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Master's Thesis

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FOOKU: Enhanced Fashion and Achieving
Personal Development with IoT E-Accessory

Keio University Graduate School of Media Design

Kuo-Wei Lin

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

Kuo-Wei Lin

Thesis Committee:
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FOOKU: Enhanced Fashion and Achieving Personal Development with IoT E-Accessory

Category: Design

Summary

Fashion has always been an abstruse concept. Its beauty lies in the uniqueness of being undefined. Because of its rare undefined characteristic, Fashion is also a form of aesthetic expression that can be tailored to portray the raw, inner self of a person, and thus creates a distinct, aesthetic identity for the individual.

On the other hand, with technology becoming an essential element of the current fashion industry, it opens up great potential for fashion to apply its glamorous characteristic and feature in diverse fields.

The goal of the *FOOKU* research is to help users achieving positive personal growth, including increase in confidence and self-awareness level, and recognizing personal identity through fashion with a creative and entertaining approach. It is also the research's ambition to assist users becoming passionate of and more engaged in fashion along the way.

Keywords:

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Acknowledgements

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Chapter 1
Introduction

Fashion has always been an abstract concept. It's expressive, it's mysterious, and it's hard to be categorized. Its beauty lies in the uniqueness of being undefined. Fashion is strongly based on subjective perception by the viewers, and hence there is no correct answer to describe the artistic conception of Fashion. On the other hand, because of its undefined characteristic, Fashion is also a form of aesthetic expression that can be tailored to portray the raw, inner self of a person, and thus creates a distinct, aesthetic identity for the individual.

In fact, tracing back to the long river of human history, Fashion has played an important rule in numerous cultures to showcase their originalities. Native American men often exhibited their toughness with their breechcloths, while Chinese and Japanese women display their elegance in Cheongsam and Kimono. Furthermore, these fashion-cultural elements can still be seen in many clothing design today.

1.1 Motivation: Fashion and Its Current State

In a much modernized society nowadays, Fashion has evolved into the symbol of personalization. The design of the cloth, the color of the garment, the choice of the fabric, the silhouette of the fit, and the concept behind every designer collection; each of the infinite combination of these elements represents a unique identity of a particular individual at a particular moment. As the legendary Japanese designer Yohji Yamamoto once said, the purpose of Fashion is to explore new ways to express inner beauty [1]. In other words, Fashion is the glamorous incarnation of a person's true self.

On the other hand, fashion has also been influenced by technology in the modern *Fashion Personalization* movement. The rise of fashion-focused social network, such as Instagram, WEAR, and Pinterest, has helped encouraging people

Figure 1.1: Modern Clothing Design with Tribal Element and Japanese Cultural Reference

Figure 1.2: Modern Clothing Design with Chinese Cultural Element

to express their personality through cloth online. With a simple OOTD (Outfit Of The Day) picture and hashtags that are relevant to describe the coordination, people are able to share the ideas behind their styling concept to a broader viewer base. Furthermore, these social platforms allow users to connect and exchange ideas with people with similar characteristics and fashion interest.
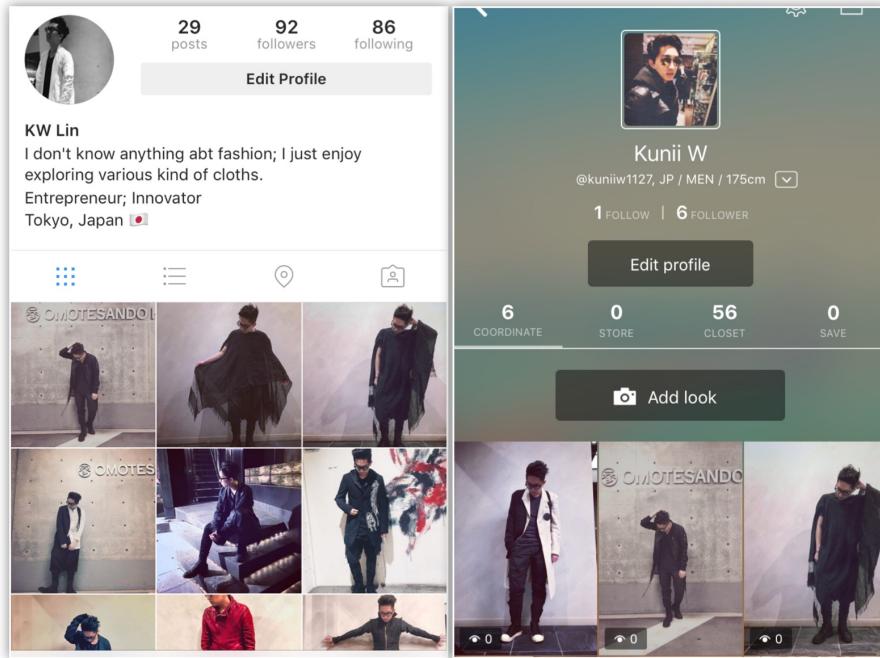
Figure 1.3: Fashion-Oriented Social Network Accounts (Screenshots of Instagram and WEAR personal pages)

In addition, with the utilization of communicable feature from social network, various online fashion commerce sites have caught up with the new wave of Conversational Commerce [2]. Companies like STYLER, which offers a Online to Offline (O2O) platform for users to directly interact with select shop staffs in Japan [3]; or Everlane, a Silicon Valley based E-commerce that provides personal shopper-like experience with Facebook Messenger Business [4], have made choosing outfits that represent users' personality much easier and smoother.

Furthermore, tech-based fashion companies also introduced a new trend of Fashion Wearable with products like Misfit Ray or Ringly accessories. These wearables not only focus on providing tech-oriented content, they also offer a fresh concept of utilizing common fashion wear to bring technology into users' daily

life. Vice versa, these Fashion Wearable accessories also provide an opportunity for people who are not found of Fashion to experience it through technology.

As technology becomes an essential way to describe Fashion and enhance user experience, it presents a great potential and responsibility for us, the Fashion-oriented designer, to apply this new method to solve fashion related issues with innovation.

1.2   The Problem: Lack of Fashion-Oriented Enhancement in Reality

Though technology, especially social networks, has brought convenience for users to access fashion content and express their inner self, the actions are mostly being conducted in the digital, virtual world. Hence, the users do not receive any actual feedback or incentive, and thus they cannot accurately project themselves in the real world. Nevertheless, as Mr. Yohji Yamamoto pointed out in his recent interview with Business of Fashion," If you want to create something you need real excitement and emotion, not superficial vision. Online, they can fall into the expansive digital vortex of images and quickly lose themselves [5]." Fashion is a special existence that needs to be experienced with true feelings and senses in reality. Whether as designer or customer, the person cannot have personal growth and explore his/her true identity through unique styling coordination without continuous enhancement and evaluation in the actual world.

On the other hand, Conversational Commerce offers convenience through chat-like shopping experience with human assistant or AI, while Social Commerce increases users' purchase intention by building the" trust" factor with peer groups and social presence [6]. They provide a much advanced, borderless shopping environment for users who seek styling guidance. However, the suggestions provided to the customers are often not based on their personal characters or preference, but generated by media or computer algorithms' take on current trend. Therefore, the recommended items may not reflect users' personality, thus then results in an unpleasant shopping experience and zero personal growth.

Furthermore, while the new wave of wearable gadgets is taking over the fashion industry by storm by defining themselves as the next generation of fashion accessories, they present zero to none fashion-related content or service. The Apple Watch is merely an extension of existing Apple products. Its main purpose

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is to enhance services and content that are already available to the users with a more convenient channel [7]. The only fashion-related function of Apple Watch one could find is its replaceable watch band. Fitbit and Jawbone's products on the other hand, focus mostly on improving users' health condition and daily habits [8]. Though these products often come with refined design as stylish, smart accessories, they yet offer any content to accompany users' needs to discover their identity through fashion.

While the technologies mentioned above have made it easier for people to access and express fashion, they also have enlarged a significant issue of the current state of Fashion Lack of engagement in reality to enhance people's personal growth and awareness through styling coordination.

The unique purpose of Fashion is to help people revealing and discovering their inner identities with external aesthetic display. In order to find the perfect garments to describe people's various characteristics, it's crucial for people to receive feedbacks and compliments that can encourage them to explore their coordinations.

During my fieldwork with Mr. Tokunaga Tsuyoshi, the owner of Osaka's well known Avant-garde select shop, FASCINATE, [9], he stressed the importance of utilizing technology to populate Fashion. However, he also pointed out that there's a lack of connection between reality and online world for the users; thus the users are often unable to receive feedback in the real world and couldn't adjust their coordination properly to present themselves. He urged the need to find a solution to connect online feedback back to reality for users to enjoy expressing themselves with cloths, understanding their characters, and gaining further personal growth.

Mr. Ishikura Takayuki, the owner of the beloved Tokyo select shop, Gullam, also provided similar insight during our interview [10]. He indicated that while innovations such as social network and conversational commerce have made it easier to expose his store to users around the world, these same technologies have also isolated the customers from the actual beauty of the cloths. He explained that most people are drawn to the "Hype" the influencers or medias promote online. Therefore, they tend to chase the popular outfits on social network to make themselves visible, instead of selecting cloths that actually make them shine and standout. Furthermore, by wearing popular garments that everyone has online, the users actually make themselves less visible, which then leads to lost of confidence and lost of self identity, and results in lost of passion for fashion. Mr.Ishikura believed fashion is a special form of personal expression that needs to be connected through

Figure 1.4: Fieldwork at Fascinate

analog approach, and he too suggested the need to find a connection to bridge the gap between online world and reality.

With current products and services in the relative areas neglecting the issues mentioned above, *FOOKU*, a new fashion initiative is created to make fashion interesting and relative to users, and help them recognizing their identities with styling coordination.

1.3   The Solution: FOOKU

FOOKU, the big picture of this research, aims to create an innovative platform to enhance Fashion experience from various aspects. The name, FOOKU, is inspired by the Japanese word for cloth. The *FOOKU Heartbeat*, which is the focal point of this research, is a fashion-oriented IoT wearable device/E-accessory that actualizes the" Like" function on social network to generate positive encouragement to the users on their outfit coordinations. It is consisted with a digital Crest display that symbolizes user ' s original fashion identity, and haptic heartbeat feedback that simulates the" Likes" on user ' s fashion-oriented pictures on social network. The purpose of *FOOKU Heartbeat* is to help users gaining confidence and personal awareness simultaneously with augmented feedback on their personal style, while

Figure 1.5: Fieldwork at Gullam

discovering diverse fashion scenes, meeting people with similar interest, and receiving accurate outfit suggestions through the process. The final goal of *FOOKU Heartbeat* is to provide a fun, innovative solution to assist people recognizing their inner selves through fashion, and thus achieving further personal growth.

The *FOOKU* initiative focuses on two targeting groups:

- People who are in their mid 20s to 38; who have strong personal styles, but are looking for more personal involvement in fashion.

- People who are in their mid 20s to 38; who have never been related to fashion; who are eager for change, but are lost in the transition.

FOOKU Heartbeat will be utilized with *FOOKU*'s interactive E-commerce *fooku.jp*, and *FOOKU*'s personal fashion tour service *Fook-Up* in the future work to form a fashion platform that help users to explore their inner beauties through fashion from every aspect.

The initial concept of *FOOKU* has been presented during IE x Keio Venture Day event in December 2014, and has reached meeting and frequent contact with Cool Japan Fund's vice president of the fashion division in 2015. The proposed concept of *FOOKU Heartbeat* has also been presented to Mr. Son Taizo's Venture

Capital company, Mistletoe. Furthermore, the prototype of *FOOKU Heartbeat* has been experienced by various CEOs and broad members of Japanese fashion tech companies and numbers of active, fashion-focused Instagrammers.

Additionally, in order to promote the glamorous Japanese fashion to the world through the *FOOKU* initiative, *FOOKU Heartbeat* has drawn design inspiration from Japanese traditional architect design and ninja accessories. It has also adapted a *Crest system* to assist assigning users to various fashion tribes to further explore their identities.

1.4 Contribution of FOOKU

The heart of *FOOKU Heartbeat* is the passion and dedication to provide innovative and entertaining solution to assist users achieving personal growth through fashion. It offers several novel contributions to the current fashion tech industry as follow:

- A new form of wearable device *e-accessory* that provides fashion-oriented function to enhance users' fashion experience and bridging users' online presence to reality.

- A simulation device that actualizes social network's "Like" function to bring users confidence through their outfit coordination.

- An interactive, game-like Crest system that evolves as the Like counts on users' coordination increases.

- A unique fashion accessory that blends Japanese cultural elements with modern technology and lure users to experience fashion.

1.5 Thesis Overview

This thesis contains five chapters.

Chapter 1, the Introduction, introduces the motivation behind the research, current issues of the researching area, the proposed solution and brief description of the design concept, and the contribution of the proposed design concept.

Chapter 2, Related Work, showcases and discusses products and academic researches that are related to the topic.

Chapter 3, Design Concept, provides the insight of the proposed design concept, including design philosophy, inspiration, fieldwork, various prototype stages.

Chapter 4, Evaluation, takes a in-depth look of the feedbacks from targeting persona in every prototype stage.

Chapter 5, Conclusion, discusses the results of the evaluation, and proposes extended usages in future works.

Notes

1   What is Fashion For?
     `http://www.businessoffashion.com/articles/opinion/cathy-horyn-ann-demeulemeester-thom-browne`(Rabkin 2199)

2   Conversational Commerce
     `https://medium.com/chris-messina/conversational-commerce-92e0bccfc3ff#.iqa523r1r`(Messina 2199)

3   STYLER
     `https://styler.link/`(STYLER 2199)

4   I just used Facebook Messenger to buy some shirts and it was pretty awesome
     `http://www.techinsider.io/everlane-shopping-on-facebook-messenger-2015-11`(Cohn 2199)

5   Inside Yohji Yamamoto ' s Fashion Philosophy
     `http://www.businessoffashion.com/articles/video/inside-yohji-yamamotos-fashion-philosophy`(Amed 2199b)

6   Xia Wang, Chunling Yu, Yujie Wei(2012) *Social Media Peer Communication and Impacts on Purchase Intentions: A Consumer Socialization Framework*

7   Apple Watch
     `http://http://www.apple.com/watch/`(App 2199a)

8   Up by Jawbone
     `https://jawbone.com//`(Jawbone 2199)

9   FASCINATE
     `https://medium.com/@fooku/avantgardeview-7c3972f52b8a#.n188zcosy`

10   Gullam
     Interview Record with Gullam

Chapter 2
Related Works

The core of the *FOOKU* research is to strengthen the bond between the" trust " generated from social medias and the" confidence " brought by fashion, and create novel fashion-oriented user enhancement based on such bond with innovative media to help the users achieving positive personal growth. Thus, it is essential to examine these elements to further develop on the *FOOKU* concept and conduct test trials.

Section 1 of this Chapter studies the relationship between Social Media, Trust, and users ' styling preference. Such relationship shows how other online users ' comments and recommendations could affect a person, which relates to FOOKU ' s concept of actualizing feedbacks from social networks to enhance users ' fashion experience.

Section 2 discusses the connection between fashion and confidence, as the main focus of FOOKU is to assist users becoming more confident and achieving further positive growth through fashion.

Section 3 explores the concept and function behind the smart accessories on the current market to seek inspiration for the FOOKU Heartbeat wearable device.

Lastly, section 4 points out FOOKU's novelty and its utilization of the related works.

2.1   Social Media, Trust, and Styling Preference

Online social network such as Facebook and YouTube have become the main medium for people to read news and absorb new knowledge, while Twitter and Snapchat serve as the transmitter for people to receive immediate emergency announcements. As Hennig-Thurau, Malthouse, Friege, Gensler, Lobschat, Rangaswamy, and Skeira suggested in their research [1], because of the open platform feature of these New Media, users are now able to not only act as the receivers of

the content, but also as the initiators of original content. Furthermore, with the implementation of Like button, interactive comment and ranking of total views, users become visible and reachable to a borderless audience group. The visibility factor then becomes the main source of" Trust " on social network, as users tend to believe the larger number of the Likes or Views reflect the reliability and popularity of the content provider.

The Trust factor on social network also has turned into the major factor of users ' fashion preference and consumption. In their research of the relationship between peer communication and its impact on purchase intention [2], Wang, Yu, and Wei proved with their research model that users seek unique product to become visible from the crowd online, and the strong trust bond between users and their peer allow the peer to be the main agent to affect their style preference and even purchase intention. Their research indicated that the initial connection between users online often begin with their brand preference or purchase intention. The rapid interaction between the users then gradually became the tie strength, or the trust factor. This" Trust" then acted as users' reference when they search for unique styles or items.

The survey Wang, Yu, and Wei conducted also showed that users are heavily attached to their peer online due to the strong bond of trust. Moreover, they often exchange and discuss product information, and are huge influences to each other ' s preference and purchase decision. Lai also supported such claim in her research [3], stating that the Trust from friendship and word-of-mouth on social media are a great force to influence users ' image and preference towards particular brands. Such effect can then later reflect on users ' coordination styles in reality.

Implementation in Real World

The unique relationship between social media, trust, and styling preference also has been derived into various consumer-focused services.

Instagram Show Now

Instagram ' s Shop Now function is perhaps the most recognizable among them all [4]. Being one of largest fashion-oriented social network existing, Instagram has over 300 million users around the globe. Additionally, with numerous celebrities, fashion influencers, and even regular users sharing their outfit and styling opinions, Instagram has become the destination for people to seek inspiration or suggestion

for their coordination.

The number of followers and the Likes on the OOTD (Outfit of the Day) posts often indicate the reliability of the Instagrammer, and generate trust bond with his/her audience. Based on the trust bond between its users and with the assistance and support from Facebook, Instagram introduced the Shop Now function in 2015. The Shop Now button allows users to directly purchase items on the pictures posted by brands, stores, and even other users through shopping links, making it easier for users to discover and purchase outfits.

Nonetheless, one of the shortcoming of Instagram has always been the insufficiency of its hashtag function. The hashtag function was introduced to help users categorizing their posts with key words. It also allows the posts to be seen by other users who are passionate of things related to the key words. However, the hashtag has been overly used by advertisers and users seeking exposure on Instagram. Thus, users are often being directed to posts that are unrelated to their search. Such situation results in users frustrating to explore fashion styles that represent their identities or receiving accurate feedbacks from the audience.

WEAR

WEAR is an OOTD based social network created by START TODAY [5], the company behind Japanese E-Commerce Giant, ZOZO. Comparing to Instagram, WEAR is strictly fashion-focused, and targeting users who are either passionate of fashion, or who want to learn to express themselves through styling coordination. It also has an Instagram-like hashtag function to help users sorting their clothing information. Nonetheless, the smart User Interface and User Experience design sort out the categories on users pictures automatically, and provide relative hashtag suggestions for users to expose their pictures on WEAR.

Another strength of WEAR is that it takes advantage of ZOZO ' s database and service to encourage its users to purchase the items from the OOTD post from ZOZO. As a result, it becomes a one-stop destination for users to learn about fashion, express themselves with outfit coordination, and purchase new items that inspire their next style look.

Nevertheless, both WEAR and ZOZO are online based platform, so they do not offer fashion enhancement that transfer feedbacks on the internet into reality. Besides, WEAR focuses on providing a space for users to showcase their outfits. It does not offer solution to improve users ' personal growth along the way.

2.2   Fashion and Confidence

Clothing has long been used as a psychological armor to strengthen one ' s confidence and appearance throughout the history. Ones with power in hands often cover themselves with glamorous, luxurious garments to exhibit their formidable supremacy with assurance, disregarding their actual physical figure. On the other hand, warriors around the world prefer to disguise themselves with intimidating, dreadful armor to bring out their mental toughness and courage to overcome their fear and confront the enemies.

Nowadays, such custom has evolved into various genres of fascinating cloths, and people still favor such practice to increase their confidence level. In their research regarding Fashion innovativeness and self-concept, Goldsmith, Moore, and Beaudoin also empasized the unique relationship between fashion and confidence/self-esteem [6]. They first echoed the Motivation in Chapter 1 that people tend to prefer fashion products and brands that match their inner selves or the ones they want to portray. The researchers further addressed that the special bond between fashion and people ' s self-concept comes from the fact that fashion garments often represent the very exclusive, personal part of people. While not everyone reveals his/her identity through cloth, Goldsmith, Moore, and Beaudoin indicated in their research that the fashion innovator test subjects, who were passionate of styling coordination, showcased more vivid, unique forms of self-images during the trials. Such result can imply that people who aggressively explore styling coordination tend to understand themselves well enough to represent themselves with fashion garments. In other words, they are more confident about revealing their true identities to others.

2.3   Current State of Smart Accessories

With products like Apple Watch and Fitbit gradually expanding the smart accessory market, people have begun to replace the traditional style of accessories with technology-oriented wearable devices.

Nevertheless, most of the smart accessories nowadays either focus on extending content services from users ' smartphones, or providing fitness-related enhancement to monitor users' health conditions. Hence, while they come with glamorous product design, they do not provide innovations to improve users' experience.

This section showcases and discusses a few wearable devices that are taking

different approaches to bring variations to the smart accessory market.

Pins Collective

Pins Collective is a digital pin that offers originality from both the design and the function aspects [7]. It also serves a similar purpose as the Crest System on *FOOKU Heartbeat* to help users presenting their identities with fashion.

While most of the smart accessories focusing on the wrist or finger areas as placement location, Pins Collective proposed an interesting idea of " pinning " the wearable device onto users ' outfit around the chest area. The users are able to change the design pattern on the digital display of the pin with connected smartphone app to showcase an unique identity of their mood at the moment.

Similar to the intention of *FOOKU Heartbeat* ' *s* Crest System, which will be elaborated in details in Chapter 3, the goal of Pins Collective is to create a social community that assists the users to finding others with similar interest, especially in design, art, and music fields [8].

The novel design and purpose of Pins Collectives separate this digital wearable pin from the crowd of numerous watch based smart accessories. Nevertheless, Pins Collective doesn ' t not offer enhancement in terms of fashion (i.e. coordination assistance or style matching) at this point. Also, it doesn ' t not focus on providing users positive growth (i.e higher confidence or self-awareness level) with fashion elements.

RINGLY

RINGLY is one of the more well-known smart accessories brands that did not start out as a tech or fitness product-related company. As the founder and CEO of RINGLY, Christina d ' Avignon, stated, the initiation was to make women ' s life smarter through things that they are already familiar with   their accessories [9]. Hence, the design process of RINGLY ' s product was similar to the ones of *FOOKU Heartbeat*: Make the wearable device attractive to the users and applicable to their daily usage. After that, then embed the tech functions to the product to convey the intention and goal to the users.

The functions RINGLY offers, on the other hand, remain similar to the ones on the majority of the smart accessories. The device serves as a filter and enhancer to transport existing content from users ' smartphones, plus the ability to track users ' steps for health reference. However, RINGLY announced partnership with

MasterCard later year to embed NFC payment tech into its smart jewelries [10]. While it may not be a fashion-oriented service, the wearable payment concept resembles the future implementation plan for *FOOKU*, and could further inspire numerous possibilities for fashion-generated IoT services.

Pokemon GO Plus

The newly announced Pokemon Go Plus is an interesting device in this discussion, as it merges digital world with reality. It is a wearable gadget that enhance users' experience of the upcoming augmented reality smartphone game, Pokemon Go [11].

However, it is the concept/purpose and function that make Pokemon Go Plus extremely relevant to *FOOKU*'s research. Pokemon Go Plus is paired with users' smartphones via Bluetooth Low Energy. Once connected, the LED light and vibration function on the device will notify the users with information from the game. In other words, the device "actualizes" feedbacks and actions from Pokemon Go, creates an augmented reality simulation, and thus enhances user experience and increases user engagement. Such user experience flow model perfectly resembles the one of *FOOKU*, which will be explained in Chapter 3.

2.4 Novelty of FOOKU

FOOKU's wearable device, the *FOOKU Heartbeat*, proposes a new type of smart accessory that not only pays detailed attention to its product design and usability, but also focuses on providing fashion-oriented enhancement. Using the smart accessory as the medium, FOOKU combines the positive relationship between Social Media and Fashion Preference, with the bond between Fashion and Confidence, to bring virtual feedbacks on user's styling coordination on social network to reality to generate positive personal growth. By doing so, FOOKU brings an innovative concept to tackle the issues in the current fashion world, and improves user's fashion experience.

Notes

1   Thorsten Hennig-Thurau, Edward C. Malthouse, Christian Friege, Sonja Gensler, Lara Lobschat, Arvind Rangaswamy, Bernd Skiera (2010) *The Impact of New Media on Customer Relathionship*(Hennig-Thurau et al. 2010)

2   Xia Wang, Chuling Yu, Yujie Wei (2012) *Social Media Peer Communication and Impacts on Purchase Intention: A Consumer Socialization Framework*(Wang et al. 2012)

3   Linda Sau-ling Lai (2010)*Social Commerce   E-commerce in Social Media Context*(Lai 2010)

4   Instagram Unleashes a Fully Operational Ad Business With shopping links and Facebook-powered targeting
`http://www.adweek.com/news/technology/instagram-just-unleashed-fully-operational-ad-business-165117`(Sloane 2199)

5   WEAR
`http://wear.jp/`(WEAR 2199)

6   Ronald E. Goldsmith, Mary Ann Moore, Pierre Beaudoin (1999)*Fashion innovativeness and self-concept: a replication*(Goldsmith et al. 1999)

7   Pins Collective
`http://www.pinscollective.com/`(Pin 2199a)

8   Pins Collective 2
`https://www.indiegogo.com/projects/pins-collective--3#/`(Pin 2199b)

9   RINGLY
`https://ringly.com/`(Ringly 2199)

10   MasterCard gets Ringly on board for new wearable NFC payment tech
`http://www.wareable.com/wearable-tech/mastercard-gets-ringly-on-board-for-new-wearable-nfc-payment-tech-1872`(Stables 2199b)

11   Pokemon Go Plus
`http://www.pokemon.com/us/pokemon-video-games/pokemon-go/`(Pok 2199a)

Chapter 3
Design Concept

3.1   Philosophy and Concept

FOOKU Heartbeat is a fashion-oriented wearable device that aims to bring self-awareness and confidence to the users through actualizing virtual emotional feedback from users' OOTD (outfit of the day) photos on social networks. The goal is to help users achieving personal growth and recognizing personal identity through fashion with three essential elements: Innovation, Entertainment, and Surprise.

In addition, serving as a medium to populate Japanese unique culture elements to the world, the interactive Crest System of *FOOKU Heartbeat* takes inspiration from traditional Japanese family crest to help users forming their own " Fashion Squad " with people who have similar characteristics and fashion sense. The purpose of the Crest System is to bring self-recognition and self-awareness to the users through a video game-like level up experience, with an innovative expression of Japanese culture.

Design Concept

With tech companies collaborating with fashion brands such as Hermes and Swarovski to produce stylish smart accessories that comes without any fashion-focused enhancement, the concept behind the *FOOKU Heartbeat* device is to redefine " fashion wearable. " The function of the device is not simply an extension of users' smartphones and track personal data. Instead, *FOOKU Heartbeat* utilizes the creative technologies to " actualize " feedback from users' online presence.

When users prepare their outfit coordination, they will scan the e-Tag on the hangers, which contains information of the cloths, with the scanner on *FOOKU Heartbeat* or cell phone. After that, as they take selfies of their outfits for the Outfit of the Day posts, the information of the cloths will be automatically uploaded to fashion and picture-oriented social networks such as Instagram, WEAR,

and Pinterest. Furthermore, the prescribed Hashtags will precisely describe the corresponding style, users ' characteristics, and item information to increase the users exposure on social media. Hence, it will be more efficient for users to reach out to the targeting audience.

The proposal of this "Scan and Prescribed" concept is to simplify the process of uploading OOTD posts and amplify the exposure on social network to reduce users ' frustration of lacking feedback from the audience.

Furthermore, one of the most important purposes of *FOOKU Heartbeat* is to actualize audience ' s feedback on users ' OOTD pictures online to deliver positive personal growth to the users. When audience likes users ' pictures on social network, *FOOKU Heartbeat* will receive the information from users ' smartphone through iBeacon. After that, the *Like* actions will be actualize through the VP2 Vibro Transducer to generate a *Heartbeat* haptic feedback to compliment the users and arouse users' confident level. With routine actualized *Heartbeat* feedback from *FOOKU Heartbeat*, users will be able to accomplish the following achievements:

- Distinguish the genre of cloths that represents their inner self the most.
- Build up confidence not only on social media but also in reality.
- Become more self-aware through fashion coordination.
- Learn to enjoy various fashion scenes while re-discovering themselves during the process

Additionally, relating to the future work that will be discussed in later chapter, *FOOKU Heartbeat* will collect the data of the *Like* counts, identify the style that best matches the users with such data, transfer the information to E-commerce site, and recommend users new items that display their characteristics on weekly basis.

Heritage and Inspiration

Another essential element of *FOOKU Heartbeat* is to provide the fashion enhancement through a fun, entertaining approach to inspire users' long-term engagement with the device. Hence, the Crest System is created to be paired with *FOOKU Heartbeat*.

Mon, Japanese word meaning emblem, is often used to represent a family, a person, or an organization. Such tradition has then been carried over and modified in the present world to establish unique identities for users. Seeing it as
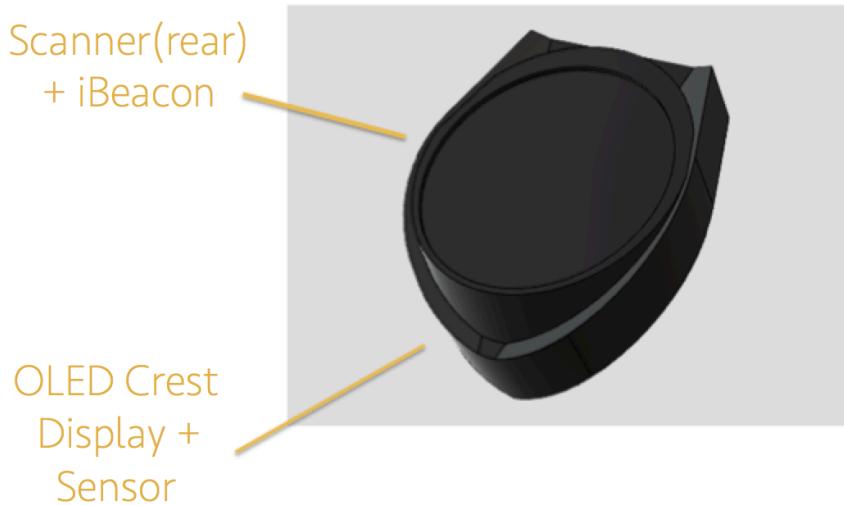
Figure 3.1: FOOKU Heartbeat Final Prototype

the symbol to bond people with similar interest, *FOOKU*'*s* Crest System also draws inspiration from such beautiful Japanese tradition to assist users finding their belongings and expressing their personalities.

When users first set up *FOOKU Heartbeat*, they will be guided to choose one of the four family crests that represents a " Fashion Squad. " The Fashion Squads define four diverse styles that assist users to display their identities and find belongings with squad mates. Moreover, the bonding between the users can help enhancing the " trust " factor among the squad, which can lead to a faster path to building up personal character and increasing self-awareness. The four squads listed below are determined based on fieldworks in Aoyama, Omotesando, and Harajuku areas, and online market testing conducted during Business Development Internship at STYLER TAIWAN [1].

- Avant-Garde: Fashion style that pursuits progressive, experimental design. Brand examples: Yohji Yamamoto, COMME des GARCONS, JULIUS 7, DEVOA

- Fushion Japan: Fashion style that focuses on blending traditional Japanese

cultural elements with Western design.

Brand examples: VISVIM, Maison MIHARA YASUHIRO, SASQUATCH-FABRIX

- Mode and Pop: Fashion Style that represents the most modern design.
  Brand examples: Ato, nonnative, N.Hoolywood, Factotum

- High-Street: Fashion Style that values sub cultures and rebellion spirits.
  Brand examples: Undercover, FACETASM, Diet Butcher Slim Skin
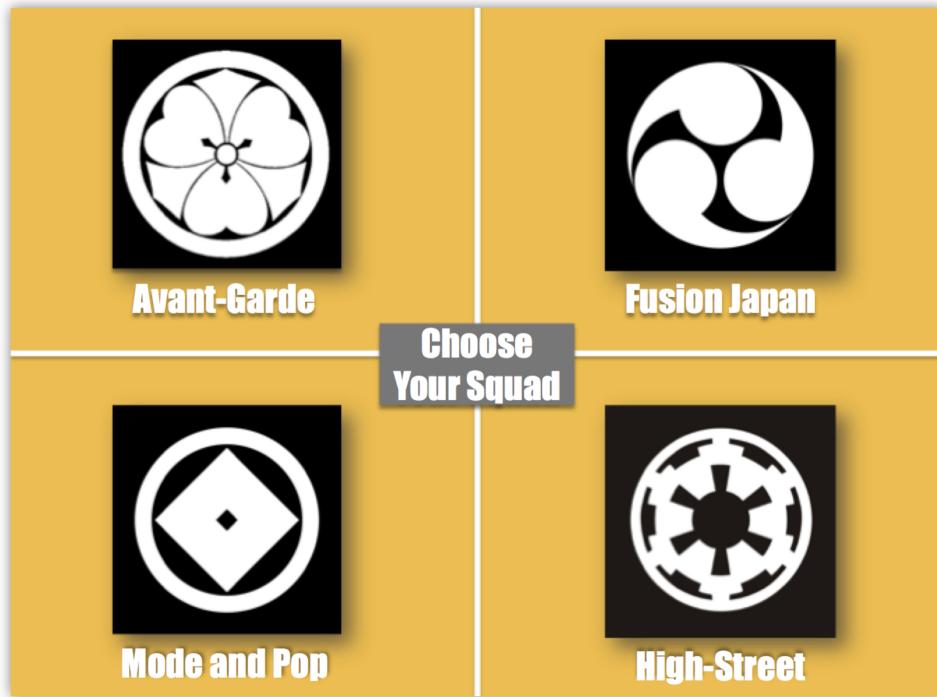
Figure 3.2: Fashion Squad User Interface Prototype

Once users join a Fashion Squad, they will automatically receive the corresponding family crest on *FOOKU Heartbeat*. The crest will then be shown on the OLED display as a part of the innovative design of the device. Moreover, the crest pattern will evolve accordingly with every ten likes received on the OOTD post. The purpose of this game-like design is to make the *FOOKU* experience more interactive and entertaining to motivates people who are not originally into

fashion to try the *FOOKU Heartbeat*. The" Likes" count will also accumulate to level up users' *FOOKU* account to receive certain incentives (i.e. 15 percent off on E-commerce purchase) to encourage users to continue expressing and sharing their personalities through cloths and building up their confidence.

Figure 3.3: Sample of Level 1 Fusion Japan Fashion Squad Crest

3.2   Fieldwork and Discovery

The background research and user study were conducted to study two major aspects of *FOOKU*:

- To learn design process and philosophy from designers and select shop owners to create unique design for the *FOOKU Heartbeat* wearable device and family crest.
- To understand users' perspective and needs in fashion activities to create the fashion-enhanced wearable device.

Fieldwork 1 - Understanding Fashion Design

The first fieldwork involved three detailed interviews with the designer of Japanese avant-garde brand, DEVOA, and the owners of two well-known select shops, GULLAM and FASCINATE. The purpose of this fieldwork is to learn the ideation process of designing fashion products from designer's perspective, and understand
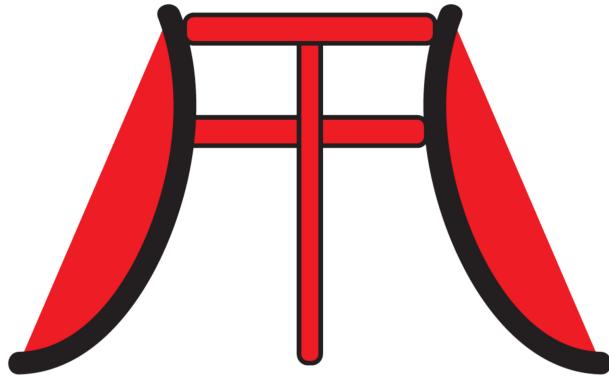
Figure 3.4: Sample of Level 2 Fusion Japan Fashion Squad Crest

what aspect of the design can attract customers and fulfill users' needs based on owners' experience.

Interview at DEVOA

During the first interview, Mr. Nishida Daisuke, the Designer of DEVOA, pointed out that similar to how one's outfit reveals the person's inner self, the products of a fashion brand also represents designer's personal character and vision. Hence, he stressed the importance of designing a product (*FOOKU Heartbeat* wearable device) that contains the designer's "tamashi," which means spirit in Japanese. In other words, a fashion product must not comes from simply taking design from different popular trends; a fashion product has to be able to tell the story of the designer, the source of the inspiration, and the path the designer takes to complete the work. Additionally, Mr. Nishida indicated that choosing the right material, and creating a fit or pattern that users can put on effortlessly are also crucial to creating a strong product.

Interview at FASCINATE

The second interview was conducted with Mr. Tokunaga Tsuyoshi, the founder of Osaka's well-known select shop, FASCINATE. Though Mr. Tokunaga is not a designer himself, he has experience interacting with customers (end users) and identifying their needs and preferences. Mr. Tokunaga pointed out that FAS-

Figure 3.5: Fieldwork at DEVOA's Atalier

CINATE has been focusing on promoting Japanese fashion to the world. He believed Japanese fashion brands have extreme qualities that are competitive to the ones of foreign brands. Furthermore, Mr. Tokunaga suggested that Japanese designers are expert in blending exquisite Japanese elements into the design, hence Japanese fashion products often have an unique ambience that is heavily connected to Japanese vivid and glamorous culture. He also emphasized that products that carry both designers' vision and Japanese culture elements often are more appealing to their customers. Therefore, he encouraged mixing some cultural references into the design process.

Figure 3.6: Fieldwork at FASCINATE in Osaka

Interview at GULLAM

The third interview was done with Mr. Ishikura Takayuki at his up-and-coming select shop, Gullam, at the Daikanyama area. Mr. Ishikura was once a craftsman himself, hence he provided some insightful information about designing and

producing fashion-related products. Echoing with what Mr. Nishida and Mr. Tokunaga highlighted during their interviews, Mr. Ishikura also suggested that the core, the vision that serves as the extension of designers ' characteristics is the most essential aspect of the products. Furthermore, as a person who has not been fond of neither accessories nor wearable devices, he advised that the *FOOKU Heartbeat* device should not only be designed with designer ' s personal vision and Japanese culture in mind; it should also focus on finding a creative take on accessories/wearable devices to attract people ' s attention.
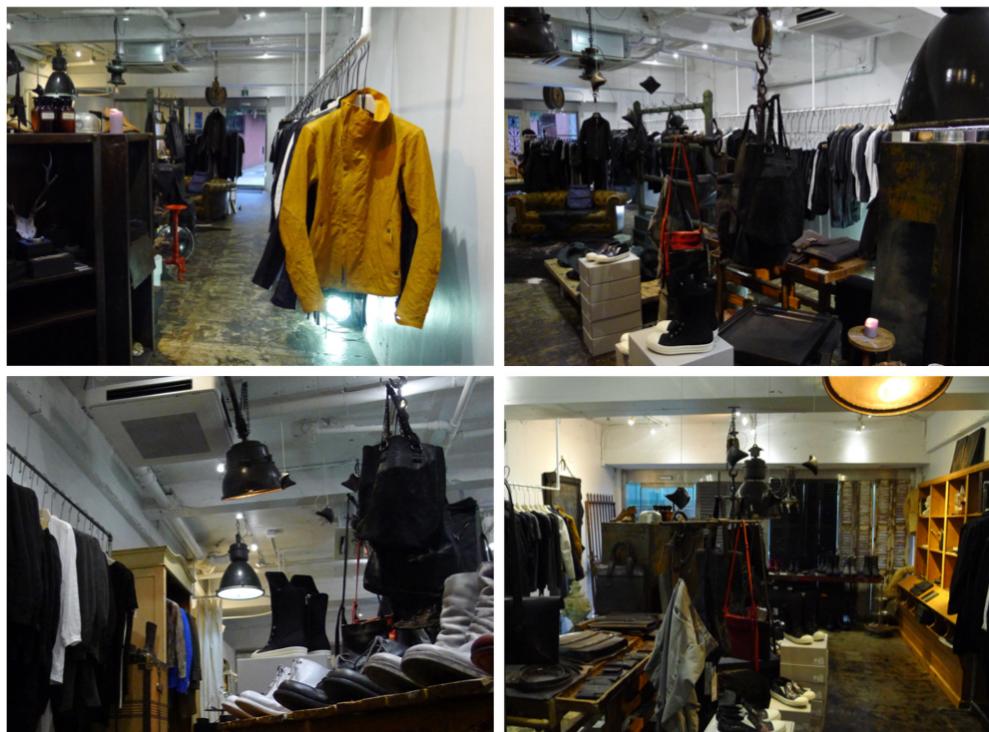
Figure 3.7: Fieldwork at GULLAM in Tokyo

Fieldwork 2 - Observing User Behavior

The second fieldwork was conducted to study users' struggles and perspective when they engage in fashion-related activities. The goal is to discover the probability and potential of *FOOKU Heartbeat* to enhance users ' fashion experience. The fieldwork was done with two study subjects:

- Person A who travelled to Japan from England during Spring break to purchase cloths to revamp his personal image.
- Person B who had his own styling preference, but was looking for new styling coordinations that could potentially match his personality.

Person A

Person A came to Japan with his girlfriend during Spring break. While he used to dress up at formal occasions, he was not known for paying attention to his styling coordination to express himself. Nevertheless, as he started dating with his girlfriend, he realized the need to update his wardrobe to better presenting himself. He began to seek assistance through social network and search rapidly on various E-commerce sites, but was frustrated by the lack of feedback and recommendation that could not describe his characteristics.

During his stay in Japan Person A would constantly seek Observer's opinions on cloths, as he and the Observer had gain their " trust bond " through daily interaction, and had found similarities in their personalities. Hence, Person A believed the Observer could assist him choosing outfits that best portray his inner self. Moreover, after a few rounds of shopping with Observer's help and encouragement, Person A had established the knowhow of selecting garments that fit him the most, and was able to carry on such habit and achieve further personal development even after he returned to England.

The feedback reinforcement in reality played an essential role in Person A's growth. Person A had significant positive emotional changes whenever the Observer or the store staffs complimented his outfit or recommended items based on his needs and personalities. Such positive reaction reached the highest point when his girlfriend praised his coordination choice and hugged him afterwards (physical feedback, incentive). Moreover, seeing the changes an outfit could make to himself and his surrounding, Person A became passionate about exploring diverse fashion scenes, which then lead to further personal growth and a deeper understanding of himself.

Person B

Person B on the other hand, had always had his own personal preference on cloths. Similar to Person A, Person B sought reference from social network such as Instagram and WEAR for inspiration and recognition, and often spent hours

browsing outfit recommendation popped out from Google Ad. However, he also felt frustrated of lacking efficient feedback on his outfit and exploring new styling potentials that might match his personalities.

During his shopping trip in Tokyo, Person B first asked the Observer to guide him to stores that he already did research on. He then would pick the cloths himself, then asked the Observer for opinions. When they had different views toward a particular item, Person B would describe his thoughts behind the decision and exchange opinions with the Observer and store staffs. While they may not always come to an agreement, Person B would always consult the Observer for other suggestions.

After visiting shops that he did research on, Person B asked the Observer to guide him to stores that might carry items that match his identity based on the Observer ' s knowledge on him. Person B then would experience the ambient of the stores himself, then asks the Observer to explain the concepts and visions behind the brands. After recognizing the brands ' values matching or developing his personalities, Person B would make purchases and receive positive emotional changes after the new styling discovery.

Positive feedback and Interaction in reality were also essential factors in Person B ' s identity exploration. While he did not need extra motivations to seek originality in his outfit coordination, he became more confident and firmed of the new style (new side of himself) when the Observer and the staffs made positive reactions. Through such activity, Person B learnt things he didn ' t notice about himself, and was able to achieve personal development.

3.3   Target Persona

Based on the user observations from the fieldworks and previous works in related areas, two types of persona were created as potential users of *FOOKU Heartbeat*.

Persona 1: Fashion Enthusiast User

Target Persona 1 is an Asian American male in his late 20s. He was originally born in Asian but later moved to the U.S. in his mid 10s. Due to his cultural difference among his American-born classmates, Persona 1 found it difficult to establish self-recognition and confidence. Nevertheless, he developed a passion for fashion, and realized it could be the perfect tool to express himself and showcase

his characteristics. Persona 1 has established his unique sense of styling coordination over the years, and has been using social platforms as medium to share his style/identity with others. However, he is struggling to receive actual feedbacks that result in positive emotional change and self-discovery. Therefore, Persona 1 is looking for enhancement that can improve his fashion experience and continue his identity development.

Persona 2: Non Fashion-Oriented User

Target Persona 2 is a male in his early 30s. He has been working for several years as an engineer and has achieved numerous career goals. He doesn ' t pay much attention to his outfit, as he mostly wears T-shirt and jeans to commute. He loves observing innovating tech development, and always gets his hands on the latest tech products. On the other hand, he rarely expresses his real thoughts during socializing situations due to the lack of social confidence. He also often finds it hard to represent himself thoroughly due to the insufficient self-recognition. Persona 2 believes such condition can be improved through better styling choices, and is eager to find a tech-related method to assist him through the process.

3.4   Fashion Enhancement Experience Flow

After combing the information gathered from the fieldworks with the *FOOKU* concept, the fashion enhancement experience flow in Figure 3.8 was conducted to give users a better understanding of the function of *FOOKU Heartbeat*. The flow was also used to guide users through the demo trials.

3.5   Prototyping FOOKU Heartbeat

A total of three physical prototypes and two unused prototypes designs were created to realise the *FOOKU Heartbeat* wearable E-accessory. This section focuses on the product design of each prototype, while the evaluation of the prototypes will be shown in Chapter 4.

FOOKU Heatbeat's Fashion Enhancement Experience Flow

1. User wakes up

2. User wears the Heartbeat

3. User scans the e-Tag on the hanger of the outfit with Heartbeat or
smartphone to receive detailed information of the items

4. User takes an OOTD (outfit of the day) selfie

5. The outfit information automatically uploads to fashion-focused social
media (i.e. Instagram, WEAR, Pinterest)

6. Viewers on social network like the OOTD picture

7. The digital Crest display flashes and evolves its pattern, while FOOKU
Heartbeat generates a "heartbeat-like" haptic simulation to actualize the
"Likes" from social network

8. User receives the actualized positive feedback and achieves higher
confidence level

9. User becomes more self-aware through fashion coordination after routine
engagement with FOOKU Heartbeat

10. User learns to enjoy exploring various fashion scenes while re-
discovering and further developing his/her identity through the process

Figure 3.8: Fashion Enhancement Experience Flow Model

Initial Prototype: The Shoulder Pad

The purpose of the initial prototype was to test the functionality and explore
possible placement location for the wearable device.

Design and Inspiration

The design of the Initial Prototype mainly focused on the innovation of placement
location. Thus the product design remained relatively simple and functional.

The Initial Prototype was heavily inspired by the unique Half-Jacket by Japanese
Avant-Garde master Yohji Yamamoto in Figure 3.10. The jacket triggered the idea

Initial Prototype
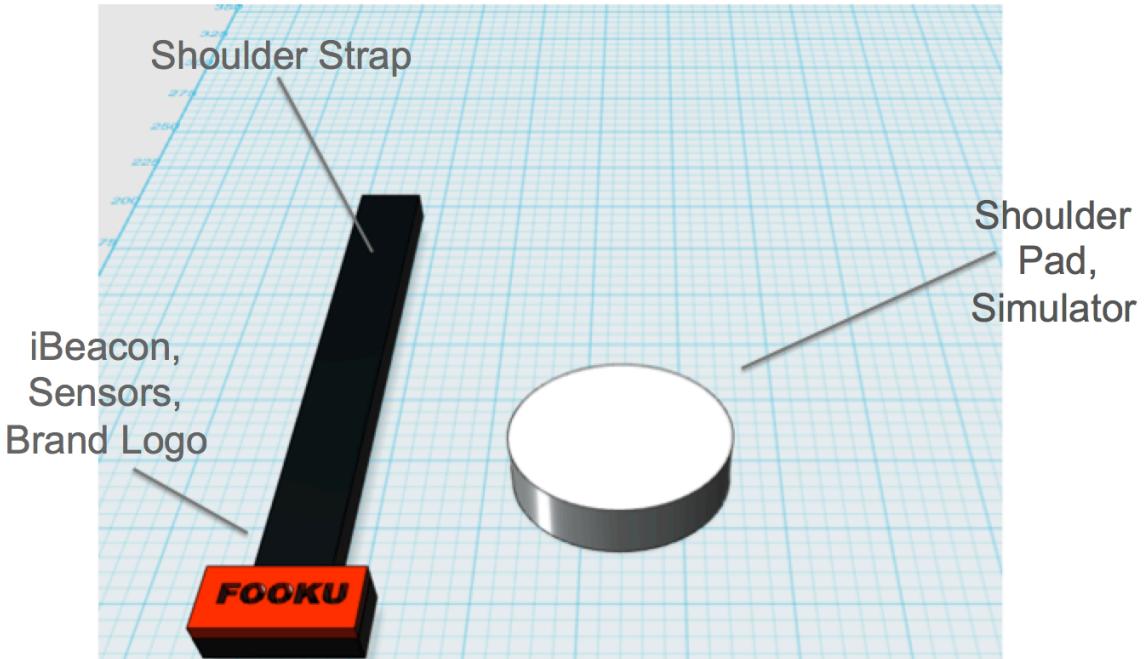
Figure 3.9: Design of the Initial Prototype

of exploring placement location other than wrist for *FOOKU Heartbeat*, and testing the idea of" Shoulder Pad." Another inspiration of the" Shoulder Pad" was to bring positive encouragement to the users by generating a" shoulder patting" simulation to compliment their outfit. The goal was to use such simulation to increase the users' confidence and self-awareness level.

The prototype came with a" Shoulder Strap" that was designed to hook onto the Half Jacket's adjusting strap. The logo part of the strap was created not only to display the name of FOOKU, but also to counter-balance the weight of the actual Pad (the white circular device) at the rear end of the shoulder. On the other hand, the Pad part of the device was created to serve one simple function: carrying the mechanic equipment of the device. Therefore, the design of the Pad was kept clean and minimal. The design was first created by hand and clay, and was later on enhanced with 123D Design to create the 3D version. After that, the

outer cover of the Shoulder Pad and the Shoulder Strap were then generated with 3D printer.

Figure 3.10: Design Inspiration of the Initial Prototype

Functionality Equipment

The main function of the Initial Prototype was to generate vibration to actualize the feedback from users' OOTD pictures on social network. The purpose was to use such simulation to increase users' confidence level and help them engaging in long-term fashion activities to continue their personal growth.

The Sony Mesh Tag prototyping tool was utilized to develop the Initial Prototype. Its distinguishing feature of instant prototyping with the Mesh iPad App was essential to construct the Initial Prototype with speed to expeditiously perform the first user trial. The Green " Button " Tag and the Blue " Move " Tag were used to create the vibration to simulate a " Shoulder Padding " feedback to encourage users on their outfit coordination (as seen in Figure 3.12). The Blue " Move " Tag was inserted onto the 3D printed Shoulder Pad to act as the actuator, while the Green " Button " Tag was held by the Observer to initiate the simulation.

Figure 3.11: 3D Model of the Initial Prototype

General User Feedback

The Initial Prototype was not able to receive an overall favorable feedback from the users. While some of the users enjoyed the concept and was interested in the placement location of the wearable device, most of the users from the test group were not fond of the product design and hence was discouraged during the trials.

The detailed evaluation of the Initial Prototype including the experiment settings will be discussed in Chapter 4.

Second Prototype: The Heartbeat Necklace

With the Initial Prototype receiving a less favorable feedback from the users on the product design, it was challenging to scrap the original design and start all over again. During the design process of the Second Prototype, the advices received from the Design Fieldwork were taken into account to bring more personal vision and Japanese elements to the composition. A total of three design concepts were proposed during the brainstorming phase, with *The Heartbeat Necklace* becoming the Second Prototype. The unused concepts can be seen in Figure 3.13 and 3.14.

Figure 3.12: The Green" Button" Tag and Blue" Move" Tag from Sony Mesh Prototyping Tool

Design and Inspiration

The obstacle of the Second Prototype was to make the design attractive and practical to the users, so they would be intrigued to experience the functions. Thus, the design process began with searching placement locations that users actually would be willing to try out at. The needed information was gathered from an extra fieldwork conducted at Omotesando Hills area, by observing pedestrians' accessories. During the observation, around 70 out of the 200 pedestrians wore watches, 45 of them had earrings, 55 of them had rings, and 70 of them wore necklaces and other accessories around the neck.

Based on the result of the observation, and discussion with users from the Initial Prototype trial about adjusting the placement location, necklace was chosen as the form for the Second Prototype.

The Second Prototype, shown in Figure 3.15, was created in mind to make the shape of the device matching the bodyline of the users for a more comfortable fit. Also, the design concept was a mixture of the author's personal" sharp but rounded" characteristic and elements from the Japanese Family Crest paddle. The overall shape was inspired by author's vision of futuristic accessory design and traditional Ninja equipment. The design was first created by hand and was

Destiny

E-Ink Crest
Display,
Sensor

iBeacon,
Simulator

Figure 3.13: Unused Concept 2: Destiny Ring

recreated with 123D Design to generate the 3D model with 3D printer.

Functionality Equipment

One of the dissatisfactions from the Initial Prototype in terms of its functionality
was the lack of the simulation from the Sony Mesh Tag. As more than half of
the test group suggested, the vibrating simulation generated from the Mesh Tag
was identical to the ones from their smartphones. Hence, they did not see the
necessity of another wearable device providing an indifferent vibration for their
OOTD posts.

To counter such issue, the VP2 Vibro Transducer was utilized to enhance
user feedback, as it had been known for accurately delivering haptic simulation.
Since the design base was necklace for the Second Prototype, the innovation of
generating a" heartbeat" simulation to actualize the" Likes" from social network
to encourage the users was initiated. The sound of the heartbeat was gathered
through online platform, and was then linked to the TECHTILE toolkit that
transferred the heartbeat to the VP2 Vibro Transducer in the prototype to create
the" heartbeat " simulation.
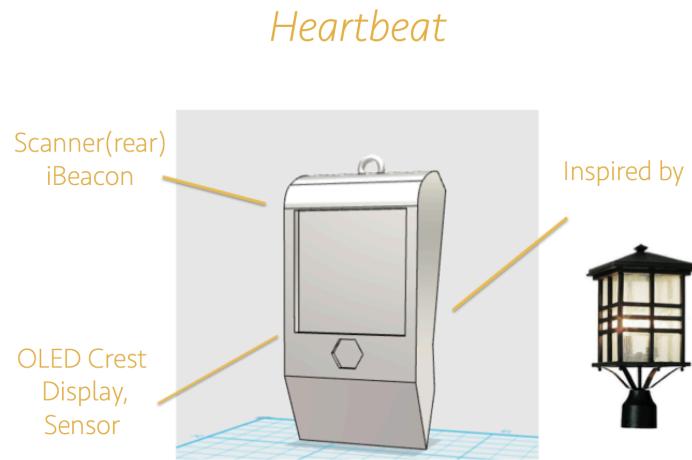
Heartbeat

Figure 3.14: Unused Concept: Lamp Inspired Heartbeat Wearable

General User Feedback

The Second Prototype received majority positive feedbacks, with 8 out of the 11 people enjoying the positive emotional change by the haptic feedback, the overall design concept, and the prototype design.

The detailed evaluation of the Second Prototype including the experiment settings will be discussed in Chapter 4.

Final Prototype: The FOOKU Heartbeat

The Final Prototype, the *FOOKU Heartbeat*, shown in Figure 3.17, was an improved version of the Second Prototype. It was also given a slight design tweak to make the overall proportion more modern and stylish.

In addition, the Family Crest System was applied to the prototype with the addition of the Pebble Watch display. The design concept and technology improvement of the Final Prototype and the Crest System will be discussed and evaluated in Chapter 4.

Notes

1   STYLER TAIWAN
   https://www.facebook.com/styler.taiwan/?fref=ts
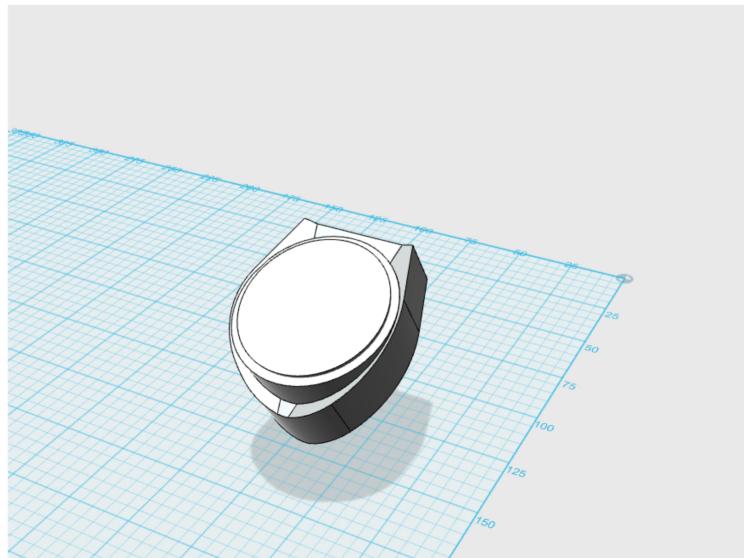
Figure 3.15: Second Prototype: The Heartbeat Necklace
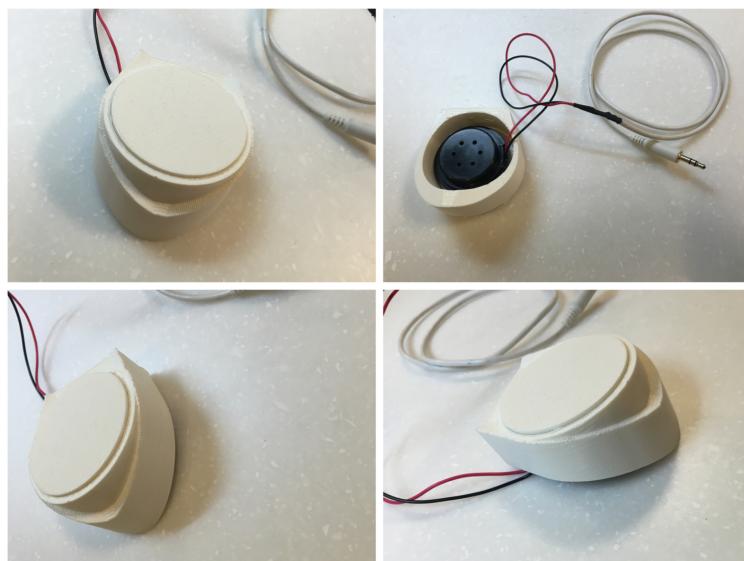
Figure 3.16: 3D Printed Second Prototype with VP2 Vibro Transducer

Figure 3.17: FOOKU Heartbeat Final Prototype

Figure 3.18: FOOKU Heartbeat Final Prototype Display Demo

Chapter 4
Evaluation

The evaluation was conducted after testing each of the prototypes with target users to analyze the design and functions of *FOOKU Heartbeat*. The evaluation includes the following four main sections:

- the Purpose
- the Setting of the Experiment
- the Method Being Used
- the Discussion of the Findings (including Overall Concept, Design, and Function)

4.1 Evaluation on the Shoulder Pad

Purpose

The purpose of the Initial Prototype, the Shoulder Pad, was to swiftly test the broad concept of *FOOKU*, the potential of " shoulder patting " function, and the placement location of the wearable.

However, it should be noted that the test was conducted in the very early stage of the research, thus the concept of *FOOKU* was simply focusing on seeking an innovative way to make fashion relative to the user ' s lifestyle with positive enhancement.

Setting

To receive feedbacks from the end-users to verify their interest of the wearable device design and the feasibility of the concept, the experiment was conducted during several socializing gathering events with five potential users; three of them one male, two females, all in their late 20s, being fashion enthusiasts, and the

two remaining late 20s males being neutral but favorable toward fashion-related products.

Method

The subject users were first given explanation of the purpose of *FOOKU*. After that, they were asked to simulate the scenario similar to the one of the Fashion Enhancement Experience Flow Model in Figure 3.8, and put on the Initial Shoulder Pad Prototype. The users were then guided through the process with oral instruction. The Shoulder Pad generated the vibration at Step 7 of the Fashion Enhancement Experience Flow Model, and the subject users were asked about their feedbacks and comments.

Findings
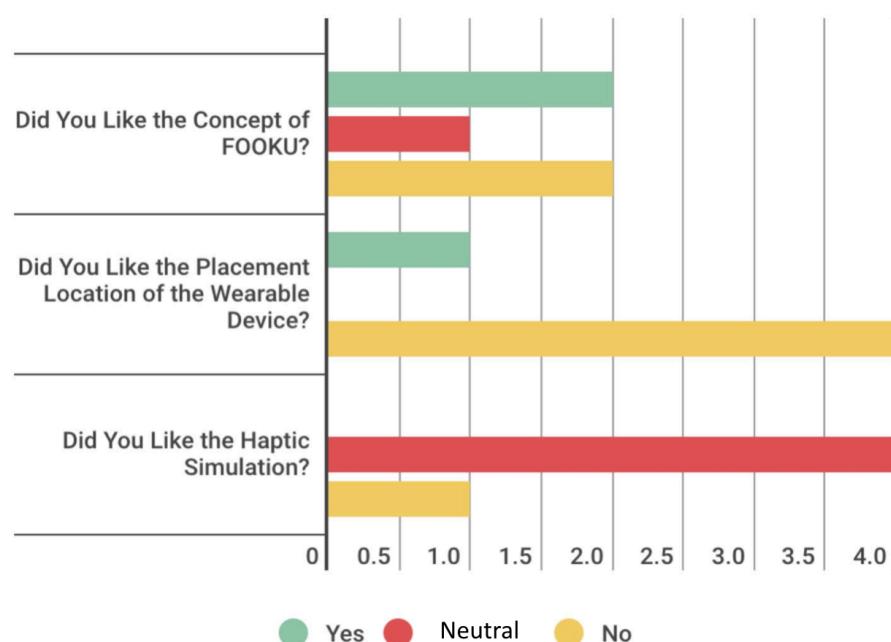
Figure 4.1: Feedbacks of Initial Shoulder Pad Prototype

Overall Concept

While there were two subjects interesting in *FOOKU* ' *s* goal of using fashion to increase confidence and self-awareness level to achieve personal growth, and the possible extensive implementation, the majority of the test group weren ' t intrigued with the overall concept.

Nonetheless, with the test being conducted in the early stage of the research, the concept of *FOOKU* wasn ' t as clear and focused as it became in the later stages. Hence, the unpopular reactions weren ' t surprising. Additionally, the lack of clear visual assistance during the concept explaining process was another factor contributing to the underwhelming result.

Design

The design of the Shoulder Pad also received a rather unfavorable feedback from the users. Most of the comments on the product design were regarding the placement location of the device. The original idea was to create a creative, interesting location for wearable product to bring freshness to the wearable market. Also, it served as the bridge to connect and actualize the " shoulder patting " encouragement function. Nevertheless, with the concept explanation already being vague, the users were not convinced of the logic behind to experience an unconventional location for wearable device.

On the other hand, throughout the human history, people seem to have the tendency of rejecting innovation or things they are unfamiliar with in the beginning. Such behavior can been seen when the first Tesla electric Roadster came out, or when Yohji Yamamoto and Rei Kawakubo first debuted their fashion collections during Paris Fashion Week. It is the author ' s belief that a good innovation takes time, better planning, more matured technology, and countless refinement to be engaged and accepted by the users. Hence, although the Shoulder Pad was not popular among the users during the initial trial, the concept was later refined and carried over through the Final Prototype.

Function

The vibrating function received neutral to poor feedback from the users due to the lack of visual assistance during the guiding process, and the similarity between the vibrations of Smartphone and Sony Mesh Tag. The users couldn ' t identify the uniqueness of the function, and therefore remained detached from the function. A

40

new haptic vibrator was utilized to resolve such issue during the Second Prototype stage.

4.2   Evaluation on the Heartbeat Necklace

The purpose of the Heartbeat Necklace was to tackle the issue with the placement location of the device, readjust the unpopular device concept from the Shoulder Pad, and accurately deliver the message of *FOOKU* to the users with visual assistance to perfect their trial experience. Moreover, by the time of conducting the second trial, the concept of *FOOKU* was more developed and direct, as it focused on improving users ' confidence and self-awareness level through their fashion coordination to achieve personal growth. The design of the wearable device was also altered to test users ' reaction.

The concept of the Crest System also was introduced to the users for the first time during the trial to test its feasibility and effectiveness.

Setting

The experiment was conducted with a total of 11 subject users in different settings. Some were done in a more interview style setting, while some were done in a casual, socializing setting, based on the subjects profile and background.

- Four of the users, all males in their mid 30s, came from Fashion-Tech related industry, and were among the Fashion Enthusiast User targeting group. The trial was conducted in the casual, socializing due to their personalities and professions.

- Three of the users, two late 20s male, and one mid 30s female, came from IT industry, with knowledge in the IoT and Wearable fields. They were not fashion-focused but they opened to changing such condition. Their trial was conducted in a more interview style setting due to the occasion and their professions.

- Two of the male users were actual select shop owners, one in his mid 30s and one in his early 50s. The trial was also conducted in the interview style setting because of the occasion and their profession. It should be noted that one of the owner wasn ' t able to experience the haptic device due to the

lack of technical support at the location. He was given detailed explanation of the concept with visual assistance, but he couldn ' t give feedback on the Haptic response.

- The remaining three users were active female Instagrammers in their early 20s. Two of them were fashion-oriented while the other one was learning to be more involved in fashion. All of their trials were done in the casual, socialzing setting.

Method

The users were first given overall concept explanation of *FOOKU* with animate style slides as visual assistance. They were then asked to put on the Second Prototype, the Heartbeat Necklace, near their chest, and were guide through the Fashion Enhancement Experience Flow Model in Figure 3.8 to simulate the scenario. After that, the subject users were asked about their feedbacks and comments.

Findings

Overall Concept

With the overall concept focusing on actualizing the " Likes" of users' coordination pictures on social network to improve their confidence and self-awareness level that lead to personal growth, it became accessible to reach out the users for their engagement. Furthermore, with the animated slides explaining the Fashion Enhancement Experience Flow Model in Figure 3.8 in details, it was easier for the users to understand the process and visualize it through the simulation.

The more refined setting contributed in achieving a 72 percent favorable user outcome of the overall concept, with the rest of the 28 percent of the group remaining neutral. The users were notably more enthusiastic during the explanation process, and the majority of them were looking forward to the realization of this research. Moreover, the users felt more engaged with the introduction of the Crest System, as it helped them discovering and building their identities.

Also, interestingly, all of the users were excited and engaged about the following possible future implementations:

- Connect with E-commerce for users to receive purchase recommendation
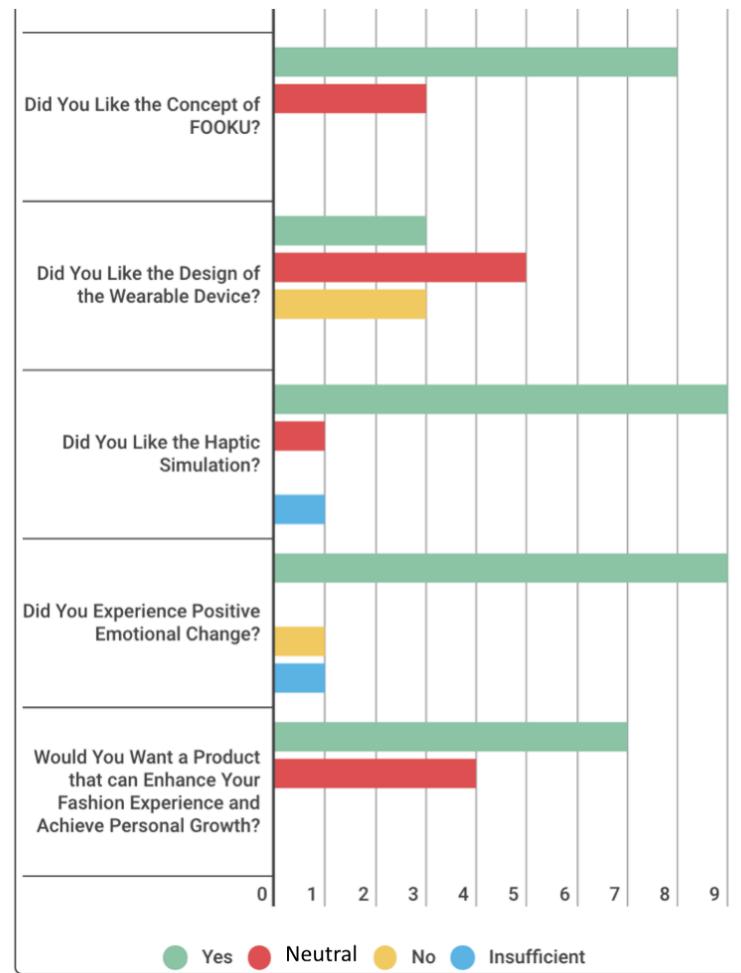
Figure 4.2: Feedbacks of Second Prototype the Heartbeat Necklace

based on the" Likes" data.

- Utilize the" Likes" data to diversify users' wardrobe coordination selections
.

- Utilize the iBeacon function of *FOOKU Heartbeat* to interact with physical store to provide secret fashion tour in Tokyo.

- Social Friending in reality to help users finding others with similar personalities and fashion preferences.
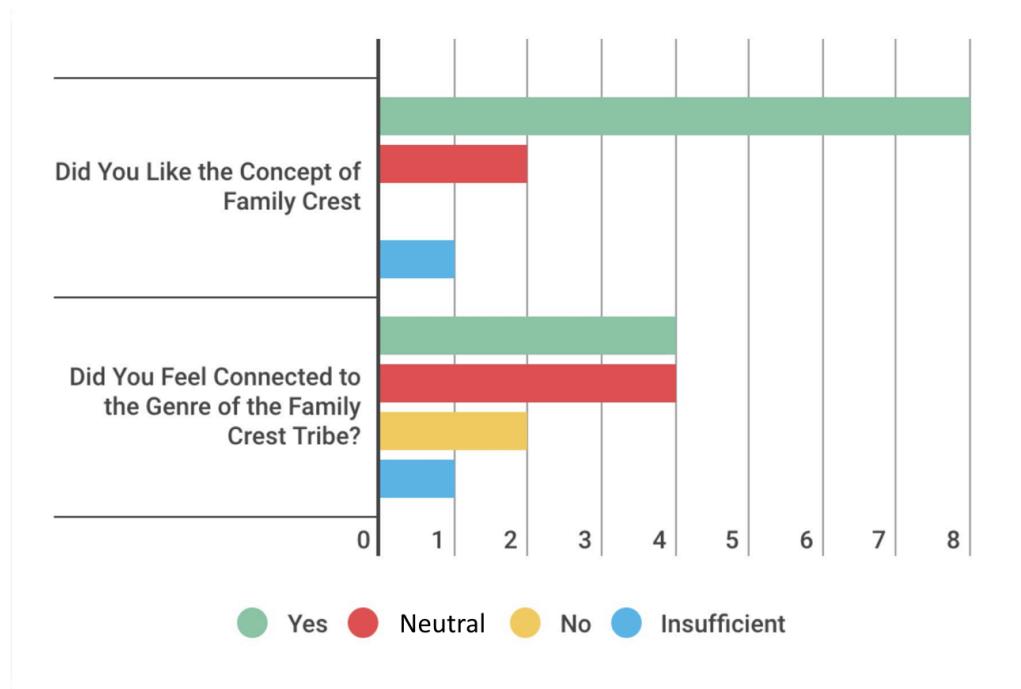
Figure 4.3: Feedbacks of the Family Crest

- Create unique daily Family Crest pattern based on the genre combination of the outfit.

Design

The design focus of the Heartbeat Necklace was to propose a new placement location for the device, and refine the over outer case design to make the device more appealing to the users.

The product design received an overall neutral feedback from the users. Most of the users complimented the choice of necklace as placement location base, as it was more conventional for daily usage as an accessory. They also pointed out

that the outer case design looked fresh and original comparing to the design of
the wearable devices available on the current market. However, they mentioned
that the size of the device was slightly larger than the regular accessories and
wearable devices, and hence indicated the desire for a smaller, easier to carry size
for refinement.

Function

With the implementation of the VP2 Vibro Transducer providing effective heart-
beat simulation, over 80 percent of the users were amazed by the haptic feedback,
and thus experienced positive emotional changes during the test trials.

On the other hand, the introduction of the Family Crest System also received
favorable feedbacks from the users. Most of the users suggested the Family Crest
made it easier to choose a fashion style to begin their personal growth with.
Additionally, the concept of the changeable interactive Crest pattern with the
growth of the " Likes ' count helped the users to be more engaged and entertained
during the trials. Nevertheless, some of the users felt detached from the Crest
patterns and the genre they represented, and advised the development of original
Crest patterns that match the fashion genre.

4.3   Proposal of the FOOKU Heartbeat

The Final Prototype, *FOOKU Heartbeat* , was created as the refinement of the
Heartbeat Necklace, with some elements carried from the Initial Prototype as well.

Design and Inspiration

The design of the *FOOKU Heartbeat* was based on the design of the Heartbeat
Necklace, echoing a mixed design of author ' s personal " sharp but rounded "
characteristic and elements from the Japanese Family Crest paddle. Furthermore,
the black color of the new prototype and some minor tweak of the outer case design
were applied to reflect the inspiration of ancient Ninja equipment. Additionally,
to diversify the placement location of the wearable device to re-test the concept
from Initial Prototype, the overall shape was made to fit on users ' shoulder,
chest, and wrist for various wearing innovation.

The size of the device was also minimized to offer more wearing comfort. On
the other hand, the usage of Pebble Watch ' s device was taken into account during

Figure 4.4: Final Prototype, the FOOKU Heartbeat

the design refinement process to embed the Pebble Watch display onto the outer case.

An original interactive Crest Pattern was also created to test users' preference in Crest design.

Functionality Equipment

The functionality equipment was mostly carried over from the Second Prototype, with the addition of an actual digital display to simulate the Crest System.

4.4   Evaluation on the FOOKU Heartbeat

Purpose

The purpose of the *FOOKU Heartbeat* was to verify the achievements of the Heartbeat Necklace with enhanced design and functions for improvement. Additionally, the new, original Crest design patterns were put into test to compare the feedback with the patterns from traditional Japanese Family Crest. The idea of diverse placement location was also being examined during the trial.

Setting

The experiment was conducted with four target users in casual, socializing setting.

- Two of the users came from Fashion Tech Industry; one mid 30s male being fashion-enthusiastic and a returning subject from trial for Second Prototype; the other male in his mid 30s being a new test subject and had neutral opinion towards fashion but was interested in fashion enhancement product.

- The two remaining users were rapid Instagram users with a early 20s female being fashion-oriented and a returning subject from trial for Second Prototype, and a mid 20s male being a nest test subject and was seeking changes and advices for his fashion coordination.

The purpose of conducting trial with returning test subjects was to verify the concept and strength of *FOOKU Heartbeat*, and to reevaluate the improvement made on the Final Prototype. The new test subjects were brought to the test to evaluate the *FOOKU* concept from new comers' perspective.

Method

The method was inherited from the trial for Second Prototype. Users were first given overall concept explanation with animate style slides as visual assistance, then were guide through the Fashion Enhancement Experience Flow Model in Figure 3.8 to simulate the scenario with the Final Prototype. Nevertheless, the users were provided with original, changeable Crest pattern, and the ones from traditional Japanese family crest design to test their preference towards Crest pattern this time.

Findings

Overall Concept

The overall concept, including both *FOOKU Heartbeat* and the Crest System, was widely accepted by the subject users, as they looked forward to research realization. Also, all of the users experienced positive emotional change during the process, displaying the possibility of increase in confidence level that can contribute to positive personal growth with long-term routine usage of *FOOKU Heartbeat*. Furthermore, several users indicated that *FOOKU Heartbeat* could bring more entertainment and enjoyment to their daily fashion activities.

Design

The refined design received positive feedbacks, with majority of the users preferring the design of *FOOKU Heartbeat* over the design of the wearable devices on the current market. In addition, both of the returning test subjects were amazed by the smaller size and the enhanced design.

The Original Interactive Crest Pattern also received favorable feedbacks, with 75 percent of the users feeling more engaged in the *FOOKU* concept with the Original Interactive Crest Pattern. Nevertheless, they also suggested for more detailed design enhancement to create better user experience.

Function

Most of the users enjoyed the haptic feedback of the heartbeat simulation, and they were intrigued by the changeable Crest Pattern. The users also showed the desire to wear *FOOKU Heartbeat* routinely to experience the long-term positive enhancement. Additionally, they were all interested in the possible future implementations mentioned in the trial of the Second Prototype.

4.5 Evaluation Summary

After the underwhelming feedback from the Initial Prototype, the trials conducted for the Second Prototype and the Final Prototype were able to deliver *FOOKU*'s purpose of helping users to gain confidence and personal awareness with augmented feedback on their outfit coordination, and receive entertaining fashion enhancement through the process. With the positive feedbacks from the users, it

is accountable that the users will display higher confidence and self-awareness level with long-term adoption of the *FOOKU Heartbeat* E-accessory wearable device.

The majority of the subject users experienced positive emotional changes during the second and final trial, and were intrigued to engage in long-term usage of the *FOOKU Heartbeat* E-accessory wearable device because of the surprises and joys the haptic heartbeat feedbacks of their outfits and the Interactive Crest System brought to them. It is the author's belief that such positive energies can contribute to the increase in users' confidence with daily routine engagement. Furthermore, the long-term usage of *FOOKU Heartbeat* and Crest System will assist the users discovering fashion styles that reflect their personality the most, and improve their self-awareness level. With positive changes in confidence and self-awareness level, it is foreseeable that the users will be able to learn more about themselves through the *FOOKU* fashion enhancement experience and reach higher personal growth.

On the other hand, the concept of *FOOKU Heartbeat* also brought a fresh breed to the current IoT wearable device market. The users were attracted to the design of the Final Prototype, and the changeable Crest pattern. *FOOKU Heartbeat* offers a new concept of smart accessory that not only decorate the users' appearance, but also represents their fashion/inner characters. It is the author's belief that *FOOKU Heartbeat* can make great impact in the smart accessory industry and induce further novel creations.
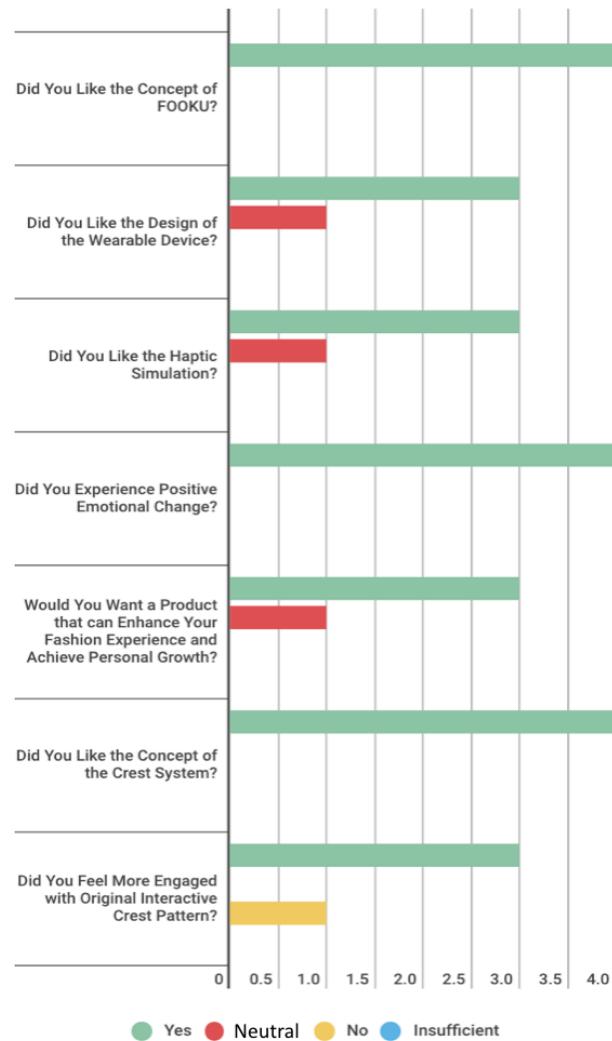
Figure 4.5: Feedbacks from Final Prototype, FOOKU Heartbeat

Chapter 5
Discussion

5.1 Conclusion

Figure 5.1: Final Prototype, the FOOKU Heartbeat

Fashion is a fascinating form of beauty that uncovers the mystery of self identity. Its unpredictable yet glamorous characteristics perfectly resemble the unique characteristics of human beings. With technology blossoming in various exciting forms, fashion also has the potential to extend its charm and effect to diverse

fields.

Contributing to such innovation wave, the goal of the *FOOKU* research, is to help users achieving positive personal growth, including increase in confidence and self-awareness level, and recognizing personal identity through fashion with Innovation, Entertainment, and Surprise. It is also the research ' s ambition to assist users becoming passionate of and more engaging in fashion along the way.

Such goal was achieved with these novel contributions throughout the research:

- A new form of wearable device *e-accessory* that provides fashion-oriented function to enhance users ' fashion experience and bridging users ' online presence to reality.

- A simulation device that actualizes social network ' s " Like " function to bring users confidence through their outfit coordination.

- An interactive, game-like Crest system that evolves as the Like counts on users ' coordination increases.

- A unique fashion accessory that blends Japanese cultural elements with modern technology and lure users to experience fashion.

5.2   Design Limitation

FOOKU encountered several limitations in both the design phase and trial phase.

The limitations in terms of *FOOKU Heartbeat* ' s product design and function are as of follow:

- The VP2 Vibro Transducer generated great haptic feedback of heartbeat simulation. Nevertheless, it had to be connected to the TECHTILE Toolkit and computer to produce effective reaction. Furthermore, the size of the VP2 Vibro Transducer limited the dimension of the wearable accessory, making it hard to be applied by the users on daily basis. Hence, it is not the ideal device for the production version of *FOOKU Heartbeat* e-accessory.

- Pebble watch was being used as the display on the Final Prototype. While it fit great with the design of Final Prototype, it should be replaced by an

actual OLED display for the production model.

- The original Crest designed by the author exhibited the evolution of the Crest pattern as users'" Likes" count increases. However, the designs can be further modified to better represent the Fashion Tribes and enhance user engagement.

- The use of 3D printing offered a convenient and efficient solution for rapid prototyping. Nonetheless, it is the author's goal to use materials from actual smart accessories to create the device for future research and production.

- None of the prototypes was able to embed iBeacon and sensor to the device. It is one of the primary goals of future prototype to include those two devices to test their feasibility.

The major limitation encountered when conducting the trials is described below:

- With the Pebble Watch unable to display the digital Interactive Crest pattern GIF file due to the model of the watch, the subject users were given the simulation of the Crest System on computer. While it might not affect users' opinion towards the Crest System and the pattern design, it would certainly enhance the user experience if the GIF file were applicable on Pebble Watch.

5.3   Future Implementation

The big picture of *FOOKU* is to create a fashion platform that connects *FOOKU Heartbeat* with E-commerce and Tokyo-based fashion tour to create a fun and innovative fashion experience for the users. Several parts of the future implementation plan were brought up during the trials, and received positive feedbacks from the test subjects.

The future implementation plan of *FOOKU* is listed below:

- Connect with E-commerce for the users to receive purchase recommendation based on the" Likes " data. Such function will allow a more true-to-user

reference and improve the overall shopping experience.

- Utilize the" Likes" data to diversify users' wardrobe coordination selections. This function will help users exploring their own wardrobe for styling innovation.

- Utilize the iBeacon function of *FOOKU Heartbeat* to interact with physical store to provide secret fashion tour in Tokyo and receive refined in store experience. Such concept can bring new surprises and opportunities for users to seek rare fashion items that lead to their self-rediscovery.

- Utilize the iBeacon function to initiate the Social Friending service to assist users finding others with similar personalities and fashion preferences in reality. This" fashion friending" function will allow users to find their belongings not only in the virtual world but in real life as well.

- Create unique daily Family Crest pattern based on the genre combination of the outfit to increase user engagement and provide the fun factors.

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Appendix