and positive about the design. She expressed her interest and confirmed it in the interview afterwards. While she wears kimono only for work - entertaining guests of "Koomon" and occasionally as a tea ceremony master - during which any additional wearables should be removed (jewellery, watches, cellphones, etc.), she would obviously not use i-obi for these

occasions. Nevertheless, she likes the idea and would definitely recommend it for young people and for her friends, for casual occasions when they decide to wear kimono. She likes the concept and thinks it "adds new breeze" to the traditional kimono designs, makes it more alive and attractive.

Ms. Marta is a graduate school student who also studies tea ceremony. She enjoys wearing kimono for special but quite casual occasions like festivals and meeting with friends. She says that wearing kimono is an interesting experience. While the body movement restriction is slightly problematic, it is something to get used to - or rather adjust your own behaviour so it fits the garment (ex. no big steps, sitting straight, etc). When she goes out wearing kimono she needs additional handbag for necessities, like cellphone. With the body movement restrictions, having your hands constantly occupied with a bag, it is a little bit bothersome. For everyday outings she wears casual Western clothes and a backpack - having free hands is important for her, and with kimono and the necessary additional bag, the whole experience of going out and wearing kimono is negatively disrupted. She found the i-obi design an interesting "twist" for the traditional garment. In her opinion, it is a good idea to use the space between layers ob the obi belt, as it doesn't affect the kimono itself and doesn't leave it looking messy. The application compliments the obi design, adding innovative and fashionable "punch".

3.3   Target Persona

Target persona for this project is a 26 years old woman. She has already graduated from university and is currently working in a company. She is an outgoing and curious person, and has many friends with who she likes to spend her free time. She is very fashionable, and especially for those occasions with her friends she likes to dress up. Because she likes to stand out from the crowd and therefore when she shops for clothes, she chooses modern and trendy designs. But she never sacrifices comfort for fashion - everything she chooses must be first and foremost comfortable to wear. While she likes to wear kimono for some occasions like date or festival, she is most of the time disappointed by the lack of choice of designs and patterns that would feel modern and fit her personality. She is very conscious about her health and on her phone health tracking apps connected to wearables she uses daily can be found. She regularly takes many photos with her phone and posts them online. She also uses social apps to talk with her friends and family.

Chapter 4
Enhanced Tradition

Enhanced tradition is a concept in which traditional, culturally charged artifacts are being augmented with technology-based solutions in order to broaden their functionality, while not disrupting their primary role in culture. To enhance tradition means to merge a traditional for the chosen culture object with technological advancements in a way that will add to and enrich the experience of using the object in traditional way. Enhanced tradition is, in other words, the purpose of this research. It means to, according to the aforementioned philosophy, vision and concept, use obi and kimono - traditional Japanese garment, discover how the hundreds years old design can be adapted and enriched by technology, how technology can add to their functionality.

For the purpose of this research, Japanese kimono and obi, with a kanzashi - a decorative hair piece for women, have been researched and augmented. The

progress of this research have been documented and can be followed in chapters below. In accordance with Japanese culture and it's respect for seasonal change that has been explained, the theme of seasons have been preserved in the following chapters.

4.1   Winter

Winter is the name for the first prototype created for the concept, and the name refers not only to season when it was completed and exhibited - the feeling of Winter as it is understood in Japanese culture have been shown in obi pattern choices. Children playing with ball and flowers have been chosen to not only convey the feeling of Winter but also to show appreciation and understanding of Japanese traditional culture.

Typical celebrations, holidays and festivals during the winter season in Japan include most importantly New Year. People who visit shrines during that time for Hatsumde (first visit in a shrine in New Year) often decide to wear kimono for this occasion. Visit in a shrine is also perfect occasion to take pictures with smart phones and share them on social media. Less traditional but very much established in Japanese popular culture nowadays are winter illuminations. Starting from end of November through December and lasting sometimes even as long as till February, LED-based installations are scattered all over Japanese cities. It is not uncommon to see especially young Japanese people taking part in those events

dressed in kimono. Taking pictures is important part of how these events are typically enjoyed.

4.1.1   Obi Design

For this design three second-hand obi have been used. In each of them, a pocket for a smart phone, iPhone 4 specifically, have been measured out and cut. Pocket have been sewn from the remaining cut out portion of the obi material and plastic. It has been sewn into the inner fold of the obi. For protection of the screen on the front silicon transparent sheet of the size of the smart phone screen have been added. It's function was to protect the phones screen from falling out while thanks to the transparency, the display would remain visible and the animation - extension of the obi pattern - could be enjoyed.

Obi has been chosen for their traditional patterns: sakura flowers, children playing with a ball and winter flowers. Portions of the design have been animated to show the following scenes: sakura flowers falling (Figure 4.1), children throwing up and catching a ball (Figure 4.2) and winter flowers blooming (Figure 4.3).

Figure 4.1: Pattern for Winter i-obi. Sakura flowers.

Place to cut out the pocket have been carefully measured to fit person who was meant to wear the garment. Once the model have put the obi on, place to make the cut have been decided and the cut have been made. In that exact place the aforementioned smart phone pocket made of plastic and remaining fabric have been sewn into obi layers. To ensure that in multiple wrappings of the obi the pocket hole stays exactly in the same place adjustments to the obi had to be made. On the back, behind the decorative bowtie a vertical cut through all obi

Figure 4.2: Pattern for Winter i-obi. Child and ball.

Figure 4.3: Pattern for Winter i-obi. Winter flowers.

layers have been made. The layers have been sewn together and to hold both parts together an adjustable velcro has been added. Thanks to this the owner of the obi can be sure that the pocket will always be in the right place.
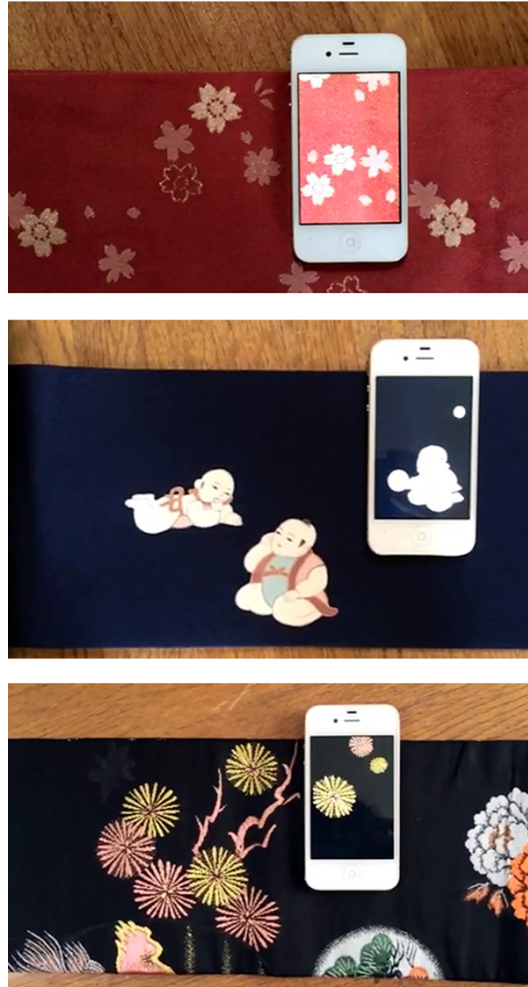
Figure 4.4: Winter obi and corresponding animations.

The animation have been created using Adobe Photoshop software. Original pattern from each obi has been photographed and transferred into computer. There, using the software animation of the patterns have been created as a GIF file. Speed and the quality of the animations have been adjusted to the texture of the obis' textile. The slightly rough texture of the material and the natural fibre pattern has been preserved in the animation. One reason was to create as

seamless as possible transition from the textile to smart phone's display. Another reason was that with a texture like this it was possible to create animation that would show the roughness of the material. For example, in the obi with sakura flowers falling, the slide of the blooms isn't smooth. The blooms don't slide easily down, but scrape down on the textile's surface.

For the front cover of the pocket two materials have been tested - 0.3-0.5mm vinyl sheets and silicon sheets of varying thickness (from 0.2mm to 2.0mm) and different material density. Testings and users' feedback had showed bad and good points of these choices.

These are good points of both materials:

- Easy to find materials,

- Do not require much handling or processing;

On top of that, vinyl proved to be easy to attach to obi's fabric by either glue or sewing. As for silicon, the material is hard to attach. It required special kind of glue, and sewing techniques differ depending on silicon sheet's thickness and density.

Both choices gave an unsatisfactory haptic feel - both materials are too smooth and have unnatural feel to them. Also silicon, does not conduct touch. It is impossible to use the phone without taking it out of the pocket. Furthermore, without the possibility of conducting touch and operating the phone in i-obi case, further research and development of the i-obi as a interactive and social tool would be impossible.

Figure 4.5: i-obi pocket cover testing materials.

The Winter design have been displayed during KMD Forum event that has been held in Hiyoshi, Yokohama at Keio University's Collaboration Complex

building. Despite being showcased only for a fraction of the event, it gathered much interest from visitors and gathered positive feedback. Many of the comments have been used as the further way to improve the design. Moreover the feedback from visitors have been similar to the development and improvement plan the author have decided on, further validating the direction the author have chosen to take.

Figure 4.6: The i-obi stand during KMD Forum event.

Visitors have expressed their wish to try the i-obi on (even though they were not wearing kimono). They also wanted to interact with the animation in some way, trying to touch the display and when nothing happened, asking why. They were disappointed the current version's GIF animations didn't allow any interaction, though expressed their interest if, in further development stages such function would be added.

4.1.2 Evaluation

It can be said that the first stage of the proposed design have been successful. It proved to be an attractive product for many age groups - young children and teenagers, as well as to those from older generations.

Animation should be improved - while the roughness of the animation was

purposeful, it was difficult to understand for viewers. They thought there is something wrong with the software and that the animation is lagging. If the haptic feeling of the fabric is to be expressed by animation, the animation itself needed improvement.

Those who wore the obi commented on how easy to use the created pocket is, and how natural the movement of putting the phone in and taking it out feels. The chosen place, front left side of the obi, was judged to be a good placement, mostly because it resembles chest pockets sewn on Western shirts. Silicon screen protection put in front of the screen hole in the obi needs improvement. While it serves it's purpose by protecting the phone from falling out and possible damage, it also looks neither qualitatively nor aesthetically appealing. Better solution needs to be found.

4.2 Spring
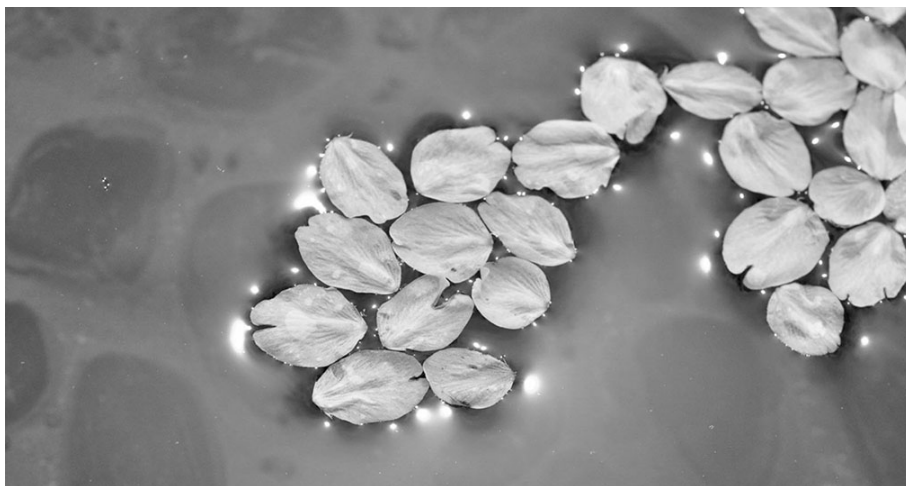
Spring season in Japan is probably the most internationally famous season in the country. All thanks to cherry blossom tree blooming (sakura trees) and the following abundance of festivals in parks and shrines. Hanami, which literally means "flower watching", is an occasion for Japanese people to spend some time with friends, family or coworkers, sitting under sakura trees, drinking and eating. It's time for relaxation and celebration of the nature that wakes up from it's slumber after cold winter. It is a common practice for Japanese people to wear kimono for those occasions. Documenting the progress of blooming with pictures,

as well as taking many pictures during the hanami festivals is a common occurrence in this time. And therefore the Spring version of the design have been created with those situations in mind.

4.2.1   Obi Design

For Spring design version obis have been chosen so that their patterns reflect the season. This time the chosen designs ranged from traditional patterns to very modern ones. Design depicting falling sakura petals and line of purple crows were the more traditional choices, while cartoon map of Japanese symbols with blooming sakura trees and one with cartoon puppies represented modern designs. For the Spring design, the obi have been sewn from raw fabric and created from scratch.

Figure 4.7: Sakura obi for Spring season.

Moreover, the four Spring obis have been modified similarly to those from Winter version. Wrapped and tied obi have been vertically cut through the layers on the back. Two striped of velcro have been attached to endings making it possible to secure the obi on the kimono without the need to retie it every time.

Various trials (Figure 4.11) have been conducted for replacement of the silicon/vinyl display cover from the Winter design. Silicon, vinyl sheets and various kinds of washi paper have been used and coated with acrylics using different techniques each time looking for new textures.
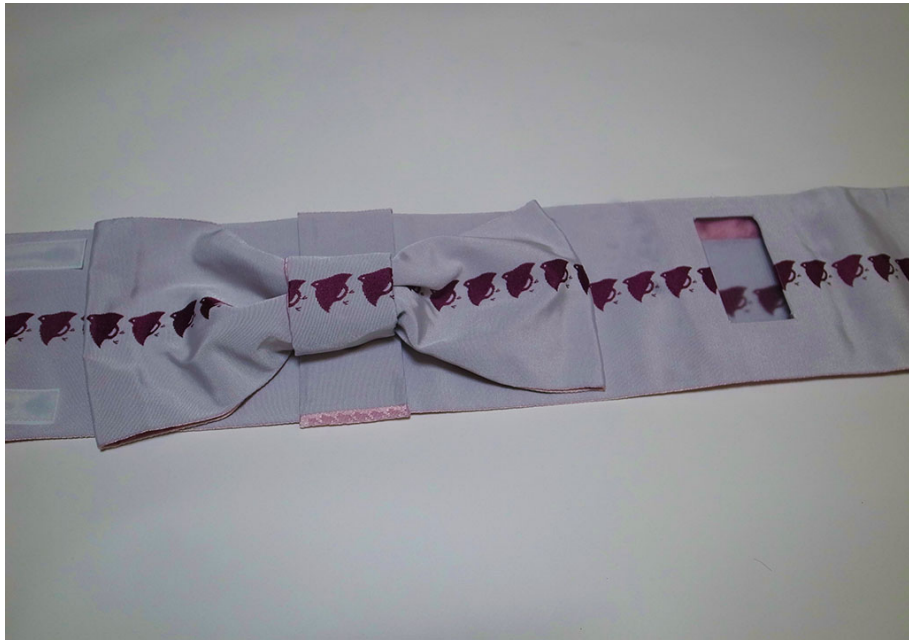
Figure 4.8: Obi design for Spring season.

Figure 4.9: Spring in Japan. Modern obi design.

Figure 4.10: Obi design for dog lovers.

Figure 4.11: Experiments with i-obi pocket cover for Spring design.

The acrylic coating was very successful, especially for the haptic feel and also gave the cover a more fabric texture-like look to both, the silicon and vinyl. As for the washi paper, the acrylic coating was not thick enough to protect the paper from tearing and also did not make it transparent enough to see the animation clearly. On the other hand, the washi coated paper proved to be very good choice for the haptic feel and natural, in accordance with Japanese aesthetics look (Figure 4.12).

For this experiments, the best solution proved to be vinyl cover. It's main advantage was, apart from satisfying aesthetic appearance, that it enabled touch. Made it possible to control the phone screen through the cover without the need to remove smart phone from the case.

Figure 4.12: Stages of washi paper and acrylics test.

Animation also have been improved. More complexity and fluidity to it have been added.

4.2.2   Kanzashi

Kanzashi are hair pieces used in traditional Japanese hair styles. Previously worn in only formal occasions, now in variety of styles and in varying price ranges, can be worn with casual kimono, as well.

For this project, a simple kanzashi piece have been modified by adding a wireless HD camera to it. Image captured through it's lens is transferred to the

Figure 4.13: Four obi designs for Spring season.

smart phone's screen and when the phones resides in the obi pocket, the real-time view can be watched as an extension of the obi design.
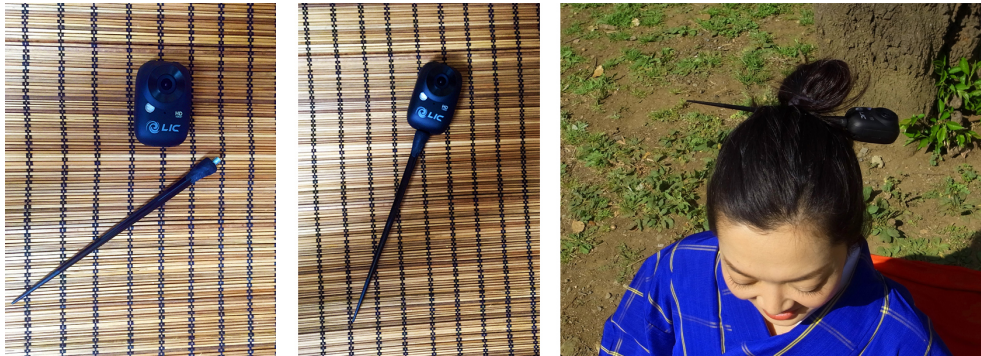

Figure 4.14: Kanzashi hair piece with HD camera.

4.2.3   Evaluation

Both designs - the obi and the kanzashi - have been tested during Spring festivals, at daytime and during the night. From the observations gathered during these

field tests the following points have been made.

For obi, both traditional pattern design and modern ones are interesting and work well. Improved animation gives better experience to both the person wearing i-obi and for people around, who look at the prototype.

The kanzashi prototype works well and gives good results. It proved to be a great solution for mothers with small children (Figure 4.15). In big crowds during event small kids have less chance to see what is happening above. Thanks to kanzashi with the camera, view from above mother's head can be viewed real-time on the smart phone. Thanks to this kids can experience the hanami events more fully, and gain an unique perspective - from above everyone's heads, enjoy the beauty of cherry trees undisturbed by crowds. It also works well as a form of calming down children (Figure 4.16). By easily keeping their usually short attention span on the display in mother's obi, kids were entertained and that allowed adults to enjoy the event more.

Figure 4.15: Real time view of sakura trees from HD kanzashi.

The display was tested during daytime and nighttime events. Visibility of the display depends on the following factors: pattern displayed, animation quality, colour scheme of the obi and consequently of the animation and screen brightness. The values of these factors change depending on the time (day or night) as well as to some extend, on the weather. On a bright and cloudless sunny day it is difficult to see the display, no matter how bright the screen setting is. In this case, darker

Figure 4.16: Small children love i-obi.

colour scheme is easier to see than bright one. During the night strong brightness of the screen is not necessary for light colour scheme of the animation. Optimal weather condition seemed to be light overcast during daytime. Further test and light measurements are required to understand the relation more deeply.

4.3   Summer

Summer in Japan is time for visiting graves of family members and night festivals. Two most popular events are connected with Obon - honoring the deceased family members, connected with festivals and special type of dance (Bon Odori); and Hanabi, in other words fireworks. Partly because the oppressing summer heat summer events and festivals are held in the late evening and at night. Participant tend to wear yukata - summer version of kimono, unlined and made from light cotton. Patterns for this season reflect the typical events. Cold and pastel colours are favoured to give out fresh and cool feeling and help withstanding the heat.

4.3.1   Obi Design

Patterns chosen for this version of i-obi, as it was in previous versions, fully reflect the season and appeal to traditional approach. Some modern patters have also been used to add more diversity and appeal to as wide as possible audience of

potential customers. Obis for this version have been created from raw fabric and modified for the i-obi pocket.

Figure 4.17: Fireworks i-obi design for summer festival.

This time, a version for men have also been designed and tested. As Japanese men seen to favour wearing yukata for summer festivals more than for other season's celebrations, it was the perfect occasion to see how the concept of i-obi works for them.

Some adjustments had to be made. Obi sash for men is significantly narrower than for women, which makes sewing in a pocket for a vertical display impossible. For men's obi therefore, horizontal pocket for phone has been created.

For the haptic display some more possible solutions have been tested (Figure 4.18). More options for vinyl coating techniques have been tested as well as experiment with acrylic coated fabric have been conducted.

The coated fabric, although looking interesting and have shown potential for further developments, had some crucial problems. Thickness or hardness needed to hold the phone firmly in place could not been achieved. Also, the fabric did not enable clear enough view of the phone's screen.

This time, the vinyl have been coated with different kinds of acrylic coatings

Figure 4.18: i-obi cover testing for Summer design.

and then was given a more natural feel by using sand paper. This version of the vinyl sheet was the most successful for its natural look and fabric texture resembling haptic feel. Furthermore it was able to hold the phone properly in the pocket and show the displayed animation clearly.

In further research an industrial way of producing the achieved effect needs to be found.

4.3.2   Kanzashi

Night condition and fireworks even turned out to be very difficult to capture with the kanzashi device.

The distance between camera and fireworks have been too great to capture clear image of the event. Also, the nighttime conditions are requiring a special type of camera to produce a clear image. With the camera currently used the quality of transferred real-time feed was not satisfying.

Second problem is the placement of the camera. As it is attached to the hair piece placed at the back of woman's head, finding an angle that points the camera

lens towards firework display is difficult and tiresome. With hanami or other events where participant is surrounded by imagery worth capturing the camera equipped kanzashi works wonderfully from all angles.

4.3.3   Evaluation

Nighttime brightness varies drastically between location. Nighttime in central Tokyo is much brighter than Sendai at the same time. While the same type of animation colour scheme works for both types of location, tests have proven that deciding on one setting for nighttime will be unsatisfactory for some locations. Other solution for screen brightness adjustment needs to be found.

For display cover vinyl still works the best. Unfortunately it is not very suitable for industrial production. In further research a different solution needs to be found.

Additionally, battery life while using the i-obi animations have been measured. Depending on battery life, it is possible to estimate that continuous usage of i-obi is possible for approximately 2-3 hours. Life time of the product is estimated for 2-3 years. It has been decided basing on frequency with which people tend to change their smart phone for newer models. As with each model release screen's and whole phone's body size changes, the prepared pocket will simply fail to hold model different than the one it was prepared for.

Overall, i-obi for summer festivals proved to be a good solutions. It provided a storing place for smart phone. It also gained positive attention from other festival attendants (Figure 4.19).

Figure 4.19: i-obi in summer. After dark.

Chapter 5
Results and Discussion

5.1 Design Evaluation Summary

In the course of the Enhanced Tradition research three consecutive designs have been build and tested. The designs have been named after seasons (Winter, Spring and Summer) to further underline the connection to Japanese philosophy and traditional Arts (eg. wabi sabi). Each of the designs solved some problems encountered during the ethnography, prototyping and testing processes, as well uncovered new issues that needed to be addressed.

First finished design - Winter - proved the Enhanced Tradition concept presented as i-obi to be an attractive and interesting product for the targeted groups of potential users. Women of all age groups, Japanese and non-Japanese nationality found the i-obi intriguing, and expressed their interested in the product if it becomes commercially available. This design encountered issues with the style of animation - purposefully made to give a tactile impression of fabrics' roughness, according to the feedback gathered, it seemed like it was lagging and low-quality. The silicon sheet that protected the smart-phone in the i-obi pocket was not aesthetically pleasing and ruptured the overall aesthetic of obi.

In Spring, the second finished design, the author addressed issues found in the Winter i-obi version. Also, a kanzashi hair piece with a mounted miniature High Definition wireless camera have been added to the Enhanced Tradition set. As the Enhanced Tradition project aims to offer a variety of solutions on how to use tradition and technology together to reach personal preferences of many users, the kanzashi piece have been added as an alternative to regular animation used in the Winter design. Tested with users during Hanami event, it brought good results. Connected to the i-obi display in obi sash, the kanzashi hair piece transmitted in real time the view from above. In a park filled with blooming cherry blossom trees, the feed shown in i-obi, placed in cherry blossoms themed obi sash worked together very well. The silicon cover have been replaced with a

transparent display cover made from vinyl. Using this material allowed to consider adding touch option to the i-obi display in the future. For now, no interaction with the display was possible without removing the phone from the custom i-obi pocket and manually making needed adjustments. Vinyl cover allows to develop in future stages option to operate the display without the need to removing phone from obi sash.

Summer version of the i-obi design have been tested during summer festivals and Hanabi (fireworks) events. Version for obi for men have been added, and issues with it's size difference comparing to female sash have been solved by preparing the i-obi pocket horizontally instead of vertically as for female obi sash. As kanzashi is a hair piece traditionally for women, in male version of Enhanced Tradition accessories only animation have been tested. Issues found in this testing environment were connected to the night time and it's brightness. It has been observed that various color schemes for obis and animations work differently in different brightness. While adjusting the brightness of the smart-phone screen is possible, for now it needs to be done manually, by trial and error method to find the setting that works best in given situation. To adjust the screen brightness the phone needs to be removed from i-obi pocket and the user needs to access phone's settings, find the best solution, and place the phone back into the i-obi pocket. For future works and development a solution for this issue needs to be found.

It can be said that, according to user test conducted in various locations and during events, the Enhanced Tradition concept is generally accepted by potential users. It solves the primary problem of the smart-phone placing while wearing a kimono and obi. It's social function of gaining interest of other event attendants and creating social opportunity for a meaningful interaction have been proven during testing. People approached i-obi users with interest and after explanations, expressed their interest and gave positive feedback. While the design most definitely still needs further development, it can be said that following the encouraging responses, the Enhanced Tradition concept has the potential to become a mainstream trend in modern fashion, and breach the void between traditional clothes and technology.

5.2   Design Limitations

There are certain design limitations that have been found in the course of product development and user testings that need to be taken into consideration in further

research. Although some of them have been mentioned in previous chapters, here the full explanation can be found.

In the course of the three i-obi versions created (Winter, Spring and Summer) it became clear very early on that mass production of this product will pose some challenges. Some of them have been successfully solved (eg. using velcro tape to fasten the obi instead of traditional wrapping method which made it difficult to predict where the i-obi pocket will exactly be places - especially for people who wear obi occasionally and are not professional dressers), some still need more in-depth research, experiments and testings.

In the last design version, Summer, display made of vinyl is used. As much as it works well enough for the purpose of concept testing, it is not suitable for industrial production. A more durable and aesthetically pleasing material that would allow people to interact with future versions of i-obi by touch and transfer some haptic feedback would be preferable.

For now GIF animations have been used for i-obi. During user test, while i-obi successfully pulled attention and interest of passer-by's and other event attendees, the lack of any implemented interactivity was disappointing to many. GIF animations, while prove the initial concept and the direction Enhanced Tradition for obi should go, are not a sufficient solution for further research and i-obi development.

During user tests, especially in the nighttime condition in different locations, it became clear that screen brightness plays an important role in the i-obi experience. Depending on the obi design and animation as well as lighting conditions, one screen brightness setting of the smart phone was not enough. While it was possible to adjust the brightness manually, the action fast proved to be cumbersome and highly disruptive to the user's experience - especially in a fast changing lighting conditions.

Best solutions for the content and brightness issue is a custom smart phone application. Content more engaging than a simple loop animation could be easily managed through the app, and thanks to functionality of nowadays smart phones, sensing lightning conditions and automatically adjusting the screen's brightness to fit current conditions is possible.

Chapter 6
Conclusion and Future Works

Enhanced tradition is a merge of tradition and technology that adds new functionality to culturally relevant objects from everyday life that surround us.

One of the best examples of such objects are clothes.

In all and every cultures clothes are representations of history, lifestyle, social position and traditions of people who wear them. In Japan it's kimono - pieces of clothing that together paint a picture of a country which cannot be mistaken with another one. Kimono can be considered a live tradition and an alive tradition - to this day it is a dress that is occasionally worn by everyone, of all ages and social stations. From formal ceremonies to everyday events like "a date" with a loved person to even being an everyday occurrence in some social circles - this traditional garment have remained as a fashion and cultural symbol of Japan, and through centuries, it has changed very little.

Modern times pose new challenges for all kinds and all types of clothing. New fibres and fabrics are being developed - ones that aspire to functionality that extends the very basic purpose of clothing - to cover and protect our bodies from an onslaught of environmental factors. With the wearables movement advancing rapidly, clothes are steadily becoming smart, just as functional and useful as our computers. While the focus of this type of research is turned into direction of broadly understood Western designs as the ones that are most widely accepted as the default clothing style, the world seems to be forgetting about traditional forms, despite the fact they are still being used. Traditional pieces of clothing are being slowly but steadily exchanged for the Western trends, and with no advancements done to them, the traditional dresses are in danger of becoming simply non functional and forgotten with time.

i-obi, the first project in Enhanced Tradition concept, is a way of bringing the traditional Japanese dress - a kimono - to modern times. To give it the advantage of fitting into demands that our current lifestyles give us and our clothes. The main problem that this project tackled was kimonos lack of compatibility with

smart phones. No pockets. No safe and aesthetically safe fold where the device could be kept on person wearing kimono was one of the observed by author issues. Creation of i-obi - a pocket for smart phone in the obi sash was a way of solving the problem, but also following the trends of our times, adding more useful, playful, more interesting functions to the design. Functions that would make a kimono garment a valid dress option for modern lifestyles while simultaneously preserving it's cultural and traditional importance.

The created pocket in the obi sash allows to not only comfortably carry the smart phone but also creates an opportunity to display phone's screen in the obi. The break of the sash' precious pattern have been filled with designing a content that can be displayed on phone's screen - and animated fragment of obi's pattern. Displayed phone with an animation corresponding to obi becomes an interactive part of the obi itself - it retains the pattern but adds a modern twist and playfulness to the sash. When combined with a kanzashi hairpiece equipped with a High Definition wireless camera which transfers the footage to the i-obi in real time, turning the i-obi into a widow that offers new perspective and new ways of enjoying events.

The design have been tested in various situations during which kimono is typically worn, and presented during academic events. User tests have been done during Spring and Summer festivals in Japan - hanami, a cherry blossom viewing festival in Spring, and hanabi, a Summer fireworks festivals. During those testings users have been asked to wear i-obi and attend the events as they usually do. Observation have been made and comments as well as feedback from users was gathered. Comments received were largely favourable. i-obi design have solved the phone carrying problem successfully and the added functionality was well received. The design created a new type of social situation where passer-byes and other event attendees intrigued and interested by the design approached the test users and wanted to know more about the design itself. In a crowd of strangers having a tool to break the barrier and initiate conversation have been an unplanned but a welcomed factor, by both the test users and the author. The discovery have added a new spectrum of functionality for further research of the project.

The design have been presented during the 19th International Symposium on Wearable Computers and won the 2015 Design Exhibition Jury Award in Functional Design category.

Enhanced tradition project expressed in form of i-obi design since being created and through it's development have gathered a rather favourable feedback and

stirred interest among not only designers but target groups of potential users. It is authors belief that this idea can be taken further. For future works first of all problems outlined in the previous Design Limitations chapter need to be addressed and solutions need to be found. It is authors hope this can be done in the course of further doctoral research.

For this, the author will be focusing on two social groups, one will be the elderly users. The goal here will be to enhance their lifestyle by integrating useful functions to the smart obi. The second target group will be the younger generation that is starting to lose their interest in traditional garments. Introduction to this new interactive and playful obi version is what author hopes will change their approach.

The next goals will be:

1. Building an interactive platform not only for self-use but also to communicate with others. A social platform that by being tied to obi sash as it's default display, would exist outside of restrictive frames of a computer, a tablet, or a smart phone, and would serve as a tool for outreach to world surrounding the user.

2. Make i-obi customisable by enabling the creation of users own design, alternative animations. While tradition is and always will be the force behind Enhanced Tradition concept, the author also strongly believes in self-expression and being an artist and designer herself, in the importance of a creative outlet for (not only) young people. Tradition has the image of being restrictive and immovable. By allowing users to play with tradition, express themselves with it, and design their own obi patterns, it is author hope that the attitude towards all things traditional will slowly change.

3. Extension of the Enhanced Tradition concept. Traditional clothes that alter their appearance based on the users wishes (achieved by direct interaction and pro-actively using user's physiological signals).

4. Experiment with new smart fabrics, e-ink etc.

5. Embedding health monitor sensors in the obi.

Figure 6.1: i-obi controller app for future product development.

Figure 6.2: Future i-obi. Users can display messages and control the look of the design.

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Appendices

Ethnography Interviews

Transcripts of the interviews done during ethnography research.

Fukaumi Yukiko
Country- Japan
Age- 56
Occupation- Owner of the tea ceremony house.
Do you wear kimono? When?- Yes. Every day. As my work outfit.
What do you think about the smart obi?- Its lovely. I like the concept adding new breeze to make traditional one be more alive and attractive.
Would you wear it/use it?- No. I do wear Kimono just on the formal occasion like the tea ceremony. Mobile phone, watches and jewelry should be removed away.
Would you recommend it to someone? To who?- Yes. To whom choosing to wear Kimono as one of attractive clothing on any occasions, either daily or formal.
Who do you think will be the target costumer?- Customer you mean? Not only young but also the ladies in 40s or 50s who start wearing Kimono, like my friends, to attend school reunion gathering or to go to Kabuki and Museum in Kimono.

Wojcikowska Marta
Country- Poland
Age- 28
Occupation- student
Reason for coming to japan- research, MEXT scholarship
How long are you in japan- 2,5 years
What are your interests in japan- I like a little bit of everything, the pop-culture side and the more traditional side, too.
Please describe your work- As a student I work on augmented reality game development. I do part time job in a tea house where I help with tea ceremony sessions for guests.

While working what do you wear?- My normal, western clothes, very casual style for university. For the tea house I wear kimono.

How do you feel while wearing the kimono? I feel ok - its not something I would like to wear everyday but on special occasions its interesting and a nice way to stand out.

What are your problems while wearing a kimono?- movement restriction, anything more makes the kimono looks bad.

What are the good point while wearing a kimono?- For a foreigner, it makes you stand out; its appropriate for any special occasion: for a date, for a festival, for a visit in a museum, going for friends wedding, etc.

What things do you take with you when you wear a kimono? and where do you put them?- If I need to carry something, I put it in a small handbag. tissues can be put in the sleeves but for my phone, documents, etc. I need a separate bag.

How did feel while wearing your kimono with the smart obi? (was it fun? cool? new? playful?)- It was interesting. I think its a good way to use the space between the obi belt layers in a way that wont disrupt the kimono itself (wont look messy).

Did it solve any of your problems of carrying your phone?- With the added space I wont have to carry the bag if I only want to take my phone when I go out.

Would you like to wear it again? why?- Yes, its a nice accent that makes obi belts more modern while preserving the traditional side of them.

In what situation do you imagine yourself wearing the smart obi?(everyday life, matsuri, ceremony etc)- For outings with friends, special occasions, when I dont want to have my hands busy with carrying additional accessories like a festival, graduation ceremony, date, etc.

Who except you do you think will be interested in wearing the smart obi?- people who like new technologies and gadgets, who enjoy social applications and want to be fashionable.
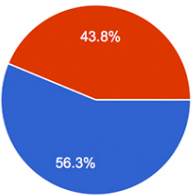
Questionnaire Results

Q.01 background

Female	9 responders
Male	7 responders

Q.02 age groups

18-27	6 responders
28-35	6 responders
35-45	3 responders
45+	1 responder

身元 background　　　**才 age groups**

43.8%

56.3%

女 female 9 56.3%
男 male 7 43.8%

18.8%

37.5%

37.5%
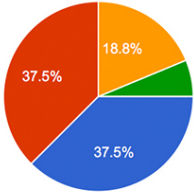
１８−２７ 6 37.5%
２８−３５ 6 37.5%
３５−４５ 3 18.8%
４５−　 1 6.3%

Figure 3: Graphic representation of responses to questions 1 and 2.

Q.03 Nationality

Japan
Germany
United Kingdom
Sri Lanka
China

Q.04 Occupation

Student (graduate School)
Computer Scientist
Assistant Professor
Office Worker
Secretary
Company Worker
Researcher
University Faculty

Q.05 Do you wear kimono?
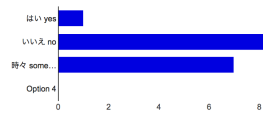
Figure 4: Graphic representation of responses to question 5.

Yes	1 responder
No	10 responders
Sometimes	7 responders

Q.06 Do you wear yukata?

Yes, I love it	2 responder
No	5 responders
Only at festivals	9 responders
Other	1 responder

Q.07 How many obi do you have?

1-3	12 responder
4-7	1 responders
7-10	1 responders
Other	4 responder

浴衣を着ますか？　Q. 06

帯はいくつぐらい持ってますか？　Q. 07

はい、大好きです yes,i love it 2 11.8%
いいえ no　　　　　　　　 5 29.4%
祭りの時 only at festivals　 9 52.9%
Other　　　　　　　　　　 1 5.9%

1-3　　12 66.7%
4-7　　1　5.6%
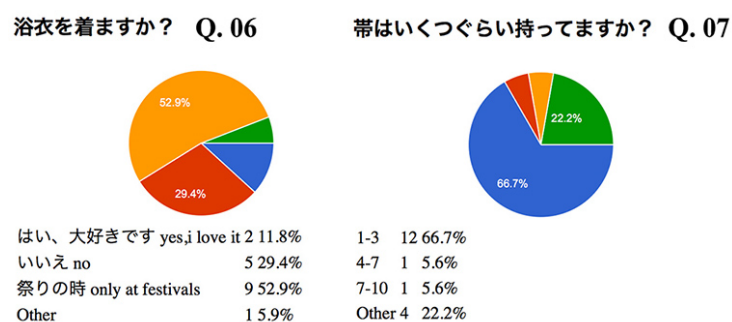7-10　1　5.6%
Other 4　22.2%

Figure 5: Graphic representation of responses to questions 6 and 7.

Q.08 Are the obis of different designs for different seasons?

Yes	2 responder
No	13 responders
Other	1 responders

Q.09 The obis are family heirlooms or did you buy them by yourself?

Family	4 responder
Bought	8 responders
Other	3 responders

季節により異なる帯のデザインですか？
Q. 08

持ってる帯は家族から貰ったか自分で買いましたか？
Q. 09

はい yes　2　12.5%
いいえ no 13 81.3%
Other　　1　6.3%

家族 family　　　 4 26.7%
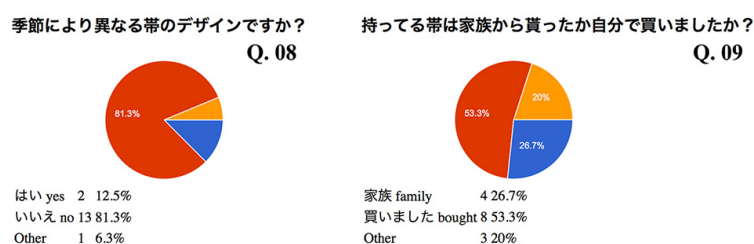買いました bought 8 53.3%
Other　　　　　　 3 20%

Figure 6: Graphic representation of responses to questions 8 and 9.

Q.10 Please give reasons why you don't wear kimono?

- does not fit my gender and culture.

- i don't have opportunity to wear.

- I'm not quite sure how I attach Obi, which makes me feel embarrassment.

- I took lessons on how to wear kimono, but I forgot. I don't have my own kimono. There are no events for which I could wear it.

- I like to look kimono and yukata. But I don't know the timing when I should wear them. And I'm embarrassed to wear because I've never wear them.

- I have never felt a need to, or it is too expensive to rent one for the festival and I just go without but maybe I'd like to try one day.

Q.11 When wearing yukata or kimono, where do you put your smart phone or wallet?

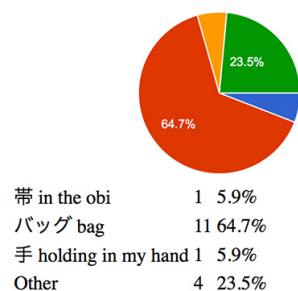| in the obi	1 responder
bag	11 responders
holding in hand	1 responders
other	4 responders

Figure 7: Graphic representation of responses to question 11.

Q.12 Is this way of carrying it comfortable for you? Is it problematic? Please explain.

- inconvenience because of no space for wallet cards, cigarette, phone...

- no problem, because i use the bag also to hold my wallet

- It's normal. I don't find it particularly inconvenient.

- It is fun to dress in Yukata at festival. I also like to in the onsen and at home if I'm out of the shower. Sometimes I get frustrated that I have to make sure it doesn't come undone and have to retie the obi.

- No, since The way to carry ones personal belongings while wearing the kimono is always struggling. It is difficult to use a shoulder bag due to the sleeve length is, also, other daily used bags such as backpack can not be used because of the a band in the back. Because there are many limitation to use a bag in this way, you have to use a tote bag, even if you have a lot of things, but is difficult to hold. In addition, bags that are commonly used in everyday life are often those that do not fit the design of the kimono,the kimono tote bag has to fit the design, is very little, and often expensive. There is a small coin purse you have to put in between the band, but you can not put a lot of things since it is so narrow.

- If I have the Japanese bag for kimono, it will be convenient for me.

- As it is, it is convinient.

- Usually bags for kimono fashion are very small so it isn't really convinient but not much of a problem

- it fits well with bag

- It's convenient. Bags matching yukata are a little bit small, so sometimes that might be a problem.

Q.13 What do you think about the modern design of obis?

I like it	13 responders
I like the old designs better	4 responders
Other	0 responders

Q.14 What do you think about combination of obi and technology?

Interesting	15 responders
Not interesting	1 responder
Other	1 responder

現代の帯のデザイン（モダン　デザイン）についてどう思いますか？
Q.13

テクノロジーと帯の組み合わせについてどう思いますか？
Q.14

23.5%

76.5%

88.2%

好き I like it　　　　　　　　　　　　　13 76.5%
昔のデザインのほうが好き I like the old design better 4　23.5%
Other　　　　　　　　　　　　　　　0　0%
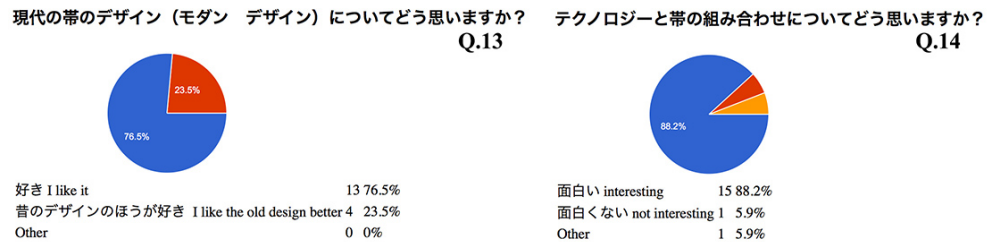
面白い interesting　　　　　　15 88.2%
面白くない not interesting 1　5.9%
Other　　　　　　　　　　1　5.9%

Figure 8: Graphic representation of responses to questions 13 and 14.
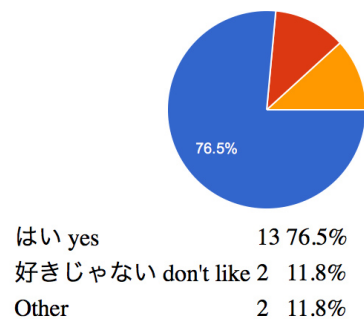
Q.15 Do you like the i-obi concept?

i obiは好きですか？

76.5%

はい yes　　　　　　　　　13 76.5%
好きじゃない don't like 2　11.8%
Other　　　　　　　　　　2　11.8%

Figure 9: Graphic representation of responses to question 15.

I like it	13 responders
I don't like it	2 responders
Other	2 responders

Q.16 Please share your reasons for not liking the i-obi concept.

- It would be cool if the whole obi was active, and not just a small screen on it, maybe bendy lcd/led technologies?

- battery issues...

- obi is one of the status you can show to people.

Q.17 Would you like to wear i-obi?

Yes	7 responders
No it	1 responder
Maybe sometimes	9 responders

Q.18 Would a smart phone animation that changes according to your feelings be interesting? For example, when you are happy the animation would speed up?

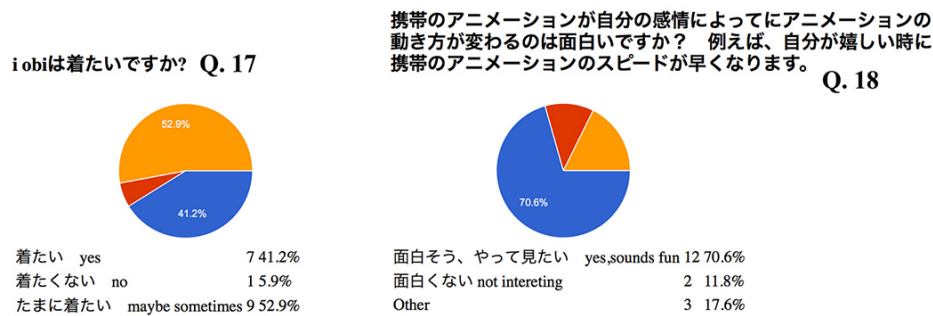| Yes, sounds fun	12 responders
Not interesting it	2 responders
Other	3 responders

Figure 10: Graphic representation of responses to questions 17 and 18.

Q.19 Do you have any other interesting interaction ideas? Please share them here.

- continuous art with people in pairs

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- synchronisation between multiple users' kimonos

- The system using any output technologies, never lose sight of friends. The summer festival space is always crowded.

- interracting with other obies, reaction when walking

- interacting with other users; responding to body movement

- Sounds of the environment (music of the festivals) beside the regular interaction

- Changes accoriding to season, weather, temperature

- I want to control the patterns

- Different appearances that can be matched with the same obi (printed obi design itself cannot be changed but iPhone image can be changed. you may be able to use ambiguous obi design for showing multiple contexts in iPhone screen).

- Matching to kimono colors

- interaction with bio data like heart rate?

- Interaction with a fellow obi wearer