

Building long-term relationships
between people and products
through customization

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Building long-term relationships between people and products through customization

A thesis submitted to the School of Design, Carnegie Mellon University,
for the degree of Master of Design in Design for Interactions

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IRB No. STUDY2017_00000456

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ABSTRACT

ABSTRACT

History indicates that products shape human society. For example, with the invention of the wheel came the infrastructural development of roads, rails and other methods to commute, and the introduction of the telephone changed the ways people communicate. Today's devices such as mobile phones, wearables, etc., have brought about massive cultural change and dictate the ways humans interact with each other, with spaces, forms, and interfaces, as well as constantly define the way humans perceive everyday products.

A lack of evolving product experience builds a shallow relationship between it and the user, leading to a disposable attitude and behavior, which is problematic. The constant volatile behavior of owning and discarding is dangerous for the environment because it is unsustainable and negatively impacts the entire society as a result causes a change of mindset towards human-relationships being more transactional and less nostalgic (Rose, 2014). Although much work has been done in the field of emotional design, designing for love, empathy, and sustainable design, there is huge potential for designers to apply these theories to the design of products that change over time to satisfy users' evolving needs. This study examines the role of design in motivating users to actively participate in reconfiguring products in use over time to satisfy evolving needs and drives. The hypothesis is that such actions will build a long-term humanistic relationship between users and everyday objects, which will positively impact people and the planet.

ACKNOWLEDGEMENTS

ACKNOWLEDGEMENTS

I would like to thank my advisor Stacie for her incredible guidance and constant support, my loving parents, my professor Olivia who has made me fall in love with stitching, and the design school members Chris and Josiah for their valuable advice. I am truly so grateful.

INTRODUCTION

INTRODUCTION

This design study applies existing theories of human needs and drives to the design of everyday objects that change over time to build a humanistic relationship between it and users. Thus, understanding users' motivation to use products for long periods of time was an important inquiry in this study. The user-object relationship fails when people grow or evolve over time while objects remain unchanged (Chapman, 2005). This causes the new needs and drives of users to not be satisfied. As a result, the focus of this study was to investigate the role of design in facilitating long-term relationships between users and objects by enabling the objects to change over time to satisfy user's evolving needs, and drives.

CURRENT STATE OF PROBLEMS

For the purpose of this study it is important to highlight the current state of problems. These are:



1. As products are static in nature, over time, users stop projecting their own personality on products causing their relationships with the objects to become stale and unimportant.



2. A lack of long-lasting relationship with products has had a negative effect on society as people have developed a disposable attitude towards objects. This is harmful for the environment and has caused a massive cultural change. Human relationships, too, have become more transactional and less nostalgic as a result of this behavior.



3. With the overuse of visual senses in product usage there is a lack of product experiences that explore a combination and multiplication of human senses.



4. Products are currently interruptive, intrusive, oblivious to social settings, often push information, and have little respect for humanity.

SIGNIFICANCE

Interactions are powerful as they are used to communicate, be it human to human, product to human, or interface and screen to human. These interactions have become a language of their own and have the ability to shape culture and society in many ways. Smart digital products widely used today strongly rely on screen-based interactions. These interactions often fail to foster emotional connections but instead tend to build purely functional relationships with people that shape human behavior over a period of time. Rose (2014) emphasizes the adverse effects caused by a lack of emotional connections between products and people in his book, *Enchanted Objects*, where he states, “The lack of objects has had an icy effect on us. Human relationships, too, have become more transactional, sharply punctuated, thin and curt. Less nostalgic. Fewer objects exist to trigger storytelling.”

Most of these products lack a multi-sensorial experience, only have visually dominant interactions that become redundant, cause boredom and thus fall short to create a strong bond with the user. They are thereby reduced to be perceived not as a product with emotional value but merely a medium that can be upgraded, exchanged and discarded easily. There is huge potential for everyday products to be designed to leverage multiple senses that engage people in storytelling and build long-term bonds. Designing for longevity and multi-sensorial interactions also enables people to see value in everyday products, build an emotional connection with them, and thus learn to cherish them over time. Chapman (2005), confirms the need for such research in his book, *Emotionally Durable Design*, where he states, “Although the need for long lasting products is widely recognized, practical working methods, design frameworks, and tools that facilitate the development and integration of such emotionally durable characteristics within products are scarce.” Chapman (2015), also says, “The design, production, and consumption of domestic electronic products is fundamentally unstable—new approaches are urgently needed.”

RELEVANCE

Designers and engineers have been unsuccessful in designing for emotional connections between people and digital products. Although much work has been done in the field of emotional design and sustainable design relative to physical products, there is huge potential for improvement. By utilizing the principles of emotional design to build emotional connections between people and digital objects, designers can positively impact the lifespan of those products. Thus, there is a need for research that investigates:

- *How can designing products that change over time increase their value among users?*
- *How can the customization of products throughout their lifespan help people build a deeper connection with them?*
- *How can the quality of people's interactions with projects, such as multi-sensorial feedback and the frequency of interaction, foster love for the objects?*
- *How can short-term feedback loops be scaled to foster strong long-term bonds that establish ever-evolving, yet positive, images of products among users?*

New paradigms of interactions that are multi-sensorial, have short-term feedback loops that aim to foster relationships can merge design thinking and business practices to become the base for designing for sustainability. However, noticeable impact of a paradigm shift will likely be realized when industry sees value in designing for long-term commitments between people and products, which can be evidenced when customer loyalty extends to brands. Designing everyday products for longevity can promote brand loyalty, opening up a new space for a service-based model that can boost business and growth while contributing to a sustainable life on this planet.

SCOPE OF PROJECT

My goal was to explore the benefits of multi-sensorial interactions that support customization of objects through prototypes that aim to foster emotional connections between people and products. I sought to achieve this goal through a subset of smaller goals, which were to:

- *Investigate the benefits of products taking on human-like characteristics to inform the design of instant, sensory feedback loops.*
- *Understand how short-term feedback loops can be designed to scale and foster a long-term relationship.*
- *Explore the nature of multi-sensory interactions and how they can build an emotional connection between people and objects.*

Project stakeholders included baby boomers, millennials, and post-millennials. Understanding and integrating the various perspectives of each of these generations of stakeholders was crucial to the success of the project because the process helped me understand “what” made certain products valuable to each of these stakeholder groups and “why” some products are considered valuable. I made multiple high-fidelity prototypes that were evaluated by my user groups. Each prototype addressed a specific facet of emotional design thus making it easier to synthesize findings. These prototypes are intended to function as examples for designers that aid their understanding of how to design everyday products based on short-term feedback loops that foster long-term emotional connections. Lastly, This study may also inform customization features that are built into product experiences, which, in turn, has the potential to positively impact long-term brand loyalty.

EXPLORATORY RESEARCH

LITERATURE REVIEW

Human theories

Chapman, J. (2005). *Emotionally Durable Design: Objects, Experiences and Empathy*. Earthscan.

Emotionally Durable Design, written by Jonathan Chapman, describes waste as being the outcome of failed relationships between users and objects. Chapman addresses designers and stresses on designing emotionally durable objects to reduce consumption and premature discarding habits. He provides readers with a different take on sustainability by calling it a behavioral crisis and providing ways to implement it with the role of design being explored fully to drive and influence material consumption.

His book provided me with answers to the question, “Why do user’s fall out of love and discard products that still work?” This information helped me define a specific use cases for my study beyond what Chapman touched on which is how to design objects that evolve over time and how to motivate users to continue to be emotionally invested in their products. Thus, the results from my study combined with the information gleaned from Emotionally Durable Design informed the basis of my explorations and helped me define the different ways to motivate users to be emotionally invested in their products.

Kaufman, J. (2012). *The personal MBA: Master the art of business*. Portfolio/Penguin.

The Personal MBA is a set of foundational business concepts aimed at helping readers make good business decisions. In this book, Clayton Alderfer’s version of Maslow’s hierarchy is mentioned to explain the general priority of human desires and from the book Driven: How Human Nature Shapes Our Choices by Harvard Business School professors, Paul Lawrence and Nitin Nohria. They describe five

core human drives that have a deep influence on the decisions and actions that all human beings make. These core human drives are: the drive to acquire, the drive to bond, the drive to learn, the drive to defend, the drive to feel. This book encourages those who develop brands to satisfy and address a few or more of these core human drives through their branding as a way of making their products more attractive and their business more successful.

Learning about these core human drives caused my work to shift from merely identifying human needs to identifying both the human needs and drives that are satisfied by having a long-term relationship with products. My research identifies these four? Core human drives as Being useful to designers and technologists. They help them conceive and develop products that satisfy basic human drives, thus creating opportunities to build long-term relationships between people and products rather than just helping businesses be more successful.

Rose, D. (2014). *Enchanted objects: Design, human desire, and the Internet of things*. Scribner.

In this book, *Enchanted Objects* the author illustrates the idea of strategically designing objects that seem magical or enchanted because they are engaging, and the importances of developing an emotional connection with objects by addressing user's hidden needs. The author believes that most products today are frustrating to use as they are difficult to understand, demand constant attention through notifications, and are jam-packed with features that go unused and thus fail to empower people. This book is meant to effectuate the imagination of brands and the creativity of designers and technologists to make captivating products through alluring experiences.

The key insight I gleaned from the book was understanding that the three dimensions for creating delightful products and enchanting experiences are technology, design, and business and it takes a polyglot to balance all the dimensions well without ignoring any of them. For my research study, the six human drives explained in this book—omniscience, telepathy, safekeeping, immortality, teleportation, and expression also help me better understand user's latent needs and define the characteristics of objects that can create emotional connections with users. I found the ladder of enchantment, which explains how an upward trajectory in relationship building, to be particularly useful. In each step, products, services, and experience gain personality, which differentiates the brand from its competitors. The ladder of enchantment helped me define opportunities for building long-term relationships with users and guide the process.

Product theories

Golsteijn, C., Hoven, E. V., Frohlich, D., & Sellen, A. (2012). *Towards a more cherishable digital object*. Proceedings of the Designing Interactive Systems Conference on - DIS '12. doi:10.1145/2317956.2318054

The paper, *Towards a More Cherishable Digital Object* expands on the definitions of physical and digital objects and their advantages and disadvantages. The paper also identifies the design opportunities for the creation of new cherishable digital products by combining the advantages of both digital and physical products.

The research conducted in this paper benefits my study in two ways. First, this paper clearly defines the differences between physical, digital and hybrid objects.

Secondly, the advantages and disadvantages of both physical and digital objects are elaborately described in this paper. Both the clear definitions and the classifications of the advantages and disadvantages helped narrow down my research to the study of physical objects. It also helped me consider the qualities of a hybrid object and take inspiration from these qualities and characteristics.

Fuad-Luke, A. (n.d.). Slow Design. *Board of International Research in Design Design Dictionary*, 361-363. doi:10.1007/978-3-7643-8140-0_251

The paper, Slow Design for Meaningful Interactions describes a case study that promotes product attachment to aid long-term use of the product. This case study is an exploration of designing mass manufactured products by applying the principles of Slow Design Theory to create mindful interactions that encourage users to be more involved throughout a product's lifespan. In this paper the evaluation of each of the slow design principles and their creative application demonstrates these principles, making them practical and broadly applicable in design practice. The set of theories presented in this paper inspired my study by guiding the ideation of product concepts that engage users in meaningful interactions that facilitate strong user-product relationships.

Verbeek, P., & Kockelkoren, P. (1998). *The Things That Matter. Design Issues*, 14(3), 28. doi:10.2307/1511892

This article briefly looks back at the history of design, pointing out that the industrial design discipline is a counterpart of materialism. However, it is more focused on signs, functions, meanings, and styles and less on the matter itself. Thus, the article explains how this discipline's way of thinking falls short of meeting the requirements of sustainability and durability. Also, the article briefly

describes varied themes, some of which are titled Eternally Yours, Platonism of Design, Technological Intentionality, Transparent Objects, and Engaging Objects. All of these concepts highlight two contrasting theories. On one hand, the meaning of products is discussed from a psychological perspective, where meanings, signs, and scripts are attached to the product causing the non-material to receive more importance than the product itself. On the other hand, the materialistic approach towards products, where matter is more important than non-materialistic things, is emphasized.

This article was extremely useful to my research study for its brief, but well articulated, description of the history of design and the various schools of thoughts that enable a comparative analysis across all theories. The comparison helped me map out and identifying the gaps as well as the overlaps between the two concepts or themes—Object's Meaning and Object's Physicality. The Identified overlap between the two themes focused my investigation and helped me effectively scope my research study.

Gruning, J. (2017). Models for Ownership. *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '17*.
doi:10.1145/3027063.3053232

The paper, Models for Ownership: Implications for Long-term Relationships to Objects explores the different ways users interact with digital and physical objects and how these differences have negative implications on how the users value their digital objects. The study builds on previous HCI research that compares certain perceptions of digital to physical objects, where digital objects are considered ephemeral or not real and thus are perceived to be objects that are not kept for long periods of time.

The study builds on previous HCI research that compares certain perceptions of digital to physical objects, where digital objects are considered ephemeral or not real and thus are perceived to be objects that are not kept for long periods of time. The ownership of digital and physical objects is discussed in depth and the paper builds on the previous work of Odom et al by investigating different contexts of digital ownership and providing insights on the concept through multi-method research.

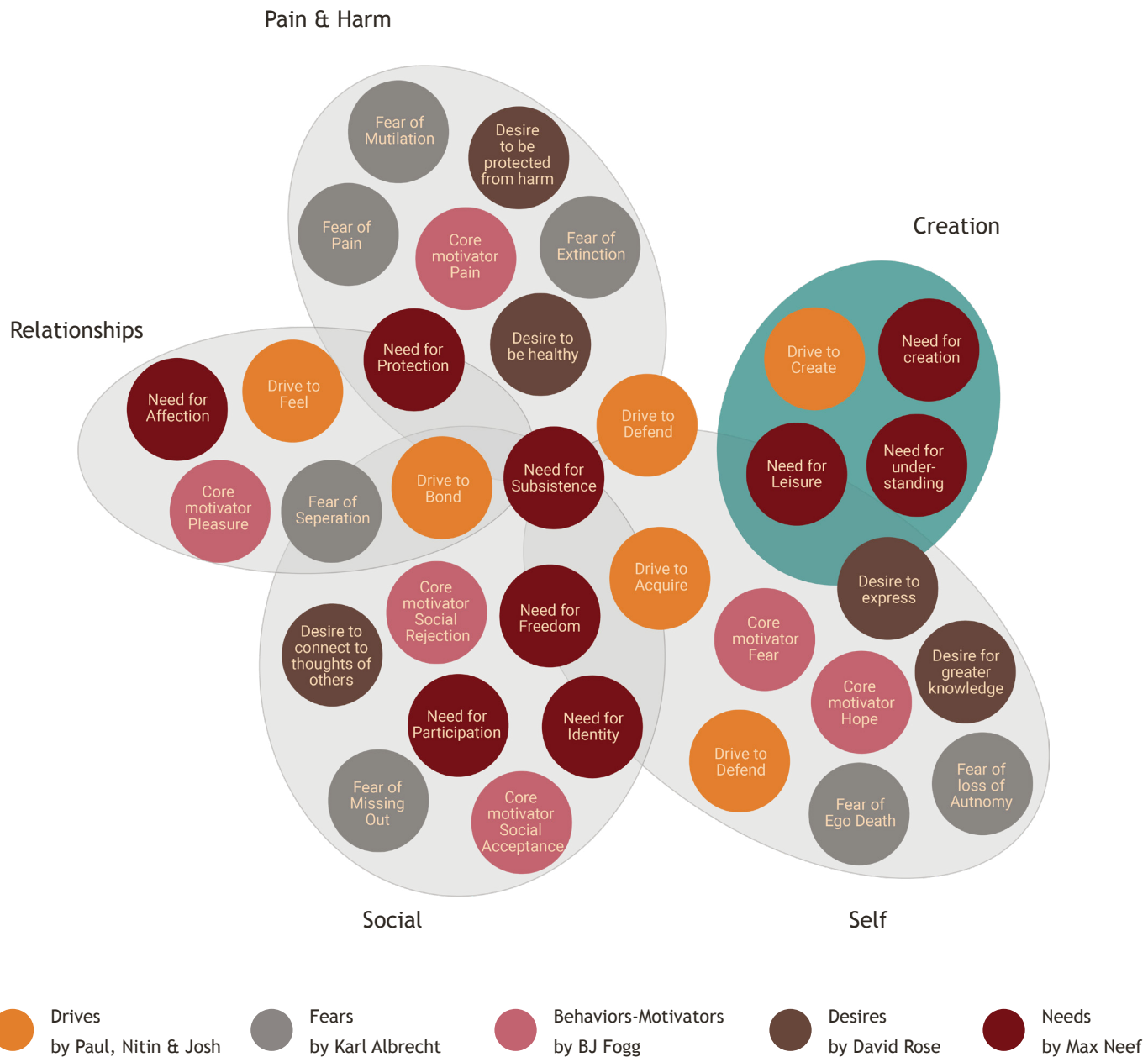
Two findings from this research paper proved to be highly influential in shaping the concepts for my research study. First, increasing the amount of control people have over their digital (as well as physical) possessions can increase the sense of ownership and the value of the object in the eyes of the owner. Second, the companies that sell digital objects can control the users' experience by provide services for the objects even after being sold, leading to a decrease in the sense of ownership and control by the owner. Thus, an appropriate amount of support from a company after a sale is complete is crucial for developing a positive ownership experience for users.

ANALYSIS OF LITERATURE REVIEW

Thus my research had two sides to it, the human's side and the product's side. I had to understand both sides very well in order to improve the ways products are made and consumed. I went through various human theories that talked about basic human needs, drives, fears, desires and motivators that influence behaviors. While reading about human theories a pattern started to emerge as many theories had some overlaps in ideas and various angles talking about similar fundamental core elements. Five important themes stood out after analyzing the overlapping pattern that had emerged. These five themes were important as they provided insight into why people behaved in a certain way and these themes could be easily applied to understand users' behavior towards products. The framing of these theories was important to the study because with the accurate framing of the categories, it became easier to narrow down on one category to focus on.

Theories that focus on how human beings react to pain and harm are well documented. They explain that as humans beings, we are extremely sensitive to the feeling of pain and fear of getting hurt. Human beings want to protect themselves and their dear ones from getting hurt. To avoid pain people tend to behave in certain ways. Albrecht (2009), Fogg (2009), Rose (2014) explain Fear of mutilation, fear of extinction, desire to be healthy, and need for protection, which can be grouped into a category that describes pain and harm.

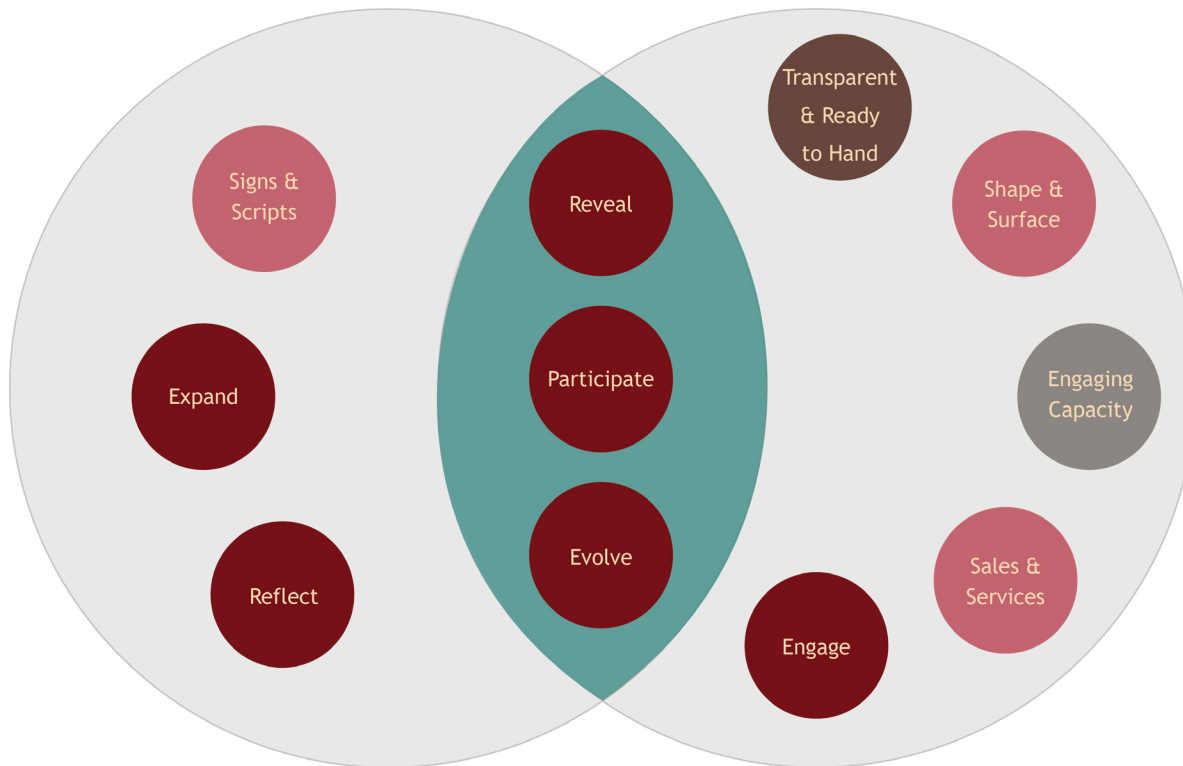
Theories that focus on the concept of people as innately social beings, and their value of, and long for, intimate relationships are well described by Albrecht (2009), Rose (2014), Fogg (2009), Visser, & Max-Neef (n.d.), Kaufman (2012). They explain that human beings are social animals, they like to live in groups or packs and rely on each other. They look to build intimate relationships to feel loved and cared for. Thus humans value their social imprint and personal relationships.



Theories that addressed the individual personality and the egocentric side of human beings are referenced by Albrecht (2009), Rose (2014), Fogg (2009), Kaufman (2012). They explain that even though human beings are social animals they are often self-centered and have an egocentric point of view. They frequently care a lot about their own well-being and individualism. They value their personal freedoms such as freedom of thought, freedom of expression, and freedom to live, which are considered to be basic fundamental rights. These are recognized as basic fundamental rights that are needed to harmoniously live in the society.

Theories that explain human beings as inherently creative, valuing creation, and striving for new knowledge and skills is highlighted by Visser, & Max-Neef (n.d.), Kaufman (2012). They state that the drive to acquire new knowledge is an inherent quality that is come in all human beings. Human beings are innately creative and constantly want to build. They often seek approval of their new knowledge or created things and products by society, thus indicating an important for wanting to be heard and understood.

I found that creation, as a theme, had the most potential for impact through design as it could be used as a method to motivate users to take action and cherish their relationships with objects. From my limited selection literature review, I noted that creation as a theme was less explored even though it was considered to be a strong motivating factor for changing human behavior. Objects made by people such as paintings, crafts, furniture, and mechanical toys held great value as well as the creators themselves were valued more by society. Self- created objects also held stronger emotional attachment.



OBJECT'S MEANING:

Psychological meanings that are attached to objects. Reduction of matter to deeper meanings and lifestyles they represent.

OBJECT'S PHYSICALITY:

Matter- object itself without reduction to psychological meaning. Materialistic approach.



Engaging Capacity of Objects
by Albert Borgmann



Eternally Yours
by Ed van Hinte



Notion of Readiness-to-hand
by Heidegger



The Slow Theory
by Alastair Fuad Luke

Targeting Slow Theory principles via comparative analysis of product theories :

(Verbeek & Kockelkoren 1998)

Eternally Yours describes elongating the life-span of objects through:

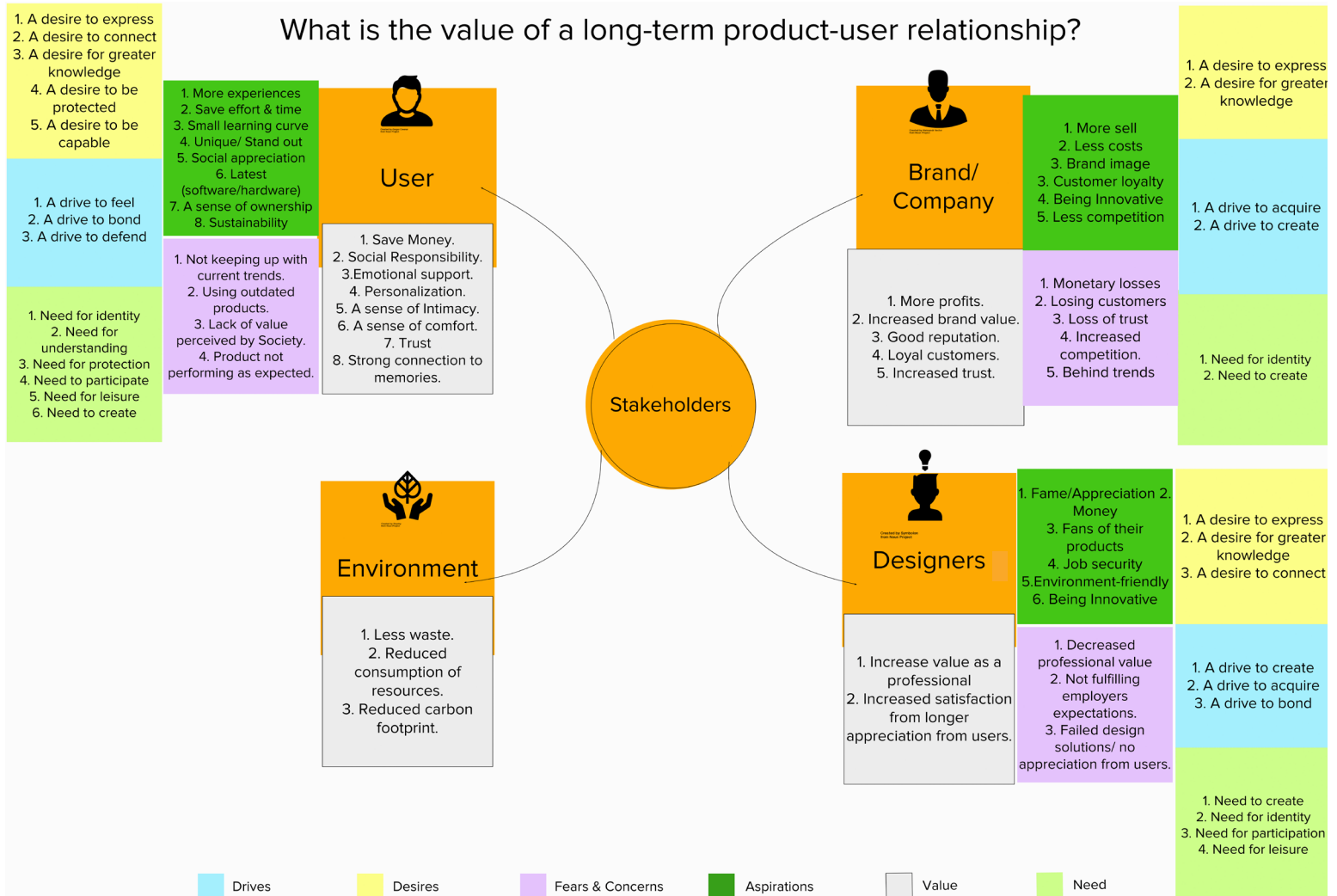
- *Shape & Surface*: forms and materials that can create longevity.
- *Sales & Services*: services connected to products can influence the length of their lifespans.
- *Signs & Scripts*: symbols or icons for our lifestyle, implicit prescriptions about how to use them (scripts). Stories giving characters to products.

The term '*transparent objects*' can be explained by Heidegger's notion of readiness-to-hand.

- *Transparent and Ready-to-hand*: object working properly absorbed into the everyday dealing.

Verbeek & Kockelkoren(1998) explain Albert Borgmann's theory of engaging capacity of the object. If the user's attachment needs to be directed towards the object and not only towards their meaning and the lifestyle they represent, it would be wise to design products from the perspective of their engaging capacity. There were two distinct classifications that emerged. Both of these overarching theories, object's physicality and object's meaning oppose each other. One emphasizes elongating the lifespan of objects by attaching psychological meaning to them (Chapman, 2005) . The other classification highlights elongating the lifespan of products by reducing psychological meaning and focusing on the object's physicality. However, I believed that significant design opportunities lie in the middle, where the two approaches overlap. An object that includes both psychological meaning and a materialistic approach is poised to build long-term relationships.

What is the value of a long-term product-user relationship?



DEFINITION OF STAKEHOLDERS

The comparative analysis of theories also helped me refine my stakeholder map by providing distinct five categories to compare the value of long-term relationship product-user relationship for each identified stakeholder. This helped me focus my study towards stakeholders that I believed would benefit the most. During this process, I identified drives, desires, fears, needs, and motivators for each stakeholder group, which enabled me to address one of the questions I posed in my research study.

I investigated the value of a long-term product-user relationship for:

- Stakeholder 1: Users
- Stakeholder 2: Brand/Company
- Stakeholder 3: Designer
- Stakeholder 4: Environment

After analyzing the value of products for each stakeholder, I chose users between 18 to 49 years of age as my target audience. This range includes users who hold onto their products until the product can no longer be used as well as those who tend to replace fully functioning existing products with newer versions. The broad audience enabled me to gain deep insights into the benefits or potential value of long-term user-product relationships, their evolving needs and drives over time, as well as various motivations that help users build and strengthen long-term product relationships.

ARTIFACT REVIEW



Image 1



Image 2

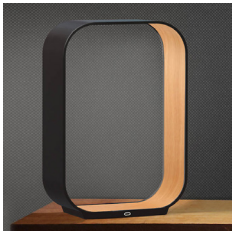


Image 3

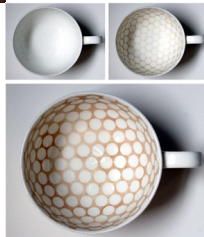


Image 4



Image 5

I compiled products that were considered to be “enchanted” (Rose, 2014), “emotionally durable” (Chapman, 2005) and which had great reviews by users and critical accolades. I visualized the various categories of products with a multi-sensorial experience which helped me choose a few artifacts that I believed would serve as a basis for further study and prototyping of ideas. The groups also helped me define two categories of objects:

Simple objects: Everyday objects that have form and function without having a brain (software of some kind) of their own (computer based technology embedded in them) that cannot be updated over time. (E.g. Book, pen, water-bottle, pan, curtains, lamp-shade, pencil-box, spoons, analog-watch, shoes, rucksack, jewelry, toothbrush)

Complex objects: Everyday objects that almost have a brain of their own (complex, latest technology/software embedded in them), which, in most cases, can be updated over specific periods of time. (E.g. Computers, laptops, keyboards, mouse, fitness-trackers, mobile phones, smart-watches, fridge, microwaves, smart-rings, E-book readers, smart-lighting, smart alarm-clocks)

Compiling products that are known for providing meaningful experiences helped me realize that I was not interested in exploring an artifact that was a “complex object” because I believed it would cause my approach to be too narrow. Complex technological products run on software that getting updated repeatedly over time which would cause my work to only have an impact on hardware. The limiting nature of this exploration would require me to expand my inquiry to include work on specific business and marketing strategies for the companies to support the solution. Why would a companies like Apple, Samsung, or Google want to change their business strategy (of updating their software and hardware every year and making users invest in their products yearly) to make everlasting hardware unless it suggested more or equal monetary gain than their current strategy?

ANALYSIS OF ARTIFACT REVIEW

I believed the design of products and their experiences would yield greater impacts that could be realized than designing new business strategies, choosing simple objects as artifact for my thesis made the most sense to answer questions such as:

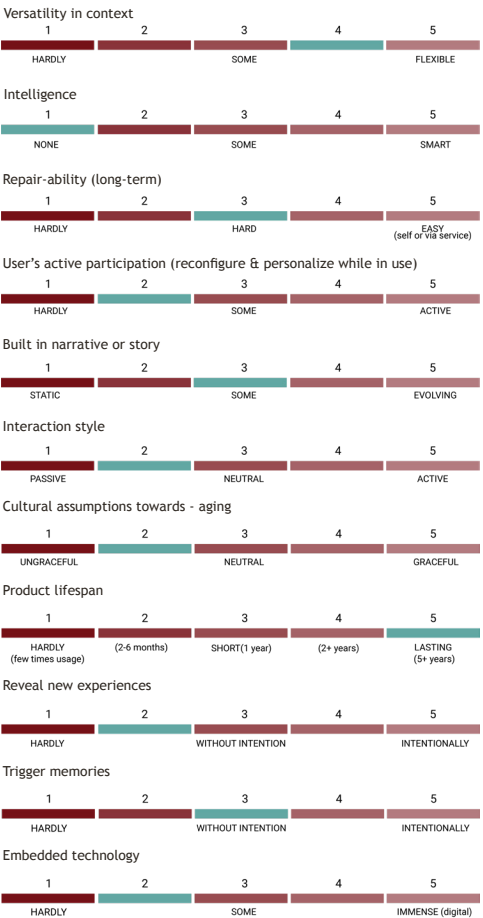
What type of relationships do people have with products? What is the value/benefit of a long-term loving relationship with a product?

What is presence? Do everyday objects have presence? What is implicit and explicit presence in everyday objects?

How do users perceive growth/change in their products? How can a product grow and evolve over time? How do users perceive changes in their products? What do the changes in products mean for users?

What are the characteristics of sustained relationships between people? I believed that the approaches I proposed needed to be time-based so that they could grow, change, and evolve rather than being stagnant. Nonetheless, I envisioned that they still could have a specific start and a perceivable end to the relationship over a period of time.

Based on the aforementioned long-term relationships with products I uncovered, I developed metrics on which the existing everyday products could be placed, which helped me identify further areas for exploration. To establish the metrics, I dissected my research question and identified the sub-questions within the main question. Based on the sub-questions I wrote methods for answering them and ways of testing my assumptions. Evaluating products based on this metrics helped me discover the strengths and weaknesses of each product and discover opportunities.



GENERATIVE RESEARCH

PROBE KIT

Although my analysis of theories offered new insights into people-product relationships, questions regarding the application of those theories in practice remained. As a designer, it is appropriate for me to infer users' needs, drives, and fears over a period of time? How could I predict how users evolve over many years and what would drive their decisions then? Also, would asking users to predict their evolving needs and drives in the future really impact design decisions and would they be able to think far in the future? To find answers to these questions I designed a probe kit that I used to conduct interviews with participants. The probe kit helped users visualize themselves in the future using an object they bought in the present. The probe kit also helped me learn why users would or would not use an object in the future. The questions asked during the interviews were directly linked to the analysis of the literature review that focused on human beings always striving to be a version of themselves that they already have imagined (Chapman, 2005). Thus, my hypothesis was that the process of asking users to forecast ten years ahead would reveal valuable insights that would trigger new angles and concepts to help build long-term relationships between users and products.



feel admired.

To prevent
personal loss.

teachable,
a correcting tool,
an improving tool.

To protect values
and beliefs.

DRIVE
TO
BOND

DRIVES

It is
popular
trendy,
cheap,
cost effective,
unique,
valuable,
useful.
desirable.

DRIVE
TO
ACQUIRE

It is
a gift,
romantic,
expressing love
and care,
likeable,
attractive,
presentable.

To show I love &
care.

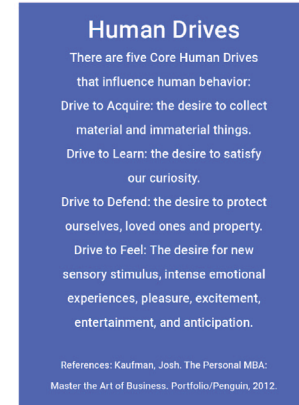
To improve my
skills.

FRONTSIDE: NEEDS CARD
The green color and the illustrations easily make the needs cards identifiable to the designer



BACKSIDE: NEEDS CARD
Explains the theory of core human needs and the reference is clearly noted giving due credit to the theory.

FRONTSIDE: DRIVES CARD
The blue color and the illustrations easily make the drives cards identifiable to the designer



BACKSIDE: DRIVES CARD
Explains the theory of five core human drives and the reference is clearly noted giving due credit to the theory.

Anatomy of the cards:

The probe kit contains two sets of cards—the Needs cards, the Drives cards. Both of these card sets have distinctive colors and illustrations to clearly differentiating them. As a result, each category is easily identifiable to designers while conducting the research activity with a participant.

The goal of the research activity interview was to identify users' needs and drives in the three phases of a user product relationship, which is:

- *Past phase (while buying a product)—“Why did you buy this object?”*
- *Present phase (product is bought and in use about 1-2 years) —“Why are you using this object?”*
- *Future phase (using the product for 10 years) —“Why do you think you will be using this object after ten years?”*

Both needs and drives set of cards have two card types. The first card type defines the characteristics of the product for example, unique, attractive, cheap, trendy etc. Words that describe the product that are directly taken from the descriptions of the theories. Second card type depict how the user feels towards or due to the product, these answers are also extracted from the description of these theories.

FRONTSIDE NEEDS CARD

Each needs card has the “core human need” marked clearly on the front side for the designer to identify.

This is for the design researcher.



BACKSIDE PRESENT PHASE

Needs Card: Each “core human need” has certain characteristics and these have been converted into answers the user can choose from.

It is
different,
bold,
universal,
revolutionary,
imperfect,
a statement.

These are answers
for the users.

BACKSIDE FUTURE PHASE

Needs Card: Each “core human need” has certain characteristics and these have been converted into answers the user can choose from.

To be open
minded.

These are answers
for the users.

FRONTSIDE DRIVES CARD

Each drive card has the "core human drive" marked clearly on the front side for the designer to identify.

This is for the design researcher.

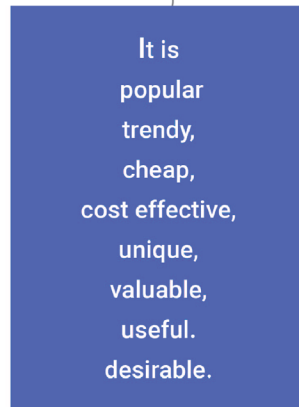


BACKSIDE PRESENT PHASE

Drives Card: Each "core human drive" has certain characteristics and these have been converted into answers the user can choose from.

It is popular, trendy, cheap, cost effective, unique, valuable, useful, desirable.

These are answers for the users.

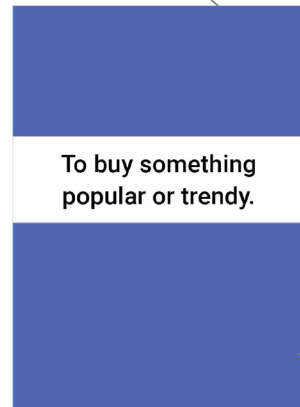


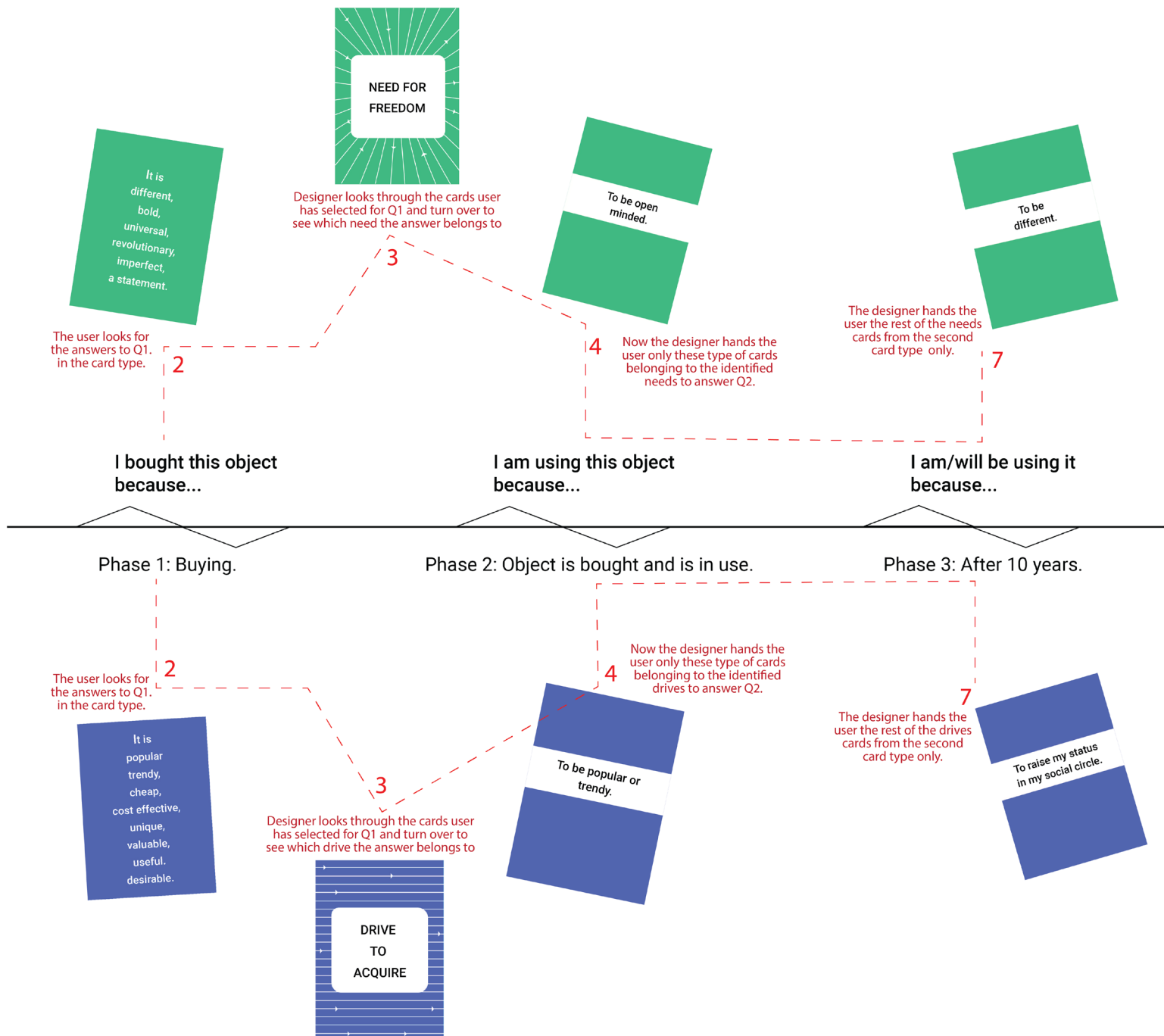
BACKSIDE FUTURE PHASE

Drives Card: Each "core human drive" has certain characteristics and these have been converted into answers the user can choose from.

To buy something popular or trendy.

These are answers for the users.





The schematic on the left explains the activity and the chronological steps involved to aid the user in responding to these three questions.

Pre-step: Setting the tone of the activity was an important step. I asked the user to choose any everyday product that they had recently bought or have been using and dearly love or like. This product/object was the example that they used to answer the steps below.

Step 1: The user was handed a sentence such as, “I bought this object because...” and asked to complete it using the first card type that defines the characteristics of the product (user could choose answers from multiple cards). The rest of the cards were kept out of the activity in phase-1 to avoid overwhelming the user.

Step 2: The user completed the sentence by choosing appropriate answers from multiple cards belonging to both needs and drives. For example, “I bought this product because it was popular and a statement.”

Step 3: The researcher read the words on the cards picked by the user to complete sentence, turned them around, and identified the answers that belong to specific drives and needs respectively.

Step 4: The researcher handed the user the second type of cards that describe the characteristics of a person based on the identified drive and need in phase 1. Here, the rest of the needs and drives were kept out of the activity as they were not relevant to the activity in phase-2.

Step 5: The user completed the second sentence “I am using this object because...” by choosing the appropriate answers from multiple cards belonging to identified needs and drives. For example, “I am using this product because it was still trendy and I want to be seen as a trendy person.”

Step 6: The user was asked to complete the third sentence “I am/will be using this object because...” by choosing the appropriate answers from the rest of the cards or writing their own answers.

Step 7: The researcher handed the user the rest of the needs and drives cards from the second card deck. If the user gave their own answers, the researcher linked these answers closely with the needs and drive category.

This designed activity, which was a part of the interviews I conducted to kickstart my user research. This activity proved to help gather deeper insights with such a short (30 minutes) activity. As users had to choose answers from the needs and drives cards they were able to articulate their thoughts better. Many times, users are not aware of what needs and drives are as well as they are unable to justify their decisions and behaviors with the concrete reasons and hence that affects the quality of the insights. Through this activity users were provided with concrete reasons that were relevant. These reasons were justified by needs and drives theories (Visser, & Max-Neef n.d., Kaufman 2012) which grounded this study.

USER RESEARCH

My user research builds on existing human theories that investigate the role of users' motivational needs in encouraging them to use products for long periods of time, which was an important inquiry for this study. I conducted a survey and twelve in-person interviews. Using the design-based research methods outlined below, I uncovered users' evolving needs and desires, found a common pattern in the perception of change in relation to objects, and the role that motivation plays in shaping users' experience of using the objects. This research also helped me investigate the perceived characteristics of a humanistic relationship as well as the value/benefit in designing long-term user-product relationships. Findings gleaned from this study informed the development of an approach that aims to help designers create better and longer-lasting product relationships than what currently exists. Thus, the research activities aligned with my research questions.

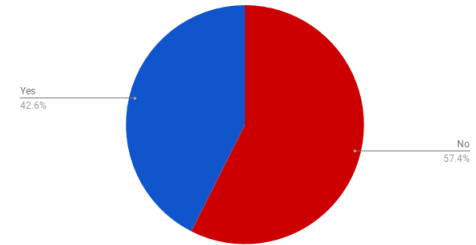
Survey:

Through this activity I investigated existing user-product relationships. Participants filled out the online survey at their convenience. This activity aimed to provide insight into the overarching characteristics of user-object relationships and what motivated users to sustain interaction with these objects over long periods of time. Surveys proved to be an appropriate mode of inquiry to get larger number participants to provide answers thus helping in finding a common pattern in the perception of change in relation to objects.

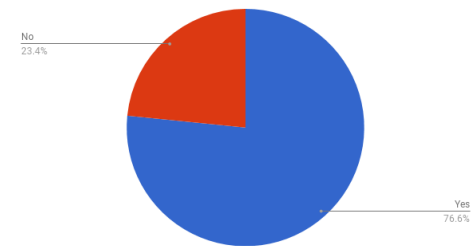
Interviews:

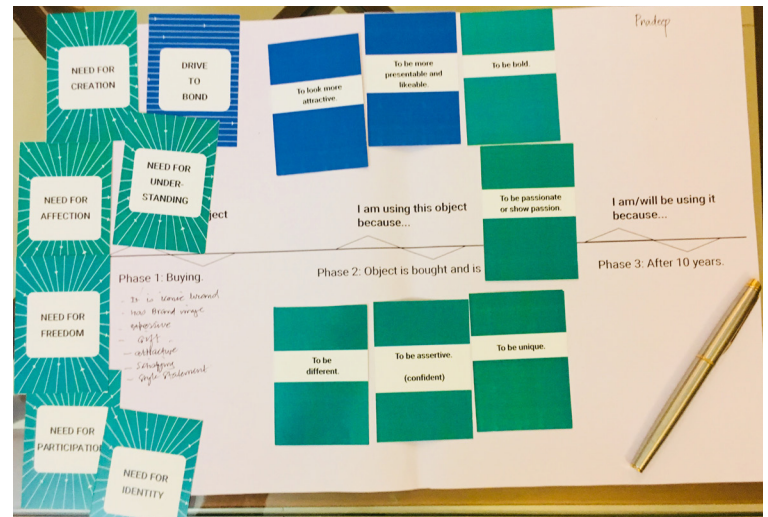
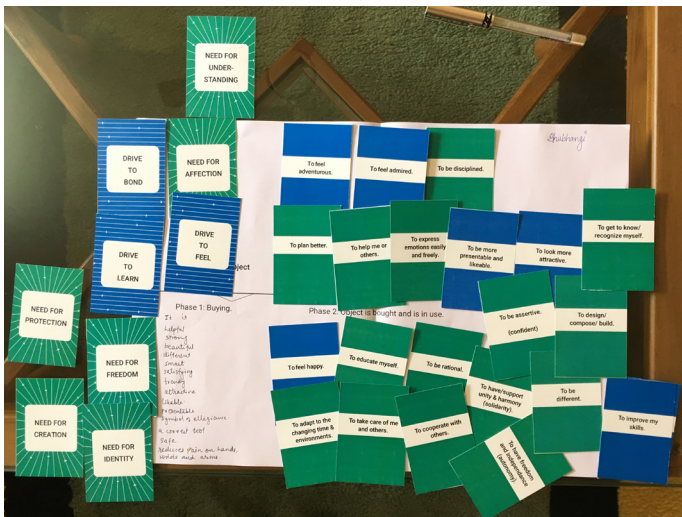
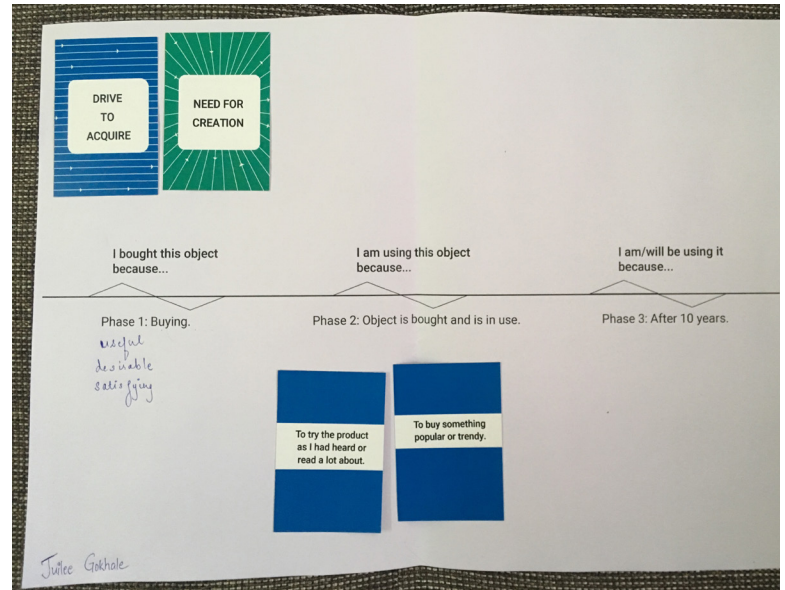
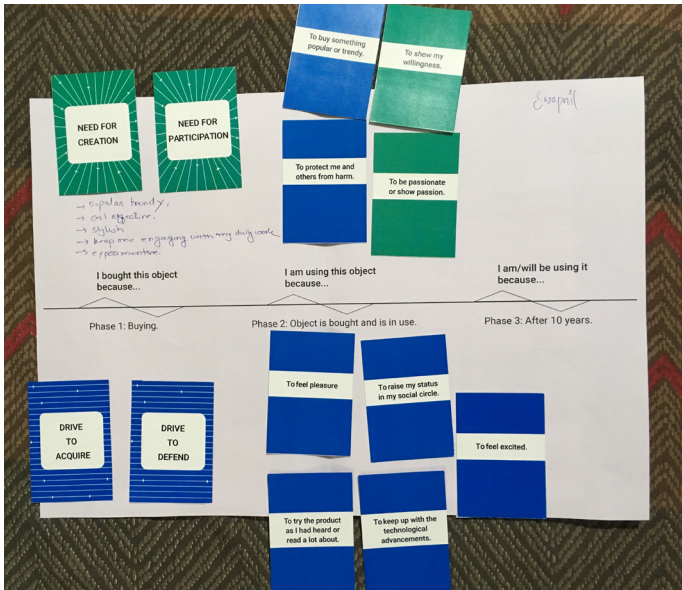
In-person interviews, part 1—For this activity, participants were asked to talk through their experiences of replacing existing products with similar, new versions and to cite their reasons for buying and replacing these products. This activity was intended to aid the identification of patterns in evolving user needs, desires, and drives.

Have you ever customized any product?

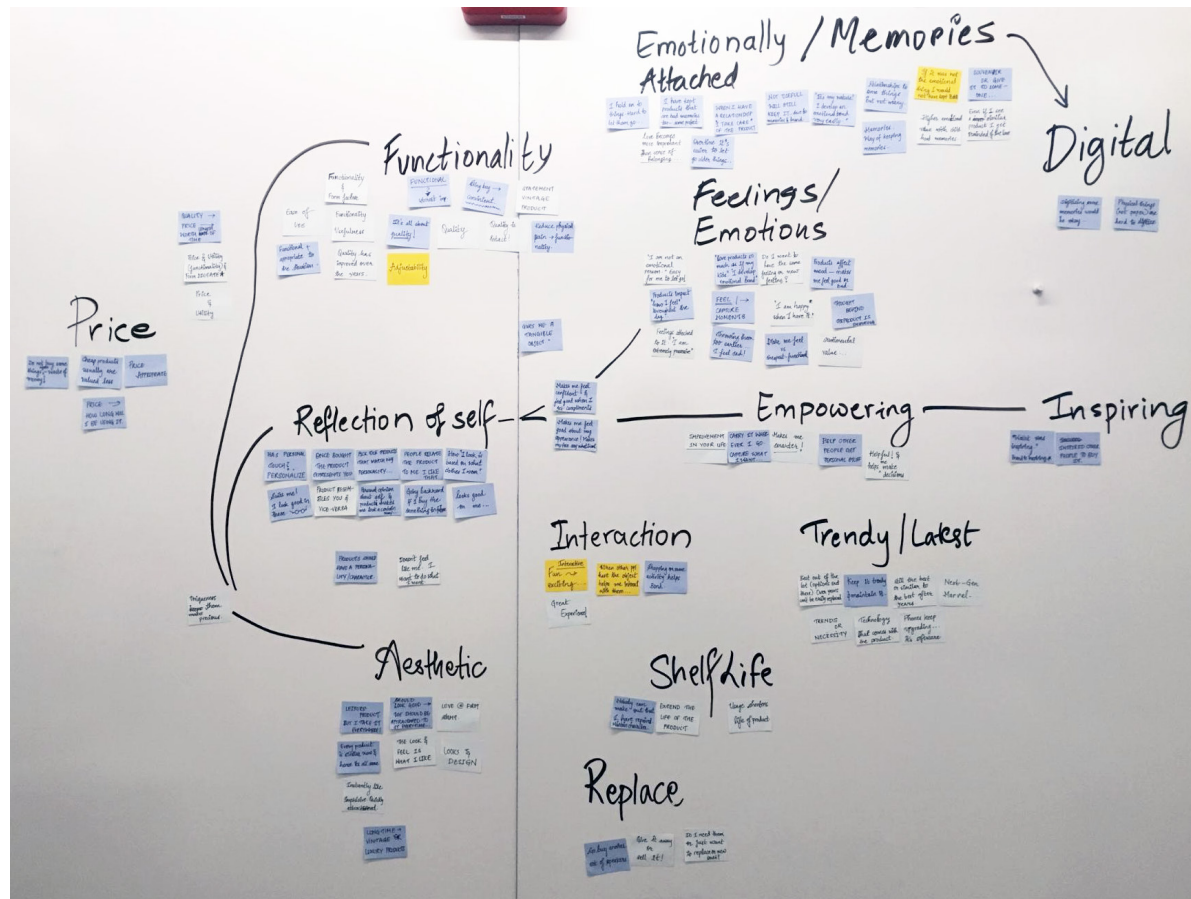


Do you have any objects that you have kept with you for a long time (between 5 to 10 years)?





In-person interviews, part 2—In this activity, participants were asked to imagine a scenario where they cherished a recently bought product for ten years, and while imagining, explain their reasons for holding onto the object. They were also asked to imagine and describe the experience of using the object for ten years.



ANALYSIS AND FINDINGS

Through these research activities I uncovered important findings. The first insight was that participants were more excited and involved in explaining the experiences they had with the past phase(while buying a product) and present phase (product is bought and in use about 1-2 years) rather than the future phase (using the product for 10 years). Most of the participants struggled to visualize themselves using the product for more than five years. This shows that the current state of our material culture is heavily influenced by marketing and branding. Participants instantly wanted to replace a product if the product was damaged or worked poorly and rarely thought of repairing it. They wanted the products that they owned to be up-to-date and in-sync with the latest trends. The second insight was that participants chose to hold on to products with which they had an emotional attachment. These products were either gifts or products that were vintage or classic that included a relatable story. Third, participants wanted their products to be unique and for them to have character. During the buying phase, they were easily attracted to products that had a strong character, story, or that they found unique in terms of their shape, material, functionality, or experience. Fourth, price was an important influencer while buying and retaining products. People looked to buy products that were worth their money and tended to retain expensive products over a longer period of time. They cared far less for inexpensive products and looked at them as affordable, short term investments and easily disposable. Fifth, participants' relationships with their products ended drastically if the product got damaged, did not support their initial purpose for buying, or did not fit the need of the hour.

These insights supported my initial assumptions that while designing an object it is important to consider and satisfy the psychological meaning as well as an object's physicality itself. These insights also supported my initial direction of motivating users to actively participate in customizing their products. In particular, these five insights fueled my ideation and helped me conceive of concepts.

ARTIFACT EXPLORATION



Image 1



Image 2

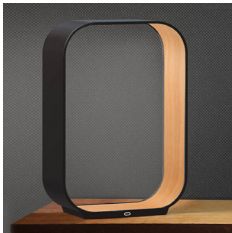


Image 3



Image 6



Image 5

I found many everyday objects that could be used to explore the ideas I was developing. Products like a juicer, coffee maker, toothbrush, shoes, clothes, bags, water bottles, books, kettle, lamps, tables and everyday objects with technology such as a smart toothbrush, smart kettle, smart lamps, objects that run with the help of technology, were all considered to serve as explorations for my research. Nonetheless, I determined that I needed to select an object that could be explored in multiple ways and thus provide me richer and deeper insights than selecting multiple products. The object I would use for my exploration needed to support the two ideas of helping users reconfigure the product and motivate people to actively participate. I also aimed to explore how the design of products could support easy reconfiguration through customization.

OBJECT DEFINITION

I did a focused artifact review on bags to explore if it was a good fit for the research I planned to conduct. Through this review, I realized that soft goods are easier to customize and configure than hard goods. Soft materials, like leather, are durable and are perceived to age gracefully. Bags also offer close user-product interaction because when in use it becomes an extension of the user's personality and when carried around is held and handled in close proximity to the user's body. In addition, bags belong to a category of products that tend to be easily replaced and disposed. Lastly, this product also supports various use scenarios and hence often includes several types that fit the needs of users.



Image 7



Image 8



Messenger bag

Backpack

Handbag

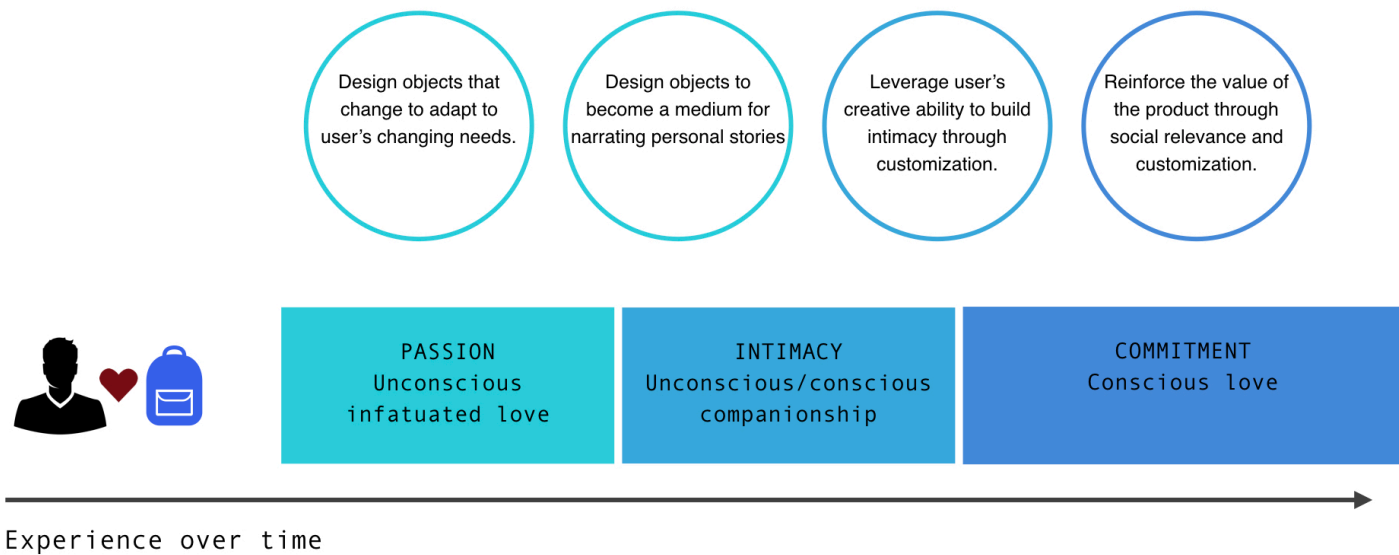
Image 9

DEVELOPMENT

OVERVIEW

I utilized “forms of love”, a diagram from the book *Design for Emotion* by Gorp, & Adams (2012). It places different types of love on a time axis, which I found helpful in positioning and analyzing products. Understanding users’ experience over time was crucial for my research question. However, depending on context, one or more of the three forms of love can occur at different times in a relationship (Gorp, & Adams, 2012). The original diagram describes three forms of love that define human relationships with products such as passionate love, intimate love, committed love, which I found useful in grounding my study. Passionate love happens unconsciously and can be an infatuation that may or may not last over time. However, passionate love is love at first sight—something that happens unknowingly, quickly, without giving a conscious thought and with very little analysis based on the visual appeal or attractiveness. Intimate love happens when there is some level of intimacy or closeness due to constant use of the object. In this form of relationship, a companionship and trust is developed towards the object. This form of love can be conscious or unconscious and take time to develop. Committed love is developed and consciously thought through over a longer period of time and is basically a mutually agreed-upon connection. It is based on the companionship developed previously, that is extended into a conscious commitment made or felt towards the object. This form of love, unlike the previous forms, is long-lasting. Committed love can develop based on the time spent with an object, memories attached to it, emotional connection with the object, loyalty felt towards the object or vice versa, or trust in the object’s performance. However, without passion or intimacy, a commitment is merely an empty agreement (Gorp, & Adams, 2012). Thus, redeveloping passion and intimacy during the committed relationship phase is extremely important to continue committed love. These sparks of passion or moments of intimacy can be short-term feedback loops that are enchanting experiences.

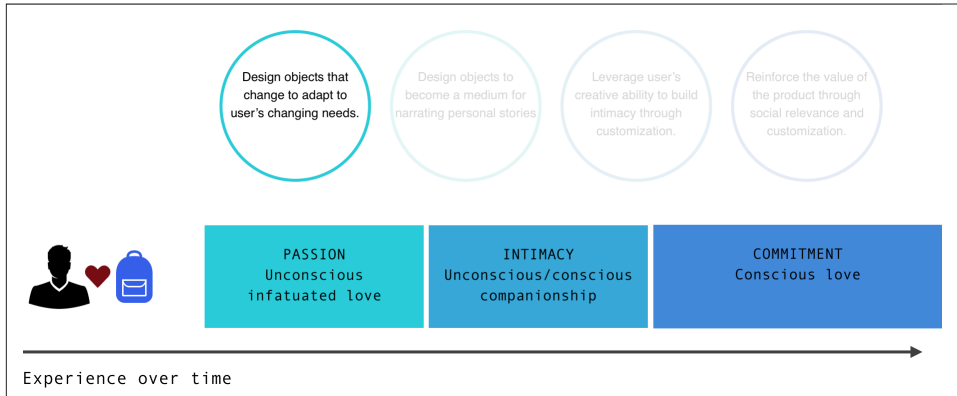
User & product relationship



These forms of love aided my visualization of a user-product relationship over time and highlighted the points for intervention. These points of intervention informed four concepts using the bag as an object for exploration. The first concept depicts a design object that can change to adapt to users' changing needs. This concept fell into the first category of Passionate love. The next concept emphasizes designing objects to become a medium for narrating or collecting personal stories. This concept supports the transition from passion to intimacy as well as developing a companionship with the product. The third concept leverages user's creative ability to build intimacy through customization. This concept supports the transition from intimate love to being committed to the product. The final concept reinforces the value of the product by keeping the product socially relevant and rewarding the user for customizing. This concept supports the journey of committed love over time.



CONCEPT 1 : Design objects that change to adapt to users changing needs.



The first concept focuses on designing objects that adapt to users' changing needs, which aligns to the category of passionate love. In this concept users can customize a bag to fit their needs in the moment. Users' use their bags for various contexts and scenarios to support their needs. These needs often change over time. For example, people frequently need backpacks to carry to work or college but a purse to carry to an evening party and a tote to carry to a picnic. Dynamique is a bag for the user's evolving style. The users can fold the bag so that it can change its size drastically to support a different style and adapt to various contexts or occasions. Dynamique can support four styles— backpack, tote, purse, and clutch. This concept is not a new one. There are similar products that change. However, their alterations are slight—a strap will be detachable to change from tote bag to a sling bag or the size of the bag changes but the style does not. Thus, I wanted to push the existing concept as much as possible to get a reaction from users and try to gain an understanding of how extensive alterations impact their relationships with a product.



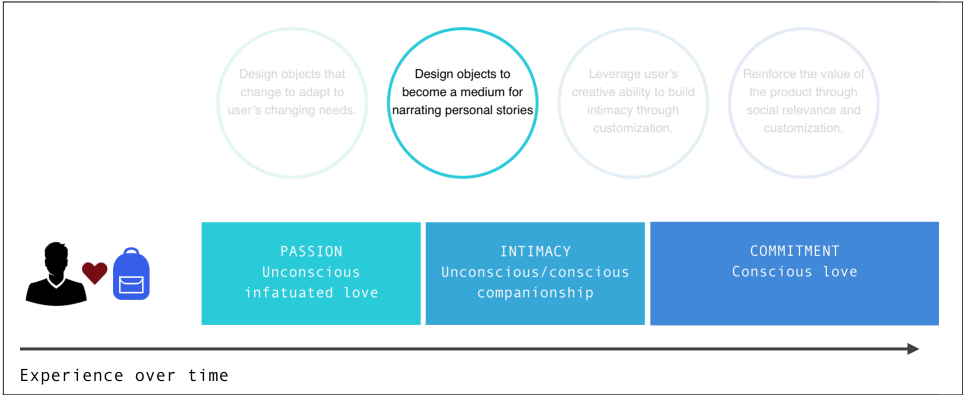


As the concept is visually attractive and adapts to users' needs this concept falls directly into the category of passionate love but has the potential to become a companion, thus also supporting the transition to intimate love. When a bag can alter to support users' various needs in multiple situations, then the user starts to rely on it, gaining users' trust thus becoming a companion.





CONCEPT 2 : Design objects that become a medium for collecting personal stories.



The second concept is about designing objects to become a medium for narrating or collecting personal stories thus customizing to fit the user's personality. Nudge is a concept bag that can collect personal stories or help users narrate their stories. The bag has transparent pockets on the outside and on the inside. It encourages users to collect artifacts that trigger memories of experiences such as movie tickets, photographs, postcards, and sea shells and place them either in the inside or outside pockets. Through this concept, I sought to understand the value of collecting personal stories for oneself in the inside pockets, which is visible only to the user, versus collecting or displaying personal stories on the outside, which is visible to the world. As this concept encourages users to collect memories in the moment, it supports transition from passion to intimacy as well as developing a companionship with the product.

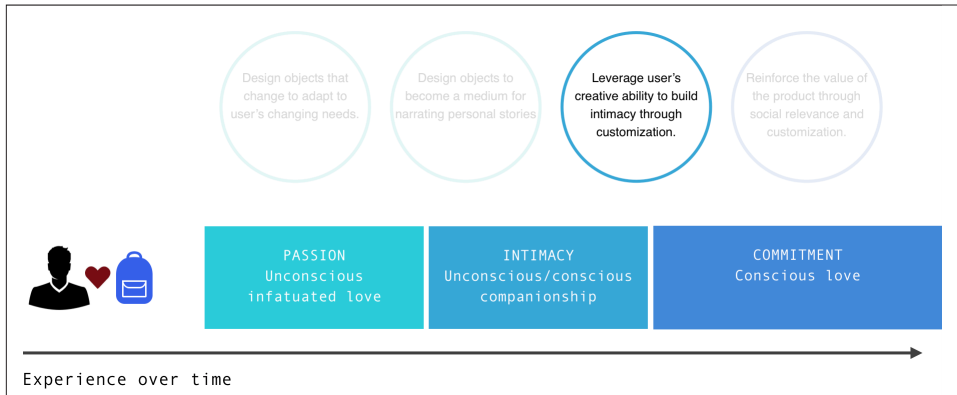








CONCEPT 3 : Leveraging users' creative ability to build intimacy through customization.



The third concept emphasizes leveraging users' creative ability to build intimacy through customization. Compose is a companion that supports user's changing needs and desires over time. In this concept, when users buy the product, they receive it in pieces that are easily attachable and detachable, users then build the product on their own. Users can swap pieces as and when they desire. They can swap any piece for a different one for example a different color, different texture, fabric, an embroidered or hand painted etc. Also, over time when any part of the bag deteriorates, users can replace individual pieces of the bag to revive it thus continuing their relationship with the bag. I made a second prototype to validate if this concept could be applicable to different shapes and sizes. The bag keeps evolving and users can replace parts as they wear out or when they desire something new. This concept supports the transition from intimate love to being committed to the product as the product is reliable and consistently fulfills its purpose, resulting in trust and commitment.





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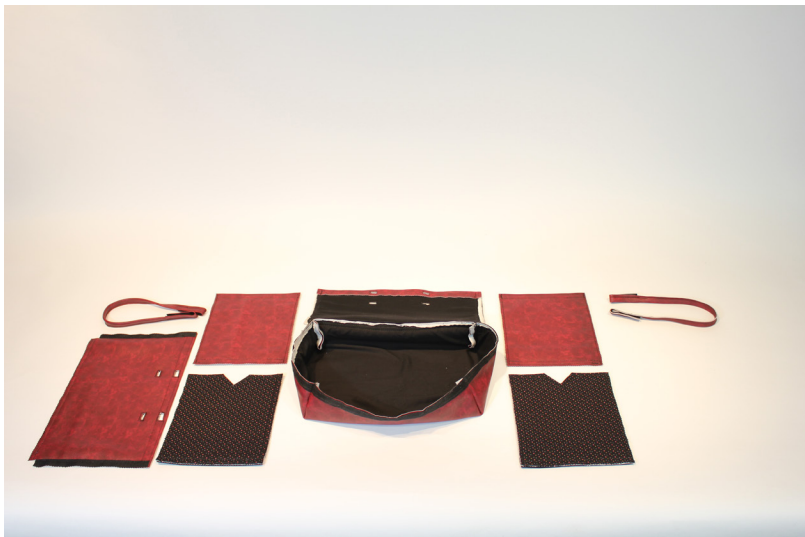
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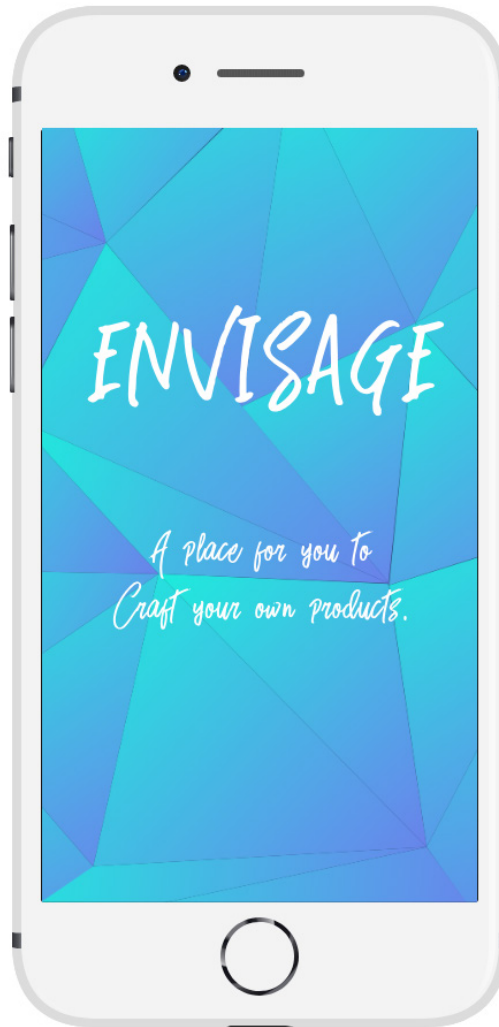
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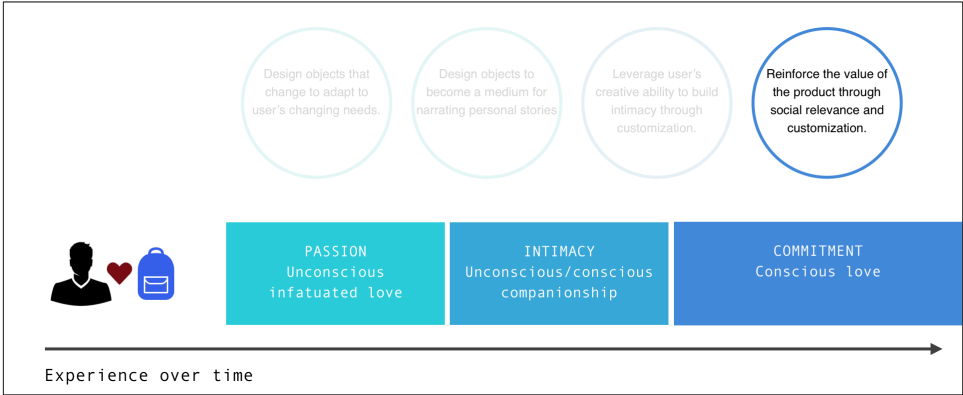
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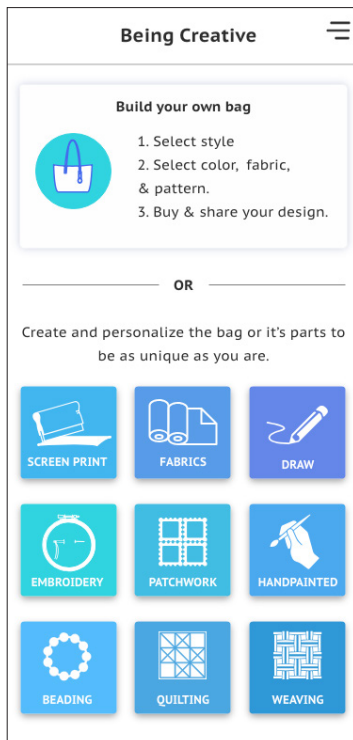
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CONCEPT 4 : Reinforce the value of the product through social relevance and customization.

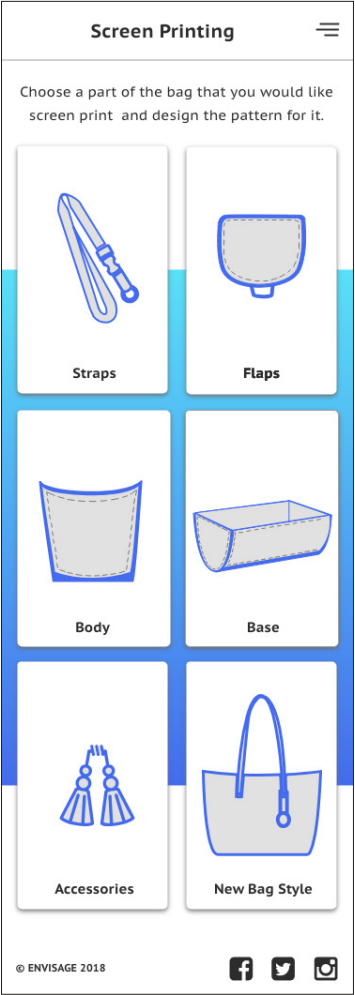


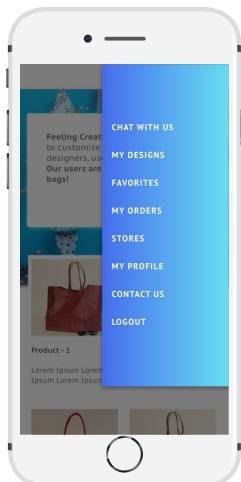
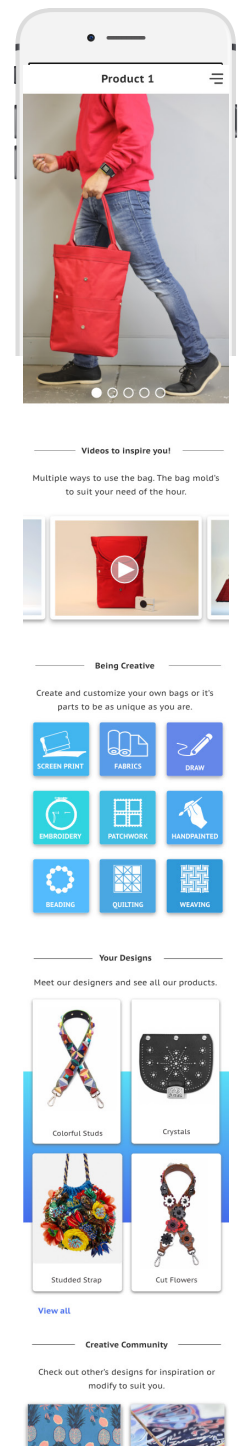
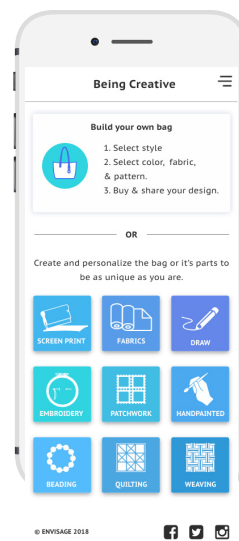
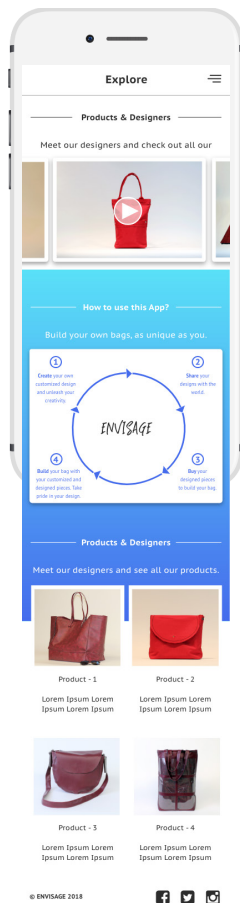
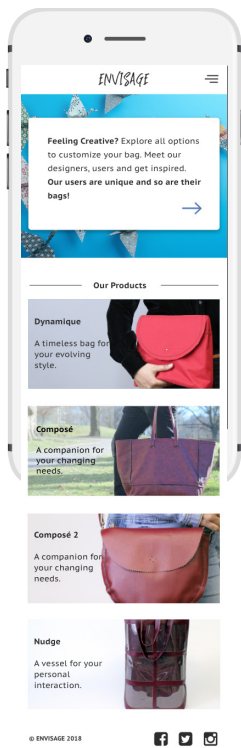
The final concept reinforces the value of a product by keeping it socially relevant and rewarding the users for customizing. The app rewards users for customizing a new bag or replacing a worn out piece of bag instead of the whole bag and hence continuing this relationship. Providing extrinsic rewards can shift disposable behaviors towards products. The application also supports customization to make on-boarding for novice users fairly easy and fosters interests of expert users. For the purpose of demonstrating the fourth concept, I created a fictional brand called Envisage. The previous concept—Compose—belongs to this brand, and it has other similar bags that are designed to have an easy attachable and detachable mechanism. With every Envisage bag, the users are offered a service that is accessible through this application. This application also supports new customers who have not yet purchased an Envisage bag. Users can design / customize the parts of their bags here, buy them, and get them delivered. They can also share their designs with the community and allow others to download their designs receiving a reward each time. Newcomers can use this application and customize their own bag by selecting the style, shape, size, color, and material.

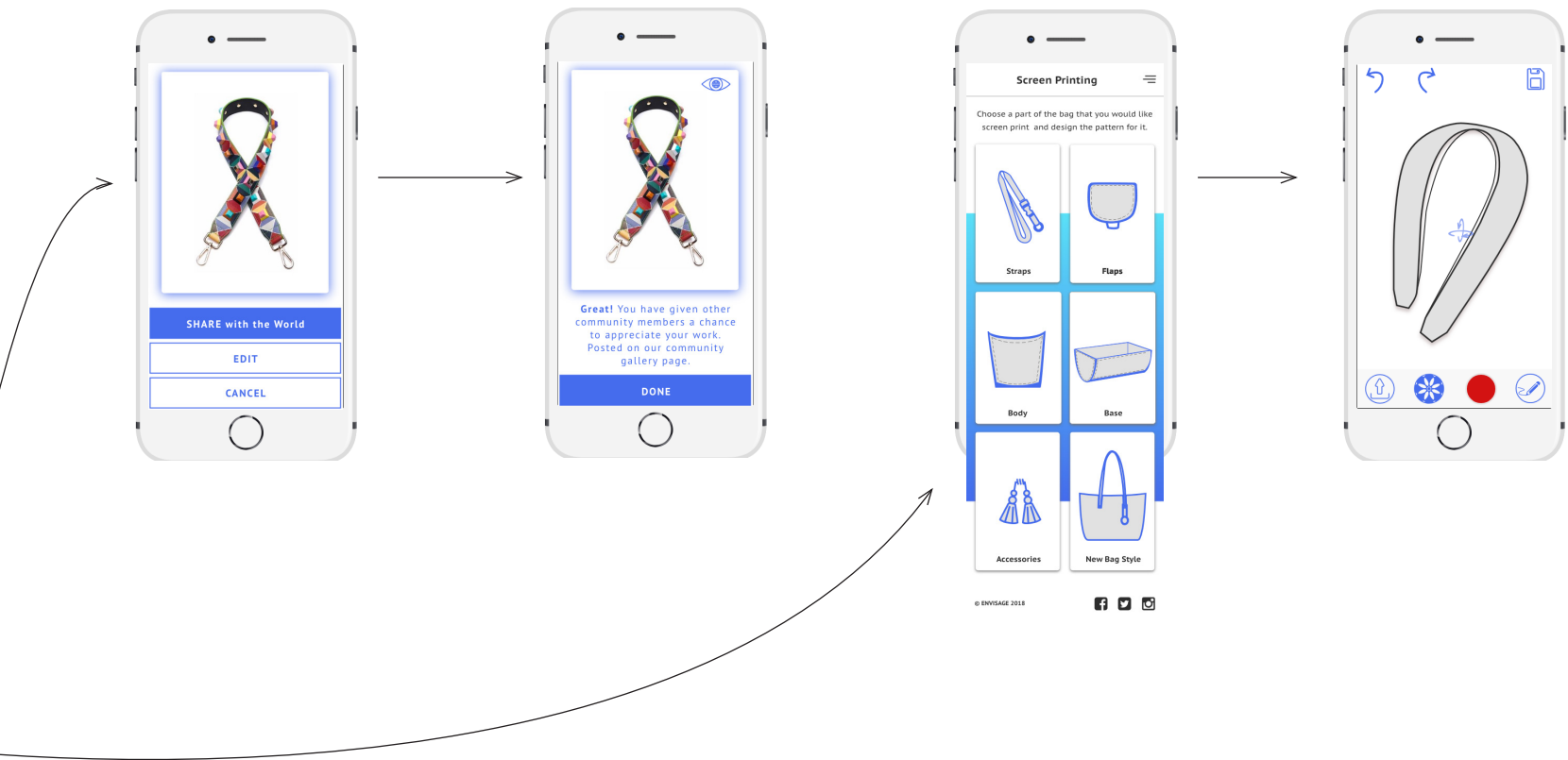


Imagine that a user owns an Envisage bag and wants to replace a worn out piece with a new one that is screen-printed, with one of their favorite artist's artwork. The user selects screen printing from all that the application has to offer such as embroidery, screen printing, patchwork, beading, weaving, quilting, hand painting, drawing, different fabrics. Then the application gives the user the option to choose the part of the bag they wish to design. The user selects the straps, then is taken to a canvas page where they get a 3D model of the straps. User can upload designs, select designs from the pattern library, or draw their own art. The patterns library is a service unique to the App. Currently, when a brand or company releases new collections and designs for a seasonal collection or topic. They bring out a completely new bag or product with the latest designs and patterns, while the shape and style of the bag remain the same. In the Envisage App pattern library, the brand shows their latest collections as patterns and the users can select a new design or pattern for the piece they selected. Thus, the user doesn't need to buy an entire new bag but rather customize their existing bag with new patterns. As a result, their existing bag can evolve over time to match users' personalities, likes, and dislikes, and help maintain the user-product relationship. As a result users' existing bags can change color, material, patterns, and style. The user designs a new strap for their existing bag by uploading a beloved artist's artwork to the canvas page, the application converts this artwork into a pattern that can be screen printed on the strap. The user then orders this strap from the app to be delivered to their home and uploads this new strap design to the community page giving the artist due credit, allowing other users to get inspired and download this exact strap design or create a similar one. If any other user downloads this exact same design the artist gets credit while the creator (first user) is rewarded through the application. Such rewards also prove to be an incentive for users to design new pieces for their bags as well feel motivated to design products that are truly unique to them. This concept supports the journey

of committed love over time with doses of intimate and passionate moments because commitment usually comes after the user has had a chance to consciously evaluate levels of passion and intimacy. The user experiences moments of intimacy while designing the bag on the app and putting together pieces of the bag when it's delivered as well as moments of passion with wearing and appreciating their design of the bag. Thus, consciously reflecting on those passionate and intimate moments develops a committed love towards the product.







EVALUATIVE RESEARCH

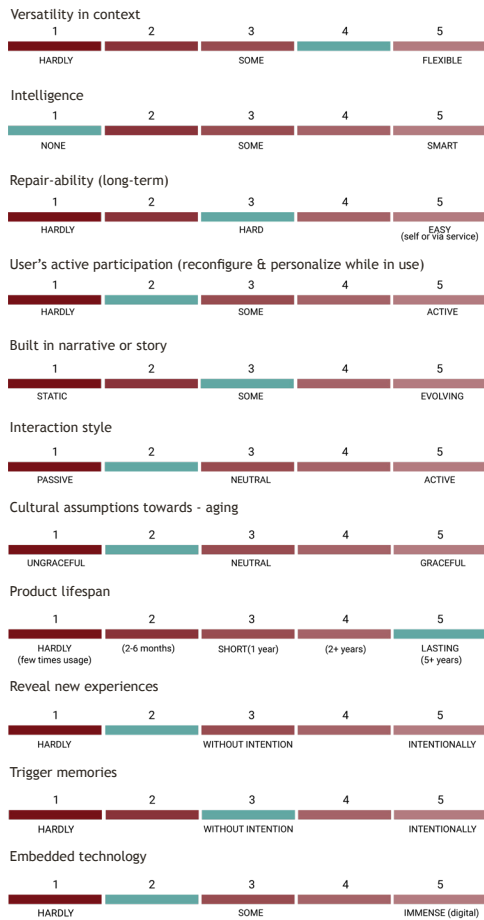
USER TESTING

I conducted user tests where participants were asked to evaluate the four concepts I had created that aimed to build and strengthen long-term product relationships through customization. The tests were conducted with seven participants aged between 18 to 49 years. Each user testing session took about 30 minutes and was divided into five short activities, with each lasting around five minutes.

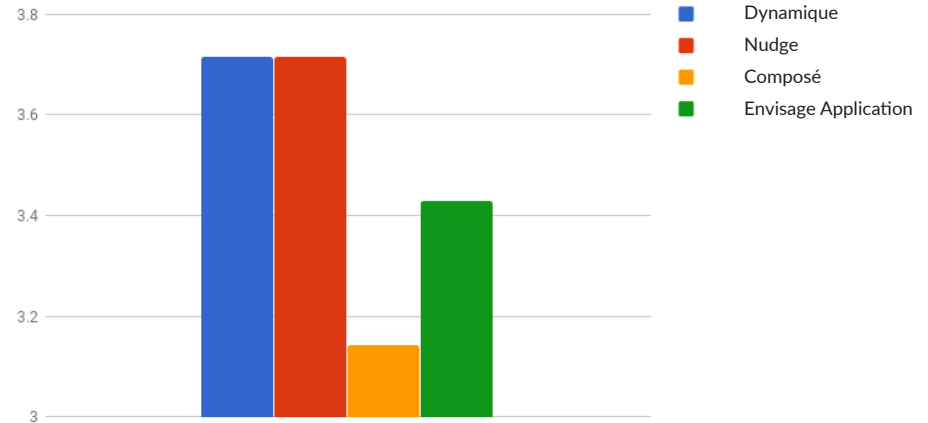
User test, activity 1— I had a short conversation with participants to get them into the mental space to evaluate the designs. Participants were asked to talk through their experiences with existing products, describe their emotional attachments to the products if any, and cite their reasons for buying these products.

User test, activity 2— For this activity, participants were presented with the first prototype. I asked them to interact with it and talk through their experiences of interacting with it. They were asked to express their thoughts and opinions on its design. This activity was intended to evaluate the concept for the first prototype.

User test, activity 3— Similar to the first activity, participants were presented with the second prototype and I asked them to interact with it and talk through their experiences of interacting with it. They were asked to express their thoughts and opinions on its design. This activity was intended to evaluate the concept for the second prototype.



Considering the longevity of bags, this prototype seems to have a _____ lifespan.



User test, activity 4— Similar to the above activities, participants were presented with the third prototype and I asked them to interact with it and talk through their experiences of interacting with it. They were asked to express their thoughts and opinions on its design. Thus, evaluating the concept for the third prototype.

User test, activity 5— Similar to the above activities, participants were presented with the fourth prototype and I asked them to interact with it and talk through their experiences of interacting with it. They were asked to express their thoughts and opinions on its design. This activity was also intended to evaluate the concept for the fourth prototype.

INSIGHTS

Participants commented:

"This one doesn't just change size but also style which is rare."

"This is great as I choose new bags based on their size for various contexts!"

"If I use it for so many occasions, I wonder if it will last long?"

Participants commented:

"This is different from any expensive bag, this is my story!"

"If you get tired with the bag it will be like an album that I can hang on the wall."

"This is a medium for active interaction with others."

The user testing session was really helpful to uncover some insights that I had not considered.

Concept 1

What worked:

Participants found this prototype to be extremely attractive. They were very excited to interact with it and exclaimed that they would definitely have bought this one if it was available in the market. Even though this concept was not new, participant's found this concept to be rare due to the number of styles (backpack, tote, purse, clutch) that the bag could support. They had not seen such drastic changes in styles and they appreciated it.

What did not work:

Most participants did not find this concept to be long-lasting or long-term, even though they were highly attracted towards it. They had doubts about the bag's physical strength and durability of the material used.

Concept 2

What worked:

This concept proved to be popular because it included layers that revealed users' personalities rather than just providing a surface representation, which is often seen in conventional bags. They believed this bag conveyed their own personal story and was capable of changing as they pleased. They found this product to be a physical manifestation of instagram or social media as well as a medium for interacting with others because the pockets of the bag allowed the artifacts

placed in them to be visible to the world, providing a short snippet of user's personality similar to posting stories and pictures on social media. Three out of seven participant's also loved the idea of collecting personal stories for themselves on the inside of the bag, which was not visible to anyone else, more than displaying stories to the world on the outside of the bag.

What did not work:

Though most user's were excited about the concept and thought it was unique, they wondered if this bag would be able to retain it's novelty after being used for some time. They wondered if they would stop changing the artifacts collected and displayed on the outside over time, and if that would make the bag lose its value over time.

Concept 3

What worked:

They compared this concept to changing parts of a car that they owned. Most of them exclaimed that by switching a small piece a bag they felt that the bag was new again or different and this idea excited them. Some people thought this product was extremely customizable and hence they would immediately think of getting a new part rather than throwing away an entire bag if one side wears off.

What did not work:

Five out of seven participants feared the durability and strength of the bag wouldn't support a prolonged lifespan since it was so easily attachable and detachable. They compared a bag they designed to a professionally designed branded one and explained that their designs would never be as strong as those expensive branded ones. Thus, they had strong doubts about how long the bag would actually last since it was customized and their own creation.

Participants commented:

"This has an evolving narrative if I keep changing the pieces once they wear-off"

"Similar to how I change the parts of my car"

"Even if a little piece is changed, I would consider it to be a new bag"

Participants commented:

"Through this app, I will invest time and effort in the product to redesign pieces."

"This is like Etsy, but easier for me to contribute to the community and all this effort would be only for myself."

"The app could be overwhelming for new users."

"My bag will be so unique! The app should help me mix and match patterns based on my style."

Concept 4

What worked:

This concept was most appreciated out of the set. Participants were rather excited to try out the application. All of the participants thought this concept was truly unique given the level of customization the application could support. They also thought that the service of personal customization addressed a long-term relationship with the bag they owned. Three of the participants said that they would love to experience this freedom of customization in other products as well. Participants explained that the amount of time and energy they would spend in customizing and designing their bags to be unique would make them feel emotionally invested in the bags even before starting to use it.

What did not work:

Participants explained that they would feel overwhelmed to use this application for the first time as they highly doubted their skills to design and customize a product to this extent. They also wondered if they could use this application on their own and how well they customize for themselves. Three out of seven participants said that though they appreciated this level of customization, for the first few times it would be easy to just buy a bag that was already designed as they were not comfortable designing and customizing it themselves. Some participants also explained their doubts on the number of times they would use this application to customize new bags versus replace parts for old ones. They questioned their own true motivations.

One of the biggest insight was that people are so used to manufactured goods that they have a bias towards products made by themselves to be less durable. They are quite accustomed to buying objects that are advertised as shiny and

beautiful and that claim to be made by extremely capable professionals. Thus, this mental model is a roadblock to my intent of helping users customize and craft their own products to develop emotional attachment.

Another important insight was that users' needs constant motivation to craft products and often lack confidence to create things. Users tend to doubt their own creative abilities and feel their skills are not good enough to try making things on their own but are motivated to try making things when they see others people doing the task. As a result, the gallery page on the application addressed this issue by pulling and pushing information to motivate users.

FUTURE WORK

In this research, I concentrated on a single product—bags—to prototype, explore, and ideate within a narrow project space that afforded a deep dive into specific challenges. After investigating that product, exploring ideas, and collecting insights from user tests, I believe it would be beneficial to apply these four concepts to other everyday objects such as water bottles, watches, alarm clocks, shoes, mobile phones, lamps, and furniture, to study the benefits and drawbacks of customization and fostering the creative abilities of the users in building long-term relationships between them and products.

BIBLIOGRAPHY

REFERENCES

- Albrecht, K. (2009). *Practical intelligence: The art and science of common sense*. Jossey-Bass.
- Chapman, J. (2005). *Emotionally Durable Design: Objects, Experiences and Empathy*. Earthscan.
- Fogg, B. (2009). A behavior model for persuasive design. *Proceedings of the 4th International Conference on Persuasive Technology - Persuasive '09*. doi:10.1145/1541948.1541999
- Fuad-Luke, A. (n.d.). Slow Design. *Board of International Research in Design Design Dictionary*, 361-363. doi:10.1007/978-3-7643-8140-0_251
- Golsteijn, C., Hoven, E. V., Frohlich, D., & Sellen, A. (2012). Towards a more cherishable digital object. *Proceedings of the Designing Interactive Systems Conference on - DIS '12*. doi:10.1145/2317956.2318054
- Gorp, T. V., & Adams, E. (2012). *Design for emotion*. Morgan Kaufmann.
- Gruning, J. (2017). Models for Ownership. *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '17*. doi:10.1145/3027063.3053232
- Kaufman, J. (2012). *The personal MBA: Master the art of business*. Portfolio/Penguin.
- Rose, D. (2014). *Enchanted objects: Design, human desire, and the Internet of things*. Scribner.
- Verbeek, P., & Kockelkoren, P. (1998). *The Things That Matter*. *Design Issues*, 14(3), 28. doi:10.2307/1511892
- Visser, W., & Max-Neef, M. (n.d.). Human Scale Development. *The Top 50 Sustainability Books*, 82-86. doi:10.9774/gleaf.978-1-907643-44-6_18

PHOTO CREDITS

Image 1: (2018, May 15). *Moleskine Smart Writing Set*. Retrieved from https://us.moleskine.com/en/smart-writing-set/p0202?ftm=8055002851152&gclid=Cj0KCQjwre_XBRDVARIsAPf7zZik0cQfzL5p2DUE6rLkC04P_vCvnBWQunno1cPrJeNFD0QPbsTe2UcaAmWoEALw_wcB

Image 2: (2018, May 10). *Smarter SMKET01-US Electric iKettle, Silver*. Retrieved from <https://www.amazon.com/Smarter-SMKET01-US-Electric-iKettle-Silver/dp/B0797PYFC9>

Image 3: (2018, May 15). *Lumens Light and Living*. Retrieved from https://www.lumens.com/contour-led-table-lamp-by-pablo-designs-PABP109030.html#q=pablo+designs+contour&gclid=CjwKCAjwiurXBRAnEiwAk2GFZqilqb7m6rjHbU1SznN6LKkXqJMirdi-GGACQaOQVjNYW8AtgIPwxoCeXsQAvD_BwE&tileIndex=1

Image 4: Pickering D. (2018, May 15). *Restart Podcast Ep 9: “Emotionally durable design”* Retrieved from <https://therestartproject.org/podcast/emotionally-durable-design/>

Image 5: (2018, May 15) *iRobot - Roomba*. Retrieved from <http://store.irobot.com/default/robot-vacuum-roomba/>

Image 6: (2018, May 15) *Trago - 20-Oz. Smart Water Bottle - Black*. Retrieved from <https://www.bestbuy.com/site/trago-20-oz-smart-water-bottle-black/5713533.p?skuld=5713533>

Image 7: Colborne Bag Co. (2018, May 5) *The Colborne Bag: The Design-Driven Lunch Bag*. Retrieved from <https://www.kickstarter.com/projects/1189548155/the-colborne-bag-the-design-driven-lunch-bag?ref=category>

Image 8: Everyday H. (2018, May 5) *Daddy Bag - Thinnest and First Minimalist Diaper Backpack*. Retrieved from <https://www.kickstarter.com/projects/1334494512/daddy-bag-thinnest-and-first-minimalist-diaper-bac>

Image 9: Grishina K. (2018 April 10). *K.K VICE VERSA BAG -backpack, messenger, handbag- all in one*. Retrieved from <https://www.kickstarter.com/projects/1246988840/kk-vice-versa-bag-backpack-messenger-handbag-all-i#>

