

SNIFFTRAIL

A new way of interacting with your senior dog
by using nose work and impulse control training

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LYNSEY JO
JEYLENE CHEON
ALL SENIOR DOGS ON EARTH, YOU GUYS ARE SUCH GREAT, LOYAL, AND LOVELY
FRIENDS AND FAMILIES
LEI ZHANG AND HIS FAMILY
MAY YOUR HEART AND SOUL FIND PEACE AND COMFORT, LULU

4 “A guy who just bought a new Maserati, will think about a new Maserati within an hour. But if you have a dog, and whenever you see your dog, you will never think about getting another dog.” -Jan Schoormans-

PREFACE

I have an old dog, named Maximilian. He was once homeless, but since 2006 he is our loved family member. Maxx and I used to be a running mate. About 4 years ago, when he was 9, suddenly he stopped running. I thought he is getting lazy and nagged about that to him: “You should do some exercise!” A few months later, Max was diagnosed with an Intervertebral disc disease and it changes a lot in his and our family’s daily life. It was a frustrating change, and I was devastated. It was the very first moment that I noticed my dog was aging. This event was my motivation and inspiration to start this project.

SUMMARY

This project is aimed on finding the new way of interaction between owners and senior dogs living in big cities in China, and consequently improve the dog’s quality of life.

Literature research pointed out that the pet care business is getting more luxurious but cannot fulfill the intuitive requirements of the dog. Also, the current trends don’t cover the holistic change of the dog when aging. In the second literature research, Chinese lifestyle was analyzed to understand the dog’s life and environment, concluding that the dogs in China have a lack of qualitative space and activities. An Emotional Journey showed that dogs in China are having a hard time when he/she is alone at home.

From the gathered insights, the problem definition and positioning statement were defined, and iteratively translated into a concept. During the following develop and deliver phase, a variety of studies were conducted to identify and clarify wishes and requirements for the concept and product.

The final design will combine nose work and impulse control training into an indoor training that helps building trust on the product, self-confidence and stimulates the senior dog’s brain. While at the same time creating a meaningful interaction between the owner and senior dog. The final concept was transformed into a tangible product and tested on its target group be able to define future recommendations.

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6 Since 2016, the TU Delft Faculty of Industrial Design Engineering has expanded their range of design research with the “Design for Animal Lab”. This lab explores how design can contribute to (the debate on) new and meaningful human-animal interactions and relationships.

The “Design for Animal Lab” collaborates with MARS Corporation. MARS Corporation is an international company, mostly known for their chocolate bar or other food products, but is currently expanding the range of their business to pet care. MARS Petcare leads the pet care market across 50 countries with forty-two brands, including the billion dollar brands, PEDIGREE, WHISKAS, and ROYAL CANIN. Recently, MARS Petcare has expanded their business from pet food to the franchise of pet hospitals (MARS, Incorporated, 2017). This collaboration allows sharing and connecting knowledge and expertise in a broad context of partnerships.

The aim of the current project is to design rich and meaningful experiences that increase the well-being of senior dogs and their owners, mainly focusing on the dog-human interaction. It is important to consider two main stakeholders through whole process (Figure 1).

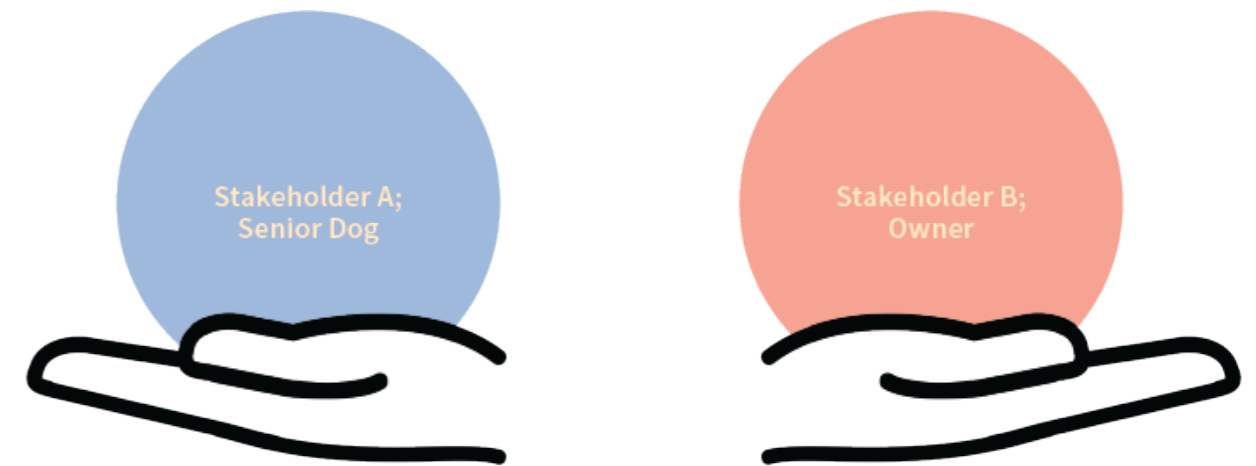


Figure 1. Two main stakeholders of the entire project

1. Introduction

The scope of this project is senior dogs and their owner who are living in big cities in China. In this project, the senior dogs and their owners are the main stakeholders, while MARS Petcare will be a source of information and guidance.

1.1.1. The Senior Dog

Compared to any other pets, dogs have a special relationship with humans. The level of emotional understanding between human and dogs is higher than with other animals. This allows human and dogs to build a strong connection which results in a friendly and emotionally close relationship (Hare, & Woods, 2013).

Meanwhile, advanced medical science has extended the lifespan of dogs as well as that of humans (Promislow, 2015). The dogs' average lifespan has expand longer than three years in last decade. (Zenkoku pettoshitta kyokai, 2012) However, the dogs still have to go through the aging process in the longer lifespan. For example, they experience a decrease of eyesight, more sleep time, a less active condition, weight issues, intervertebral disk deterioration, bad joints, and many other problems (PetcareRX, 2012). It is natural that the dogs needs extra care and attention to assist their physical movement. Consequently, there will be changes in the way of interaction between the dogs and their owners as well as the relationship.

A human being has different needs by their ages. For example, baby, adolescence, adult, and senior require different needs. Especially, baby and senior ages, they require more attention and help from others. This also applies for dogs. However, owners rarely catch the changed needs of their old dogs since dogs can't speak and have a relatively short lifespan compared to humans (Heimbuch, 2015).

When the dogs need more help in their senior age, it can be a chance to build a stronger relationship, on the other hand, aging can be a sad and unexpected accident to the owner.

1.1.2. Pets in China

In the last few years, MARS has been trying to expand their market to Russia, Vietnam, and China. China has been chosen for this project as the target region since China has a unique and interesting pet culture these days.

Like any other industries in China, the pet market in China is rapidly increasing. Approximately 7% of households in China now have a dog, and 2% have a cat (Yan, 2014) The Chinese pet market has a 48 percent increase from 2010 to 2015 (98 yuan), and 100 million pets are living in China in the year 2015. According to the research of CIW, Chinese pet owners willing to spend an average of 400 yuan (US\$58) per month, and millennials are even willing to pay more (500 yuan) (US\$73).

Some experts assume that China's 'One-Child Policy' was the effect of the rapid growth of the pet generation. China is the country that has one of the world's lowest birth rates. The number of middle-class couples who are choosing pets rather than kids is growing. Therefore, extreme luxury service towards pets is also increasing, and this growth just started (Fullerton, 2014).

Unlike the rapid growth of pet care business, a part of Chinese culture still takes a dog as meat. A pet/dog culture in China has a significant controversy in this Generation. Hu Shujuan, 28, an animal rights activist in Shanghai, mentioned that about 80% of the people in Shanghai regard dogs as pets and that 20% enjoy eating them (Kaiman, 2016). It shows that China's pet culture is now passing a transition phase. Therefore, there is a lot of opportunities in the market and this project can offer valuable data and insight. Not only from business perspective, but also in creating or finding a new pet culture.

Moreover, Compared to western regions, where pet culture and market are stabilized, China has a high potential for new needs and solution. Moreover, since China's major cities have enormous capital, a big market, and fast adapting people, this target area will give interesting opportunities.

1.2. Project

1.2.1. Project Goal

The aim of this project is:

to design rich and meaningful experiences that increase the well-being of senior dogs and their owners, mainly focusing on the dog-human interaction. To enhance the quality of the relationship between the owner and senior dog as a positive experience of their last duration of the senior dog by suggested product and/or service.

The relationship between human and dogs have studied by psychologists, anthropologists, and ethologists through history. Dogs have a notable meaning in human lives, and from time to time, the relationship can be regarded as symbiotic since both species get advantage from the relationship. Currently, people often get a small sized dog instead of a baby. Therefore the consumption of the luxury products for dogs is rising (Ferdman, 2014). Well-aging of current and to be aging dogs are in a need for a positive, high quality interaction with both the dog and owner.

1.2.2. Design Challenge

'HOW TO SUPPORT WELL-AGING OF SENIOR DOG AND ENHANCE THE QUALITY OF RELATIONSHIP BETWEEN HUMAN AND SENIOR DOG.'

We are not yet familiar with newly developed needs of the senior dogs and their owners. It seems important to deeply understand their changes and the following needs. This can potentially bring more rich and meaningful experience that can increase the well-being of both senior dogs and their owners.

Next to the new needs, MARS Petcare is highly interested in distinguishing an opportunity for new products or services that can support their business. Other than pet food, MARS Petcare has not specified their product line that can serve the needs of senior dogs. Therefore, this project aims to propose a new product and/or service that can add value to the dog-human interaction and experience during the dog's aging process.

10 1.2.3. Approach

For understanding the senior dogs and the Chinese owners, firstly literature research is conducted.

The definition of the older dog and the trends in pet care business and Chinese lifestyle are studied. Then, context research is done on the relationship between the senior dogs and the Chinese owners in order to analyze their latent challenges and needs. For this step, several methods such as interviews, and online surveys are used. As a result of this phase, an understanding of senior dogs and their owners' lifestyle in China, emotion, surrounding environment, and what is missing in current trends are studied.

After investigating, the problem definition and positioning statement are created to suggest a design direction as a base for the following steps.

An additional literature research on how to increase

the quality of life of a senior dog is conducted to come up with a stronger concept.

After formulating a concept, ideation, and a design language are explored. During this phase, aesthetic, and form study are applied to openly examine materials, shapes, and structures for the final design. As outcome of the previous process, multiple prototypes were created. Those prototypes were tested and recreated through several iterations, till a final design was reached.

For the last steps, a working prototype was evaluated to capture new problems, experience the feeling of the product, and improving the concept.

Figure 2 presents the whole structure of the project including research questions (in a cream-colored box), their outcome (in a pink colored circle), and design process(in a red and cream gradation box).

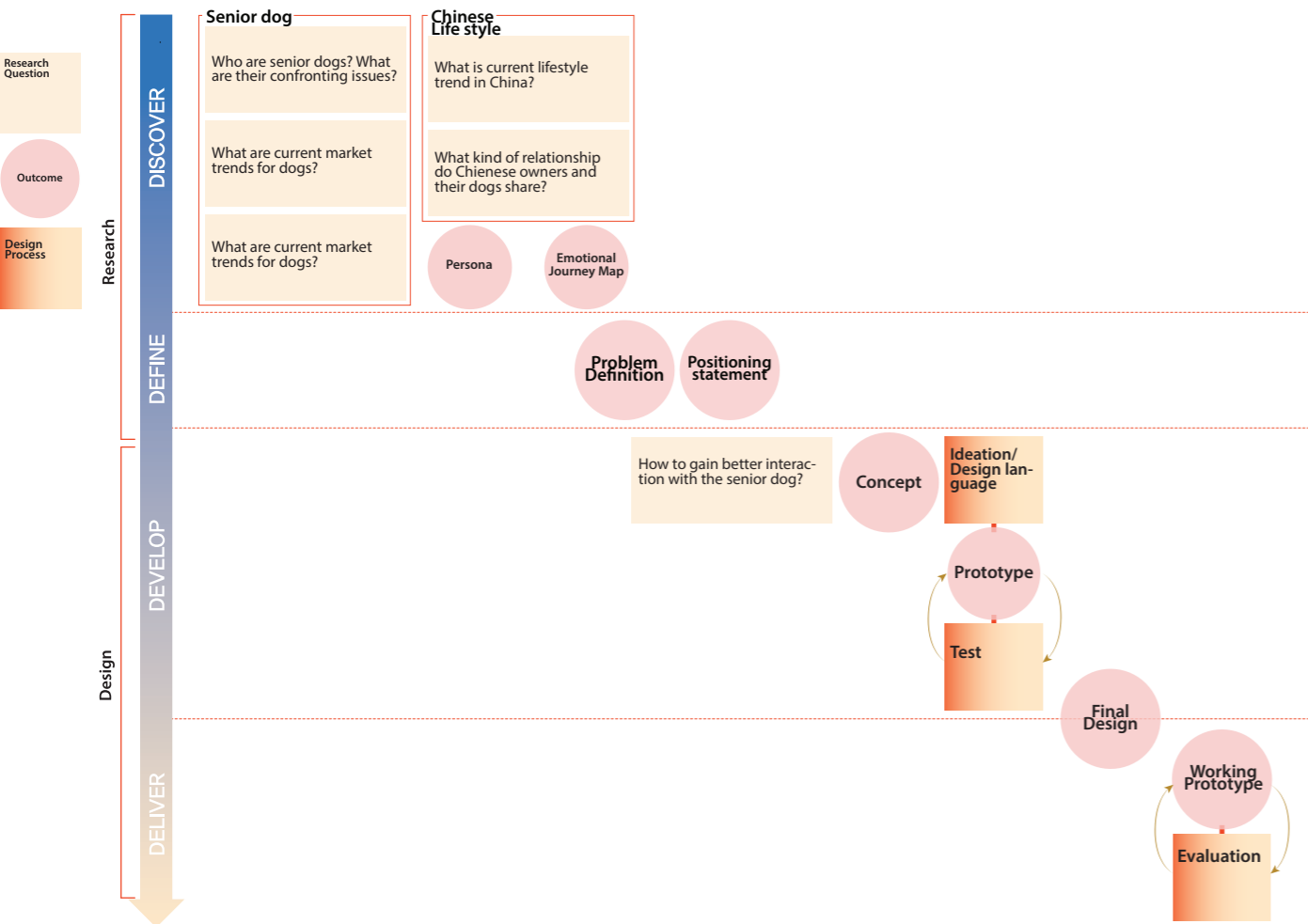


Figure 2. Project approach steps

1.3. Structure; Double Diamond Method

To give structure to the project and this report, the Double Diamond method will be used. It is an overall linear process, and every stage will go through multiple iterations, but will end with a final product. In the first diamond step, the project starts from the design challenge and can verify the problem definition. In the second diamond phase, the project can build the solution based on the result of the first diamond step. (Lange, 2015) Moreover, the Double Diamond Model support an iterative and creative process to find the best idea. During the process ideas are generated, questioned and improved many times. This sequence is a fundamental element of good design.

The four phases are (Figure 3):

•Discover; Discover phase is the first section of the Double Diamond model captures the start of the project. In this step, literature research and contextual research will be conducted to consider information of the senior dogs and China in a broad context, gaining new knowledge and searching insights. What are important challenges and needs of senior dogs and Chinese lifestyle; How do the pet care market and Chinese market look like and what trends will play a leading position in the future.

•Define; In the previous sections, clear challenges and opportunities for senior dogs and Chinese owners were formulated. In the Define phase, all the possibilities identified in the Discover phase will be cohered and structured. These challenges and opportunities will be translated into a problem definition and a design brief, which is a foundation for

the next steps. During the Define stage, all insights from the Discover phase will be analyzed and clarified what insights are valuable, why they are and how. The purpose of the Define phase is to determine a design brief that formulates a meaningful design direction.

•Develop; Develop phase is the third quarter marks a period where concepts are designed, prototyping is made, tested and iterated. During this process of experiments and failures improve designs to enhance and refine the ideas. In the Develop phase, ideation and creating concepts are started. The ideas are experimented and verified with quick and dirty iterative prototypes.

•Deliver; Deliver phase is the final step of the double diamond model. In this period, the resultant product is concluded and produced. After going through Discover, Define, Develop phases a final concept will be started the last stage of the Double Diamond model. In this phase, the final concept will be developed into a working prototype and investigated in an evaluation.

The intention to apply the Double Diamond Model is to concentrate on the entire process. Not only the delivery of the product but also, the relationship with the right stakeholders in the proper context in the process is vital to the project. The process will create various views in the diverging study stage. Furthermore, to convince the stakeholders the reason of what and how to make decisions.

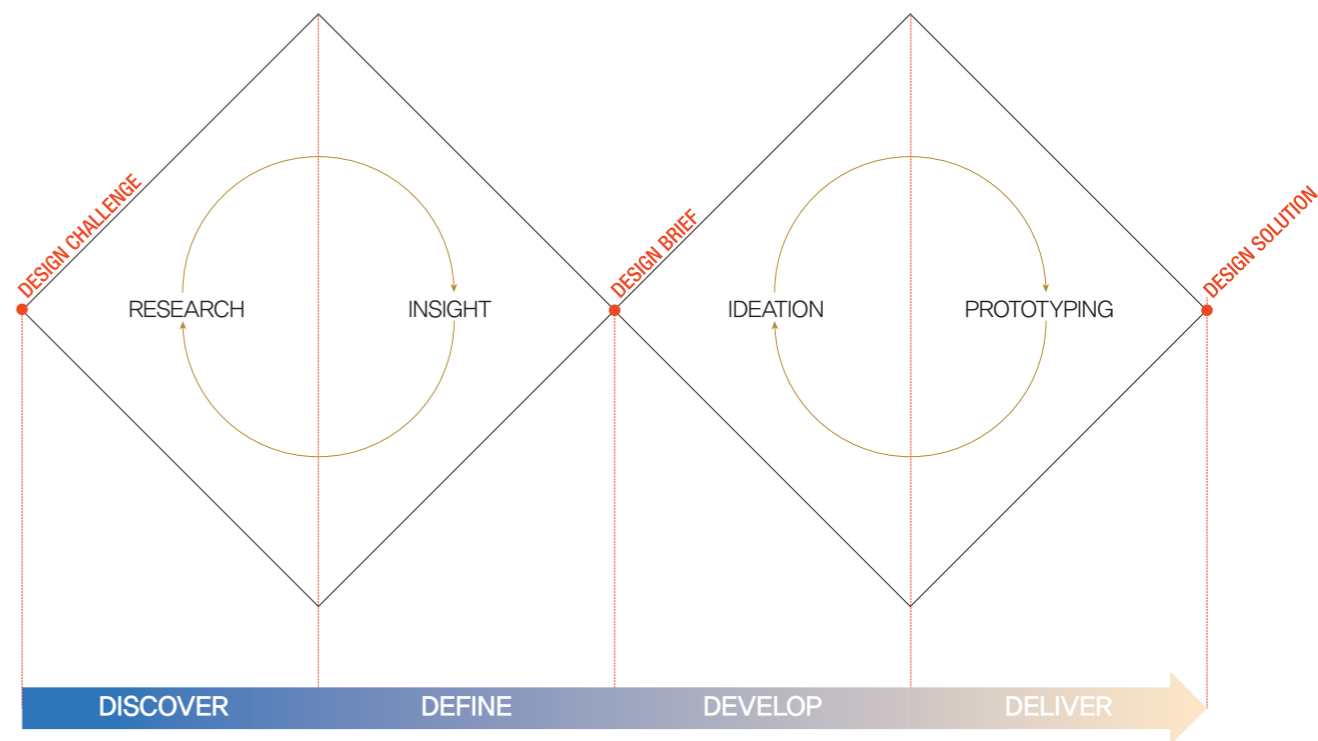


Figure 3. Double diamond structure

A. DISCO - VER PHASE

2. Literature research 1-Understanding senior dog

3. Literature research 2-Understanding Lifestyle Trends in China's Big Cities

4. Contextual research-Understanding human & senior dogs interaction

14 To create a better understanding of the context, literature research on senior dogs and the industry is necessary for the following reasons:

Firstly, to figure out the state of the current industry and to define the overall concerns and needs. The research will capture the future senior dog care industry and expected needs.

Secondly, to gain insights from the perspective of different stakeholders. Since the overall project focuses on the relationship between old dogs and their owners, the viewpoint is mostly from a service receiver (partners.) The findings from this analysis will be useful for delivering feasible and relevant solutions for the market and different stakeholders.

And at last, to know how the current industry is dealing with senior dog care and to clarify places it needs to be improved.

Based on this, following research questions were formulated;

- When can a dog be considered of Senior age?
 - What are common problems in senior dog?
 - What are the changes in their body, mental and behavior?
 - What are the trends and visions regarding the senior dog care in the industry?
- And what are underlying reasons for these trends?
- What are the challenges that the senior dog care in present faces? What are the underlying reasons?
 - What is the recommended direction for future senior dog care concerning the interaction between human and dog?

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2. Literature research 1- Understanding senior dog

Image source: AE Pictures Inc. / Getty Images

16 **2.1. The Senior Dog**

Senior dogs are one of the main stakeholders of the entire project. In order to fulfill their needs, it is reasonable to study their current statement. In this chapter, the stage of the lifespan of the dog and the senior dog will be defined, and through the definition of the senior dog, the common issues will be studied.

2.1.1. Lifestage of dog

Most of the books, websites, papers, and other media about dogs are give notice on the different life stages of dogs. However, each resource explains the life stages slightly differently. By interpreting these findings, clear definitions can be formulated. It is not possible to split each life stage at a specific age because dogs are aging at different speeds by their breed or personality. However, this information will still be useful to create background knowledge and an overall understanding of the senior stage and the transitional phase towards stage. However, timing aside, all dogs must go through the same steps: active puppy phase, changeable adolescence, the relatively easy adulthood, and the dull, and inactive senior phase.

- Puppy(born-12 months)
- Transition phase
- Adolescent(6 months-18 months)
- Transition phase
- Adult(12 months-10 years)
- Transition phase
- Senior (8 years-rainbow bridge)

The definition of aging terms from collected data will be a foundation for the entire project (Figure 4). The conclusion is that dogs' senior stage starts from eight years old and the defined senior stage contains transition phase.

This number will be used as a standard for this project and it isn't absolute truth.

2.1.2. Common needs and states of Senior dogs

For each stage of their life, dogs have different needs due to changes. For instance, puppies are demanding and active, adolescents are unpredictable, adult dogs are eager and confident, and seniors are slow and indifferent.

DOGS AGING PROCESS; DIFFERENT INDIVIDUAL BUT SIMILAR IN GENERAL

Not all dog breeds age in the same way, it is important to clarify this. In general, dogs of small breeds grow into adults faster than larger breeds (Dogtime, 2012). However, the average lifespan of small breeds is longer than that of big breeds(SONIAK, 2014). The process of aging often begins slowly and together with the fact that there are many variations in the rate of maturation among breeds, makes the aging process imperceptibly for their owners. Therefore it is smart to look for the signs and symptoms of old age. Senior dogs should not only live long, but also have a cheerful, relaxed, and painless last years together with their family.

During senior stage of the life cycle, old dogs suffer from many of the same aches as elderly human beings, such as joint pains, hearing loss, cataracts,

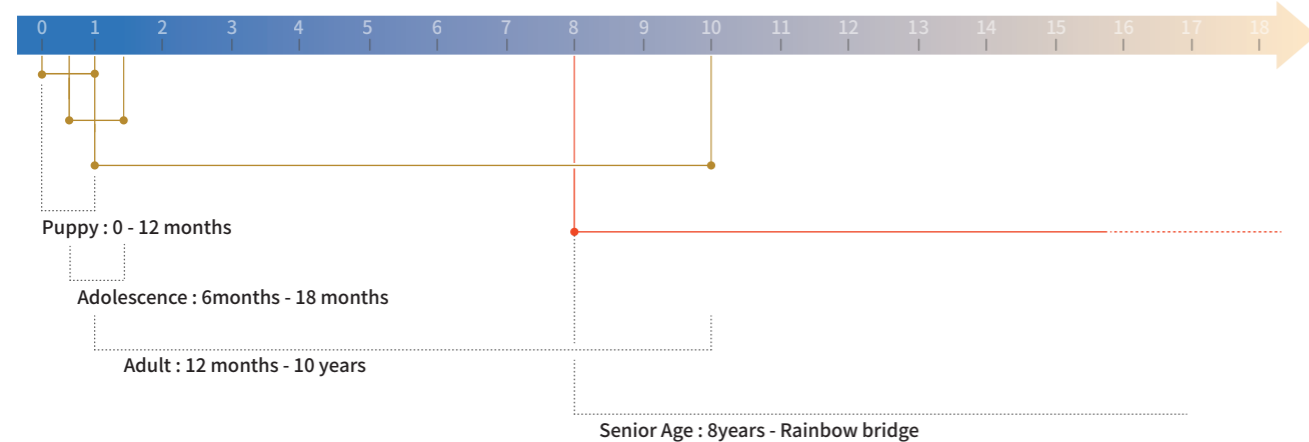


Figure 4. Lifestage of dog

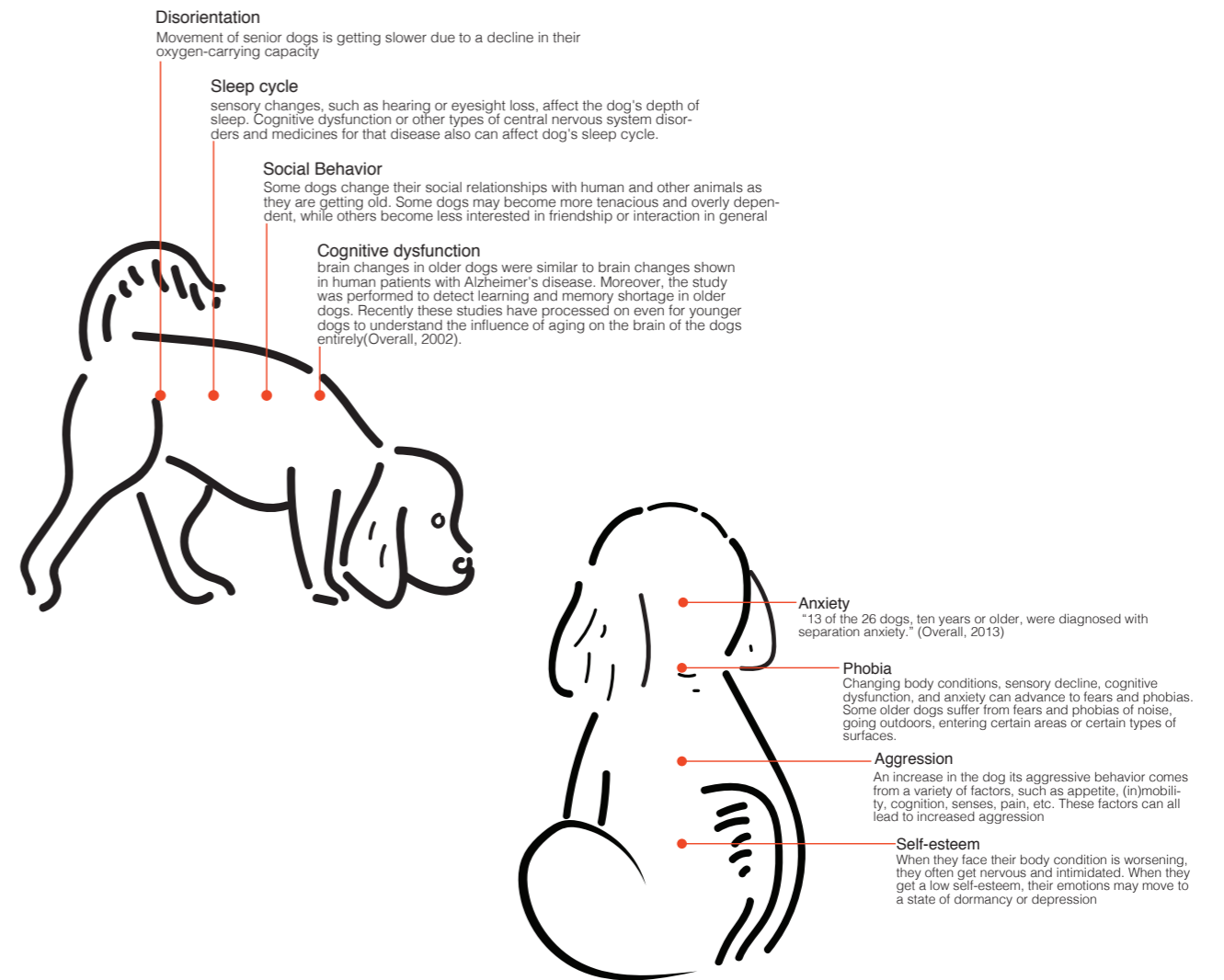
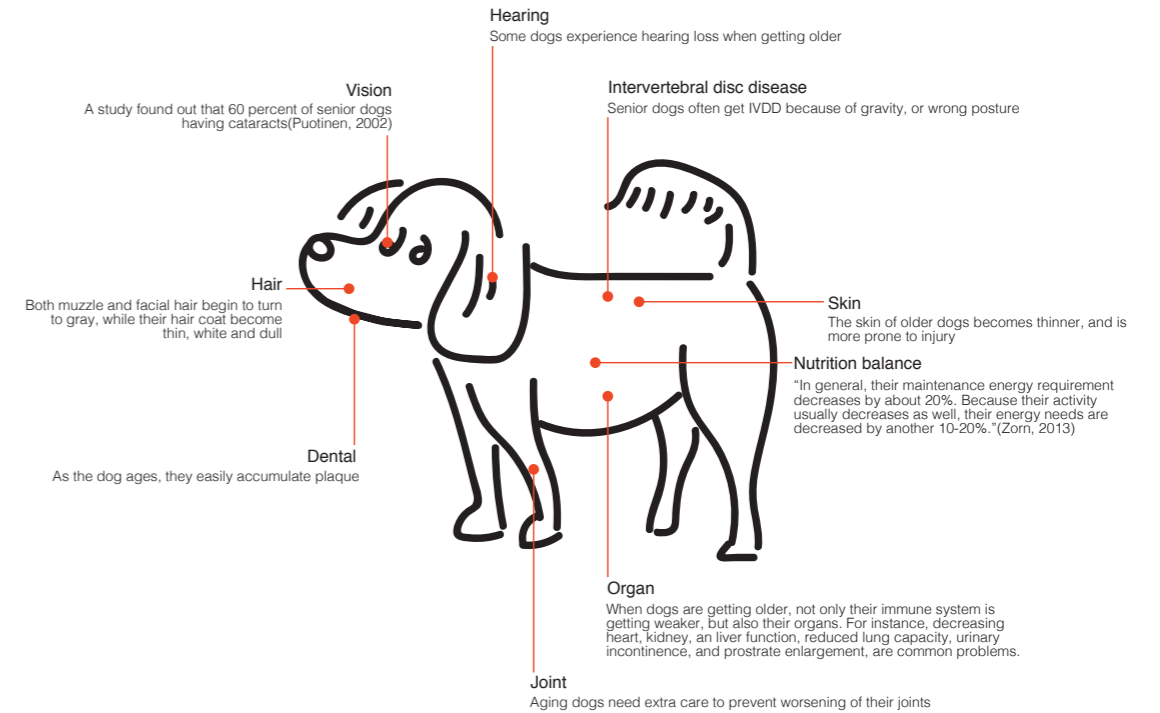


Figure 5. Senior dogs' body, behavior and mental aging symptoms(from top to bottom)

18 kidney disorders, blurry eyes, etc. However, sense of smell is commonly not affected much by aging. The most common changes can be divided into physical, behavioral and mental problems(Zenkoku pettoshitta kyokai, 2012). These symptoms and signs are the signal of dogs' aging(Figure 5). More specific information is in appendix A.

The physical change of the old dog its body, also affects their mental and behavioral state. Furthermore, the mental and behavioral states also affect the physique of the dog, and thus these three aspects are connected and influencing each other. It has already proved that canine emotion and mental health have a connection with the immune system and health state (MCMILLAN, 2017.) Moreover, a Recent study conducted by Neuroscientists at the University of Pittsburgh proved that evidence for the neural basis of a mind-body connection (Admin, 2016). For example, a depressed dog stops eating or moving, and the dog's body condition will worsen. It is important to work on all three aspects if one wants to help the dog increase their overall health. Therefore, all three aspects need to be concerned for a better aging of the senior dogs.

2.2. Pet Care Trends Analysis

In this chapter, the trend of pet care industry will be studied. The study about pet care industry is a necessity to understand underlying challenges and opportunities. In the previous chapter, senior dogs' changes from aging and their needs are studied. Through this chapter, a comparison between senior dogs' acquired needs and market needs will be done.

2.2.1. Humanisation on the dog

According to Sarah Schmidt, a trend researcher, mentioned that one of the most significant trends in 2017 is the pet industry is humanization (Schmidt, 2017). Humanization in the pet is easy to see in the daily life, for example, dogs' clothing shopping mall, dogs in clothing dogs in stroller, etc.

It is not difficult to see people treating their dogs as if they were their children. According to a Fortune-Morning Consult Poll, 76% of owners in US categorize their pets as "beloved members of the family," compare to the 19% who answered that they are "well cared for, but still considered animals". The circumstances come down to demographic shifts. More population live alone, (the percentage of single households rose to 28% in 2014 from 17% in 1970 in the US.) who are waiting for marriage or having kids. At the same time, retired people are living longer, with healthier lives. These trends wind up in a significant percentage of the population that has the money, time, and emotional space to treat their dogs as if it were their child.

Every part of the pet industry has been affected by this major trend, the concept of humanizing pets. In the time, the term "humanization" has been a crucial issue in the animal market business. It means something very different from the "anthropomorphism." The humanization of pets is mostly about quality and safety. For instance, procedures such as hip or renal transplants are now popular in veterinary medicine because dog owners are asking human-quality treatment for their dogs. The content ideas here are limitless. In this chapter, humanized dog food, social media, and body care will be discussed.

FOOD;

This trend correlates with the growth of the pet food market, including healthy treats, specialty pet foods, and cooking for your dog. The trend is moving from expectations of "high quality (for pets)" to "humanized". It means pet owners desire pet food options that address the same health concerns as human food production.

The "organic" dog food category used to be a favorite

19 in certain consumer segments. Nowadays it evolved into a more specified issue, "no genetically modified ingredients (GMOs)". Despite the fact that it is still considered that "non-GMO" to be a disputed value for human food.

Nowadays, consumers drastically prefer pet foods made in their kitchen over those made in a factory. (NIELSEN, 2016)

Consumers seek for more honesty on food origins. For instance, in France, strict labeling requirements for human food have raised expectations for pet food. It shows that consumers want to see transparency on ingredients of their dogs' food.

Following these trends, people are starting to cook for their own dogs(Figure 6). Cooking books for dogs are published more and more. These books show a wide variety of styles, cooking skills, and balanced diet. Also, people are buying food dryer machines to make homemade snacks for their dog. They are sharing ideas and skills to make meals for your dog on their social media or Youtube channel. (NIELSEN, 2016)

SOCIAL MEDIA;

Humanization causes an increase of social media for pets, this includes private dog accounts, and even commercializing these accounts by using sponsorships. The trend is moving from only pictures of the dog in the owner's social media account to an individual social media account for the dog. It means pet owners desire to give more emotional meaning to their dog, and create a personal space of their dogs.

According to a study conducted by BarkBox, a company that provides pet-themed products and

technology, canine owners post a picture or talk about their dog on social media six times a week on average. Also, those people watch footage of dogs or check out dog pictures about three times a week, and one in ten has a own social media account for their dog(SPECTOR, 2017).

Most dog owners perceive their furry friends as members of the family and express and represent them on social media. Posting pictures on social media is for some dog owners a way to relax, and feel connected to their dog.

One hand, posting dog related media on the web can be an opportunity for a new business model. Nowadays, humanization of dogs give advertisers and retailers new sources of revenue. As the pet industry grows, some dogs are making up to \$10,000 per Instagram post (Entis, 2016). There are dog owners who upload photos of their dogs on social media and tag a particular business or brands to provoke interest to their followers. The dog owners tagged the dog and, referred to a certain brand as the dog's favorite place to go or eat, etc. Even if the brands doesn't pay for the posted pictures, it will generate more followers (Figure 7). However, not everyone that is using Instagram accounts for their dog is supporting their favorite brand. Some people are more interested in building a space where is it is cheery and separate from their social media neighborhood. Joselin L Estevez, social media director at X Factor Media, states that pictures of dogs posted on social media tend to be "free from politics."

Likewise,"people create an Instagram account for puppies share the pure pleasure of looking at



Figure 6. Cook book for dog(instagram @ssongssongyi)



Figure 7. Famous Instagram dog Popeye (instagram @popeyethefoodie)

20 posted picture of dogs during hard times. People take posting their dog's picture or creating dog's own account as a stress reliever.

SPECIAL CARE

Dog humanization opens up a new special pet care market. Before humanization of pets, body care for the dog had mostly to do with hair cuts or medical treatment. However, nowadays, the trend is moving to special treatment like dog spas, and veterinary acupuncture. It means dog owners seek to give more special experience and care to their dog.

These pet spas are spreading, starting from the major cities. These spas do not only take care of the dog its looks, but also reduce stress and skin issues. Both owners and dogs use these spas as a social meeting where they easily make friends whom they can occasionally meet (at the spa). (Entis, 2016) See Figure 8.

Normally, acupuncture is a treatment where the practitioner inserts fine needles into the body to help control pain and cure chronic illnesses. It's an ancient practice in humans and animals. Acupuncture was studied in India for more than 7,000 years, and 5,000 years old evidence of acupuncture was found in China.

The underlying concept of acupuncture according to Ancient Chinese medical theories is balance. These theories believe that sickness is the consequence of an imbalance in chi, which is the body its vital energy. By guiding the chi along a determined route in the body (with needles), the energy can go to the right places. Medical research has found changes in electrical activity, enhanced blood circulation, reduced in muscle contractions and the release of endorphins and other chemicals in the brain during the acupuncture process (Mahaney,2017).

The International Veterinary Acupuncture Society provides a certification program for veterinarians. Currently, more than 150,000 vets use acupuncture on their patients(Figure 9).



Figure 8. Dog spa (Instagram @gomsillove)

In this chapter, humanization of dogs is clarified and categorized. As dog owners treat their four legged friend as family more and more, this trend will only expand further into new areas. However, a dog is not a human, and their natural instincts are often overlooked.



Figure 9. Dog acupuncture (image source: <https://www.theguardian.com/lifeandstyle/gallery/2017/aug/25/acupuncture-for-cats-and-dogs-in-pictures>)

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2.2.2. Technology meets your dog

It is not only people who are living longer than before but their pets do too. According to the study conducted by the Tokyo University of Agriculture and Technology, the latest patterns show how the longevity of pets have steadily increased in recent years, with the average lifespan growing 1.5 times for dogs in the past 25 years. (Demetriou, 2016)The growth of indoor dogs, quality food, more advanced medical treatment and assistive technologies are most fundamental reasons behind why the lives of dogs are extended. In this chapter, technology in the field of pet care and how this technology changes the life of dogs will be discussed.

MEDICAL EXAMINATION

X-rays, ultrasounds, CT scans, MRI, and other types of medical imaging are common medical examination in the human world. Nowadays those medical tests are used on the canine body check too. The advanced technology brought abundant opportunities on animal hospital practices and longer lifespan of canine (TUFTS University, 2013). Thanks to all these high-tech examinations, it is easier and faster to find disease and problems that dogs have.

The Eötvös Loránd University in Hungary recently found out that the dog brain is working similar to that of humans by examine dogs in a MRI machine. The dogs brain is able to understand meaningful words while they also have the ability to combine different

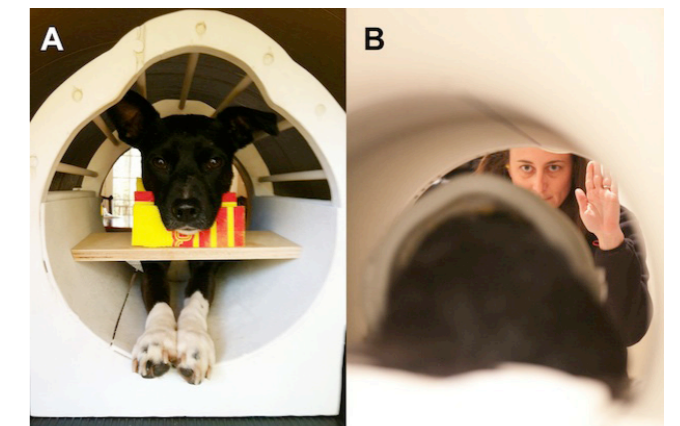


Figure 10. Functional MRI in Awake Unrestrained Dogs (image source:<https://doi.org/10.1371/journal.pone.0038027>)

words and sounds, to create an overall understanding of the situation. (Howard, 2016) See Figure 10. This kind of studies can help owners understand their dogs better.

COMMUNICATION

Several companies are applying technology to stimulate human-dog communication.

The company, NSID, based in Sweden, release 'No More Woof' what is a small gadget around dogs' head that uses the latest technology in micro computing and EEG to analyze the thoughts of dogs

“Whatever you might want to give for yourself and your children, you might want to do for your pets as well,” -George Puro, an analyst for the market research firm Packaged Facts-



Figure 11. No Mo Woof

and translate them into the human language using a speaker (NSID, 2017). See Figure 11.

Also, North Carolina State University developed a suite of technologies that can be used to enhance communication between dogs and humans. The goal of the study is making better understand what is on the dog's mental. The researchers developed a platform for computer-mediated communication between people and dogs. The technology is a harness that fits comfortably onto a dog and is equipped with a variety of technologies to, again, translate the dogs mind (Roberts, 2017).

DAILY CARE

Dog owners actively adept to new technologies for their pets, especially "Internet of Things" is seeing a ramp up in the daily care-taking of dogs.(Figure 12)

Many companies have released automatic feeder on the market to solve the problem of feeding while the owner is not at home (in time). Now, the user can set feeding times and programs to dispense the ideal portion at the ideal time for their dog. These ideal feeding portions are also beneficial for the dogs health. Some products even use scientifically proven feeding patterns and amounts.

Smart toys contributes to proper quantity of exercise and treats for dogs by stimulating the dog's senses (light, motion, sound, etc.).

Some products are playing dog sitter during the day. The user can track or interact with their dog through their phone, PC or tablet and can spend some time with their dog who's home alone.

10 million pets get lost every year, and smart tech is beneficial for that. The smart trackers mostly have a shape of the dog collar. Those products track not only their dog's 3D physical grid but also their body statement such as body temperature, stopping barking, etc. The products are connected to user's smartphone via Bluetooth or wifi. Some trackers are installed somewhere in the house. It has a camera in it and shows their dog to users' smartphone. It is useful for remote duos.

In this part, applied developing technology on dogs and examples are presented. The divisions of using high-tech on dogs are getting more influential and larger-scale is found with the conducted study. The technology makes the life of the owner of dogs and dogs easier than before. Nevertheless, It should not be disregarded that protecting the natural instinct of dog and overly depending on cool pet products.

The pet care market is getting bigger and bigger while pet care business and dog owners claim to do it for the well-being of dogs. However, dogs have a long history as a domestic animal, and people tend to forget that. A dog is not a human being, but a pack animal. As pack animals, dogs obey rules, boundaries, and limitations from the pack leader (owner). The famous dog whisperer, Cesar Millan mentioned that exercise and discipline should come before affection. If these natural instincts are ignored, there is a big chance of anxiety, antisocial personality, Luxating patella, nutritional imbalance, behavior disorder, etc (Huff, 2008).



Figure 12. Diverse dog daily care smart product

24 **2.3. Conclusion; Underlying Opportunities and Challenges of Senior dogs**

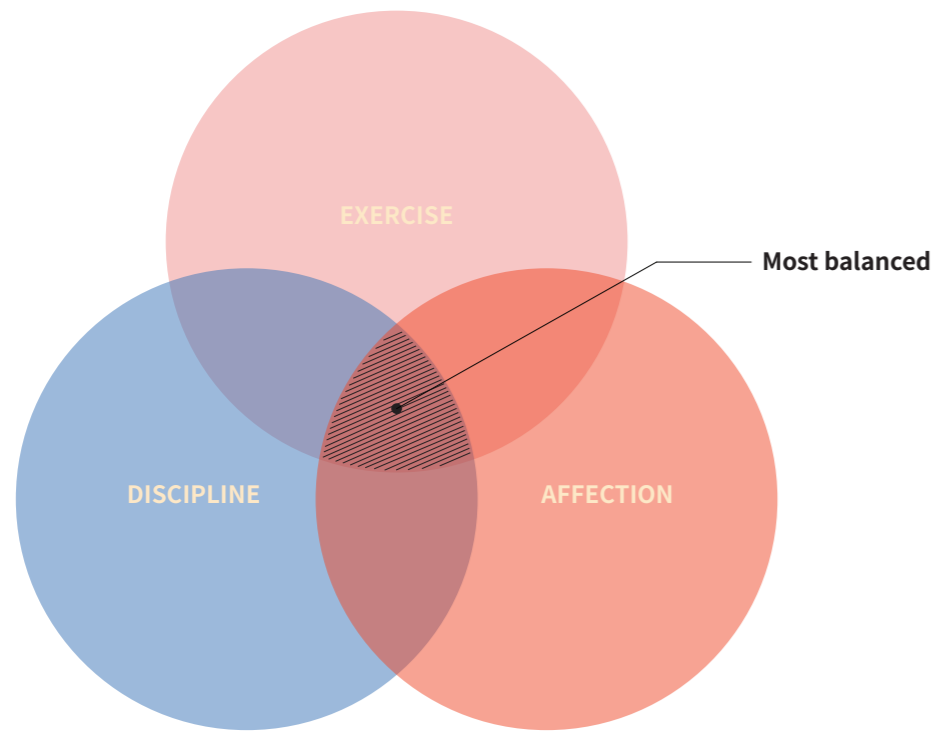


Figure 13. Most balanced well-aging of Senior dogs

2.3.1. What is well-being and well-aging of your senior dog?

A remarkable finding from the trend research was that dogs never enjoyed such a luxurious lifestyle as they do currently. Some dogs live a better life than the average human, and their owners are proud of it.

Not all humanization trends are bad, increase in animal rights, social and political consideration on the dog, and better healthcare are some of the many positive improvements for dogs. Living in a balanced environment is important for dogs to prevent confusion of their life in a human world. The owners must help their dogs achieve a balanced life by starting to fulfill their needs as nature intended.

As the study shown, dogs are human in this generation. The dogs all over the world get the human level or better than the human level of service and product in various fields. The owners of dogs excited to treat their dog same as other family members and give the best for their dogs well-aging.

However, on the other hand, they are still animal. As the previous research pointed, the basic requirement of dog is the combination of exercise, discipline, and affection(Figure 13).

The service or product for the senior dogs should expand the meaning and role to follow the trend and also satisfy dogs' natural instinct. The quality of service or product should be high as humans'. However, the service or product has to respect senior dogs' natural instinct to protect their mental health.

25 2.3.2. The holistic care for senior dog is required

As these changes are not pleasant, and extra supports is needed for senior dogs. Based on the conducted study in the previous chapter, the biggest trends is the humanization and technology of dogs. People spend more time and money on their dogs since they see their dogs as human. However, The current solutions found on the market don't fully cover the problems, and often do not solve underlying problems (Figure 14). These one-dimensional products and services available now mostly cover and focus on the senior canine physical change or the facilitation of comfort and satisfaction for the human owner.

The dog's changing body affects their behavior and mental state, so a revised treatment is needed to prevent worsening their health. Stopping physical change (aging) is hard. New medical treatments and technologies can slow this down, but aging stays inevitable. Therefore mental or behavior care is ever more needed for a better life quality for the senior canine.

Physical Changing	Behaviour Changing	Mental Changing
Improved Medical Technology		
Improved Pet Food Non GMO Premium food line Strict labelling		
Cooking Book for Pet		
Pet Spa		
Pet Acupuncture		
Medical Examination Pet X-ray Pet MRI Pet CT		
Feeding Machine Programmed feeding machine Smart feeding machine		
Smart Toy		
Tracker GPS tracker Pet cam		
	Communication 'No more wool' ,NSID	

Figure 14. Current trends do not offer holistic care for the senior dog

For the sake of getting a better knowledge of the context, literature research on the lifestyle trends in China is a requirement for the following reasons:

Firstly, to study the complete scene of the current life trends and to define the matters and needs. The research will promote catching the challenge of the Chinese life style market and required needs.

Secondly, to know how the current Chinese trend is dealing with the daily lifestyle and to clarify points it demands to be improved.

Lastly, to study and build the link in between Chinese life style trends and the needs of senior dogs.

Based on this, following research questions are built;

- What is the current lifestyle trends of China?
- What are the changes in the environment, people, and general home product market?
- What are the insight and visions on pet care market regarding the new lifestyle trends in China?
- What are the challenges in the Chinese trend in present faces?
- What are the underlying reasons?
- What is the recommended direction for future Chinese market on senior dog care concerning the interaction between human and dog?



3. Literature research 2- Understanding Lifestyle Trends in China's Big Cities

Image source: Photographer, Tomohiro Ohsumi/Bloomberg

Analyzing the current trend is helpful for getting a better understanding of target users since the trend is a reflection of present needs. In this chapter, three aspects of trends will be examined, environment, people, and product, to understand Chinese who are living in major cities in China.

3.1.1. People

This entire project is for the senior dogs and their owners. Pets and people are giving influence to each other in daily life.

In the previous study, it was clear to see that people believe that their pets are their family. Therefore, in this chapter, not only the changing in Chinese family structure but also effect on dogs after changing family structure will be studied.

CHANGE IN FAMILY STRUCTURE LEAD TO A BIGGER PET MARKET

The family structure in China has undergone changes with industrialization, urbanization, modernization and globalization.

The study found that there was an accelerated increase in the number of family households, reduce in family size, a continued shrinking in household size, and a trend of simplification in recent years in China. The proportion of the one couple household is the largest rise, and the two-generation standard nuclear family presented is the biggest fall from 1982 to 2010. The single-person household has been becoming more abundant, and the nuclear family still took the most remarkable proportion. The extended-family household still maintained a relatively significant percentage. Reduced fecundity, population mobility, aging, and the improvement of housing conditions are the primary reasons for changes in the family structure and the household in China (Hu, & Peng, 2015).

One person household is a world wide trend. The one person household on all over the world will rise 18 percent from two hundred eighty-thousand in the year 2011 to three hundred thirty-thousand in the year 2020. It is one house among six houses. In China, the pattern of family structure is getting smaller and smaller. The difficult parts of living alone or small family are the anxiety of finance, managing emergency, and loneliness. In reality, the buzz rate of 'loneliness' is increasing. Therefore Pet care business in Chinese consistently increases to support loneliness of one person household or small family.

The lack of activities is not only from the limited

space. A Huge amount of workload of Chinese is also an important cause. According to Wang Qi, a researcher of the Beijing Normal University, the average Chinese worker works between 2,000-2,200 hours every year. It is around 500 hours more than workload of European countries(Qi, 2014).

3.1.2. Environment

According to the dictionary, the definition of the word 'Environment' is 'the social and cultural forces that shape the life of a person or a population.' Like this definition, people have a strong influence from where they surrounded by. In this chapter, internal and external housing environment will be studied to get knowledge of lifestyle of Chinese.

INTERNAL HOUSE ENVIRONMENT; CHINESE HOUSES ARE SMALL BUT THE FUNCTION OF THE HOUSE IS GETTING BIGGER

After the global crisis on 2008, the housing trend has changed from bigger and luxurious to smaller and efficiency. Even before the global crisis, compared to other countries, the average size of the house in China is smaller than another country(Figure 15). An average size of Chinese housing is 60 square meter.

Recently the desire of safety is increasing among people in China since the elements of environmental peril are deepening, such as safety issue, environment pollution, crime, etc. People who have felt menace on their safety prefer familiar and stable thing to brand new, and take the house as their

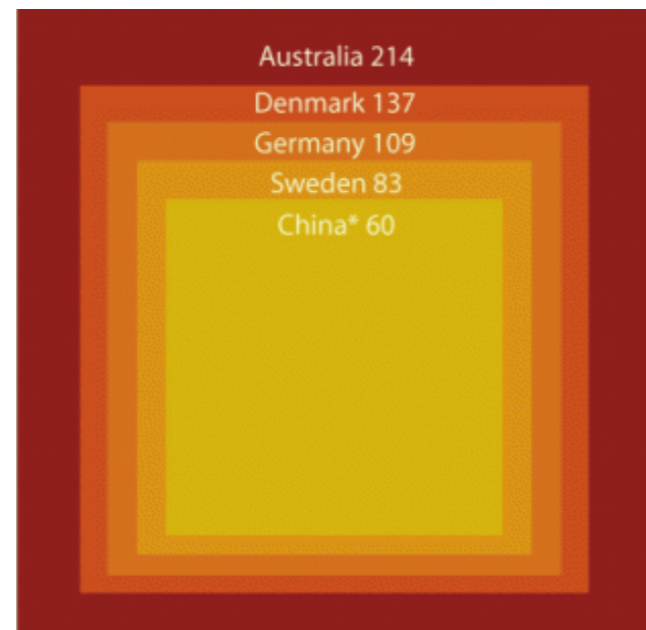


Figure 15. Comparably small Chinese house (Image source: shrinkthatfootprint.com)

The huge trend 'Home cooking' and '家饭(Soul food)' that cooking food at home brought consumers to their kitchen. Not only home cook but self-interior is getting popular. Compare to the year 2015, the rate of self-interior products, such as door knob, light, wallpaper, etc., is 20 percent higher than in the year 2016. The example is extreme sales growth of Ikea China. The history of Ikea China is very short, but now China owns 4 of Worlds' largest 5 Ikea store (Magnusson & Molin, 2016). These examples shows that Chinese people spend more care and money on and in their house.

Nowadays, the house chores are not only a duty for housewives but also diverse people such as students, business people. This self-control will be expanded wider field since it is easy to get professional gadgets and information. The support is needed for home cooking and home activities. The meaning of house in China is becoming to a place where they can find the meaning of daily life, and where they can express their personality. As people stay longer at their home, companies in China are trying to bring outdoor activity and other outdoor experience to their home.

The process is more important than the result of most activities in the house. The performance at home now plays. People enjoy chores as a game such as cooking at home, grow the plant at home. Every moment in home authorized the meaning by people post the activities on their social media. Therefore, the support is needed what makes people enjoy the process.



Figure 17. Dogs with masks (Yoo, 2017)

EXTERNAL HOUSING ENVIRONMENT; BAD AIR QUALITY ATTACKS NOT ONLY HUMAN BUT ALSO PETS

Decreasing air quality is one of the biggest reason why Chinese people spend more time at home. The air quality level in Beijing and other cities in China is up to 40 times higher than recommended exposure limit(Figure 16). Chinese weather forecast is reporting not only weather but also the level of fine dust in the air. People are suffering from a chronic cough and stuffy nose, even shorter life expectancy. It is worse to children and pets(Wong, 2013). The owners of dogs taking a basic step as 'no walk' for a high level of air pollution. Dogs' body is mostly placed near the ground. Therefore, it is easy to expose to polluted material(Yoo, 2017). See fFigure 17. Some owners design hand made 'puppy mask' or put their dogs in a stroller, with wearing dog sunglass. So far, the study about the relationship between fine dust and animal has not conducted. However, it is assumed that fine dust has a bad effect on domestic animals. Heavy metal in fine dust can be absorbed into the respiratory tract and become inflamed. Also, polluted air can be a cause of conjunctivitis, inflammation of the cornea, skin disease, etc. Especially, polluted air affects on senior dogs health, because senior dogs have a weak respiratory system(Yoo, 2017).



Figure 16. Chinese air quality is on dangerous level (image source:aqicn.org)

30 3.1.3. Product

As the study conducted in the previous chapter (3.1.2. Environment), the function of the house is changing among Chinese people. This section is expanded research of the prior study. In this chapter, what type of products are preferred in Chinese houses and what type of products do Chinese people put more value in nowadays will be studied.

EFFICIENT PRODUCTS FOR SMALL HOUSE

Following conducted study by GFK, a global market research company, the global market for small domestic appliances was almost seventy-million dollar in 2015. It grew 9% from the year 2014. The new products and new technology lead 30 percent of the success of small domestic appliances. Health and beauty products such as skincare product, mixer, air purifier, air fryer, etc. show drastic growth. In the previous chapter (3.1.3. Environment), it has studied that the boundaries on things people can do between indoor and outdoor have disappeared. At the same place, people do work and play together. Space can change its characteristic based on the goal and purpose of users. Moreover, connected life with smartphone or tablet PC giving power to mobility. Therefore, the mobility, which user can use wherever whenever they want, has to be considered by diversity on usability pattern (디자인트렌드, 2016).

The concerning on making better use of space is increasing in China since the house has not big enough area. Nowadays companies launch such a standing refrigerator which uses smaller floor area but has a larger volume, a speaker has slim shape, and product can hang on the wall. The concerning on making better use of space is not only remain in the area but also its functionality. The consumption of Smart Convergence product, which is supporting control on multiple high-tech products by users, will increase.

A PRODUCT THAT CAN HAS STORY AND MEANING

A Chinese electronics company, 'Xiaomi' has had extreme growth last few years because of cost-effectiveness and the long term recession phase changes the pattern of consumption. However, on the one hand, one trend act counter to cost-effectiveness trend. One example is 'MUJI's success in China. MUJI is a Japanese retail company, which sells a wide variety of household and consumer goods. The products of MUJI is not cost effective compared to other Chinese brands. However, people in China consume their products because customer thinks that the goods can represent themselves and their lifestyle. Their product is simplistic and basic(디자인트렌드, 2016). Therefore the focus is on a person who uses the product, not the product itself. It is possible to assume that nowadays consumers take 'cost efficient' as not only price but it also can be

longevity on using the product.

Chinese consumers prefer the product that reveals the story of the user. The product should not contain same ordinary meaning with others, and each product has a different story that expresses the style and taste of users.

31

3.2. Conclusion; Chinese and Their Dogs Living with Lack of Space, and Activities

Through the research, it is clear that China is going through a significant transition in many different spheres in the social scope. On the other hands, the big country also shares post figurative values. Therefore, during the phase of transition/development, frequent conflicts occurs over different values. The conflicts generate many challenges and needs.

The first challenge in China is a lack of space. As mentioned in the previous research, the average size of housing in China is getting smaller and smaller. People get more home appliances or furniture in their house. Therefore, the actual utility space in their home is less. However, people spend more time in indoor because of external elements, such as air pollution.

With increasing the quality of life by developing society, the meaning of the house has changed from habitation to a channel where people can express their individuality. As the meaning of the house is getting wider, individuals and some companies are trying to bring outdoor activity into the home. Still, the home is a limited area. Hence, even if people do outdoor activities in their house, the level of experience and an active mass will be restrictive.

The number of people living with the pet is increasing. However, other problems are derived from that also growing, such as homeless dogs, quarrel over noise, smell, etc. Moreover, dogs' health issue is also increasing since most of the dogs are spending their life in indoor such as lack of exercise, and spinal disk disorder which is a result of a slippery floor.

The positive change in a symbiotic relationship between human and dogs will expand from product to place. Especially small house and one person household need to share a limited place with animals. Therefore, the development for utilization of space is required.

Consequently, big number of the people in the major cities in China live a life with lack of space, activities, and time. Therefore, it is important to support them with quality experiences and process in limited space and time.

Through the previous research, it can be clear to comprehend the life of senior dogs in China affected by their owners' lifestyle, which is lack of time, space, and activities.

The former study stated that Chinese people and companies are trying to bring outdoor activities into

indoor. Therefore, also high-quality pet activity or service should move into the house.

Besides the context of the activities or service, the way of how to sharing human's time and space with senior dogs in the most efficient way, especially when the dog needs extra care.

In this chapter, online survey, and literature research are studied on the core topic of this study, understanding the interaction between human and senior dogs. Based on the conclusions from the previous literature studies, extra research is needed in order to define the needs of the owner of senior dogs based on their concerns, and understand how owners of senior dogs perceive and accept their old dogs.

Taking this into account, the following research questions are formed:

- What is the specific characteristic of Chinese owners of the senior dogs?
- What are the differences on the relationship between human and dog before and after dogs' aging?
- What are the underlying challenges of the senior dogs and their owners in daily life in China?
- Do owners want to give extra support to offer to their senior dogs? If so, why? If not, why not?
- What are the concerning issues in Chinese pet care market?



4. Contextual research- Understanding human & senior dogs interaction

Image source: Vogue Korea

34 4.1. Online-survey and Interview ; Characteristic of Chinese Owners of the senior dogs

An Online Survey and interview were conducted to understand and figure out the human(owner) and senior dogs interaction and relationship in China. The questionnaires and interview questions are based on a comparison between the past and now to extract clear opinion and thoughts on their current relationship with their senior dogs.

Chinese lifestyle trends analysis helped to know more about Chinese dog(pet) care style, values, and general characteristics as an owner of the dog. However, on an individual level, interesting details and thoughts in daily life are also inspiring for early-stage research. Therefore, questionnaires were used together with this kind of information.

SETUP

The main research question is 'What are the differences on the relationship between human and senior dog before and after aging?' In order to answer this question, other sub question must be taken into account such as; What is the meaning of dog? What is most representative emotion for your relationship with dogs before and after aging? What is the level of your sympathy/empathy level on your dog before and after aging? What kind of differences can be found on old dog compared to when he/she was young? When and how fond the differences?

Participants are required to older than eight years dogs' owners who are living in China.

Surveys are used as an approach to gain more insights on current state and environment of senior dog care and potential needs of the target group. The questions were listed according to an individual and dog information, the past experience(age of the dog 0 to 5), and current experience. These were phrased in an either closed or open structure. The goal was to collect around ten valid surveys, an amount which was considered to be enough for the qualitative research. People who are living in the major cities in China having senior dogs are taken as primary participants. They needed to be in the targeted dog's age-group, with different status, ages, and occupations.

腾讯问卷 a Chinese online survey form, is chosen as the tool to spread the questionnaire because China doesn't allow people to use Google form, and it provides a reliable survey platform in China.

Finally, seven valid responses were collected from qualified participants group. The number of

participants couldn't reach the goal. However, most of the participants claim similar opinion. Therefore it was clear to reach the conclusion.

Besides questionnaires, the conducted interviews enabled researchers to step into and observe their life. Though this is done towards Chinese, who are currently living in the Netherlands. The interview provided a complete and saturated narrative about experience with their senior dogs. The interview and questionnaire participants partly overlapped.

RESULT

The key findings are listed below. More detailed information is in Appendix D.

- Most of the age group, fields of occupation, and salary groups in China take their dog as their family member (more than 85 percent of people answer their old dog is their family).

- Most of the breed is small size species; barely it is medium size.

- The level of sympathy towards each other is rising by years.

- People are trying to give extra support to their dog even who mentioned they don't treat them different after aging. However, the support is not specialized. For example, most of the answers were only spending time together not in particular support.

- All of the participants don't trust and have pessimistic perspective on the Chinese veterinarian system because "The medical service is in a bad management, and the staffs lack a sense of responsibility and medical ethics." Therefore people expect more professional and trustful medical service for their senior dog.

- Price, lack of professional and facilities, and unethical custom are biggest reasons of that person rarely visiting the veterinarian.

- The time noticing signal of aging of dogs is different by a person.

- Cherish and grateful are main emotion that people have towards their dogs and it is not changing by time or aging.

- The owners taking special care on their dogs' physical changes, but behavior and mental changes.

DISCUSSION

The result of the online survey and interview show interesting fact. More than 85 percent of participants answered that their old dog is their

35 family. It is even higher number than the US. In the previous study(chapter 2.), 76 percent of US pet owners answered that their dog is their family.

Most captured problems from the senior dogs are behavior and eyesight. The problematic behaviors of old dogs are such as being quiet, avoid running or walking very slowly.

The owners don't want to treat their dog differently. However, they give additional support to their old dog.

The way of their support is mostly spending more time, that is abstract and they don't have other specific activities, and buy special(expensive) food. The additional support is now missing holistic care, which can cover body, behavior, and mental changing.

According to the result of interview and online survey, they want to give help to their old dogs but don't know how to, and they don't have a reliable infrastructure in their country. Most of the interviewees show distrust towards vet, and to solve the problem new pet care systems are arising, such as wecarepet.com (one of the participant mentioned the website) suggests a system that offers connecting Chinese owners to qualified vet or western vet service system. See Figure 18.

The interviews have turn out not to be as insightful as expected. Most of the answers are very similar to the online survey. However, participants were two Taiwanese and one

Chinese. Before the interview, Taiwan was expected as China. However, the level, expectation, and facilities of the pet care service system in Taiwan are extremely different from China. Thus the interview only provided some clues in the relationship between human and senior dog and disconnected options instead of clear and convincing conclusions. However, the results may help to evaluate ideas in later design stages.



Figure 18. Wecarepet offers developed pet care service to Chinese pet owners

The purpose of the persona is to summarize and communicate the findings. It will help to visualize the behavior and needs of target users (Delft design guide, 2013.)

According to conducted online-survey and interviews, particular characteristics of senior dog owners in China. Those unique features developed into one persona, which represents senior dogs owners in China.

The online-survey and interviews are done by the limited quantity of participants. The persona only driven by the result of the survey and interview. Therefore, the result can be limited.

4.2.1. Sun Li

A persona is named Sun Li (Figure 19). Who is 36 years old, born and living in Shanghai with her husband, six years old child, and her old dog Lulu. She thinks Lulu as her first child because when she first took Lulu, Sun Li wanted a dog instead of a child. The way she takes care of Lulu is quite preventative through healthy, and aging. She gives special supplements to her dog for anti ageing. Her bonding moments with LuLu are taking a walk with the whole family after the work every day, cuddling in front of TV in the bed, and sometimes cooking for the dog. Her knowledge about the dog is mostly from the internet, and she doesn't trust the vet a lot.



Sun Li, 36



Shanghai



Office staff



Status

Married; Husband, and 1 child (6 years old).



Personality

Proud, explorative, confident.



Emotional Value of Pet

Sun takes Lulu as her first child.



Bonding Moment

Taking a walk with the whole family after work.
Cuddling in front of the TV in bed.
Cooking for her family and Lulu.



Ambitions

Travel Europe with her husband.



Current Life Scenario

Conscious about her health, trying to eat organic and doing exercise, trust in natural way of healing (acupuncture, etc).
Too busy to take care of her kid, work and senior dog at the same time.



Care Habits

Preventing is better than curing. She gives special supplements to her dog against aging and for well-being.



Pet Knowledge

Her knowledge about dog is mostly from the internet. She doesn't trust the vet a lot.



Hobbies

Yoga, Wechat Moment (Chinese Instagram), traveling



Notes

Born and grow up in Shanghai.
Trying to take a walk with her kid and dog once a day
Believes in materialism.
Earns 1500 euros per a month.

Figure 19. The persona of Sun Li

She has proud, explorative, and confident personality. Her hobby is yoga, posting her life on Wechat Moment (Chinese Instagram), and travel with her husband. Her new ambition is traveling Europe with her husband. She is health conscious, trying to eat clean and do exercise, and trust naturopathy such as acupuncture.

Sun Li shares materialistic value, earn 1500 euros per a month. These days she feels it is too busy to taking care kid, work and senior dog.

4.2.2. Lulu

Following human persona, senior dog's persona has made, based on a study, in the previous chapter, about typical characteristics of the senior dog.

Lulu is Sun Li's old dog (Figure 20). She is nine years

old poodle. She stays home alone more than 6 hours a day since both Sun Li and her husband work and kid is going to daycare. Lulu used to be explorative, confident, and proud. However, nowadays she is losing her confidence and more relaxed. Slight intervertebral disc disease, amblyopia (losing eyesight), hyperacusis (losing hearing), and weakening on her behavior and mind. Recently she is getting tired quickly and staying at her bed most of the time because she sleeps more than 12 hours a day. It seems the bed is her comfort zone. Even outside, she has difficulty in walking more than 30 minutes also difficult to use stairs. However, her appetite is still good.



Lulu, 9



Poodle



Personality

Used to be explorative, confident, and proud
Nowadays she is losing her confidence which makes her confused and stressed.



Current Life Scenario

Getting tired easily these days.
Staying at her bed most of the time.
Bed is her comfort zone.
Difficult to walk longer than 30 minutes outside.
Sleeps more than 12 hours a day.
Stays home alone more than 6 hours a day.
Appetite is still good.
Difficulties with using stairs.



Notes

Slight intervertebral disc disease (twisted spine).
Amblyopia (losing sight).
Hypoacusis (Losing hearing).
Demoralized (less confident).

Figure 20. The persona of Lulu

38 4.3. Emotion Journey Map

The Emotion Journey Map workshop took place last moment of the developing phase. By reason of that at that point, the developing phase had not started, the design direction to follow was not decided yet, therefore the workshop used as a bridge between analysis and developing phase.

The goal of this session is to analyze the owners and the senior dogs' daily life in depth, and catch their emotions. Understanding the emotional experience suggests fundamental insights for improving current state and forming suggestions for new products or service.

Emotional Journey Map is a method built by Pieter Desmet. This method captures basic emotions passing through the context.

This method is originally from The Holistic Experience Scan (HES.), which is also created by Pieter Desmet. It has adjusted by Pieter Desmet for the last workshop, which was organized by MARS Petcare Europe. For the workshop session, the same method has used.

Based on this Journey map, the Holistic Experience Scan (HES) has three main categories: Sensorial, Emotions, and meaning. This adjusted method is mainly focused on emotions.

SETUP

Participants were asked:

- What are daily activities of Sun Li?
- What are daily activities of Lulu?
- What would Sun Li feel for each activity?
- What would Lulu feel for each activity?
- What are their pain points during their daily life?
- What are their top 3 universal needs through their daily life?

Target user's input and data were collected from participants who were able to freely express themselves through the workshop(Figure 21).

To understand human and senior dogs' emotional journey, each human and senior dog persona from the previous chapter has used. To fulfill the persona, and to minimize the cultural gap, five Chinese participants who are in different generation are selected. Two participants can't speak English, so others who can speak English translated English to Chinese through the session. Among the participant's group, four participants have senior dogs in China,



Figure 21. Emothinal Journey Map session

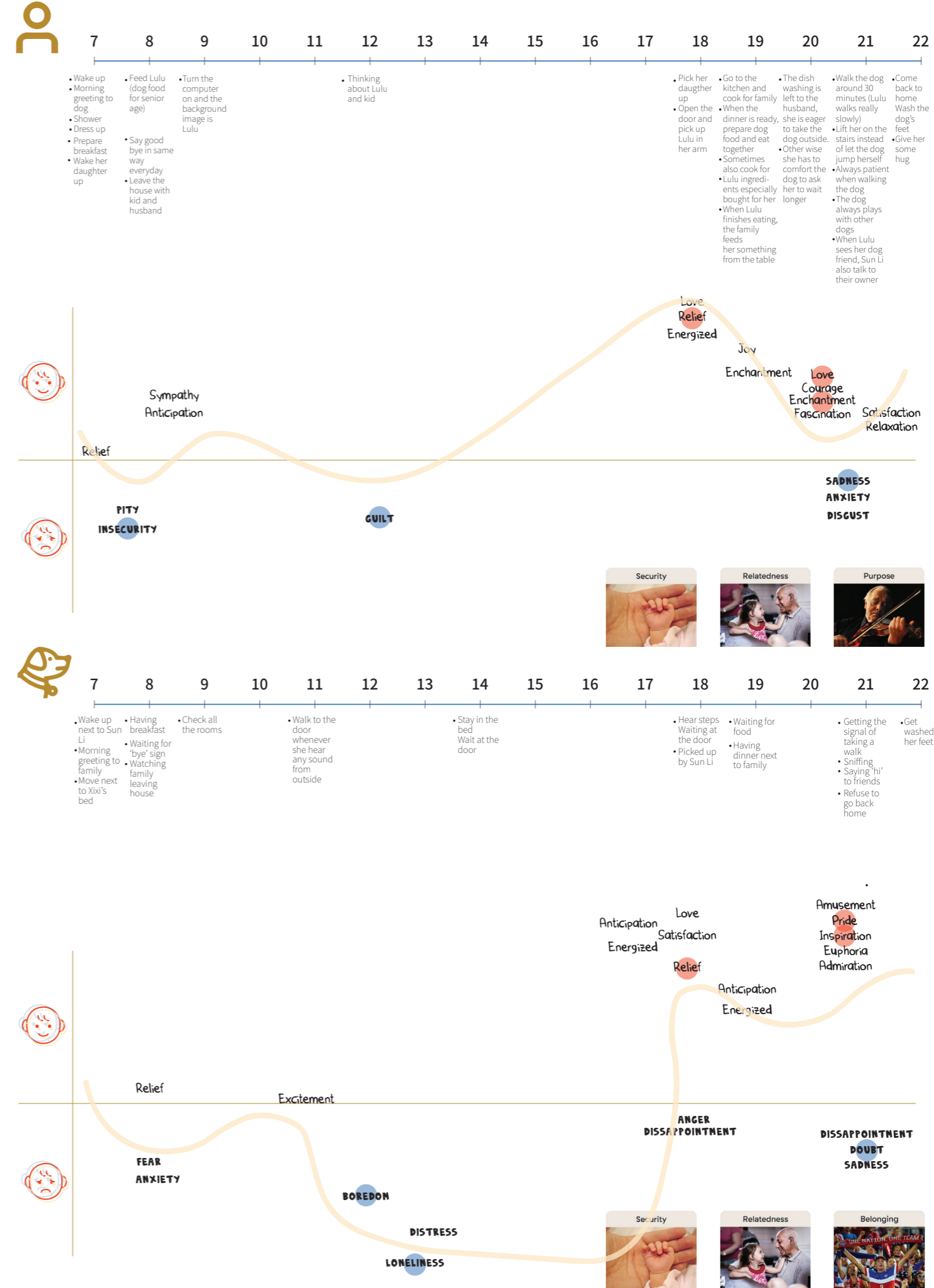


Figure 22. Emothinal Journey Map Top: Sun Li, Bottom: Lulu

40 and living in major cities in China(Hangzhou, Suzhou, and Beijing). Even, one participant has remarkably similar age and life style with Sun Li.

The workshop session was starting with introducing the persona of Sun Li, and Lulu. The introducing describes the background and guide the direction where the session needs to go. The emotional journey targeted the daily life of Sun Li and Lulu. Participants led through building persona's daily life, penetrating deeper into the subject.

First, the group made a timeline on paper with the key moments with Sun Li's daily activity and put them on the timeline. At this phase, Sun Li's specific sensory activities and interaction with their senior dogs are captured. Since members are Chinese, it was helpful to represent realistic Chinese daily moments.

For the next step, the group choose and match emotions out of 24 positive emotions, and 24 negative emotions with daily activities.

For the following step, as same as tracking Sun Li's everyday life, Lulu's daily activities and emotion have assumed by participants.

After finish the emotional journey map, the group pick the three most important positive and the three most significant negative emotions that participants can imagine experiencing in that activity. Then combine to three basic human needs that activate in each activity. The three basic human needs are chosen by vote. Daily activities, emotions, and needs have put on the timeline.

RESULT

Through the session, few facts and findings on the relationship between Sun Li and Lulu have found(Figure 22).

- Sun Li's daily life has affected by Lulu in small moments, such as background image in her computer, social media, etc.

- Universal needs are similar to each other; Security and relatedness are same. Sun Li concentrate on purpose and Lulu focus on belonging in their universal needs.

- Lulu affected by Sun Li more than the other way around; Sun Li has many duties and things to concern to live. However, Lulu doesn't have things to get affected but Sun Li and family.

- During the walk, Sun Li feels love and enchantment, meanwhile, she feels sadness too, because she can see negative changes on Lulu.

- When Lulu takes a walk, Lulu feels inspiration and pride, however, at the same time, doubt about

herself.

- Sun Li feels insecurity when she is leaving the house.

- Lulu feels boredom and loneliness extremely when she is home alone(Figure 23).

- Lulu feels relief extremely when Sun Li arrives home.

- Sun Li feels guilt when she is thinking about Lulu at her work.

DISCUSSION

The outcome of the Emotional Journey Map of Sun Li and Lulu are comparable. The biggest difference is that Lulu's emotional changes in daily life are radical compared to Sun Li. It is because Sun Li gets more external stimulation from her family, work, etc. While having drastic emotional change, it is captured that Lulu has extremely negative emotion in the home alone moment. The external stimulation is wholly cut off, and she is isolated thoroughly, and it makes her mood hitting bottom. This factor implied that dogs like Lulu desperately need stimulation even when they are alone at home.

The project has two main stakeholder groups, the senior dog, and the owners. Through the Emotional Journey, it figured out that two stakeholders have different emotions. There is emotional goal for the owner and the senior dog during the day.

The emotions that the final design seeks to achieve are described for two aspects to fulfill two stakeholders needs;

1. The senior dogs should feel indoor activity like how they feel in outdoor activity; Pride, Inspiration, Amusement, Energized, and Satisfaction.

2. The owners should feel during the interaction process; love, joy, fascination, satisfaction, and enchantment.

These are emotions that this project needs to offer to the users. In the developing process these will be considered and in the evaluation session, it will be tested.

4.4. Conclusion; From boredom and loneliness to inspiration and pride in home alone moment

In this chapter, multiple methods were used to figure out the relationship between Chinese owners and their dogs. The interview and online survey were conducted to figure the strong characteristic of Chinese owners out. However, it's hard to distinguish the Chinese owner from other cultures. Just like another region, the owners want to give unlimited love and support to their dogs.

According to the previous emotional journey map, in daily life dogs having negative emotion when they are alone in the home. When the owner is home, they can encourage their dog to move and stimulate their sensory cognition. However, when the person isn't home, the dog lost all stimulation. In the 'Emotional Journey Map' shows that senior dogs mostly feel boredom and loneliness when they are alone at home. Furthermore, the person also feels guilt when they are away from their dog. Therefore there is a need for supporting and increasing their negative emotion to positive emotion such as inspiration, pride, love, and enchantment.

The holistic support, that can solve this problem, has mentioned in the previous chapter. The holistic care has required to senior dog care. The holistic care represents, physical, behavior, and mental support.

Through the research about the relationship between Chinese and senior dog, it shows that holistic and mindful support for senior dogs is needed. This support connects to the problem that revealed from the previous study in the senior dogs, which is the lack of mental support for the senior dog.

The guidance is required to move negative emotion that dogs and human feel when they are not together to positive emotion.

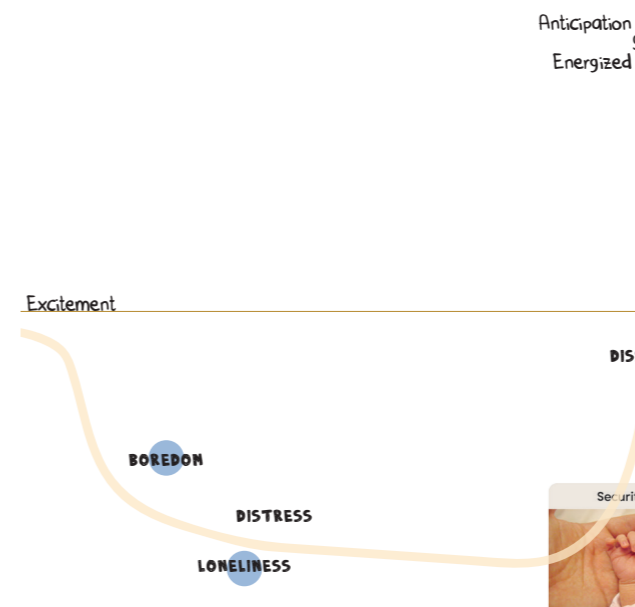
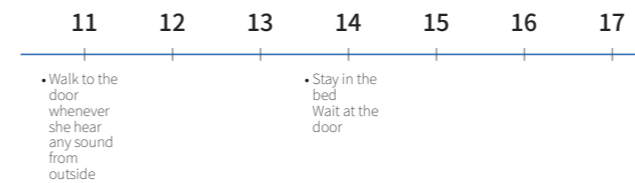


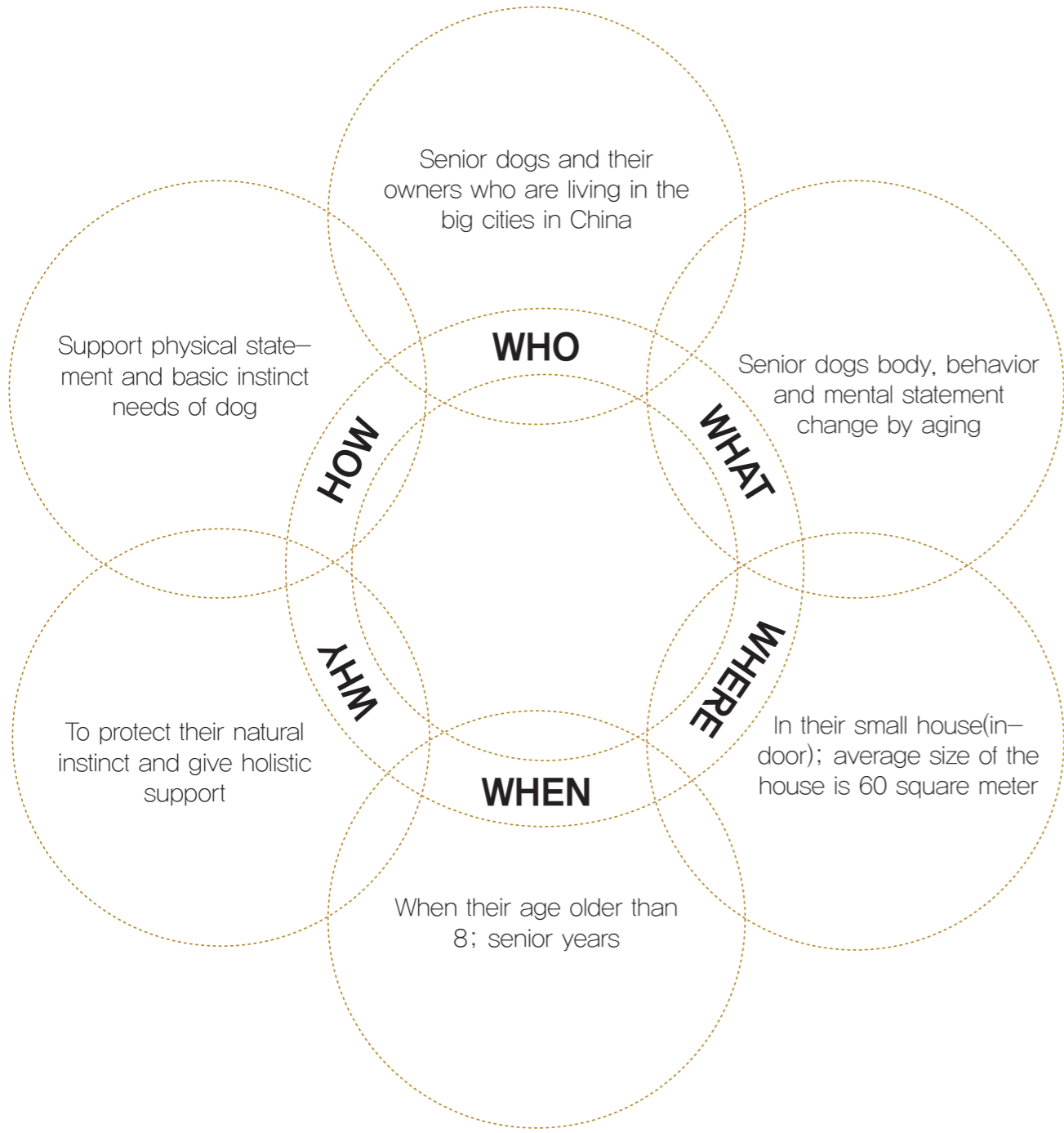
Figure 23. In a home alone moment, Lulu has deep negative emotion

B. DEFINE PHASE

5. Problem Definition

6. Design Brief

44 After the literature and field study on senior dogs, lifestyle in China, and the survey result, connections between the researched topics were found. This lead to the development of the following problem statement:



45 “Senior Dogs are passing through a transitional phase of their body, behavior, and mental statement, and natural instinct. Chinese senior dog owners try to support their dogs, but their lifestyle in a relatively small house, high workload, and air pollution cause a shortage of qualitative activities with their old dogs.”

TARGET USER SEGMENT
 The identified target user segment is the dogs’ well-aging seeker, characterized as supporters who are willing to spend time and money on product or service for their senior dogs. They take their dogs as their family and as least spend \$50 on there dogs’ well-aging support for health purposes and have a high quality of life standard.

In the previous research research(Chatper 3.2.1), it was found that Chinese average house is 60 square meter(Figure 24). This fact will be a standard and definition of indoor.



Figure 24. Example of small house in China (image source: 나를 닮은 집+)

5. Problem definition

46 The design brief will describe the direction for further development of the product based on the findings from the previous phases. It will give a clear vision in the form of a positioning statement and a specified design direction.

6.1. The Senior Dog in China

The target user analysis showed that special needs are required for senior dogs and their owners in China. The new luxurious humanization trend in the pet care business is flourishing in China. However, as stated in the problem definition, lack of time, space, qualitative activities, and trustful facilities bring another issue to senior dogs. Therefore the holistic care is needed.

As the senior dogs have difficulty to do outdoor activities, because of pollution and lack of time, a qualitative indoor activity is preferred. This activity should stimulate the small to medium sized senior dogs (see online survey, chapter 4.1.) even when their owner isn't around.

47 6.2. Positioning Statement

From the analysis of the currently available products that support senior dogs, came forth that the problems senior dogs encounter are not solved in a holistic manner, but mostly only solving aspect separately.

Trying to overcome this problem for the defined target group, resulted in the following positioning statement:

My vision is to make
a supportive interior element
Distinctive Product Feature *Category*

For the owners of small to medium sized indoor senior canine living in big cities in China
Target Evidence

Who seek for holistic well-aging of senior dogs
Distinctive Benefits

It does so by offering indoor activity, stimulating their instinctive needs.
Supporting Evidence

In the design vision, the home or interior is the main category. 'Supportive' is a distinctive product feature from other products in the same category. The owners of small to medium sized indoor senior canine living in big cities in China are the target group. Holistic well-ageing of senior dogs is distinctive benefits that the design vision want to achieve in a later design process. The Holistic includes physical, behavior, and mental care. Offering indoor activity, stimulating their instinctive needs is supporting evidence of the distinctive benefits. The instinctive needs represent affection, discipline, and exercise.

This poisoning statement will be the base requirement for the concept developing phase.

6. Design brief

C. DEVELOP- OP PHASE

7. Concept Development; The Story

8. Concept Development; The Form

9. Concept Description

50 Moved to the Deliver phase, the story of the concept will be generated. The story should be created based on the design brief, which is a base requirement of the concept. To fulfill the requirement, extra research will be an essential part.

51 7.1. Specified Design Direction

To get better and more ideas out of the positioning statement, brainstorm sessions, how to's, and various other ideation methods were used. The average size of Chinese houses was used as a fixed context during the processes.

During the brainstorming sessions, the results of the emotional journey map and 60 square meter house were shown to participants, and various extreme questions were asked. Such as "What if you are deaf and blind in the house? What if you are in the silver town? What if you are in prison? And What if you are alone at your home?" Also, How-To questions were formulated for senior dogs and their owners perspective (see appendix B, C).

Through all sessions, it was found out that extreme situations, such as dogs that are losing eyesight, appeared most interesting. Moreover, losing eyesight is the most severe issue with aging compared to other problems such as skin disease or weak hearing (see chapter 4.1.). Therefore the design goal has been narrowed down into supporting senior dogs with vision problems.

Moreover, when the canine cognitive stimulation is considered it clearly shows that dogs touch, taste, and smell have better chance to stimulate their cognition (Figure 25). Because senior dogs' hearing and sight are easily lose. A method that will be introduced in next chapter, fulfills those three sensors that are touch, taste, and smell.

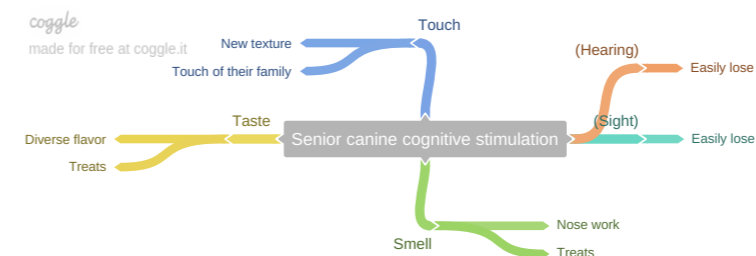


Figure 25. Options for senior canine cognitive stimulation

7.1.1. How to Improve the Quality of Life of Senior Dogs that are losing eyesight; Nose work

The dog perceives the world through, nose, eyes, and ears in that order. Dogs and humans feel the environment through a different order of senses. A dog's sense of smell is the most essential. Humans rely on their sight more than 70 percent, but dogs rely on their smell more than 50 percent. Therefore, if a dog is blind or deaf, they can live normal only by relying smell (Gilbert, 2017).

A dog brain is one-tenth of the size of a human brain. However, olfactory bulb, which is recognizing smell, is 40 times bigger than with humans. It shows that smell effect their brain a lot (Rinaldi, 2007). See Figure 26.

Nose working is a way to train and stimulate the smelling sense of a dog. Nose work is invented in 2006 at California by a dog trainer. It started

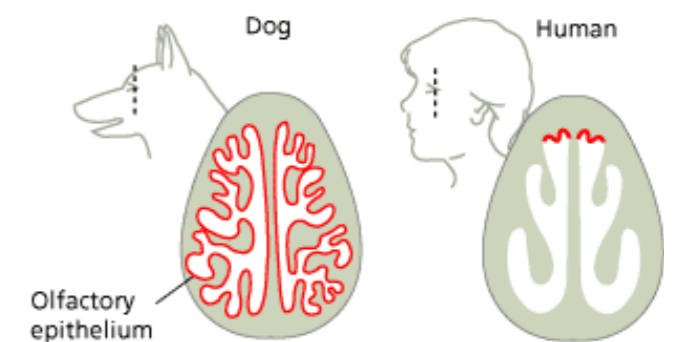


Figure 26. Dog's olfactory epithelium is much bigger than human ("The Nobel Prize in Physiology or Medicine 2004", 2017)

from mimicking a training of professional detection dog. The activity is mainly finding treat using dogs' smelling sense. Finding treat can be easy or difficult by the level of difficulties. The fun recreational exercise encourages dog's intuitive energy to hunt, and the specific talent for finding smells and their origin. (Becker, 2012)

It can be searching, and also, training for a police dog. Nose work is effective on dogs that having less outdoor activities because it helps to get out from boredom and consuming energy. Nose work is also good for restoring dogs' self-esteem. The exercise use dog's brain a lot, thus it promotes intelligence development (Zenkoku pettoshitta kyokai, 2012).

In appendix E, The three most popular 'Nose work' examples are introduced.

Nose work is advantageous for senior dogs, that are with hearing loss or eyesight issues. Since basic nose work is never too old to learn; it's a mental and physical exercise for any dog drive the decent motive. The activity doesn't have space constraints; for some senior dogs, indoor activity is better for them.

7. Concept development; The Story

52 7.1.2. How to Involve the Owner to Nose work; Impulse Control Training

The project started with an aim of create the new way of interaction with human and senior dog. It has been essential to involve both of the main stakeholder, the owner and the senior dog. In this chapter, what form of the relationship will be build in the concept will be described. The relationship should fullfill holisitc needs as the positioning statement mentioned.

Dogs are social pack animals; dogs want to hear what they're supposed to do. Their instinctive goal is to support the group and following the leader. In this case, humans are the pack leaders, who provide protection and direction. Therefore, enforcing rules, boundaries, and limitations make dogs feel more comfortable and satisfied, and these are positive reinforcements they need. Body, mind, and heart, these three aspects are required for a balanced dog, and it is up to humans to ensure that they get that balance(Millan, n.d.).

Humans and dogs both have instinctual, intellectual and emotional dimensions. In daily life, humans use the intellectual and emotional dimensions over the instinctual dimension as opposed to dogs, who have the instinctual dimension as most important(Millan, n.d.). This makes understanding dog behavior difficult for untrained people.

An animal behavior expert, Cesar Millan, made the Fulfillment Formula(Millan, n.d.):

- Exercise is for the Body = Fulfilling Instinct = Creating Trust
- Discipline is for the Mind = Fulfilling Intellect = Creating Respect
- Affection is for the Heart = Fulfilling Emotion = Creating Love

Impulse Control Training is one of the best balanced trainings a dog and their owner can do and is very popular amongst dog trainers. It combines exercise and affection through discipline. The goal of the training is to prevent arousal and default behavior the dog. However, this approach is not only to control the dog, but also to learning the dog how to control themselves. This way, the dog can learn self-confidence, and trust (Your dog's friend, 2017).

Training can be done with or without an object (mostly towel). If the training is done with an object, the owner should use the same object every time. The training goes as follows: the owner shows a treat to the dog, which makes the dog excited. The owner waits until the dog is relaxed and gives an easy order such as "take a seat" or "lie down" on the object. If the dog becomes relaxed and stays put, the owner puts a treat on the object. The owner is rewarding good behavior that the dog initiates on his/her own. The training is repeated so that the dog can accept

the object as a safety zone (Your dog's friend, 2017).

Smelling is not only the most important sense for the dog, but is also a mental and physical stimulation. Combining nose working and Impulse control training in one product creates a symbiosis with added benefits like: two training principles in one, and a dog-owner bond/interaction while fulfilling the dog its instinctive needs. It fits the positioning statement and creates a qualitative interaction.

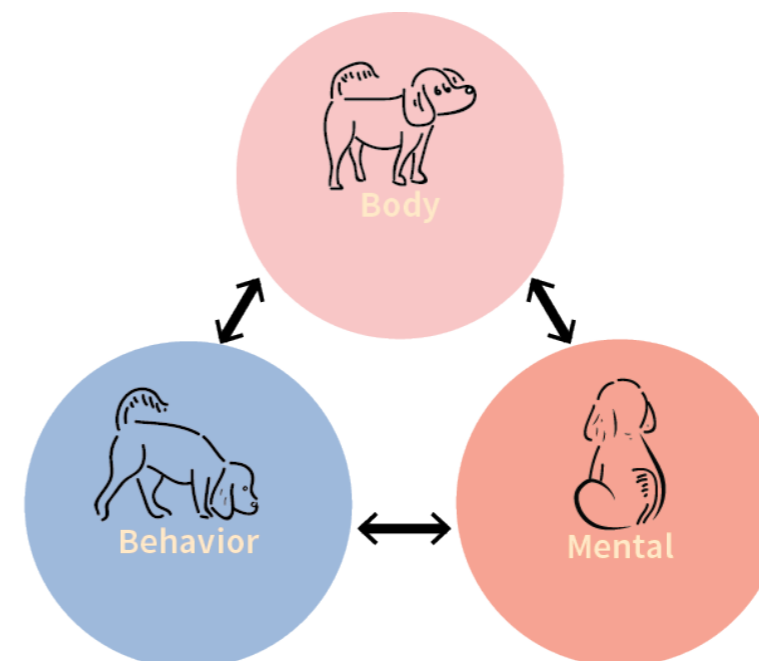
To conclude, the positioning statement will be combined with the additional studies to form a concept: The indoor activity should involve smelling and impulse control training.

53

7.2. Conclusion; Refined Design Goal

Concept generation started with ideation sessions, such as brainstorming, and how-tos. Through these sessions, it was found that dogs with eyesight problems have great opportunities to get additional support. While finding a way to give appropriate help to dogs with vision issues, nose-walking was used to solve this problem while also improving and stimulating their brain. Impulse control training was applied on the concept to generate a strong interaction between the owner and the senior dog.

This makes the final idea of the product whole, and ready for the next step; making a tangible, testable, and manufacturable concept.



54 With the refined story and design goal, the shape and form of the product will be studied in this phase. By using appropriate design methods, from 2-dimensional to the 3-dimensional form will be created. The shape of the form also needs to fulfill the requirement(design brief). Through this phase, the specific requirement for the product will be generated.

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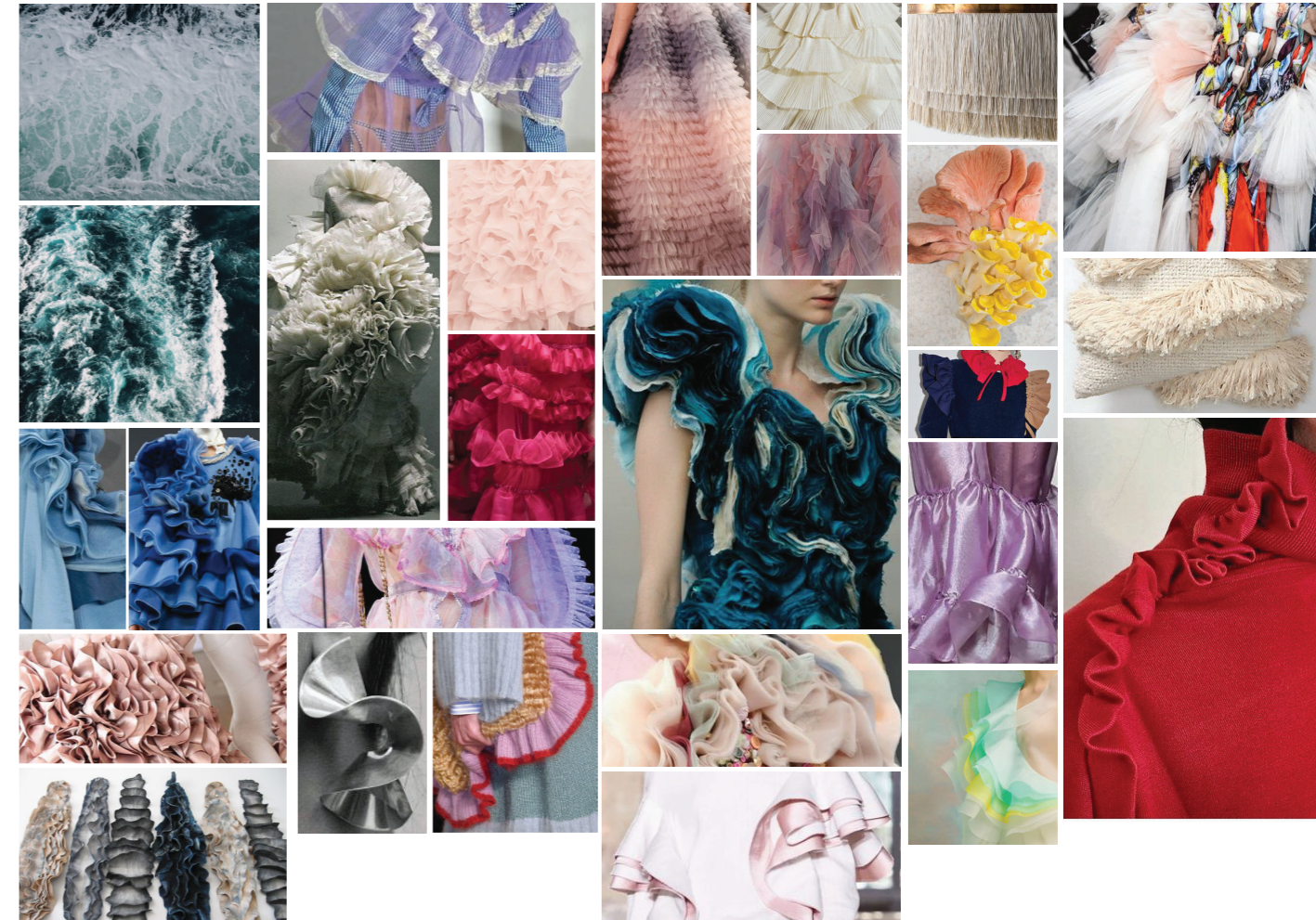


Figure 27. The visual characteristic and shape of the **ocean** is represented mostly through ruffles and frills. These create fluid and organic forms.

8. Concept development; The Form

8.1. Design Language

During the conceptualization and ideation phase, various ideas were generated, gathered and visualized on paper and in the 3-dimensional form using mood boards, brain drawing, and prototyping. Keeping the insights from the previous study in mind, a design language had to be created that would help defining material, shape, color, and other physical aspects of the product. Further design selections were made based on personal and general aesthetic judgment.

8.1.1. Aesthetic Study

As stated in the emotional journey map(Chapter, 4.3), the senior dogs should experience the indoor activity like how they experience an outdoor activity; Pride, Inspiration, Amusement, Energized, and Satisfaction. This statement is used to create an aesthetic goal. The product (inside activity) will therefore be inspired by nature (outdoor activity). And after various attempts to visualize the different mind states, four different natural environments have been chosen; Ocean, Canyon, River, and Desert. Mood boards are used to create a clear image of what the product will look like(Figure 27,28,29,30).

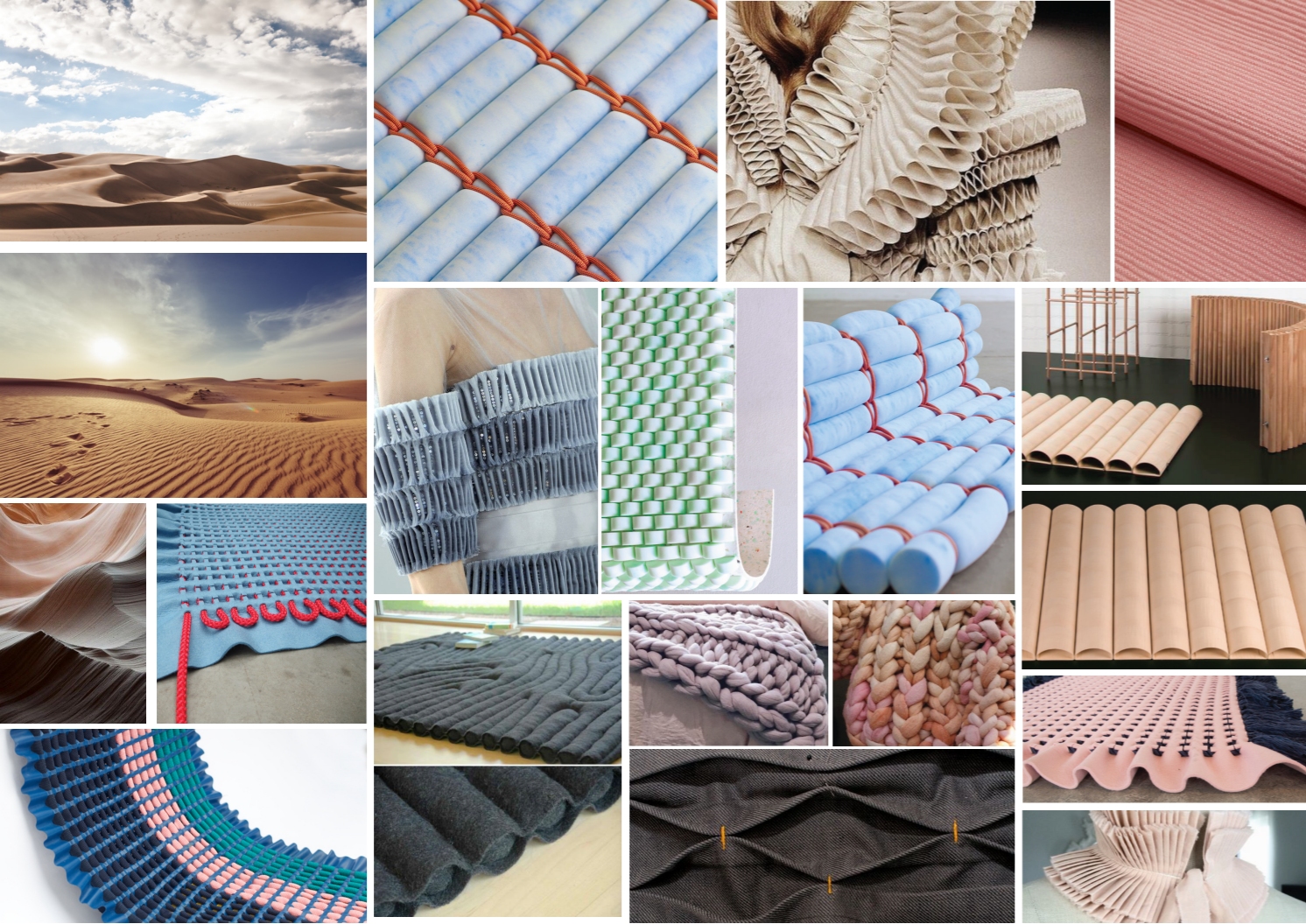


Figure 28. The **desert** shows slight hills, silky soft surfaces, wrinkles, and an overall flat shape.

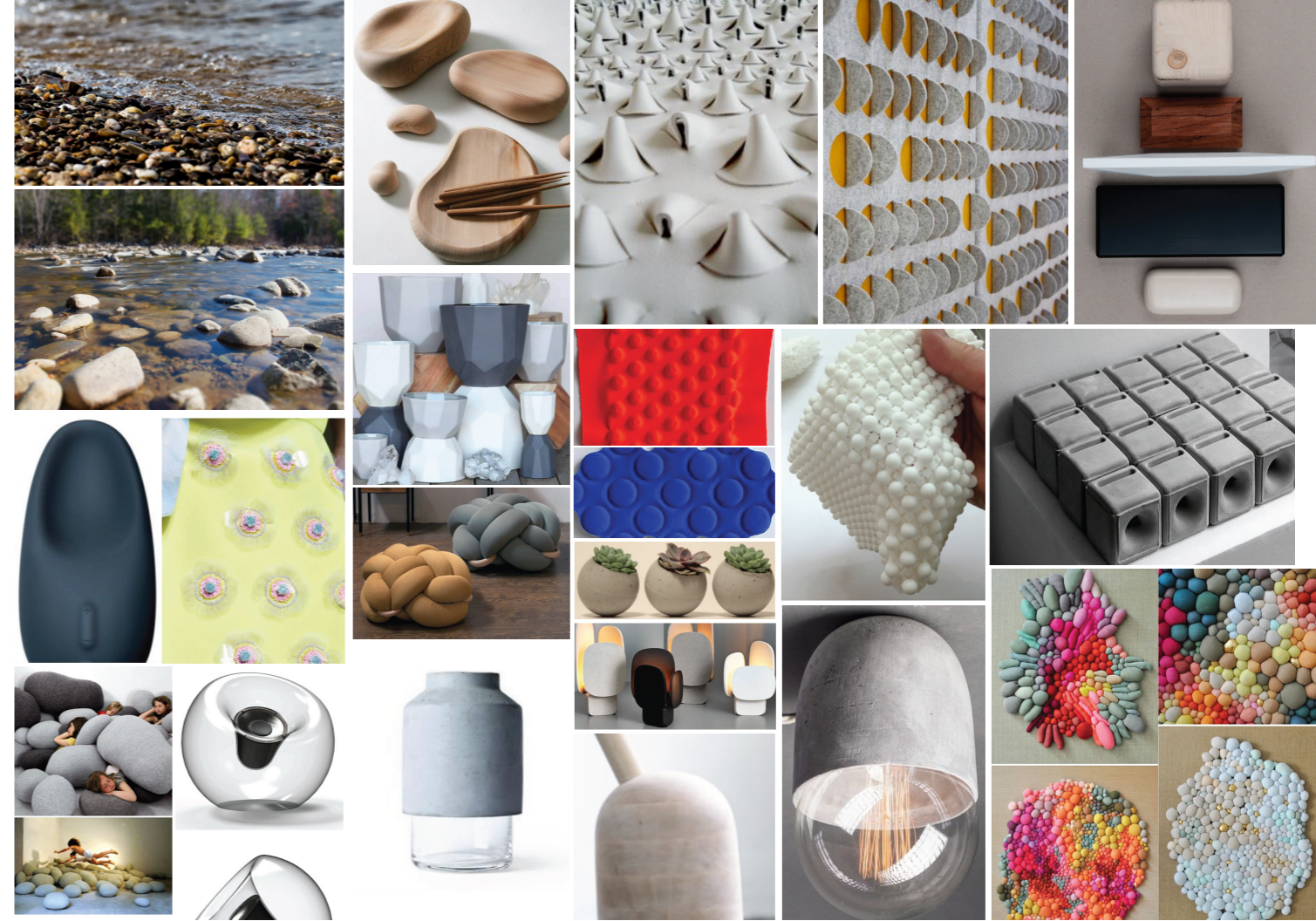


Figure 30. The **river** comes back in soft and curved surfaces, chunky shape, and roundness with various materials. River bedding is coming back in the form of eroded stone like shapes.

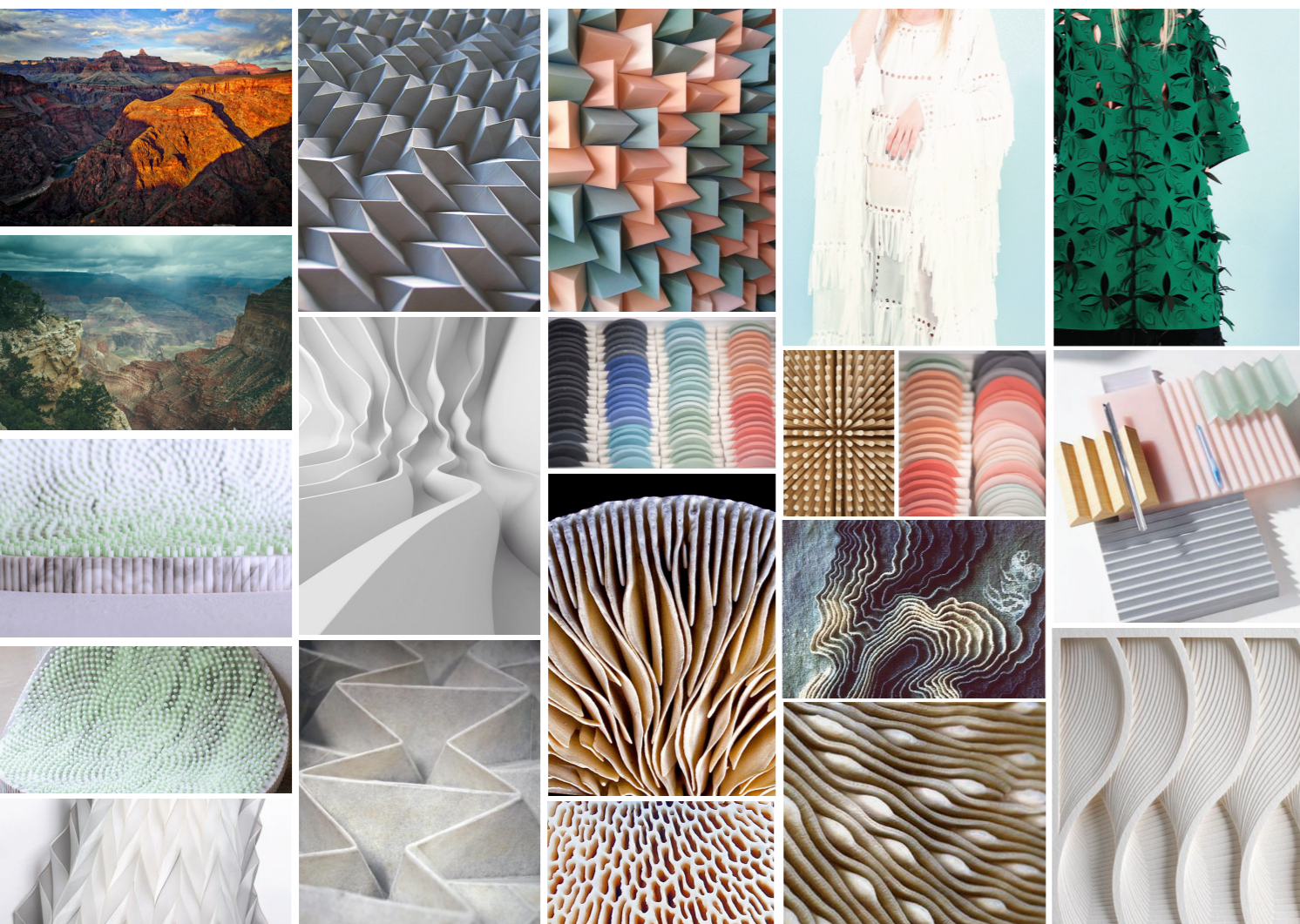


Figure 29. The **canyon** shows different heights, gaps between the object, and angular shapes, all at a semi regular interval.

8.1.2. Form Study

In the previous chapter, Aesthetic study, 2D forms have been studied. In this section, these 2D form are translated into 3D shapes so they can be tested with real dogs.

The most considerable point at this moment is finding a form that fully support the story of the concept what is generated in the previous chapter.

During the iterative ideation phase, numerous forms were generated using prototypes(Figure 31). Keeping the insights that were learned through research, in mind, the design was evaluated using the results from the design language (chapter 8.1.1.). Further design decisions were made based on the list of requirement, and personal design perception.

At the end of this process, ten different types of prototypes were made according to the set boundaries(Figure 32). Those prototypes are inspired by the story of the specified direction and aesthetic study.

Each of these bridges was evaluated during the test described in the next chapter.



Figure 31. Variety materials, methods, and forms were tried.

The prototype was also called 'bridge' at this moment, since the prototype looks like a strap and it connects different area.



Figure 32. 10 prototypes

8.2. Prototyping and Testing

The goal of this experiment is first, exploring the instinctive behavior and interaction without senior dog its habits or customized behavior. Secondly, to see the dog its preference on a shape of the bridge and at last, adhesion to the floor of the bridge.

SETUP

With the prototypes made in the previous chapter, a test was conducted at an animal shelter, Dierentehuis Leiden Stevenshage, with five shelter dogs and two home dogs. All participating dogs are older than eight years. Detailed information of participant dogs is in Appendix F.

The test area is a brand new empty space for the senior dogs, so they will not fall into habits, or get distracted. Ten bridges are connected to each other, and one treat is hidden in each bridge (Figure 33). One dog comes into the room and has time to explore the bridges. After the dog found all ten treats, the test is finished, and the next dog will come in (Figure 34).

RESULT

Through this test, fruitful insights were gathered. It could be clearly seen that the dogs noticed a difference between bridges. The following insights were most interesting:

- The level of understanding and concentration on the bridge are different by dog. To finish the track and eating all the treats, one dog took ten minutes, and another dog took two minutes. Out of the tests, a time track was made to see how the dogs behave with the prototype.

- Dogs are easily moving in same texture bridges. However, they were distracted when the same texture bridge is ended.

- Some types of bridge are too easy for dogs, and it wasn't challenging enough. For the next step, those design should be avoided.

- With of the track does not matter for senior dogs. They could follow and sniff on a narrow track without any difficulties as well.

- During the test, the bridges were easily flipped, even when one of the adhesion methods (anti-slip, suction cup, rubber pad) were attached. Hence, the bridge has to be attached to the floor in a more permanent way.

- Dogs interact with the prototype using their mouth, trying to pull it upward.

- During the prototype test, the dogs were staying on these three test mockups. (Figure 35)

DISCUSSION

Based on the evaluated prototypes, a standard in the form of a list of stakeholder requirement was made. This list will show the most important factors that the product has to fulfill for its stakeholders (Table 1).

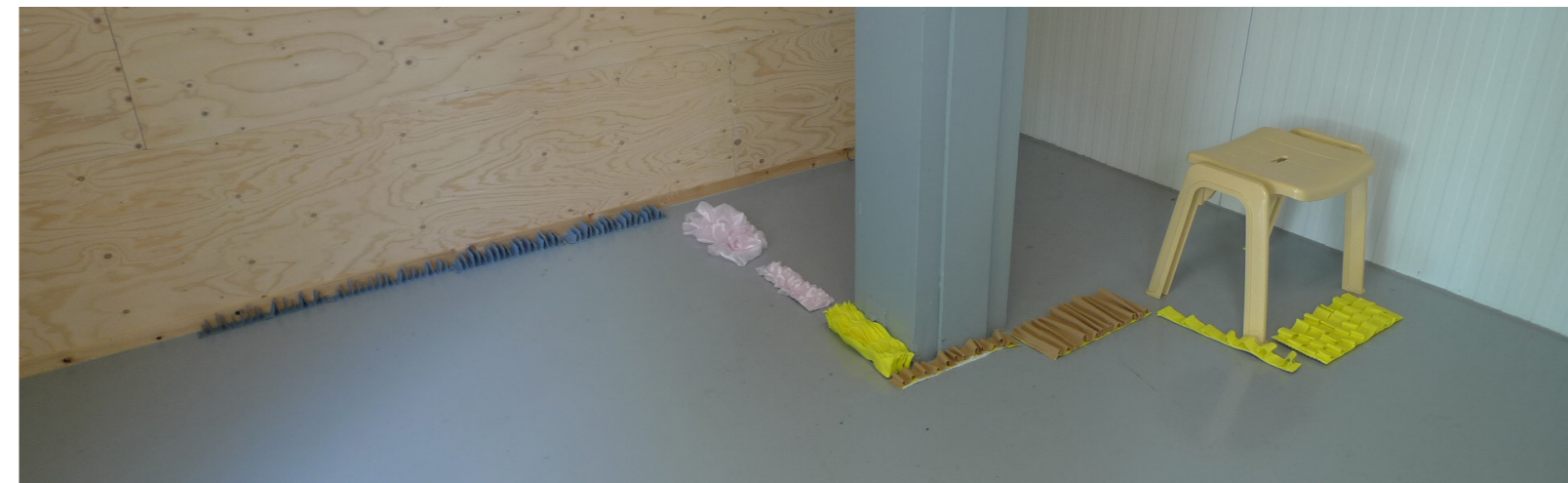


Figure 33. Prototyping test setting



Figure 34. Prototyping test

Table 1. Basic list of requirement

Stakeholders	List of requirement
Senior dog	Dogs can sniff the product Dogs can follow the product Dogs can feel/touch the product The product is safe/harmless for dog Dogs can notice the direction by the different texture of products
Owners	Owners can not trip over the product Owners can easily install the bridge Owners can easily detach and the bridge The bridge doesn't ruin interior design of the house Owners can clean the bridge Owners can sprinkle treats over the bridge
The product	The bridge doesn't harm the floor The bridge doesn't come lose 5 years if permanently attached The bridge is easy to adjust in size and shape The bridge allows to follow the wall The bridge is fixated on the floor (Should not moving when dogs sniffing on it) The bridge has a place to hide treats The bridge is easy to stack The bridges shares same base(bottom) The bridge is made with soft materials The bridge has several different looking and feeling version The bridges are inspired by nature The bridge challenges dogs in mild way



Figure 35. Top 3 popular prototypes

8.3. Finalized Form Design

Based on the list of requirement, the final design has made. In the previous prototype test, dogs spend more time on three styles of a bridge than others. (Figure 35) Therefore these three prototypes were starting point for the finalized design.

The fabric is mostly used for the prototype to make the product safe for dogs that are losing sight. The materials for the product are considered as well. However, those materials that used for the finalized design are not final material. The finalized material will be discussed in feasibility chapter.

To make dogs can sniff and follow the bridge, there are pocket shapes on each bridge. In those small pockets, the owner can hide treats easily. To give differentiation, each track has a unique texture and shape(Figure 36).

There were several iterations to optimize the design. During the process, some simple test was conducted, like put treats in the prototype to check if the owner can hide a treat in it, and leave the product in the living room to see if people trap over it.

After all the process three final designs are generated(Figure 37).

The first design (A) has cylinder shape that can hide a treat in and between cylinders.

The unique feature of the design (B) is that it has consistent deep wrinkles that the owner can hide a treat in and between wrinkles.

The design (C) has more organic shape than other designs. Between the organic wrinkles the owner can hide treats.



Figure 36. Generating final design

8.4. Conclusion

In chapter 7. (Concept development; the story), the story of the concept is generated. Based on the story, in this chapter, the form that supports the story is build through prototype, test, and iteration. For the result of the process, three final design is generated.

The finalized design needs to be improved in manufacturable level and this study will be conducted in chapter 10. Feasibility.

For the next step, the story and the form will be combined and completed in one final concept.

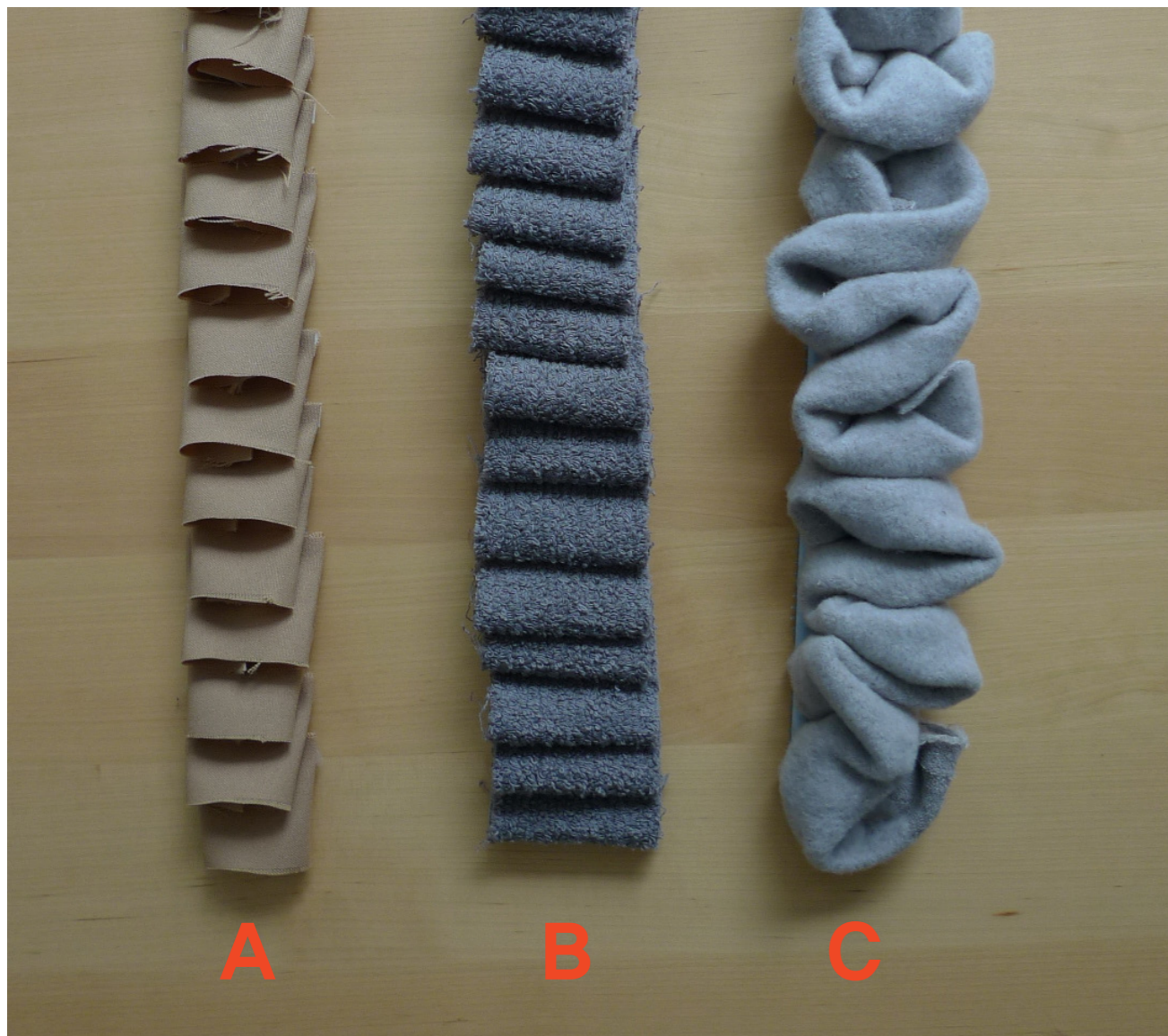


Figure 37. Final design

After various ideation steps, workshop sessions, and of course combining all the research, a basic product idea was developed. This product will be named: "The Snifftrail".

It is an indoor interior element that increase the quality of interaction between senior dog and the owner and provokes cognitive ability of senior dogs that are losing eyesight.

The name of the Snifftrail came from a combination of 'sniff' and 'trail'. The sniff means that dogs smell over the product and trail contains the meaning that it gives the feeling of adventurous outdoor activity to the senior dog.

It consists out of two parts, of which the first one is **ORIENTATION**. This part will create a qualitative interaction between the dog and the owner, and making the Snifftrail a trusted and familiar place by using impulse control training in a new way.

The second part, **EXPLORATION**, functions as guide and stimulation for the senior dog to move around the house when the owner is not home. It does so by using a trail between the comfort and essential spots in the house of the dog. These spots can for example be: Kitchen (food), living room (sleeping), and bathroom (toilet). By bridging these spots, the dog will not get lost as easily, and is more prone to

move to from one spot to the other.

The Snifftrail can be seen as a form of tactile pavement. This is a method of textured ground surface signs located on the pedestrian road, stairs, and train station platforms to guide pedestrians who are visually disabled to their destination (Pluijter, de Wit, Bruijn & Plaisier, 2015). The Snifftrail is not only tactile, but also works by smell so the strongest sense of all dogs will be stimulated.

The Snifftrail is placed on the floor of the house using velcro so it is easy to move, install, and de-install against the walls to the spots of interest. Dogs (that cannot see properly anymore) will find their way by sniffing the Snifftrail intuitively by themselves and follow it to the next spot(Figure 38). The dogs will feel comfortable and confident using the Snifftrails because they did the impulse control training on them creating a save spot.

The unique fabric features of the Snifftrail will make it; easy to hide treats, intuitive to use for dogs, and protecting both the dog and owner. Three types of products will be used to create a difference in location and direction the dog can go to.

The coming chapters will further explain how this concept was developed, and will give the underlying reasons for the specific choices made.

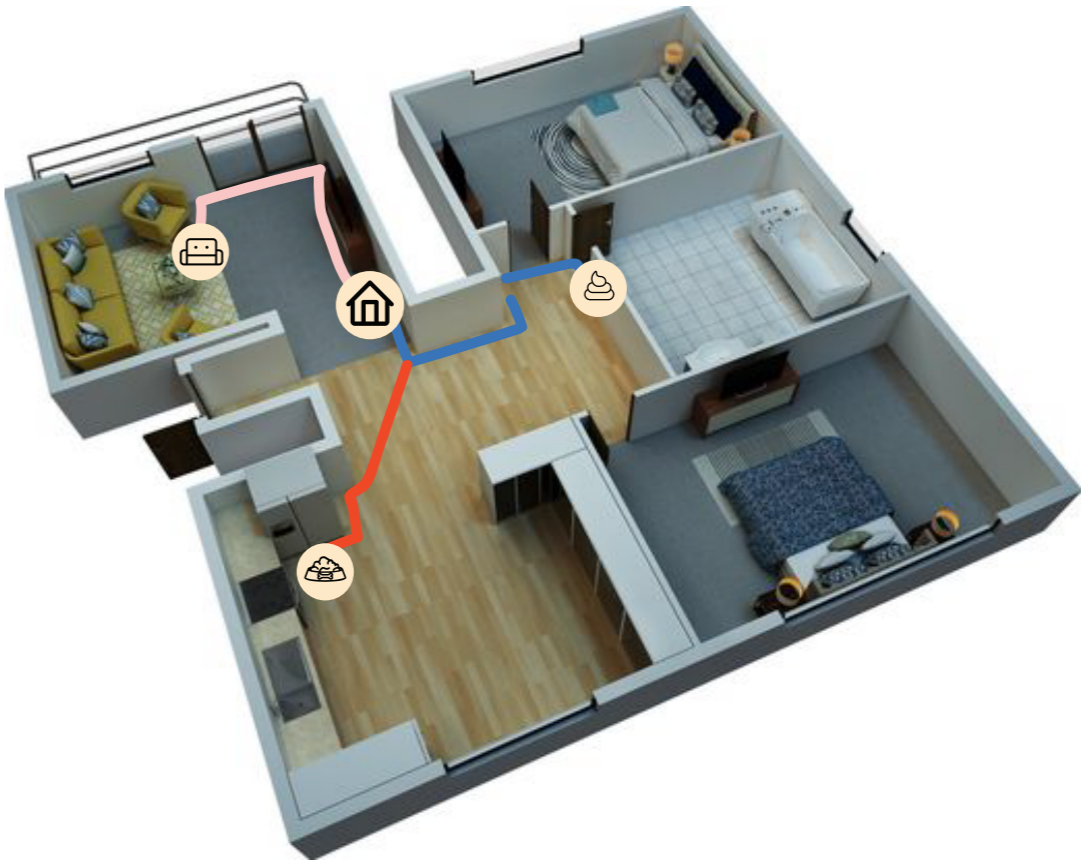


Figure 38. Example of the place where the Snifftrail can be placed

9. Concept description

By using Impulse control training, the dog can get familiar with the Snifftrails and see them as comfort zone, while at the same time creating a strong bond between the owner and the dog (chapter 7.1.). The training will actually be like a game to the dog, and it will stimulate the sense of smell, mental well being and physically. By making the Snifftrail comfort zones, the dog will have enough confidence to move through the house even when the owner isn't home, the

product will always be there. To guide the owner through the interaction process, a manual will be included in the product. The manual will contain a guide on how to install the products, and two methods to let your dog interact with the product. Users can follow the manual step by step, and keep repeating the training part until the dog gets used to the process and understand the process (Figure 39).

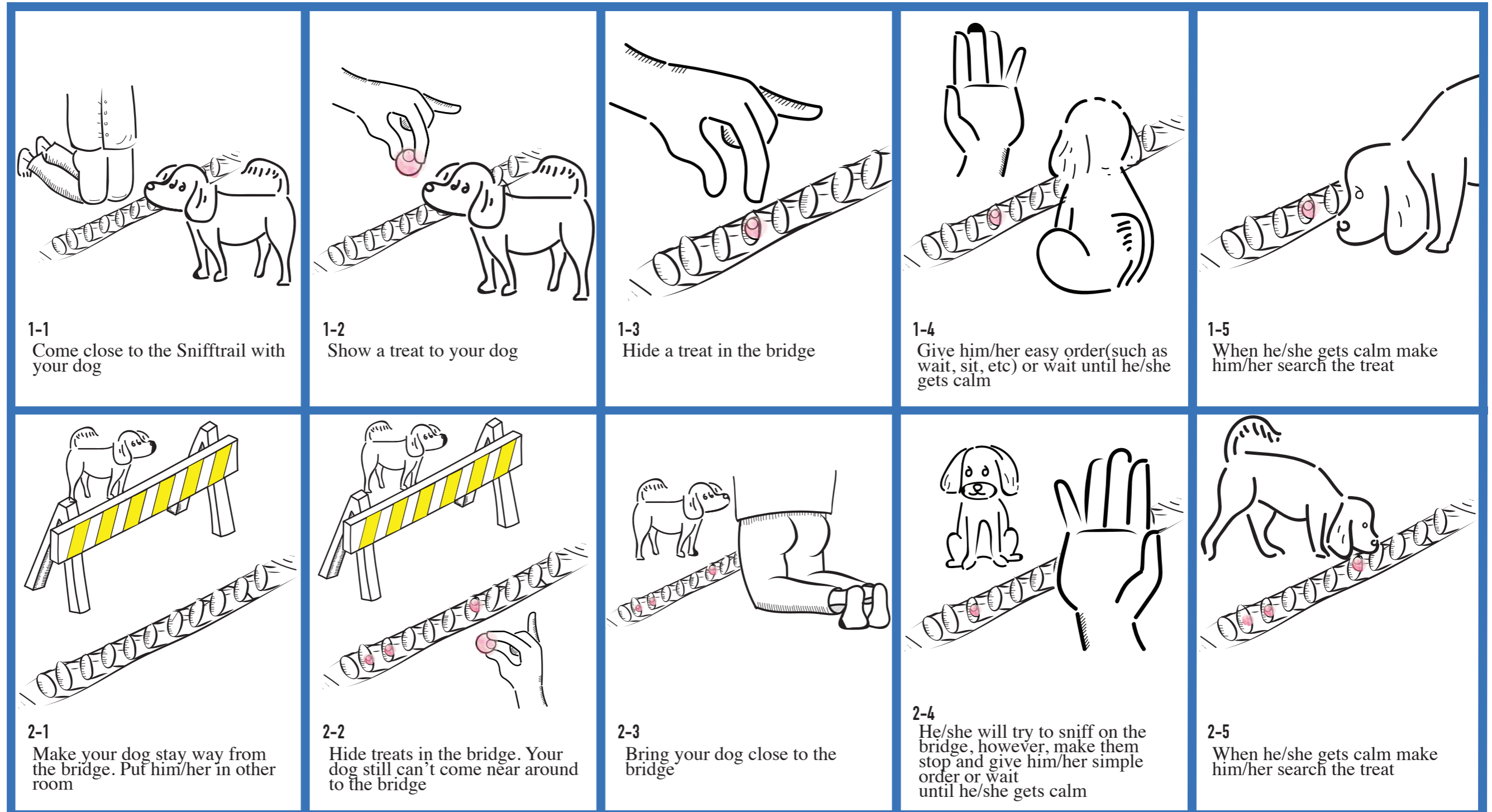


Figure 39. Interaction manual

To give the users instructions on how to install, maintain and use the Snifftrail, a manual will be included with every product. This manual consists out of two parts, of which the first one is explaining installation and maintenance(Figure 40), and the second one will show the owner how to use the product to interact with their dog(Figure 39).

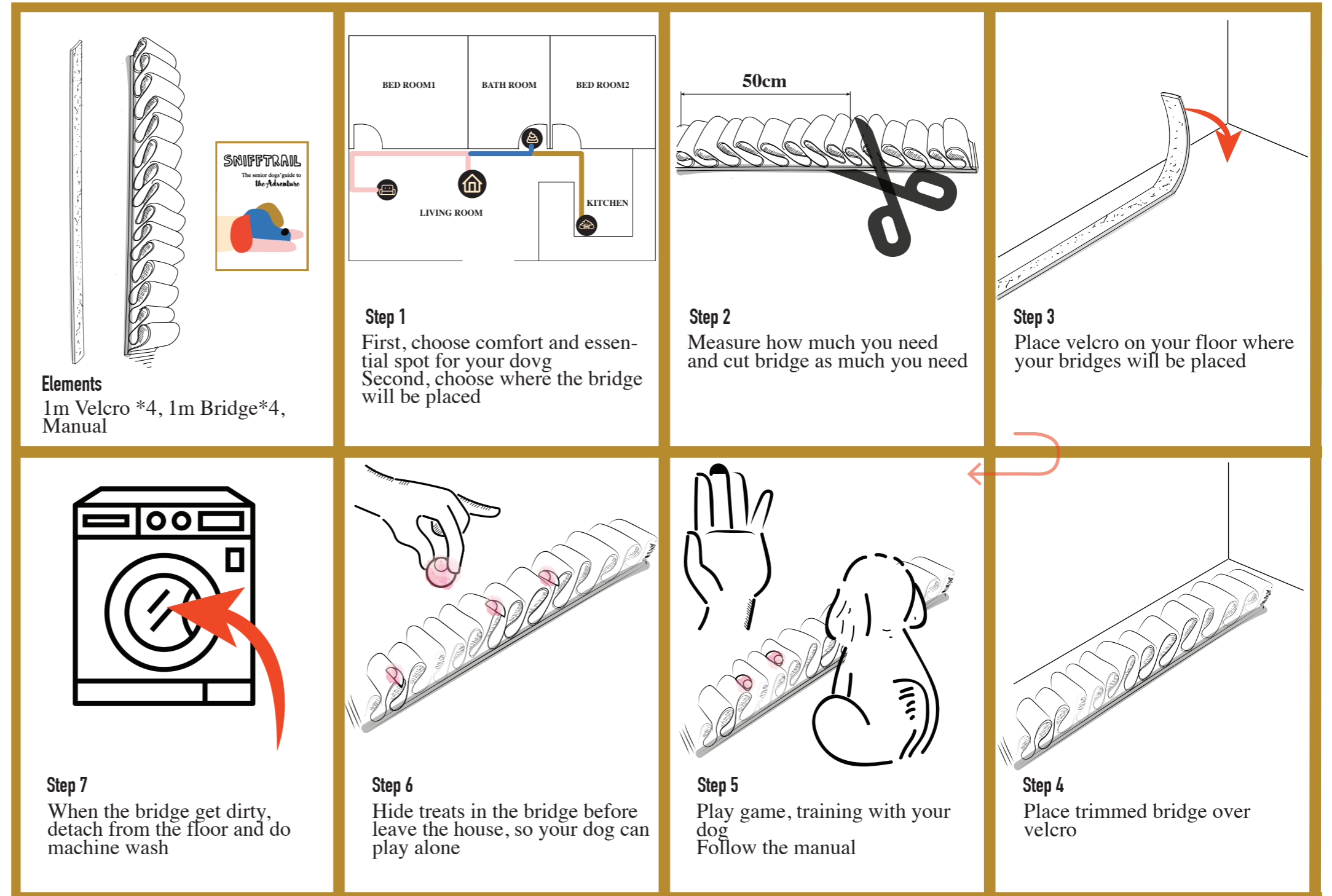


Figure 40. Install, and maintenance manual

D.D DELIV- ER PHASE

10. Feasibility

11. Product Evaluation

12. Conclusion and Recommendation

72 The Snifftrail is made out of three layers that each fulfill a unique purpose. This chapter will explain why and how these three layers are made, and connected to each other.

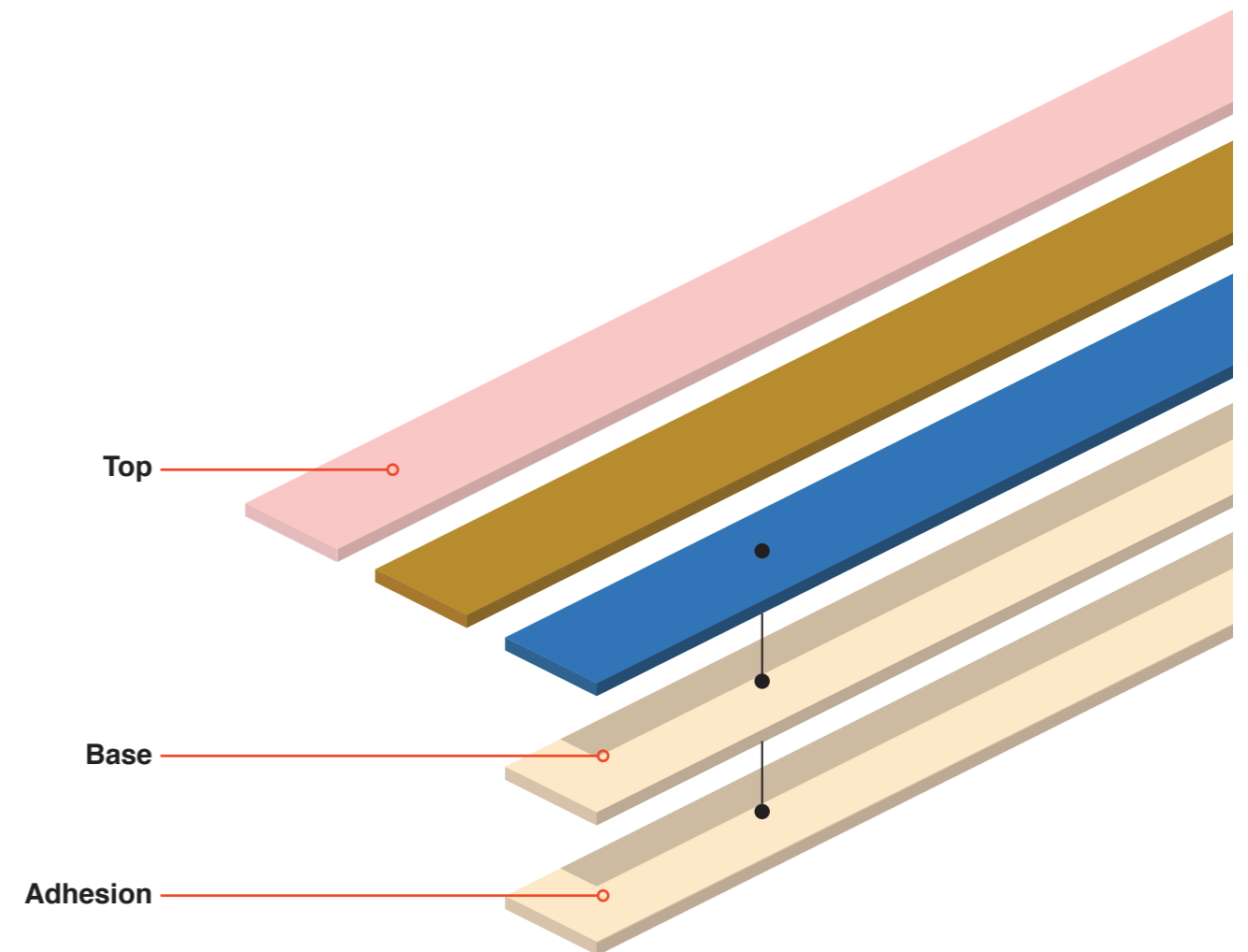
Starting with the first layer, the adhesion layer, interacts with the user during installing, maintaining(wash), and removing the product. In addition to interaction with the user, the adhesion layer is the only part of the product connected to its environment (floor). For this layer fixation to the floor, and installation need to be defined.

The main role of the base layer is structural support since the base layer holds the top and bottom layer together, and gives the overall integrity to the Snifftrail. This layer also defines the ease of removal from the floor together with the last layer.

The last layer, the top layer. This layer is in direct contact with the dog, and the owner has to see this layer all the time in their house. So both the dog and the user have interaction with this top layer. However, the material and shape of this layer will be mainly defined by the needs of the dog, as they are in direct contact with this layer.

Next to the three different layers, production of the prototype, manufacturability, and general product properties will be discussed.

73



10. Feasibility

Each layer has its unique function, and thus requires different materials and various tests to fulfill the earlier defined requirement. Based on the results, a selection will be made on materials, shape, and manufacturing methods.

10.1.1. Adhesion Layer

The adhesion layer is the only part of the product to attach to its surroundings, the floor. It will keep the Snifftrail where it is supposed to be, even when the dog is playing with it.

Before choosing an adhesion method, it is important to find out what the typical Chinese house flooring looks like. After contacting several people living in Shanghai, they send out pictures of their house flooring. All of them had “wood” laminate in all

rooms(Figure 41). This type of floor is flat and dust free when cleaned.

Based on this floor type, five different adhesion methods have been chosen for a force test, two anti-slip materials, double sided tape, suction cup sheet, and two types of velcro. For each tested material, the pull force was measured with a force meter up till the point the material comes off from the cleaned laminated flooring (Figure 42). The size of all the test models are 25 * 5 cm.

The test was done by pulling in the diagonal direction, where you need the smallest force, and it is the most intuitive direction to remove a long small object (tape like) from the floor.

The strongest result was double-sided tape(Table 2). However, double-sided tape isn't a perfect material

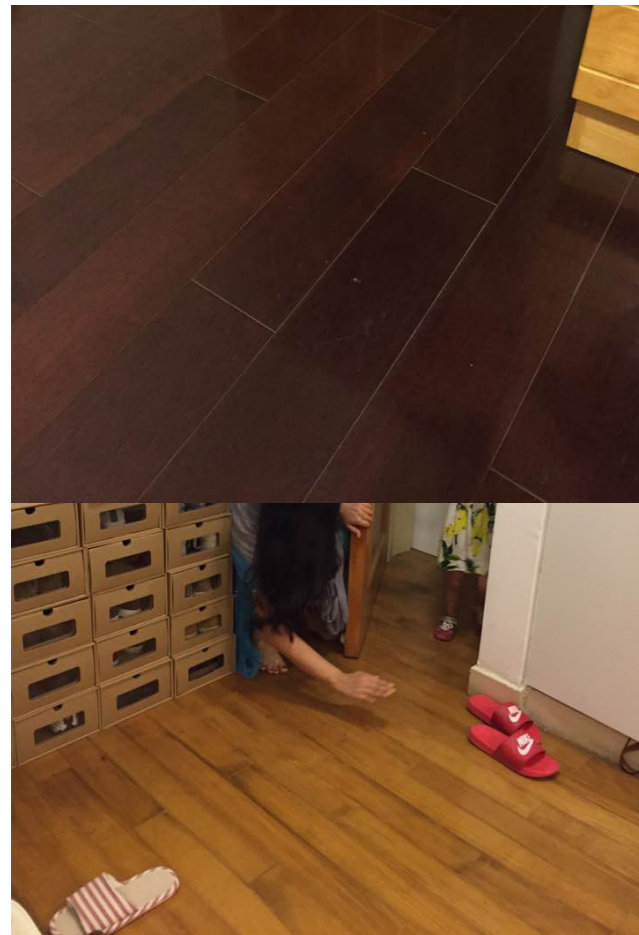


Figure 41. Typical Chinese floor type; laminated flooring



Figure 42. Adhesion test

Table 2. Adhesion test

Types	Anti-slip1	Anti-slip 2	Double side tape	Suction cup	Velcro1	Velcro 2
Newton(avg)	0.7	0.0	15.9	0.6	9.9	8.8

for maintenance, removal, or protecting the floor. Therefore, the second strongest material was chosen for the adhesion layer, which is velcro type1. Velcro is also easy to remove, machine washable, and easy to maintain.

Removing the product is as important as installation. To minimize damage on the floor, damage free strips (3M, 2017) can be used to stick the bottom velcro layer to the floor.

10.1.2. Base layer

The base layer is placed in between the adhesion and top layer. It connects the two different layers together, and gives the product its structural integrity. To define what material is suitable for the base layer, a boundary must be set. This boundary is based on the pull direction and force the dog and owner apply on the Snifftrail, in combination with the stiffness of the whole product. As the top layer is made from fabric, and the adhesion layer does not provide a lot of stiffness, it is mainly defined by the base layer. Stiffness is influencing the adhesion to the floor very strongly. Imagine a stiff beam double taped to a stiff floor, this is very hard to remove because you need to overcome all the adhesion force at once. If the beam

was flexible fabric, it would be very ease to remove the whole by just peeling it of the floor, so overcoming only a small part of the adhesion force. So a very stiff base layer would make it very hard to detach the Snifftrail from the floor regardless of the pull direction, whereas a very flexible base layer would not influence the pull force needed and rely on the adhesion layer only to keep the product attached.

Based on tests with the earlier prototypes, the force small senior dogs apply on the product are mainly in the vertical direction and sideways direction, and around 20 Newton or less on the product .

The size of all the test models are 25 * 5 cm.

The adhesion method discussed in the previous chapter (Velcro) has probably enough force to withstand the pulling of a dog. So a more flexible base layer would suffice for the Snifftrail. To validate this, an extra force test was conducted (Figure 43) (Table 3). A soft polyurethane foam sheet(anti-slip) was used to represent a soft base layer, and a hard piece of cardboard was used as a stiff base. In the test, the up direction symbolizes a dog biting, the side direction scratching with their paw, and the diagonal



Figure 43. Solidity test (from left: Diagonal, up, and side direction)

Table 3. Solidity Test

	Diagonal	Up	Side
Semi flexible (polyurethane) Newton(avg)	7.76	22.8	24.73
Stiff (Cardboard) Newton(avg)	15.1	25.26	21.83

76 direction pulling/peeling the strip from the floor by the user. The up and side directions don't show a significant difference. However, the force needed to pull in the diagonal direction is lower and thus preferred for the user with the flexible base layer. The flexible base layer is preferred so the user can easily remove the product with a "peeling" motion in the diagonal direction.

10.1.3. Top layer

The top part has three unique textures dogs can sniff on made from different materials and patterns.

Before further decisions were made, a couple of additions to the list of requirements were needed: the top material should be organic/non-toxic (direct contact with the dog), machine washable (cleaning), and thick enough to hold the shape/pattern (durability).

The color of the top part should fit with the average home interior of the owner since it will be visible on the floor at all times. A brief analysis of Chinese interiors and interview with Chinese dog owners showed that dull, calm, beige or grey color tones will be suitable for the top layers. These colors make the product not invisible, but also not stand out too much.

The pattern of the top part should make it easy for the owner to hide treats, but a challenge for the dogs to find. To find the right pattern, the best designs from the earlier set of prototypes were used to iteratively create better versions that also take into account the aesthetic study (chapter 8.1).

As the product easily catches dust, dirt, and dog saliva, it is important the whole product, and especially the top, is machine washable to keep it clean.

Finally the following three materials were chosen for the prototype (Table 4), based on the requirements mentioned above. However, cost is not taken into account for these specific fabrics, so cheaper substitute fabrics with the same properties must be found. Other options are for example to buy larger quantities, buy directly from the manufacturer, or decrease fabric waste during manufacturing.

Table 4. Types of material that are used for prototype

	Design (A)	Design (B)	Design (C)
Fabric	Pure organic cotton	Non-toxic terrycloth(for baby)	Organic cotton fleece
Special features	Organic cotton is planted in an environment without pesticides, and chemical fertilizers have been used for a minimum three years. The dyeing and finishing of organic cotton observe an accurate system in a use of a chemical in processing, excluding all harmful materials to the human and the environment.(Fabric.com, 2017)	Soft and cozy, terrycloth is an absorptive textile that is usually making towels, robes, and soft toys. The loop on textile absorbs liquid easily.(Fabric.com, 2017)	Lightweight, cozy, super soft, and perfect for making hoodies, loungewear, baby apparel, and other comfort garments. Organic cotton fleece is GOTS certified and is grown in an environment without pesticides, and chemical fertilizers have been used for a minimum of three years.(Fabric.com, 2017)

77 10.2. Product Dimension and weight

In the previous study (chapter. 3.2), it was found that the size of an average Chinese house is 60 square meters. The product is aimed to connect two "comfortable spots" together, where the main island is mainly placed in the living room (middle of the house). Approximately 4 meter is needed to connect from middle of the house to one of the other islands when following the walls(Figure 46).

The weight of each design is (A)72g, (B):173g, (C):163g per 1m each(Figure 44).

To keep the product universal, one set of the product consists out of four 1 meter tracks, where each meter can be cut into half(Figure 45).



Figure 45. Every 50 cm has closed stitch so the user can cut if they need to

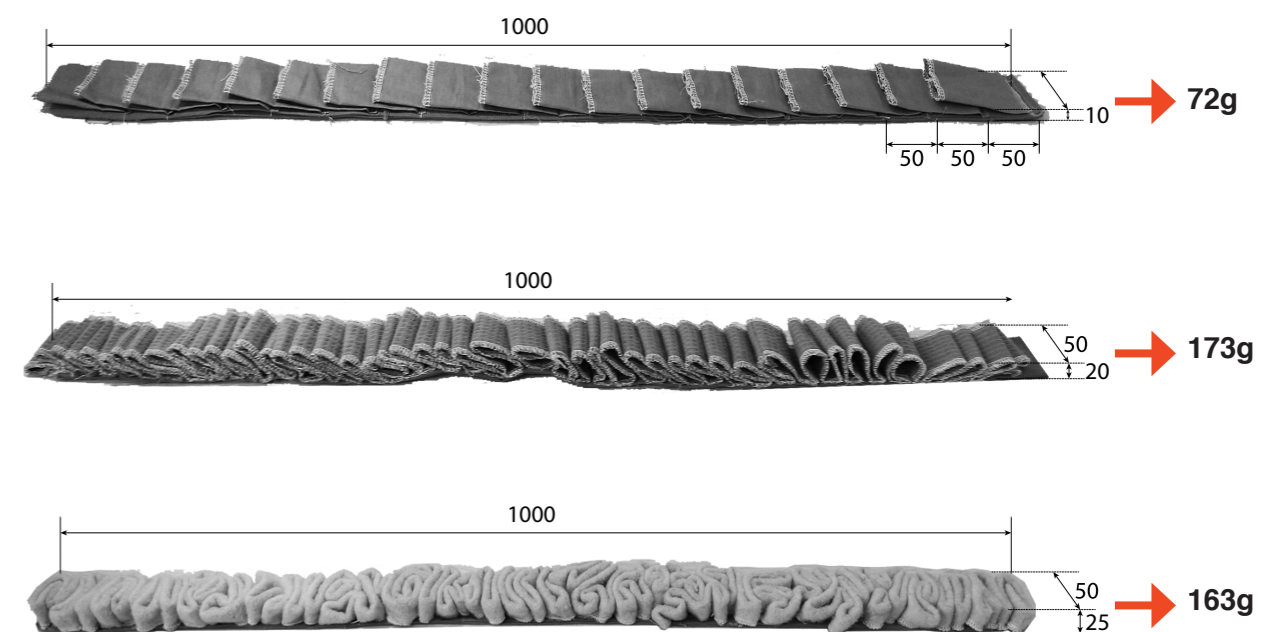
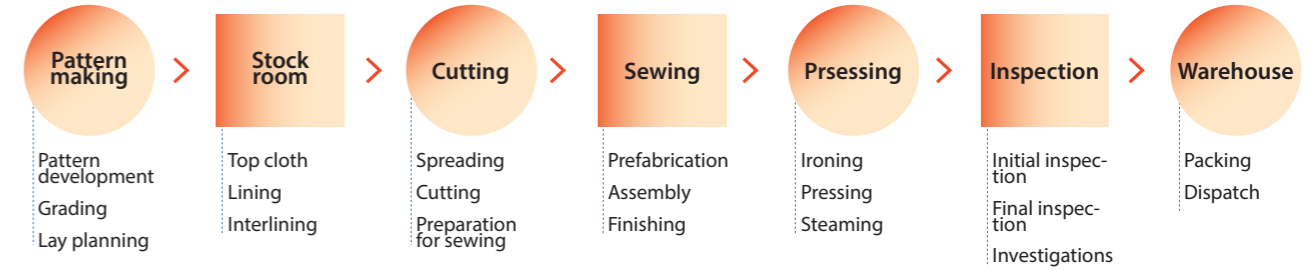


Figure 44. Product dimension and weight

10.3. Manufacturing Process

Garment Production



Production in big quantities will be cheaper in a factory than in a sewing atelier. In this sub chapter, the work process of garment factories will be studied to understand the requirements for each step. Most information comes from the collaboration with AMFI student Yu Bin Kim, and a book, Clothing Technology (Eberle et al., 2014).

Marking, preparation for sewing

Distinguishable marks and notches are sometimes needed to give a direction for accurate sewing and assembly in next steps. These cuts or marks should not be visible in the finished apparel. In this project, some designs have a lot of foldings. Hence, a hot notcher can be used for making a fold, and a sewing mark.

Pattern development

After the design is finalized, the factory makes a pattern during the pattern construction phase. The pattern is a basic requirement of fabric mass production. At this stage, garment production techniques are combined with the design. Each component needs its own pattern.

Sewing

For sewing, many aspects should be taken into account, such as what kind of machines, needles, stitch types, tools, presser feet, etc., are needed. Top stitch, hidden stitch, and overlock stitch will mostly be used for this project based on the fabric types.

Lay plan

The lay plan defines how the separate patterns are placed on large pieces of fabric in an efficient way. During this phase, not only efficiency but also directional properties, thread directions, pattern directions, etc. are taking into consideration. All patterns for the Sniftrail are square. Therefore, it minimizes fabric waste and thus cost, and environmental impact.

Pressing

Pressing is ironing, and it shapes and smoothes the textile. Pressing happens as one of the last steps, before inspection. There are three common types of pressing operations in the garment manufacturing process. First, under pressing off all the separate components before assembly is done. Secondly, moulding a semi finished product in a three-dimensional shape. At last, top pressing is the final finishing process on the completely assembled product.

Spreading

Spreading is smoothly laying out of the fabric in overlapped plies of the same length. The cutting marker is placed on the top layers to prepare for next step.

Inspection

Inspection is the final step before packing and dispatching. Companies and factories use various methods and tools to give high consistency and quality. These steps are what commonly happens in the garment factories.

Cutting

Cutting in a garment factory has two different stages. One is rough cutting, what is dividing the single pieces, and the other is final cutting, what is detailed and perfect cutting of each shape. For this project, as all patterns are square and straight, machine controlled straight knives are used.

There are various details in the process that are not discussed in this report. However, this level of information is sufficient to design the product to be manufacturable, and prepare for the next step; prototyping.



Figure 46. Examples, how the product place in 60 square meter house (red lines)

A 1:1 scale prototype was made to find new problems, experience the feeling of the product, evaluate and improve the concept of the Snifftrail. During the process of making the prototype, the manufacturing steps of the previous chapter were taken into account too.

Before starting with the real prototype, various types of fabric and patterns were tested. The final fabrics are nontoxic or organic and have unique characteristics to stimulate the dogs while not harming them in any way.

All of the patterns for the Snifftrail are square, which means there is almost no waste during the manufacturing process and sewing is straightforward and fast.

During the prototyping phase, technical assistance was given by Amsterdam Fashion Institute student Yu Bin Kim(Appendix G). She helped fine-tuning the pattern for manufacturability, and with prototyping with fabrics(Figure 48).

There are three types of design for Snifftrail which are in this chapter called design (A), (B), and (C). The difference is only in the top player, the base and adhesion layers are the same. (Figure 50)

A detailed illustrated step by step guide of the prototyping can be find in appendix H(Figure 47).

During the prototyping phase, various iteration and modification on the pattern and material were made to make the product manufacturable. Each material has its unique characteristics. Therefore, testing the fabric was an essential step before and during prototyping to find the right textile and shape. Even after the prototyping was finally done, improvement is still needed (chapter 11).

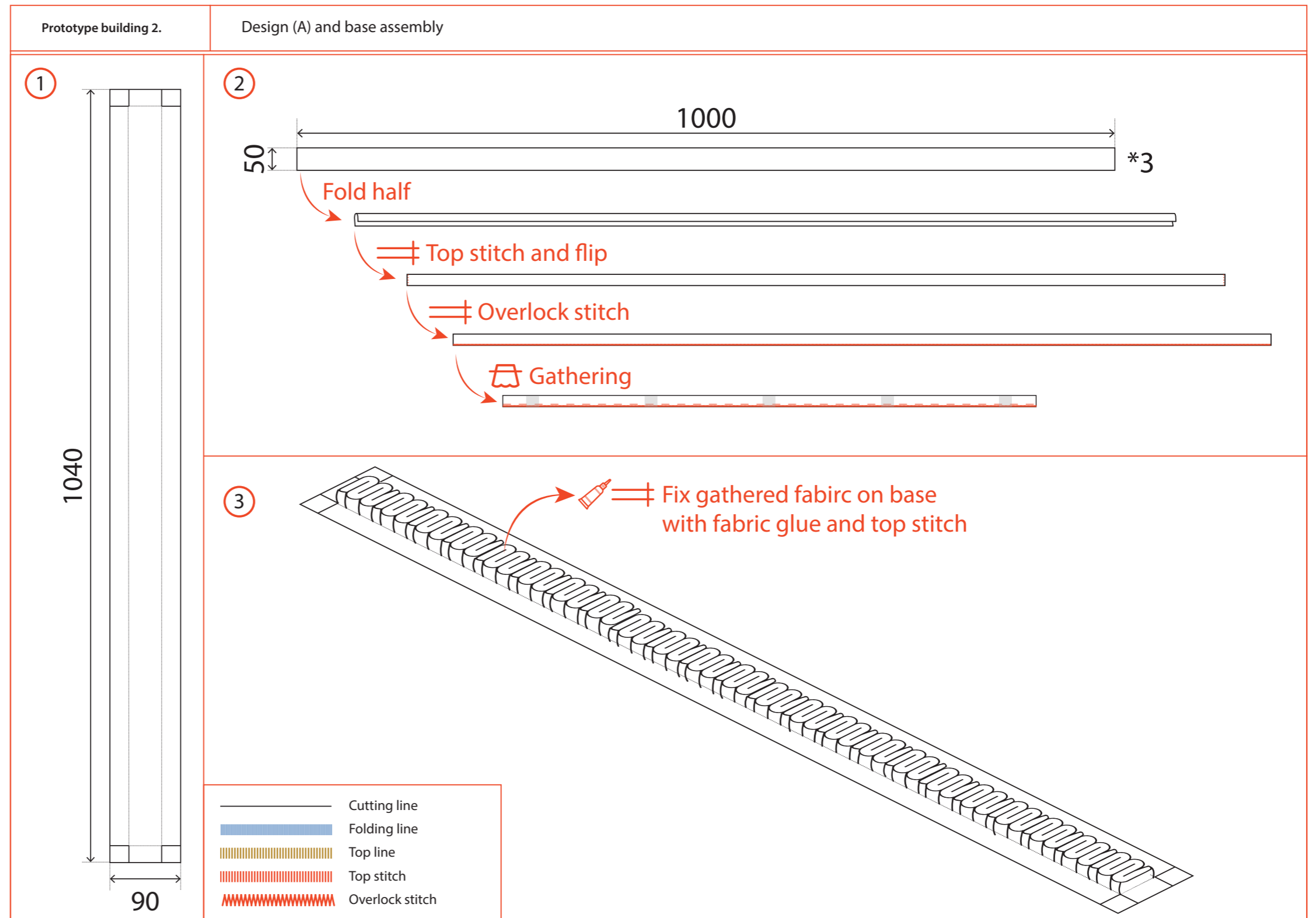


Figure 47. Manufacturing instruction



Figure 48. Prototyping Process



Figure 49. Final prototype models



Figure 50. Details

The price of the Snifftrail is mostly defined by material, labor, and manufacturing costs. This chapter gives a rough estimation on the different parts of the price (Table 5).

Table 5. Cost lists

	Resource	Price
Material	Organic fleece (top)	US \$1.65-8.7 / m ² *
	Non toxic terrycloth (top)	US \$1-9 / m ² **
	Organic cotton (top)	US \$1.91-1.96 / m ² ***
	Canvas cotton(base)	US \$1.05-1.65 / m ² ****
	Velcro(adhesion)	US \$0.2-0.3 / Meter*****
	Average price for 1m Snifftrail	US \$0.46 = (3*(top avg)+1.3*(base) + 0.25*(bottom))*0.1(1meter piece)
Labor	Chinese average minimum wage for 4m Snifftrail	US \$2.5/hour*****
Manufacturing	Manufacturing in Asia area for 4m Snifftrail	US \$3 - 4/one garment*****
Total(Avg)		US \$7.34 = €6.30 (11/2017)

The manufacturing price is greatly dependent by the location of the factory. In North American and European regions, the labor and manufacturing costs will be extremely high compared to Asian or African countries where the prices are at least two-thirds lower. For this project, average Chinese labor costs are used.

The final price of all parts combined is **€6.30** for 1 set (4m) of Snifftrail. In general, the retail price is around five times more than the manufacturing price. So it can be assumed that the minimum product retail price will be around **€32**. In this calculation, transportation, storage, and other service fees are excluded from the price. As chipping in China is cheap (WIRED, 2017) the price will not increase much from this.

The aim to target Chinese who are spending an average \$50 per month for their dog will be feasible.

*("Top Quality Brushed 32/1 And 21/2 Combed Cotton Fabric Organic Cotton Knitting Fabric Fleece For Garment - Buy Fabric Fleece,Cotton Knitting Fabric,Organic Cotton Fleece Fabric Product on Alibaba.com", 2017)

**("Item Eco-oc-355 100% Organic Cotton Terry Fabric For Baby Cloth And Sheet - Buy Organic Cotton Terry Fabric,Organic Cotton French Terry Fabric,Organic Cotton Knit Fabric Product on Alibaba.com", 2017)

***("Cotton Thin Organic Denim Fabric For Shirts - Buy Organic Denim Fabric,Cotton Organic Denim Fabric,Thin Organic Denim Fabric For Shirts Product on Alibaba.com", 2017)

****("6.5oz White Combed Cotton Canvas Fabric Roll - Buy Cotton Canvas Fabric,Canvas Cotton Fabric,White Cotton Fabric Product on Alibaba.com", 2017)

*****("Colorful Self Adhesive 100% Nylon Hook And Loop Tape - Buy One Wrap Ties,Hook And Loop One Wrap Ties,One Wrap Velcro Tie Product on Alibaba.com", 2017)

***** (WageIndicator.org, 2016)

***** (Dawson, 2017)

This Chapter proves the product is manufacturable while not compromising on price, functions, or design. But before the Snifftrail can be seen in retail stores, a lot of detailing needs to be done. The final patterns, fabrics, and manufacturing methods and steps need to be optimized with various fabric experts, and manufacturers. And the price can be optimized if the number of different materials and manufacturing steps are reduced. Regardless these optimization steps, it is proven the Snifftrail is a product that can exist in the set boundaries.



88 After finalizing the concept and building a prototype, the product was evaluated to check if the concept fulfilled the requirements. The evaluation is split into three aspects, usability, acceptance, and aesthetics. These three aspects are based on the needs of the stakeholders. The usability test will check if both the owner and the senior dog have a benefit (increased qualitative interaction). The acceptance test will prove if the old dog is satisfied with the Snifftrail, and the aesthetic test will prove if the Chinese owners are happy with how the Snifftrail looks in their house. More detailed instruction is in appendix I.

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11. Product evaluation

11.1. Usability Test

With the usability test, it will be proven if there is an increase in interaction quality between the owner and the senior dog. This is most important for the orientation (training) part of the product as it involves both owner and dog at the same time.

SETUP

The test was conducted in Hangzhou, China, with three family members (parents and son) and one senior dog, Lulu. Lulu is a thirteen years old Chihuahua, which has breathing issues, bad eyesight, bad hearing, and other common aging issues.

The following procedures were executed for the test:

- Before starting, the test, product, manual, and treats are prepared.
- First, fix the prototype on the floor, and follow the manual.
- In the manual, Impulse control training is explained. Two types of the training session in the manual were repeated.
- After the session, participants filled the questionnaire and had an interview.

The adhesion system could not be tested during this test, since the participants were afraid to harm their floor. The prototype was fixed on the floor with sticky tape instead.

RESULT

The new way of interacting between owner and senior dog was received positively. At the beginning of the session, it was challenging to understand the product for the old dog. After three to four times of repetition, Lulu finally understood the system. See Appendix J. According to what a participant said;



“Although it was a bit confusing to my dog at the very beginning, he seemed to really enjoy it as a game, he was really focusing on doing something, which was not very common at his age. *It is way more difficult to get his attention and keep him staying interested nowadays, but it seemed that he just wanted to have more playing with it.* My mom was really happy to see her old baby having fun with something even though she didn’t get the point of the initial purpose of the design. She said when she has some spare time, she would love to play with Lulu in that way. The idea really brought up Lulu’s enthusiasm (usually he only reacts on female dogs), and it was nice to see him achieving something with his own abilities.”

DISCUSSION

It demonstrates that the Snifftrail encourages and bring back a senior dog to be more active and enthusiastic.

Moreover, it was found during the interview that Lulu didn’t follow the owner for the last few years. However, after the session, **Lulu started to follow the owner again**. It proves that the Snifftrail helps to improve the quality of interaction between the owner and a senior dog.

Physical usability (if the owner trip over the Snifftrail) was also asked. During the test, the owner didn’t trip over the Snifftrail. However, they still worry of tripping over the object but will get used to it.

An additional evaluation was conducted in the Netherlands. The participants were thirteen old Kooikerjondje, Jingo, and his owner. The results of this session were also positive. However, one difference is that the training method introduced by the Snifftrail wasn’t new for the owner, which already plays similar activity with his dog. According to what the owner said;

”This is fitting my dog because he always like snack games and his smell ability is still good. Also, if I install the game for him he can finish it without my help (if he gets to know the toy better) because it doesn’t get stuck (unlike a ball under the couch). **It is like my other snack hiding games but better** (safer, softer and more challenging (takes longer). I would like to have something that he can play over a long time too. Also, something like automatic installing would be nice if he is home alone.”

At the beginning of the test, Jingo was overwhelmed. He kept barking and couldn’t focus on the test. After several tries, it could be noticed that he became more calm and stable. Moreover, the owner mentioned that Jingo never used his paw when he was playing a game, but during the session, Jingo actively used his paw.

The goal of the product is to offer qualitative indoor activity including qualitative interaction. As seen in the result of the test, the Snifftrail has a positive effect on the interaction between the senior dog and the owner. The positive impact was not only temporary; it extends after the training session. The owners who

experienced the Snifftrail wanted to keep using or buy it after the session. The other interesting point is that both participants called the training a game, even when all the manuals mentioned it as training. This suggests that the training is seen as enjoyable or lighthearted.

EMOTION EVALUATION

The aimed emotion that was defined earlier in this report (Chapter 4.3.) is evaluated on the following points:

• **The senior dogs should feel the indoor activity like how they would feel in during outdoor activity; Pride, Inspiration, Amusement, Energized, and Satisfaction.**

• **The owners should feel during the interaction process; love, joy, fascination, satisfaction, and enchantment.**

After the usability evaluation, participants were asked about how they and their dogs felt during and after the experience. From 30 plus emotions they only choose the following six, of which satisfaction and energized are the most wanted emotions for the dog, and fascination, and Joy for the owners.

• **During and after the session, the dogs felt; Anticipation, Lust, Relaxation, Satisfaction, Desire, and Energized(Figure 51).**

• **During and after the session, the owners felt; Amusement, Anticipation, Relaxation, Relief, Respect, Surprise, Energized, Fascinated, and Joy(Figure 52).**

The owners assume the emotion that their dog had by their dog's behavior.

“He was looking at me when I have the treats in my hands as usual and really concentrated on digging the stuff out from the bridge. When I think it was time to finish the playing, he seemed to want more, swinging his tail and following me, which haven't happened for a long time.”

“He was eager to try the toy, so it was a bit difficult to stop him before he could play (but that's usually the case). When he got more familiar with it, he tried to scratch and jump on it more.”

The experience and story from the Snifftrail fulfill the emotion goals defined in this report (chapter 4.3.). Besides the emotions aimed for, other aroused feelings during and after the test confirm a positive result.

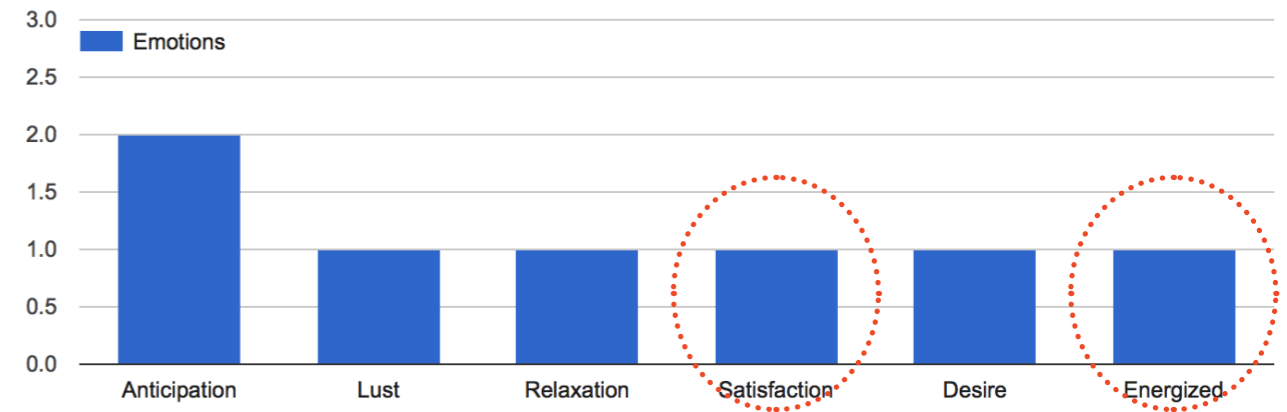


Figure 51. What dogs feel during after the experience

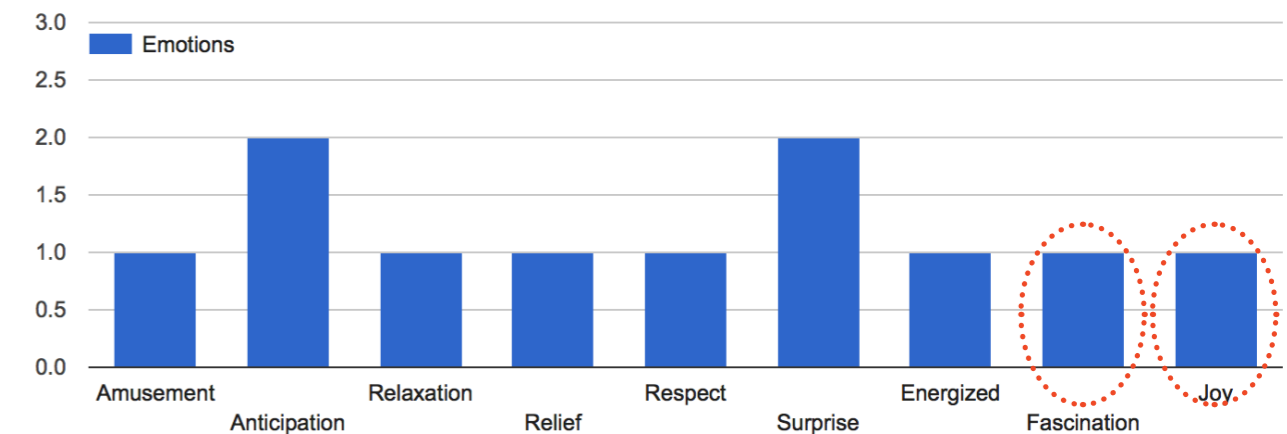


Figure 52. What owners feel during after the experience



Since there is no similar product currently existing like the Snifftrail, a user acceptance test is essential to see if this kind of product would fit the market. The test was done with two families with a senior dog from China and the Netherland.

SETUP

The test started with the owners preparing small treats for the evaluation session, and installing all three bridges next to the wall. The same amount of treats were hidden inside each bridge, and the normal training session was started. This was repeated three times. During the session, the dog its behavior, response, and interaction with the bridge were observed.

RESULT

The owners said the dogs had interest in the Snifftrail on first sight (4.5/7 score) and the dogs understood the Snifftrail (5/7 score). However, it took several tries to make them understand the goal of the snifftrail, and this was not even with all of the dogs.

The owners saw that their dog could follow and sniff the Snifftrail (4.5/7 score) even when treats weren't there. The dogs still had interest in the product when the training session was finished, and kept smelling the product even when left alone. Based on this, it can be assumed that dogs will have an interest in the product even when they are alone at home.

Participants mention that the Snifftrail seems safe and harmless for their dogs (6/7 score).

It was also asked if the dogs preferred one of the

bridges more over the other. The owners answered that there was no difference in preference. It is not clear if this means all the bridges are seen as equal by the dog, if it is due to the new exciting interaction for the dog, or if this is going to change in long term.

DISCUSSION

Based on the results above, it can be assumed the personality, intelligence and environment influence how fast and to what extend the Snifftrail is understood. If a dog has difficulties to concentrate, he/she needs extra help from the owner. The orientation phase of the snifftrail is essential to let the dog understand the Snifftrail.

As the product can be seen as an interior element, and it is placed on the floor in plain sight most of the time, it is essential to validate if the product is aesthetically pleasurable for the user. The aesthetic evaluation is only relevant for the owners.

SETUP

The survey was conducted on a group of aesthetic experts (design students) to validate the design. The participants were 12 design students from China (Figure 53). The first step was to let the participants see, feel, and observe the Snifftrail, while the context is explained with images and video. Secondly, after observation, a participant fills in the questionnaire, which analyzes the aesthetic value on general feeling, form, color, and material.

RESULT

In general aesthetic point of view, the design needs improvement to be more harmonious in Chinese house decoration (4.3/7). Some participants answered the design does not fit Chinese house decoration because it looks too European (some participants mentioned Nordic style). There was also some concern on how the track looks like when cross a corridor or another part of their house.

To analyze the aesthetic value in deep, defined aesthetic group from 'FORMULATION AND USE OF CRITERIA FOR THE EVALUATION OF AESTHETIC ATTRIBUTES OF PRODUCTS IN ENGINEERING DESIGN' is applied to questions (ROUSSOS & DENTSORAS, 2013).

Based on the journal, aesthetic evaluation standard specified into color, material, and form.



96 Most participants mentioned that the color should be warmer. On the other hand, some said the color of the product is neutral so it will fade in the house decoration. The total aesthetic color score is 4.9/7. On material aspect, the participants claimed that the soft feeling of textile gives a positive and friendly image to the product (5.4/7). A negative opinion of the material is that the fabric looks like it will collect dust easily, and it doesn't look hygienic. The last aesthetic value, form of the product, got 4.9 out of 7 points. Some participants said that the organic shape is decorative. However, others mentioned that it takes too much attention.

DISCUSSION

Overall, the Chinese experts group did not give a very high score to the Snifftrail on an aesthetic point of view. There are a lot of opportunities to improve the design into Chinese taste. The color of the product needs to be warmer to make it harmonious with the Chinese house decoration. To make the the product look more hygienic, the fabric should have a less fluffy look, and maybe even be made from smooth plastic or fabric. There were some contradicting comments on the shape of the product, so a more in-depth research is recommended for the product shape.

11.4. Conclusion

After validating the Snifftrail on three different aspects, it became clear that the orientation phase is very important for the dog to understand the product. The role of the owner is essential in this phase because every dog reacts differently, and has a different level and speed of understanding the product. A bigger group of participant that can test for a longer period of time is required to get a better understanding on how much this deviation on the dog its behaviour is, and how the owner can control this better.



Figure 53. Aesthetic Evaluation with Chinese Expert Group



98 In this chapter, the overall conclusion concerning the project is described. The unique selling points about the final concept are discussed based on facts that validated through evaluation. The project will concluded by giving recommendations for the company, MARS, and designers who are going to work further.

12. Conclusion and Recommendation

99 12.1. Unique Selling Point

INTERACTION; THE STORY AROUND THE PRODUCT

The Snifftrail offers a new interaction to create a better relationship with the owner and the senior dogs by using impulse control training and nose working. The senior dogs can stimulate their senses, and in particular smell which is the most important sense of dogs. And the Snifftrail fulfills a modern dog its requirements (see chapter 2.3.) exercise, discipline, and affection. According to the results of the evaluation, both the owner and the senior dog have a sense of satisfaction during and after the experiencing the Snifftrail.

ENCOURAGE INDOOR MOVEMENT

According to the the Emotional journey map sessions, senior dogs need support when they are home alone, to overcome their negative emotions. The evaluation showed that the Snifftrail can offer an indoor exercise to stimulate intuitive curiosity of senior dogs by themselves. The various materials and shapes will act like a guide for dogs with severe eyesight problems, and create a way to navigate through the house.

FLEXIBILITY

The Snifftrail is made out with fabrics which are easy to maintain. The product has a small space footprint, and efficiently creates a path through the house. It can even be cut to the right size while not neglecting the product finish. The product uses the small space efficiently, which is Chinese product trend (see chapter 3.3.) because the user can adjust the length of the product.

12.2. Recommendation

12.2.1. Longterm usability and acceptance evaluation

In this project, the evaluation was based on short-term use of the snifftrail. It is important to prove the function of the product as it is an interior element, so the product should have a long test to see how the owners deal with it. Also, long term usability and acceptance should be tested. A more in depth evaluation on how senior dogs interact with the Snifftrail when they are home alone would test if they keep interest in the product. This test can be done by installing a remote controlled camera at home and check how they behave. By testing it at a regular interval over a longer period of time with multiple participants, a more definitive conclusion can be made on their home alone behaviour.

More acceptance test like discussed in chapter 11.2. would give better insights on how much the owner has to guide the dog during the orientation phase.

12.2.2. Aesthetic quality of the product

According to the result of the aesthetic evaluation, the product has a lot of opportunities to improve on how it looks. The main material is fabric, and the fabric has various types and characteristics, and other flexible material can be a substitute. There will be a more proper fabric that hasn't tested for the product.

The color needs to be a warmer tone (color chart) that can fit on Chinese house decoration.

During the evaluation, it was found that Chinese people worried on 'What if the Snifftrail collecting dust?' The plastic/silicon/etc. material that collects less dust can be tested for new material of the Snifftrail.

The shape needs to change more simplistic form. The Chinese participants said that their house isn't decorative and it makes the Snifftrail seems too dramatic for Chinese house. The Snifftrail can be developed more simple form but still can hide treats.

During the improvement process, it is essential to have consistent check of Chinese consumer's taste. Also, more studies and understanding on Chinese house decoration are required.

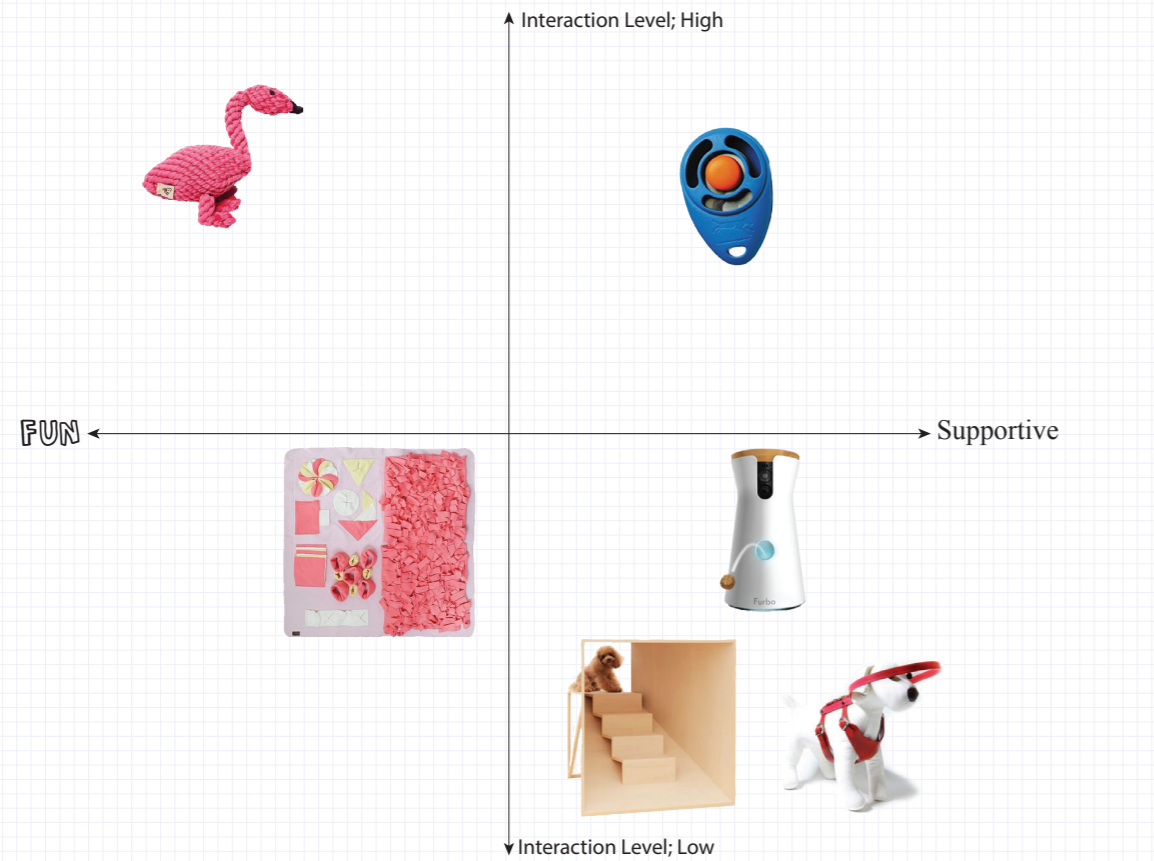


Figure 54. Market Positioning; where the Snifftrail can be placed?

12.2.3. Market positioning

The Snifftrail started from an open design challenge and is finally end up with a brand newproduct category.

In the positioning statement, it is mentioned that the product category is an interior element. However, the final product has also aspects of various other dog related products such as dog toy, dog furniture, train tool, physical support product, and nose work carpet. The existing products that are similar to the Snifftrail can be classified according to fun/supportive and low-high interaction level. (Figure 54)

To introduce the product on the market, it need to be placed somewhere inbetween these products. Based on where the product will be placed, the price will differ too. If the product is in the scope of dog toys, the price will be lower, but if the product is in pet furniture area, the price will be higher.

Comparable products;

- Toy
- Clicker; training tool
- Nosework mat
- Smart toy or smart feeder
- Pet furniture
- Angel ring; supportive gadget for blind dog

To guarantee a good market introduction, more research needs to be done on when, how and where to sell to Snifftrail on the Chinese market.

12.2.4. Optimize for manufacturing and price

In the target user segment (chapter 5.1), it was mentioned that the target group is spending 50 euro every month for their dog. Compared to this price goal, the product price may be on the high side. It need to be verified that potential buyers want to spend this amount of money at once for a product with these features.

To reduce the costs, the high quality organic fabric and canvas could be replaced by similar less expensive options. Secondly, the manufacturing process can be more simplified by reducing the amount of operations and thus simplifying the patterns. The price mentioned in chapter 10.5. could also be too high due to wrongly estimated fabrication costs, as this can fluctuate depending on deals, geography, and pattern complexity.

12.2.5. Packaging

Packaging is the first impression to the consumers. It needs to communicate with the consumers with the proper packaging. For the Snifftrail, this will be a package that uses a light-hearted design and material. The concept of the product offers a casual experience and an interaction between the owner and the senior dog. Therefore, the packaging should not be formal.

Since, the Snifftrail is a modularized product, it is expected that some users won't use the whole 4 meters. It can be an option to reuse the packaging of the Snifftrail as a storage box for the leftover pieces.

The packaging of the Snifftrail can be suggested in the feeling of following images(Figure 55);



Figure 55. Packaging suggestion

102 Although the project took more time than expected, the whole process gave me a lot of inspiration and new insights. I've not only learned a lot about the topic of the project but also how to deal with myself and my surroundings. I plan to bring this experience to good use for the rest of my life.

AUTONOMY

At the beginning of the project, I had difficulties writing the report because the responsibility for the project was too big for me. However, by building the project step by step, I felt that I'm achieving something and it motivated me to move on next step. Still, sometimes, I was horrified that I needed to do all the work myself. But, passing through this moment, I could reflect on myself and my own project.

COOPERATION

I found it difficult to ask help to others like, shelters, experts, participants for tests, etc. Especially as student and foreigner. However, a few were always there for me. Not only my colleagues, friends, and family members but also strangers gave me precious advice, guidance, and ideas. I learned that I need to recognize when I can ask/need support from others, and put that support to good use. And also, what kind of channels I need to access to get that support.

DETERMINATION

For me, it was difficult to make the right decisions at the right time. Mainly because of my lack of (working) experience. To overcome this problem, I tried to structure my process by using design methodology, and think more with a scientific mindset like I have learned in the past two years at the TU Delft.

Those are surely not only what I have learned. The year 2017 is an unforgettable year for me. I had to fight with my negative thoughts on myself and needed to learn how to look at myself in an objective way. This affected the project as well. Luckily, nowadays I feel stronger and more proud of what I achieved.



13. Reflection

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