

# Exploring design intelligence

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01. AI generated image for test session

## 0.0 The project

The project consists on the creation of a new method for designers in the initial phase of the design, in particular in the research and definition of the concept.

The added value that the project wants to have is to highlight, in the research of the concept, the values that the product must have according to a principle of value-sensitive design.

The objective stems from two issues identified between the possibility of linguistic misunderstanding in storytelling and the lack of a framework in value-sensitive design.

To do this, the method uses two tools: **artificial intelligence**, in particular in the form of image generation and linguistic analysis, performed by **LIWC**.

# 1. Context

Introduce the problem or opportunity you are addressing in your work, what your solution or idea is, how you explored it (what data was collected, what analyses were performed), and what your findings/insights are.

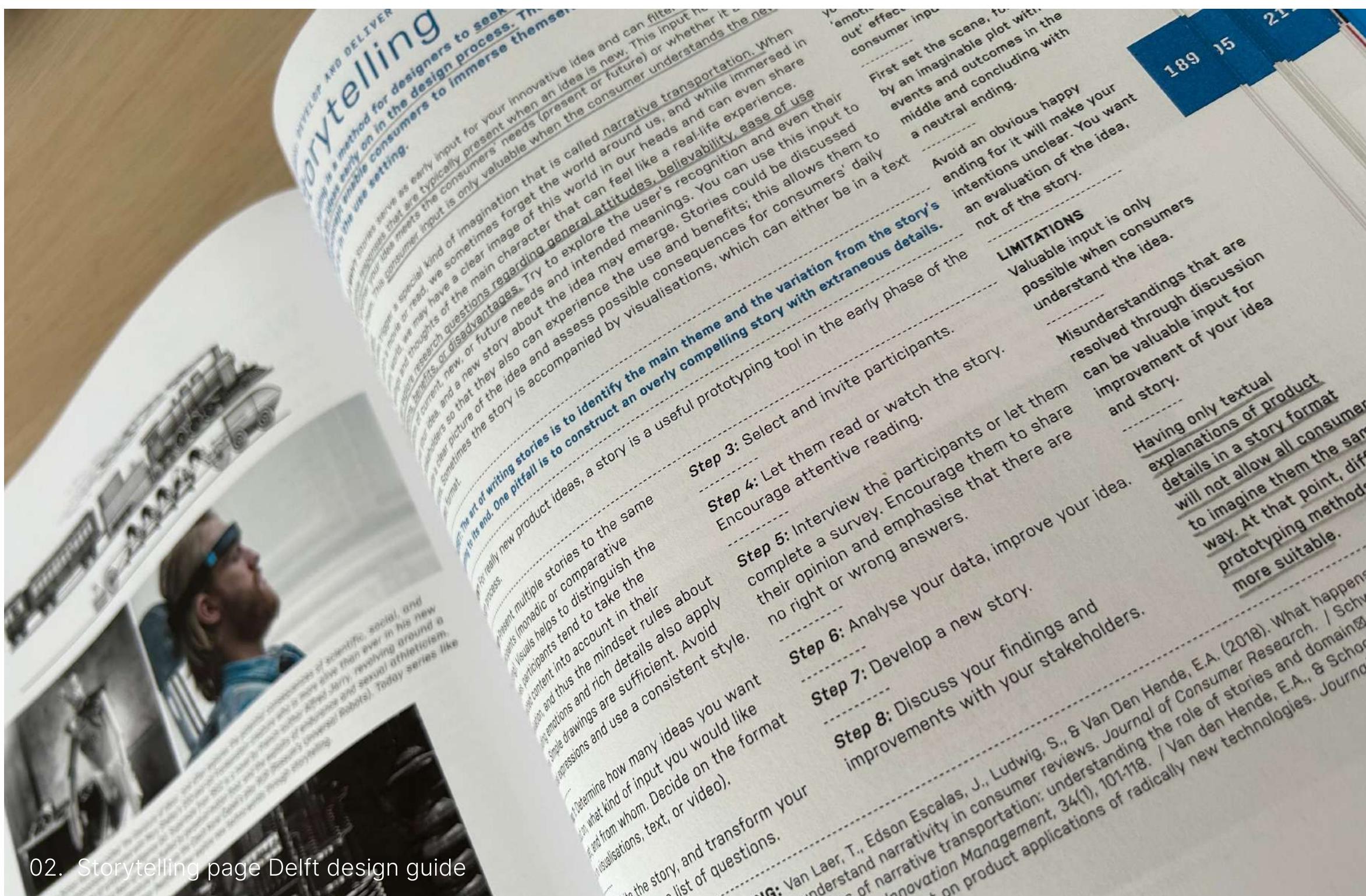
# 1.1 Language-communication

Language is a powerful tool for communication, but it often presents challenges when it comes to conveying complex ideas or concepts.

When describing something to another person, especially in a design context, there is a potential for misinterpretations since individuals may interpret the same words differently based on their personal experiences, perspectives, and imagination.

This variability in interpretation poses a challenge in comprehending the real differences in user preferences and requirements for the concept of the design.

(1)



02. Storytelling page Delft design guide

Storytelling then seems to be a weak method especially if addressing the limitations of language understanding in design.

Furthermore, visual elements have the ability to convey information more effectively than words alone. Sketches, drawings, or digital representations, facilitate a shared perception of design elements such as colour, shape, and overall aesthetics. (1)

This approach enables designers to gain valuable insights into the variations in user interpretations and preferences, leading to more effective and user-centric design solutions.

The combination of storytelling and visual aids, as advocated by resources like the Delft Design Guides (1), empowers designers to transcend the limitations of language and unlock the true potential of effective communication in the design process.

## 1.2 Design for value

**Value-Sensitive Design (VSD)** is a methodology that seeks to incorporate humans' values, ethics, and morality into the design process.

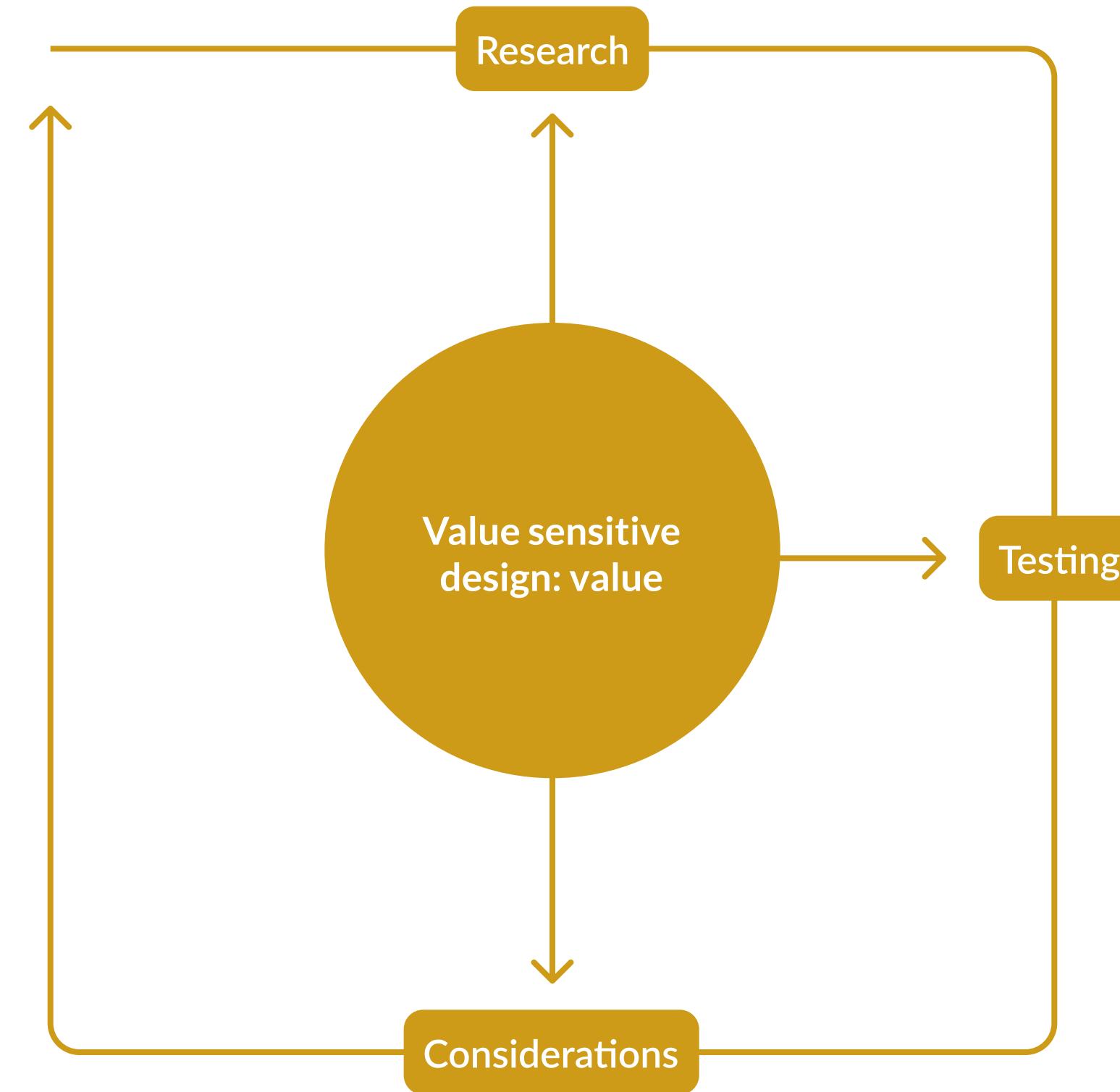
However, one of the main challenges faced by VSD is the absence of a comprehensive theoretical and methodological framework.

Without a structured approach, designers may struggle to consistently and effectively integrate values into their work, making it difficult to identify and address the value dimensions most pertinent to the intended users. (2)

What sets VSD apart from approaches driven by technological or social determinism is its **recognition of the active role played by humans**, be it as individuals, organizations, or corporations, in shaping the tools and technologies they design. (3)

Unlike viewing technology as an independent force influencing human behaviour, VSD acknowledges the agency of humans in **shaping the design process** and emphasizes understanding their values, needs, and aspirations.

To fully leverage the potential of VSD, the development of a comprehensive theoretical and methodological framework is crucial. This framework would provide **designers with guidelines, tools, and methods** to consistently integrate values into their work.



(2) K. Einar Himma, H. T. Tavani. (2008) *The Handbook of Information and computer ethics* John Wiley & Sons, Inc., Hoboken, New Jersey

(3) M.K. Pratt (2021) Value-sensitive design (VSD) <https://www.techtarget.com/searchcio/definition/value-sensitive-design-VSD>

## 1.3 Use of AI

Choosing to use AI as a tool for image generation is tied to the challenges associated with creating visual representations and the time required to produce drawings for effective communication.

AI offers a solution by providing the capability to input values and thoughts, allowing it to generate visual outputs that aid in problem-solving.

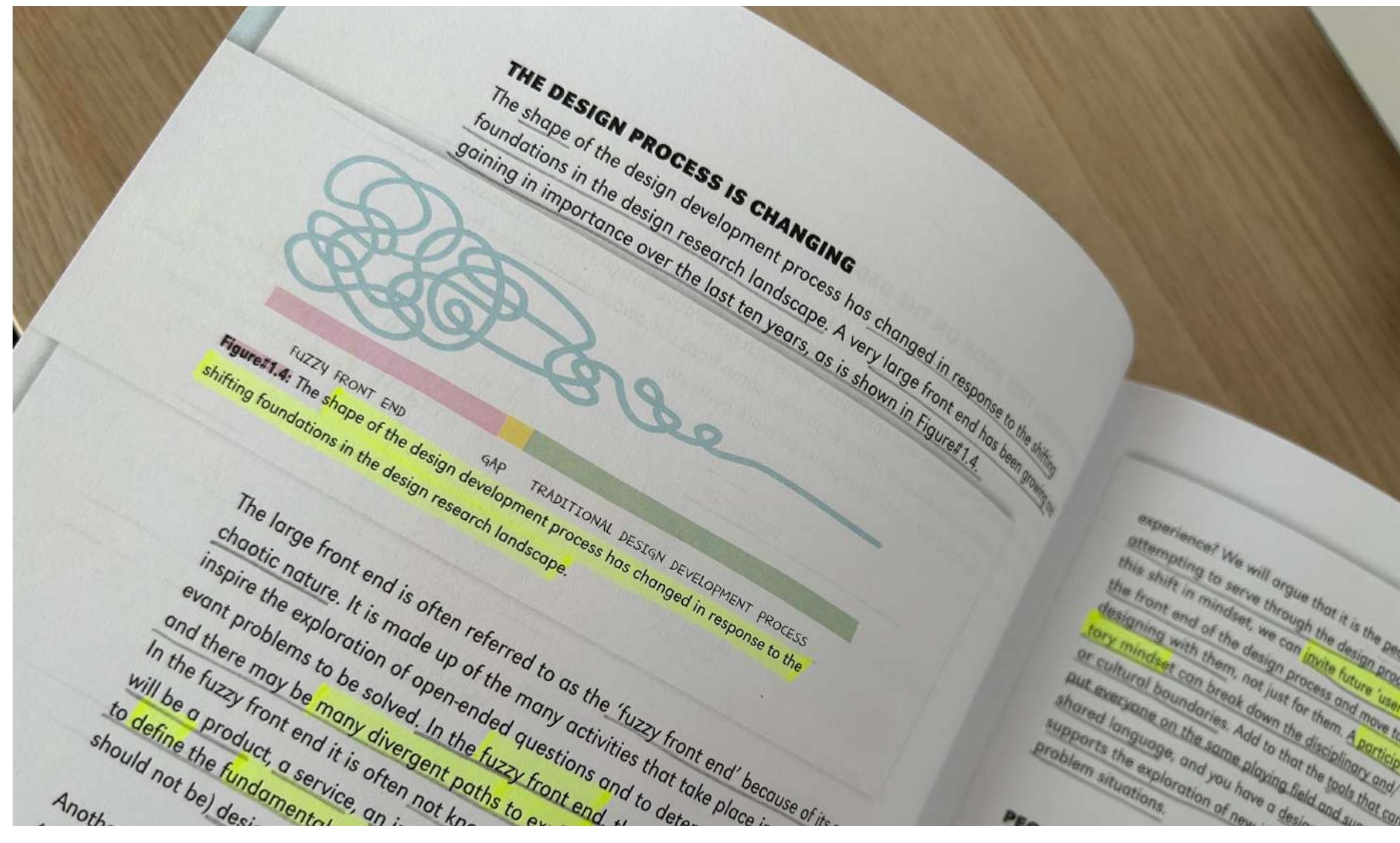
This approach saves time and effort by automating the creation of visual representations, enabling designers and users to convey their ideas and values more efficiently.



03. AI generated images

# 2. Idea

Describe your idea (a new method, exploration of some phenomenon or behaviour etc.) in detail, and where possible link to specific work you cite in your background research.



04. Fuzzy front end representation

The final outcome of this research is the development of a new method that seeks to comprehend the values perceived by users in a project based on their descriptions of AI-generated photos.

This method is positioned within the design process spectrum, specifically in the **fuzzy front end**, in the early stages where decisions and ideation for the final concept are still being explored. (4)

By integrating this method in the fuzzy front end, designers have the opportunity to gain valuable insights into users' perceptions of values associated with the design.

The primary objective is to determine whether the intended values of the design are recognizable to users. Additionally, an inherent secondary goal is for designers to engage in self-reflection and potentially discover new values during the design process. This dual purpose ensures a comprehensive understanding of user perceptions while fostering a creative exploration of novel value considerations.

## 2.1 The process



### Prompt design for image generation:

the designer's role is to write the prompt based on the values he wants to communicate with the photo.

### Generation of photos:

AI comes into play by generating photos based on input - the designer's role is to select the photo that allows him to better convey the value you want to transmit.

### Feedback collection session:

users selected by the designer describe the products and especially the values they transmit.

### Framework reference for LIWC analysis:

This is where the VSD interacts with a more systematic method (VDD) and creates the framework used to select the category on LIWC to have the outcome from the analysis.

### Analysis of the answers:

through the different categories chosen in the framework, the designer can recognize if the values that are wanted to be communicated are effective and have been recognized.

## 2.2 Prompt engineering

V.Liu, and L.B. Chilton introduced a novel paradigm that involves the use of various types of prompt templates, which are categorized based on their shape and task-specific prompts. The researchers also explored alternative methods for prompt engineering, including automated template learning and multi-prompt engineering. Their findings provide valuable insights into the design and implementation of prompts in natural language processing tasks. (5)

The method employed for structuring the creation of prompts for the project is as follows:

### General description of the product

- selection of the value: description of the intent
- selection of the second value: etc... |

Template prompt

### A living room chair that has:

- aesthetic value: white, clean lines, natural materials
- emotional value: remember the chairs of the past but with a modern interpretation |

Example prompt

## 2.3 The framework

The framework combines the LIWC categories (A), which capture linguistic patterns in the text, with the notion of value-sensitive design (VSD) and value-driven design (VDD) (B) for text analysis.

The aim is to provide a structured method for analysing text data while considering the specific qualities and values associated with the design input in the prompt. The analysis process involves clustering the LIWC categories based on the types of values. This clustering approach helps categorize the data and facilitates a streamlined analysis process.

The goals of this framework are:

### 1. Identifying Present Categories:

By examining the occurrence of specific words or linguistic patterns associated with each value category, the presence of these categories can be determined by the presence of some words.

### 2. Analysing Frequency of Values:

The framework allows for an assessment of the frequency of words associated with each value category providing insights into the predominance of certain values among the participants.

	A	B	C	D	E	F	G	H	I	J	K	L
1	cogpro	general topic				affect	social	socrfs	perception	time		
2		culture	lifestyle	physical						focuspast	focuspresent	focusfuture
3	Functional value											
4	Emotional value											
5	Aesthetic Value											
6	Experiential Value											
7	Social value											

## 2.3.1 Framework (A): LIWC

The framework developed for this report is based on the integration of LIWC categories. (6)

The LIWC categories used in this framework are as follows:

### 1. Cognition:

This category reflects different ways people think or refer to their thinking. It serves as the overarching dimension that includes the subcategories of all-or-none thinking, cognitive processes, and memory. Cognition captures language related to thinking patterns and mental processes. In particular, the section used for this category is Cogproc.

### 3. Social Behaviours:

This category encompasses words associated with various aspects of social interactions and behaviours. The section used is socrefs.

### 2. Affect:

The affect dimension distinguishes between "emotion words" and "sentiment" and addresses changes in emotion language usage. This category focuses on words associated with emotions and sentiments expressed in the text. Here the section is used in its all.

### 4. General Topic:

This category is based on various categories and subcategories such as culture, lifestyle, and physical aspects. All three categories are used in the language analysis to capture different dimensions of the general topic being discussed.

### 5. Perception:

This category focuses on internal perceptions and includes subcategories such as attention, movement, space, visual, auditory, and feelings. It enables the analysis of language related to how individuals perceive and experience their surroundings through different senses. This category is entirely used.

### 6. Time Orientation:

This category involves the analysis of language related to temporal aspects. It includes subcategories such as past, present, and future time frames. Time orientation allows for examining how individuals discuss and express their thoughts, experiences, and attitudes towards different temporal contexts.

## 2.3.2 Framework (B): Value

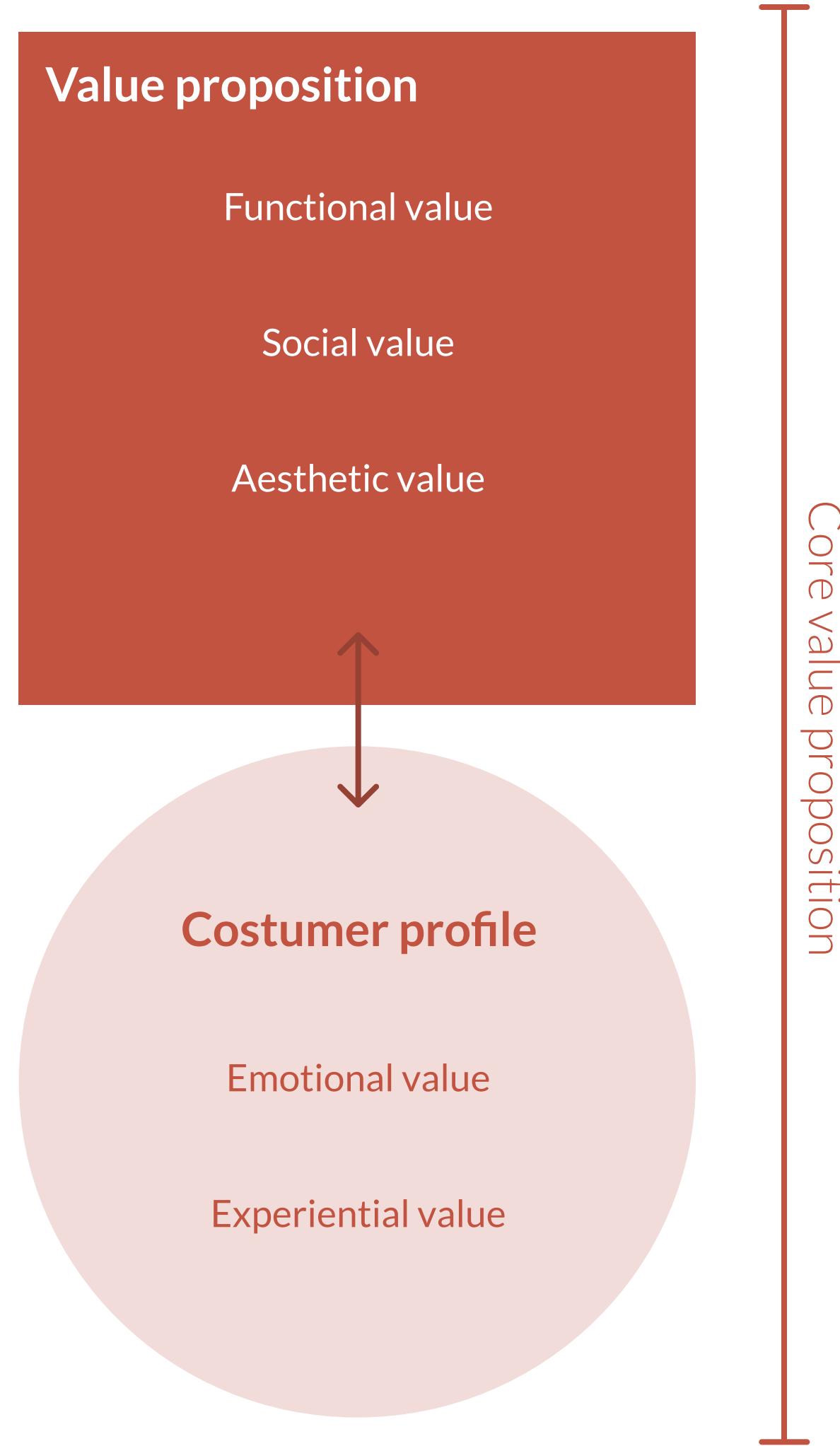
To write the categories of values, the notion of the value of the VSD was taken and then combined with the more engineering and structured approach of **Value Driven Design (VDD)**.

This is a part of systemic engineering that empowers product owners and designers to create products or services that hold significant value for all stakeholders involved. Essentially, design is the process of finding solutions to problems and delivering a functional and effective product or service. To achieve optimal design outcomes, it is crucial to possess a deep understanding of the problem at hand. (7)

A first reference method for the drafting of the categories of the framework is given by the article "The Elements of Value" (8) which explores the concept of customer value and identifies four main categories of value elements: **functional, emotional, life-changing, and social impact**.

Understanding and effectively delivering on these elements of value is considered essential for businesses to stand out from competitors, attract customers, and foster strong customer relationships.

Thanks to this first draft, however, then the elements were crossed with a second model derived from the VDD called **core value proposition** to understand the breakdown and the correlation between the various values. (9)



(7) I.Cuijpers (2021) An introduction to value driven design, <https://www.keen.design/en/design-blog/an-introduction-to-value-driven-design>

(8) E.Almquist, J.Senior, N.Bloch (2016) The Elements of Value Harvard Business Review <https://hbr.org/2016/09/the-elements-of-value>

(9) B. Krawczyk (2022) Understanding different types of Value Propositions to design better products, UX Design - Medium <https://uxdesign.cc/understanding-different-types-of-value-propositions-to-design-better-products-350255cc578b>

## 2.3.2 Framework (B) : Value

By categorizing values into these five dimensions, the value-sensitive design aims to capture a broad range of user needs, desires, and aspirations. It encourages designers to consider the multidimensional nature of value and design products, services, or systems.

The values are the following:

### **1. Emotional Value:**

refers to the impact of a design on users' emotions and feelings aiming to create emotional experiences, both negative and positive.

### **2. Functional Value:**

focuses on the practical benefits and utility that a design offers to users. It pertains to the extent to which a product or service meets the functional requirements and fulfils users' needs.

### **3. Aesthetic Value:**

refers to the visual appeal, attractiveness, and sensory experience associated with a design. It has elements such as beauty, elegance, simplicity, and the overall aesthetics of the product or service.

### **4. Experiential Value:**

emphasizes the overall experience and enjoyment that users derive from using a product or service. It comprehends factors such as novelty, enjoyment, engagement, and the creation of memorable experiences.



### **5. Social Value:**

relates to the impact of a design on social interactions, relationships, and community well-being. It recognizes that users are often embedded within social contexts and that designs can influence social dynamics and collective experiences.

# 3. Data Collection And Analysis

Explain how you went about collecting data, and describe the kind(s) of analyses you have performed. Justify your choice of data collection and analysis.

The data collection process involved two tests to generate the actual data for this report.

The first test was a preliminary one conducted to establish the method's structure and assess its effectiveness. It included only two participants and featured a different internal structure compared to the final test.

The second test, (10) used for the actual drafting of this report, involved a total of eight participants.

## Test #1

Hello, this is a test for the testing of a new valuation method for Value Sensitive Design through the use of artificial intelligence in the creation of the early concept stages

[costanzadarcangelisa@gmail.com](mailto:costanzadarcangelisa@gmail.com) Cambia account

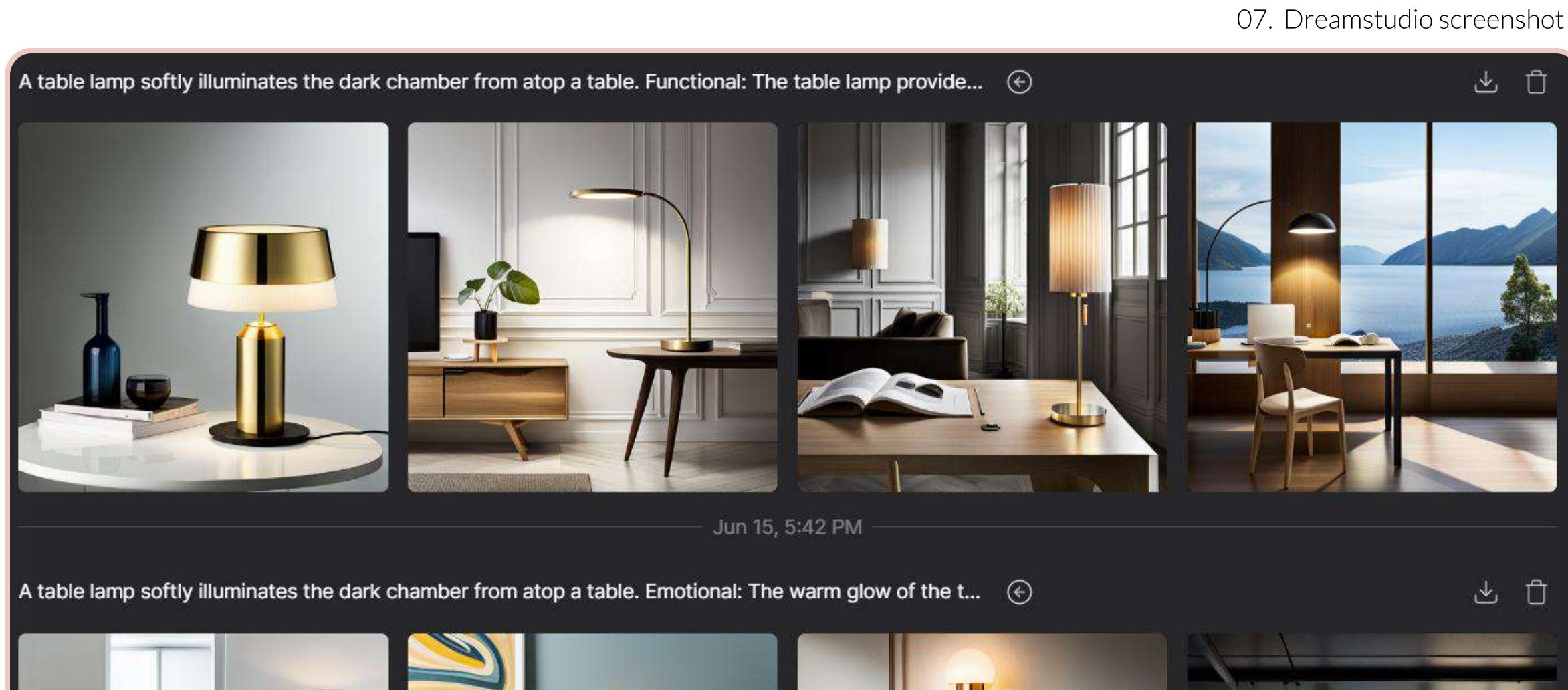
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Describe in up to 50 words (maximum) the product you see in the photo below, paying particular attention to underline what the values and characteristics that evoke you..

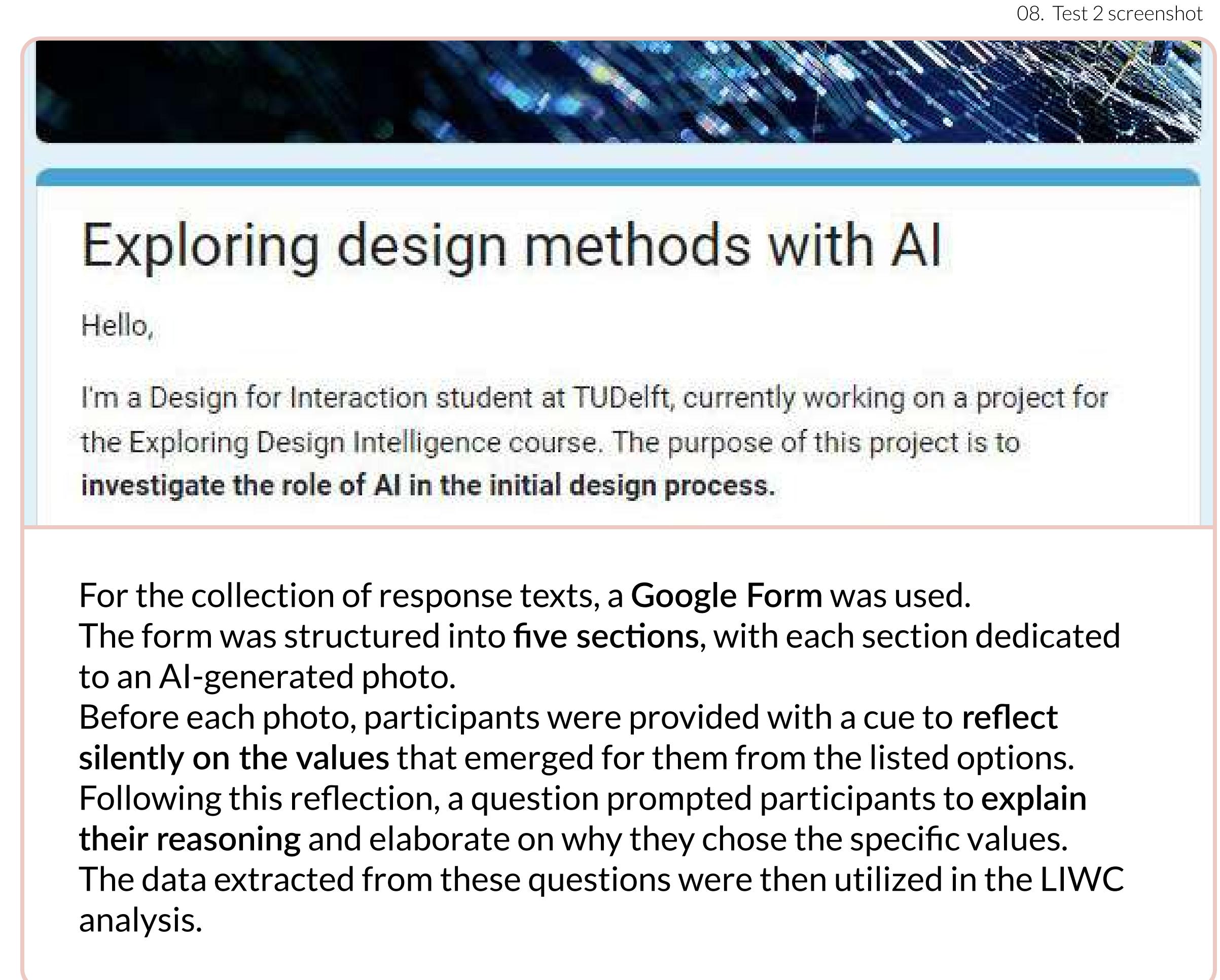


## 3.1 Data collection

The data collected in this research can be categorized into two main types: images generated by artificial intelligence (AI) and the response phrases provided by the participants.



To collect the images chosen as prompts, two tools were utilized: Dream Studio and Generation AI, the new generative image tool of Adobe express. These tools allowed for the generation of images based on given prompts. The selection of images was then carried out by a designer (me) who personally chose those that best represented the values they intended to convey.



**Test run #1:** The first test was done based on one value at a time.

Aesthetic value



Social value



Emotional value



Functional value



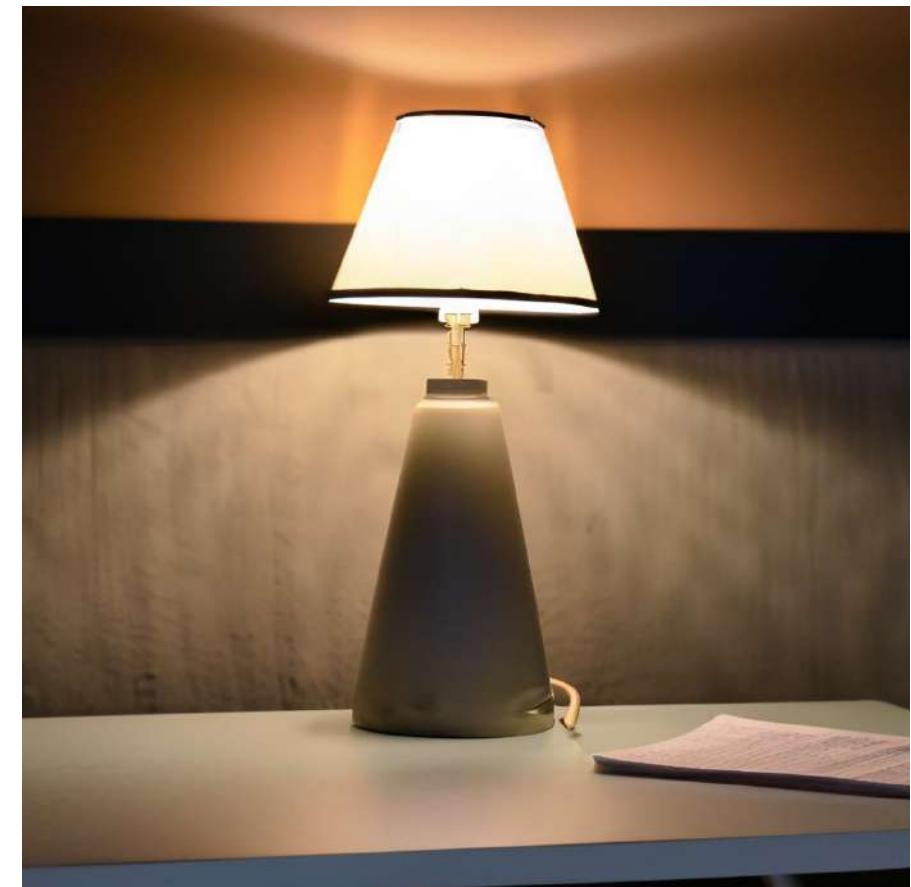
Experiential value



09. Sets of images AI generated Test#1

**Test run #2:** The second test was done based on a mix of the different values.

Functional + Emotional value



Aesthetic + Experiential value



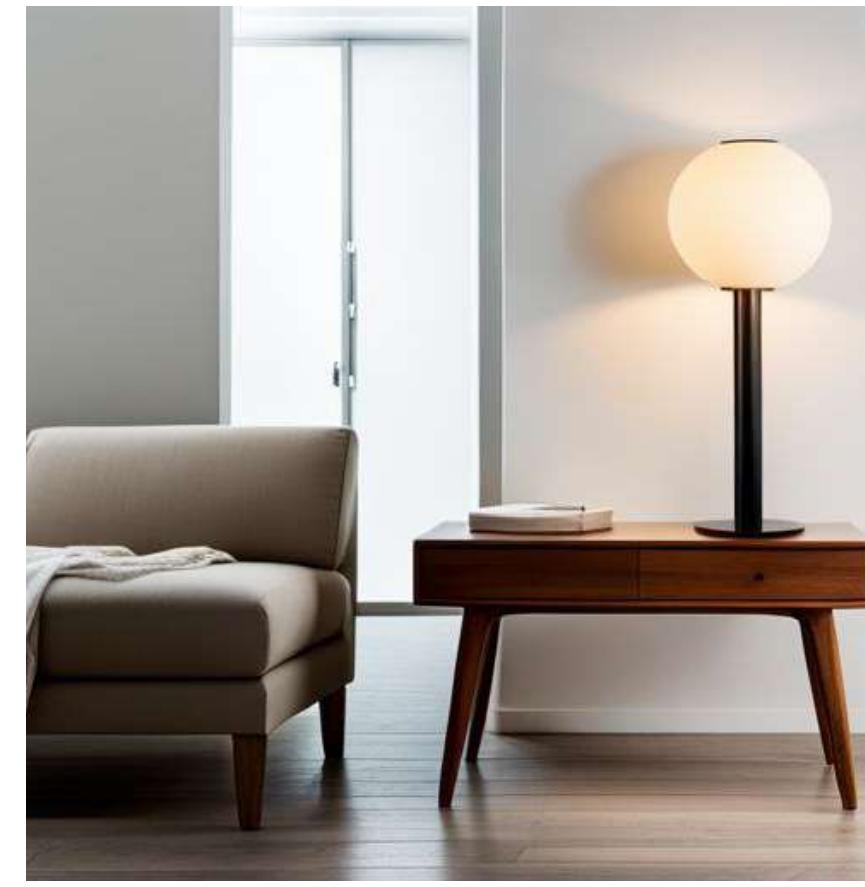
Functional + Social value



Social lamp



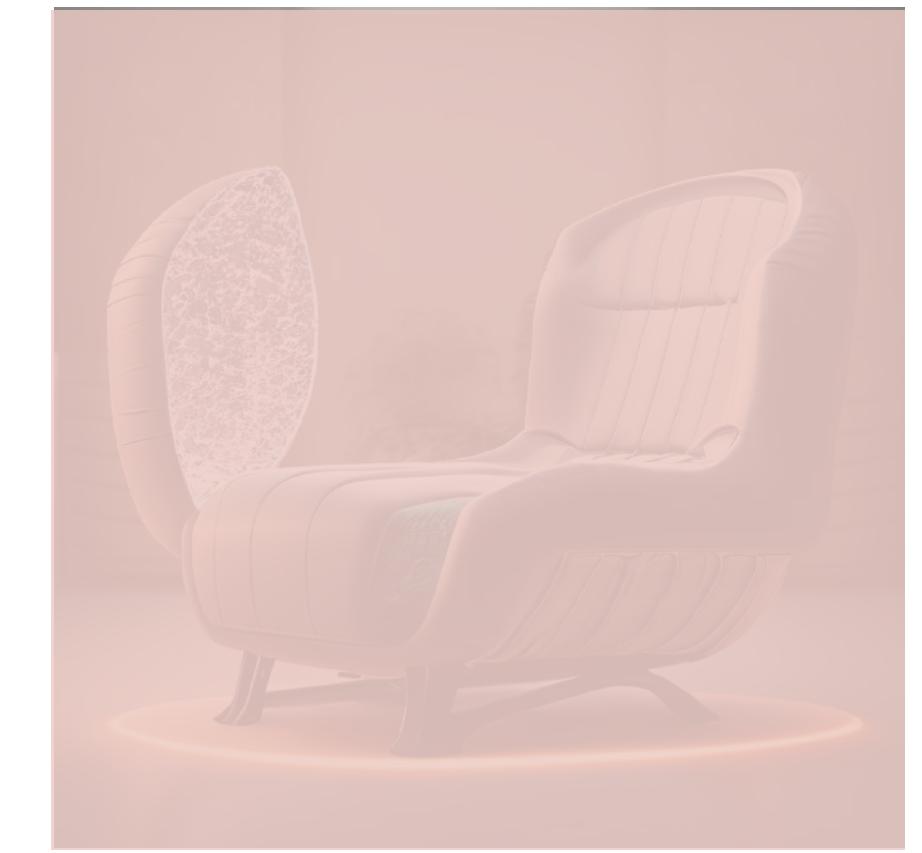
Emotional+Aesthetic+Experimental



10. Sets of images AI generated Test#2

## Test run #1: Answer were from 2 participants

### 11. Sets of images (reference for text)



**P1:** Armchair, very soft, white, office, leather, creme, short

**P2:** it is very elegant and refined both in shape and color, also very sober and not extravagant but still manages to capture attention and make you want to sit on it. I imagine it as a chair in the living room of a classic style house with parquet, white walls and wooden furnishings

**P1:** Wheelchair and armchair without armrests, soft, white, cozy, creme

**P2:** on the left a piece of furniture that vaguely looks like an armchair but which does not give a feeling of comfort, on the right instead a chair on which I hope I will never have to sit again

**P1:** Armchair, royal, cozy, modern and neutral pillow in the middle, kitsch, creme, soft

**P2:** It has the shape and the patterns of an old chair but with a modern and more comfortable seat, it reminds me of chairs in my older aunt's living room

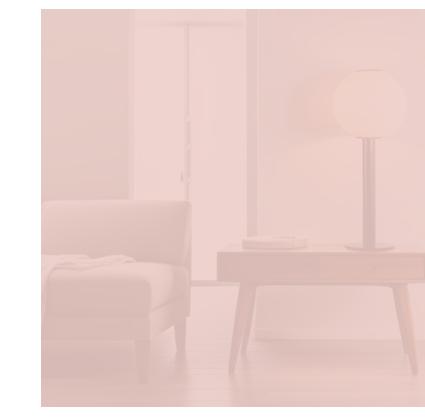
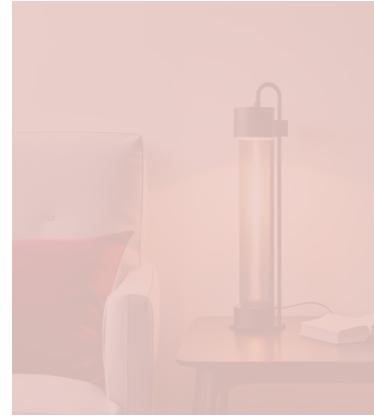
**P1:** Office chair, short, weird armrests, old, grey, soft, ruined

**P2:** Looks like an old office chair

**P1:** Futuristic, armchair, neon light, seat, inflatable, portal, space

**P2:** it looks like a futuristic chair due to the shape and the materials from which it is made, the arm of the chair resembles the open door of a luxury car. I imagine it as the chair of an open space house of a multimillionaire full of avant-garde furnishings

## Test run #2: Answer were from 8 participants.



12. Sets of images (reference for text)

**P1:** Functional: it's a lamp and has the function to light up, also without a particular aesthetic but a very basic appearance Experiential: it reminds me the moment when you read in the bed before sleeping with this lamp lightened up. Emotional: connected to the moment expressed before, it reminds me of that moment of peace and relax when you finally rest from a busy day

**P2:** Functional, the shape also resembles the light cone.

**P3:** I would say emotional because of the soft and warm light. And aesthetic because of the selection of the materials and the minimalist shapes

**P4:** Functional , because it represents an object that illuminate . It's for studying

**P5:** Functional, because there are some documents on the table so the light could be used to be able to read those pages.

**P6:** In my opinion, the image represents the emotional and experienced values. I compared the image to each value, in order, and for each of them i chose if it was representative, also comparing it to the previous values. It evokes calm, mystery and silence. Doesn't evoke functionality, joy

**P7:** The lamp serves the purpose of providing illumination without any specific aesthetic features, opting for a simple and basic design. It evokes feelings of serenity and tranquility, reminiscent of the much-needed respite at the end of a busy day, with the comforting glow of the lamp.

**P8:** Experiential, and aesthetic. Experiential because of the vibe, the warmth, the shadows and the textured wall. Eesthetic because of the nice use of textures shapes and contrast, creatign a well ballanced whole. Quite calming, yet exciting.

**P1:** Functional: same as before Aesthetic: it has a particular and distinct shape, very modern Experiential: it reminds me more of a moment of focus, in the daylight, when you read your mountain of documents in your cold and sad environment

**P2:** Aesthetic. Should provide light but light is dim. Recalls industrial aesthetics

**P3:** I would say again aesthetic also because of the context in which the lamp is placed. The settings of the sofa and the book seems like everything is placed in a certain spot for a aesthetic reason. And experiential because it doesn't look as a traditional lamp

**P4:** Aesthetic because it has a particular line , functional because It is used to read a book

**P5:** Functional and experiential. Functional because it's next to a reading chair. Experiential because it is supposed to help during the reading experience, to support that moment.

**P6:** Functional and aesthetical. As it seems it points the light in different useful directions and it's different from the others. The steps were drastically shorter because I already did them for the previous image so i only had to quickly evaluate the values.

**P7:** Both functional and visually pleasing, it offers unique perspectives and stands out from the rest. The steps were significantly reduced as I had already completed them for the previous image, allowing me to swiftly assess the values.

**P8:** Functional and social. Functional because, well, in this context the lamp seems intended to be used for reading, and the shapes are quite functional. Social because of the bubbly nature of the picture, with colour, textures and a playfull composition. A bit restless but fun.

**P1:** Functional Emotional: it makes me smile. It has a funny shape and reminds me of a lamp that a grandma can have

**P2:** Social. Looks like a welcoming light with round shapes. Old aesthetic usually puts people at ease.

**P3:** Emotional because of the materials  
**P4:** Functional , just light up. And it transmits peace ,peace of mind .

**P5:** Functional and aesthetic. Functional because it illuminates the space around. Aesthetic because it has a classical design.

**P6:** Aesthetical. Different shapes make it an interesting object to observe. Still looks a bit sad because of the light

**P7:** It exudes a friendly radiance, reminiscent of rounded shapes. Its classic beauty typically creates a relaxed atmosphere for people.

**P8:** Mainly emotional, because of the calm yet volatile scene. The lamp looks old, making me think of old people who are not here anymore. But their is also a lot of warmth in the picture. The picture evokes some unease in me, but it also gives me feelings of a warm embrace.

**P1:** Experiential: it looks like a lamp that swallowed something that got stuck in her throat. Bad experience

**P2:** Functional. Very simple design.

**P3:** I would say functional because some parts of the cables are visible and experiential for the same reason. It looks more like a handicraft piece than a industrial product

**P4:** Functional because it performs the essential function

**P5:** Functional. It serves as just a light in the room, it's more accentuated thanks to the wire coming out of the base (if that is a wire)

**P6:** Emotional. It evokes sadness and seriousness. Shorter than one shown before. It just feels a downgrade of the other

**P7:** From my perspective, it appears functional primarily because certain cable components are visible, contributing to an experiential aspect. The overall aesthetics lean more towards a handicraft piece rather than an industrial product.

**P8:** Aesthetic and functional. Aesthetic because of the clean intentional design of the lamp, almost over designed yet somewhat minimalistic. Creatign a sense of calm and pleasure. The picture also gives me a functional vibe. Clean, well litt, it invites me to work, finish the letter is was wrtiting before dinner etc... Realexing yet motivating.

**P1:** Functional, and emotional. The emotion is weird, as if it has nothing to do with the context but I don't know exactly why. Maybe because it really looks like a street light or something that I would expect only outdoor

**P2:** Experiential. The pic shows an environment. There is no focus on the lamp as a single item.

**P3:** this one I would say aesthetic because of the clean profile of the shapes but also social because of the sofa close it is so that if there are people sitting it can light up the room for them. At the same time, it reminds me of the street lamp and give me a sense of community and social environment

**P4:** Aesthetic because it beautifies the decor And it makes everything colder

**P5:** Functional becasue it illuminates the room (even if there is a big window) Aesthetic becasue it feels it has been designed following the current interior design trends. Social becasue it is placed in a living room, looking at the sofa with the used blanket on it

**P6:** Social and aesthetic. Social because of the place where it stands. Aesthetic because it has two different shapes

**P7:** Emotional: The lamp's strange vibe, detached from its surroundings, evokes peculiarity, resembling an outdoor street light in an indoor setting, creating discord.

Experiential: The lamp blends into the environment, not drawing attention as the central focus. The overall scene emphasizes integration and continuity, making the lamp an incidental element.

**P8:** Aesthetic. This picture represents a non functional design. The couch bloks half the room. But it looks nice. It looks ballanced, nice colors and shapes. It pleasures and gives me some energy.

## 3.2 Analysis

The first step of data analysis involved applying the recently created framework to the text data. The framework provides a systematic approach to analysing the linguistic content and extracting valuable insights.

The texts were transcribed, and the words within each text were categorized according to it. This categorization allowed for the grouping and clustering of words based on their semantic properties and underlying themes. (tab 1)

The next phase of analysis involved searching for patterns within the categorized words.

This process aimed to uncover the main categories and discern the prevailing word profiles or typologies used by the participants. Through careful examination of the clustered words, it has been possible to identify common themes, recurring patterns, and significant linguistic markers. (tab 2)

COGPRO	AFFECT	LIFESTYLE	SOCIAL	SOCREF	FOCUS PAST	FOCUS PRESENT	PERCEPTION	PHYSICAL	FOCUS FUTURE
- because	Emotions:	Negative/Lifeless:	Personal Pronouns:	pronouns:	placed	exists/Presence:	envied	envied	
- reason	+ emotional	- bad	- you	- you	+ has	exists/Presence:	envied	envied	
- why	+ joy	- lifeless	- them	- them	+ is				
- since	+ anxiety	- energy	- who	- their	+ seems				
- compared	+ tranquility	- energy	- their	- her	+ doesn't				
- contrasting	+ comforting	- anxiety	- did	- had to	+ needs				
- same	+ calming	- calm	- had to	- had to	+ want				
- distinct	+ exciting	- fun	- been	- been	+ are				
- different	+ playful	- playful	- been	- been	+ don't				
- than			- been	- been	+ looks				
- rather than			- been	- been	+ contrasting				
- other			- been	- been	+ envied				
- unlike			- been	- been	+ positive				
Opinion/Feeling:	- opinion				+ same				
- opinion					+ distinct				
- feelings					+ different				
- sense					+ than				
Purpose/intention:	- purpose				+ other				
- intention					+ unlike				
- motive					+ Opinion/Feeling:				
- integration					+ focus				
Usage:	- used				+ look				
- into					+ line				
- allowing					+ directions				
- making					+ stand out				
Recollection/Reminder:	- reminds				+ looks				
- recalls					+ there				
- reminiscent					+ attention				
- would					+ center of focus				
- should					+ environment:				
- seems					+ cold				
- supposed to					+ street				
- probably					+ outdoor				
- uncertain					+ sense				
- unsure					+ color				
- maybe because					+ interior				
- know exactly why					+ beautifies				
- can					+ colors				
- embrace									
- something									
- parts									
- perspective									
Evaluation/Assessment:	- evaluate								
- evaluate									
- unique perspectives									
- motivating									
- mind									
- think									
Overall/General:	- without								
- particular									
- without any									
- overall									
- volatile									

Tab 1: In this photo, you can see how the transcription of the words from all the forms (envied by LIWC) clustered under each macro-category.

Appendix I

Cogproc	A	B	C	D	E	F	G	H	I	J
1 Reason/Cause:	Emotion:	Negative/Indesirable:	Personal Pronouns:	pronouns:	verbs:	Existence/Presence:	present:	Location/Placement:	swallowed	
2 because	+ emotional	- bad	- you	- them	- placed	- is	- in	-	- dinner	
- reason	+ joy	- lifeless	- them	- their	- used	- seems	- placed in	-	-	
- why	+ anxiety	- energy	- who	- her	- need	- doesn't	- need to	-	-	
- since	+ tranquility	- calm	- did	- had to	- relax	- it's	- sitting	-	-	
- compared	+ comforting	- fun	- had to	- been	- comforting	- aren't	- up	-	-	
- contrasting	+ exciting	- playful	- been	- been	- relaxed	- are	-	-	-	
- same			- been	- been	- fun	-	-	-	-	
- distinct			- been	- been	- playful	-	-	-	-	
- different			- been	- been	-	-	-	-	-	
- than			- been	- been	-	-	-	-	-	
- rather than			- been	- been	-	-	-	-	-	
- other			- been	- been	-	-	-	-	-	
- unlike			- been	- been	-	-	-	-	-	
Opinion/Feeling:	- opinion				-	-	-	-	-	
- opinion					-	-	-	-	-	
- feelings					-	-	-	-	-	
- sense					-	-	-	-	-	
Purpose/intention:	- purpose				-	-	-	-	-	
- intention					-	-	-	-	-	
- motive					-	-	-	-	-	
- integration					-	-	-	-	-	
Usage:	- used				-	-	-	-	-	
- into					-	-	-	-	-	
- allowing					-	-	-	-	-	
- making					-	-	-	-	-	
Recollection/Reminder:	- reminds				-	-	-	-	-	
- recalls					-	-	-	-	-	
- reminiscent					-	-	-	-	-	
- would					-	-	-	-	-	
- should					-	-	-	-	-	
- seems					-	-	-	-	-	
- supposed to					-	-	-	-	-	
- probably					-	-	-	-	-	
- uncertain					-	-	-	-	-	
- unsure					-	-	-	-	-	
- maybe because					-	-	-	-	-	
- know exactly why					-	-	-	-	-	
- can					-	-	-	-	-	
- embrace					-	-	-	-	-	
- something					-	-	-	-	-	
- parts					-	-	-	-	-	
- perspective					-	-	-	-	-	
Evaluation/Assessment:	- evaluate				-	-	-	-	-	
- evaluate					-	-	-	-	-	
- unique perspectives					-	-	-	-	-	
- motivating					-	-	-	-	-	
- mind					-	-	-	-	-	
- think					-	-	-	-	-	
Overall/General:	- without				-	-	-	-	-	
- particular					-	-	-	-	-	
- without any					-	-	-	-	-	
- overall					-	-	-	-	-	
- volatile					-	-	-	-	-	

Tab 2: In this table, you can see a further grouping based on macro aerial (of the same colour) horizontal. The individual categories were named by the name of the subcategory of cogproc.

Appendix II

In data analysis, there were two iteration methods. First, we analyzed all the answers together with all the categories of the framework inserted then to avoid overlap each set of answers for each photo was analyzed for each category.

The screenshot shows the LIWC-22 Dictionary interface with the following settings: Select dictionary: LIWC-22 Dictionary. The categories selected are: cogproc (selected), Affect, Social, socrefs, and Physical.

Functional: it's a lamp and has the function to light up, also **without** a **particular** aesthetic **but** a very basic appearance Experiential: it **reminds** me the moment when **you** read in the bed before **sleeping** with this lamp lightened up. **Emotional: connected** to the moment expressed before, it **reminds** me of that moment of **peace** and **relax** when **you** finally **rest** from a busy day

Functional, the shape also resembles the light cone.

I **would** say **emotional because** of the soft and warm light. And aesthetic **because** of the selection of the materials and the minimalist shapes

Functional, **because** it **represents** an object that illuminate . It's for studying

Functional, **because** there are some documents on the table so the light **could** be **used** to be able to read those pages.

In my **opinion**, the image **represents** the **emotional** and experienced values. I **compared** the image to each value, in order, and for each of **them** I **chose if** it was representative, also **comparing** it to the previous values. It evokes **calm**, mistery and silence. Doesn't evoke functionality. **joy**

The lamp serves the **purpose** of providing illumination **without any** specific aesthetic features, opting for a simple and basic design. It evokes **feelings** of **serenity** and **tranquility**, **reminiscent** of the much-needed respite at the end of a busy day, with the **comforting** glow of the lamp.

Experiential, and aesthetic. Experiential **because** of the vibe, the warmth, the shadows and the textured wall. Eesthetic **because** of the **nice use** of textures shapes and **contrast**, creatign a **well** ballanced whole. **Quite calming, yet exciting.**

13. Image of the text from the 1st photo in the second test analysed with all the categories together.

The screenshot shows the LIWC-22 Dictionary interface with the following settings: Select dictionary: LIWC-22 Dictionary. The category selected is: cogproc.

Functional: it's a lamp and has the function to light up, also **without** a **particular** aesthetic **but** a very basic appearance Experiential: it **reminds** me the moment when you read in the bed before sleeping with this lamp lightened up. Emotional: connected to the moment expressed before, it **reminds** me of that moment of peace and relax when you finally rest from a busy day

Functional, the shape also resembles the light cone.

I **would** say emotional **because** of the soft and warm light. And aesthetic **because** of the selection of the materials and the minimalist shapes

Functional, **because** it **represents** an object that illuminate . It's for studying

Functional, **because** there are some documents on the table so the light **could** be **used** to be able to read those pages.

In my **opinion**, the image **represents** the emotional and experienced values. I **compared** the image to each value, in order, and for each of them I **chose if** it was representative, also **comparing** it to the previous values. It evokes calm, mistery and silence. Doesn't evoke functionality, joy

The lamp serves the **purpose** of providing illumination **without any** specific aesthetic features, opting for a simple and basic design. It evokes **feelings** of serenity and tranquility, **reminiscent** of the much-needed respite at the end of a busy day, with the comforting glow of the lamp.

Experiential, and aesthetic. Experiential **because** of the vibe, the warmth, the shadows and the textured wall. Eesthetic **because** of the **nice use** of textures shapes and **contrast**, creatign a well ballanced whole. **Quite calming, yet exciting.**

14. Image of the text from the 1st photo in the second test analysed with the category cogproc.

For more: Data collection (zipfile)

# 4. Insights

Present your findings clearly, and discuss them. How do you interpret your findings? What implications do your findings have for design?

Thanks to the analysis and iteration of the project, the main insights that there have been, specifically for the second case study are:

### 1. People's connection with images and their attribution of values are largely influenced by their personal experiences.

This understanding prompted the inclusion of cognitive processes (cogproc) in the study to explore if it is the most frequently utilized framework in this context.

By examining the cognitive processes associated with image interpretation, we can gain insights into how individuals form connections and attribute values based on their unique experiences.

### 2. The evocative nature of the images extends beyond their direct association with specific values.

In the participants' responses, we often find that values are expressed even when they are not explicitly mentioned alongside the images. This suggests that the images serve as triggers for a broader range of values, invoking emotions and associations beyond the immediate object or function depicted.

### 3. Within the collected responses, two sub-categories emerged as the most commonly used: opinion/feeling and purpose intention.

These sub-categories emphasize that the emotions and intentions evoked by the object under examination are significant factors that prompt reflection in the user.

These statements are often supported by the use of the first-person singular, indicating the strong sense of connection and identification that users perceive between themselves and the potential object.

Aesthetic. Should provide light but light is dim. Recalls industrial aesthetics

I would say again aesthetic also because of the context in which the lamp is placed. The settings of the sofa at certain spot for a aesthetic reason. And experiential because it doesn't look as a traditional lamp

Aesthetic because it has a particular line , functional because It is used to read a book

Functional and experiential. Functional because it's next to a reading chair. Experiential because it is supposed support that moment.

Functional and aesthetical. As it seems it points the light in different useful directions and it's different from the because I already did them for the previous image so i only had to quickly evaluate the values.

15. Cogproc analysis screenshot of results

Both functional and visually pleasing, it offers unique perspectives and stands out from the rest. The steps were significantly reduced as I had already completed them for the previous image, allowing me to swiftly assess the values.

16. Perception analysis screenshot of results

In my opinion, the image represents the emotional and experienced value was rappresentative, also comparing it to the previous values. It evokes calmness and relaxation.

The lamp serves the purpose of providing illumination without any specific serenity and tranquility, reminiscent of the much-needed respite at the end of the day.

Experiential, and aesthetic. Experiential because of the vibe, the warmth, the shapes and contrast, creating a well balanced whole. Quite calming, yet energizing.

17. Affect analysis screenshot of results

# 5. Conclusion And Limitations

Discuss the limitations of your work. What are they, and if given the opportunity to continue working on your idea, what work can you plan to do based on what you have done so far?

## 5.1 Limitations

The method is a work in progress, which implies that there are several limitations associated with its current implementation.

The primary limitation, closely tied to its strength, is the utilization of **artificial intelligence (AI)**.

While AI is a valuable tool for rapidly generating concepts, it also introduces a level of **unpredictability** in terms of output.



1. A potential issue arises when the designer envisions an image that cannot be accurately conveyed through drawings or sketches but attempts to describe it to the AI, emphasizing its underlying values.

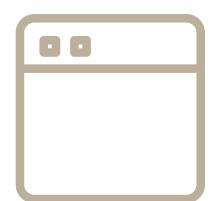
The AI-generated images may lead to two outcomes: **innovative perspectives** by breaking design fixation or partial alignment with intended values, causing dissatisfaction. Awareness of these possibilities is crucial in the design process.



2. The output of the photo generation process is influenced by the designer's intentions and their alignment with the generated image, as well as the selection of tools and their level of quality. For instance, different tools like Dream Studio or Midjourney may yield varying levels of photo quality. Therefore, it is crucial to consider the specific tool employed within this approach.



3. AI used for generating images could exhibit a tendency to be trained on a specific type of photo, leading to fixation. This is exemplified in the case study of the lamp (test run 2), where the AI may have become fixated on generating images of lamps due to a training bias.



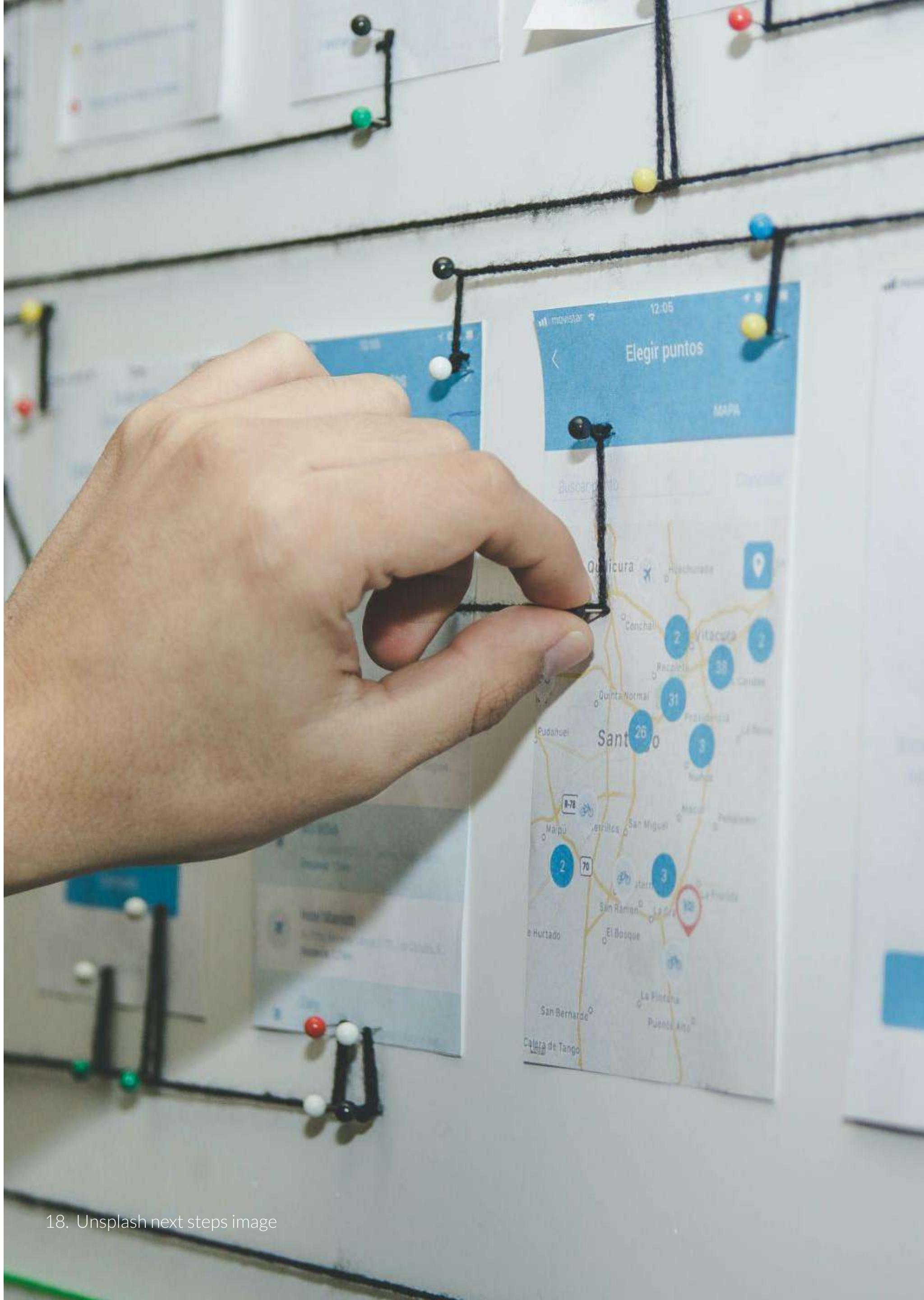
4. The technology struggles to create intricate patterns or follow readability and interface rules, especially in user interfaces (UI). As a result, it can generate **confusing or unrelated images** that don't align well with the intended concept. This can distract users and make it harder for them to understand the intended values. While I believe these challenges can be overcome, it's important to carefully consider and invest in the future development of this field.

## 5.2 Conclusions

In summary, the devised method has generally fulfilled its purpose. Through analysis of the responses and word frequencies, it is possible to understand which macro-themes are of greater interest. However, there are important considerations for future development, including:

1. Improved organization of post-LIWC data analysis, especially when dealing with large amounts of responses to avoid transcription and classification challenges.
2. Exploring prompt methods that better align with value descriptions, potentially automating and saving time in the initial phase.

Furthermore, what emerges is that the method itself is not only useful in its end but (using it myself) seems to be more of a continuous cyclical cue that invites the designer to reflect throughout the journey.



18. Unsplash next steps image

# Appendix

# Appendix I

## Appendix II

15	rather than	calm	old				outdoor
16	other	nice	industrial				into
17	unlike	well	couch				
18		clean	room				Direction/Attention:
19	Opinion/Feeling:	beautifies	living room	Social/Community:		Representation/Appearance:	focus
20	opinion			social			look
21	feelings	Reminiscence:	Performance:	welcoming			line
22	sense	reminiscent	performs	friendly			directions
23				community			stands out
24	Purpose/Intention:						looks
25	purpose						there
26	intention						attention
27	motive						central focus
28	integration						
29						Environment:	
30	Usage:					cold	
31	used					street	
32	use					outdoor	
33	allowing					sense	
34	making					colder	
35						interior	
36	Recollection/Reminder:					Aesthetics/Visual:	
37	reminds					beautifies	
38	recalls					colors	
39	reminiscent						
40							
41	Certainty/Uncertainty:						
42	would						
43	should						
44	seems						
45	supposed to						
46	possibly						
47	uncertain						
48	unsure						
49	maybe because						
50	know exactly why						
51	can						
52	embrace						
53	something						
54	parts						
55	perspective						
56							
57	Evaluation/Assessment:						
58	evaluate						
59	unique perspectives						

20	Integration		
29		Environment:	
30	Usage:	cold	
31	used	street	
32	use	outdoor	
33	allowing	sense	
34	making	colder	
35		interior	
36	Recollection/Reminder:		Aesthetics/Visual:
37	reminds		beautifies
38	recalls		colors
39	reminiscent		
40			
41	Certainty/Uncertainty:		
42	would		
43	should		
44	seems		
45	supposed to		
46	possibly		
47	uncertain		
48	unsure		
49	maybe because		
50	know exactly why		
51	can		
52	embrace		
53	something		
54	parts		
55	perspective		
56			
57	Evaluation/Assessment:		
58	evaluate		
59	unique perspectives		
60	motivating		
61	mind		
62	think		
63			
64	Overall/General:		
65	without		
66	particular		
67	without any		
68	overall		
69	volatile		
70			
71			
72			

