UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

# Design Thinking (DT)

Gema Calleja (gema.calleja@upc.edu)

**MUEI. Technology Innovation. Academic Year 2022-23**

## What is Design thinking?

**DESIGN THINKING** is a methodology for **creative problem solving**.

It is used to **generate innovative ideas** by understanding and solving the **real needs of customers**.

# What is Design thinking?

DESIGN THINKING can be described as a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity."

*Tim Brown* CEO, IDEO

# Why Design thinking?

- Initially, this methodology comes from the way **product designers** worked.

- It was **in the 70s** that the innovation company IDEO began to explain this methodology at Stanford University

- However, it is currently used to analyze and **innovate in any field** of the organization.

- One reason for the proliferation of design thinking in industries is that it's **useful to break down problems in any complex system**, be it business, government, or social organizations.
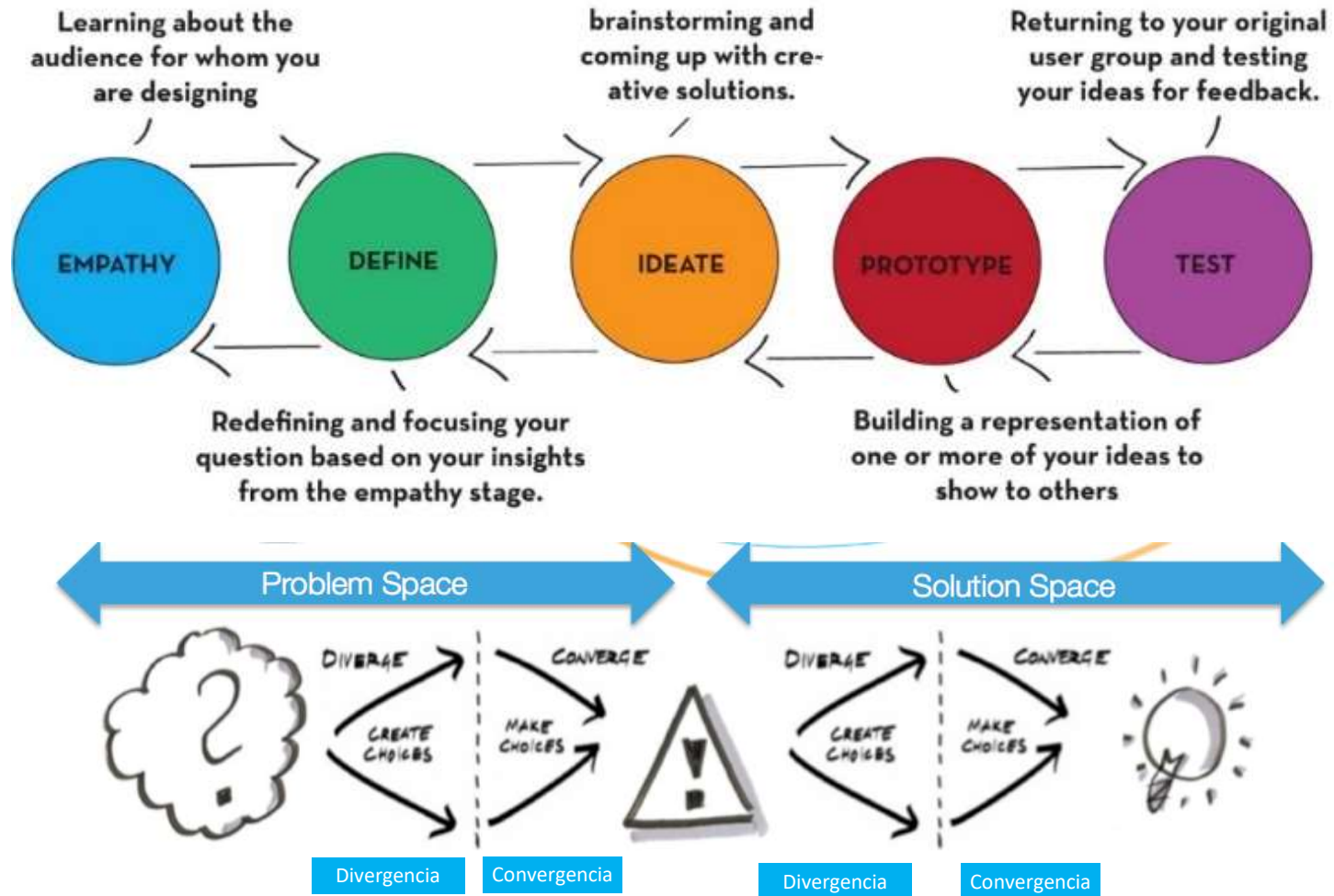
# Objectives of Design Thinking

- Discover and understand real costumer needs

- Use creativity tools to generate innovative ideas

- Create new products / services that meet those needs

# Design Thinking is a process, a methodology



Learning about the audience for whom you are designing

brainstorming and coming up with creative solutions.

Returning to your original user group and testing your ideas for feedback.

EMPATHY · DEFINE · IDEATE · PROTOTYPE · TEST

Redefining and focusing your question based on your insights from the empathy stage.

Building a representation of one or more of your ideas to show to others

Problem Space · Solution Space

DIVERGE · CREATE CHOICES · CONVERGE · MAKE CHOICES

DIVERGE · CREATE CHOICES · CONVERGE · MAKE CHOICES

Divergencia · Convergencia · Divergencia · Convergencia

# Design Thinking, a user-centric methodology

We should:

- Identify the main users and stakeholders of the problem that we are analyzing. Understand what their priorities are, and what their pain points are to effectively implement a solution.

- Identify the role that our target user is adopting in relation to our product or service (customer/co-creator/intermediary) and understand their needs and problems from this role's point of view.

# Example: Social Robots
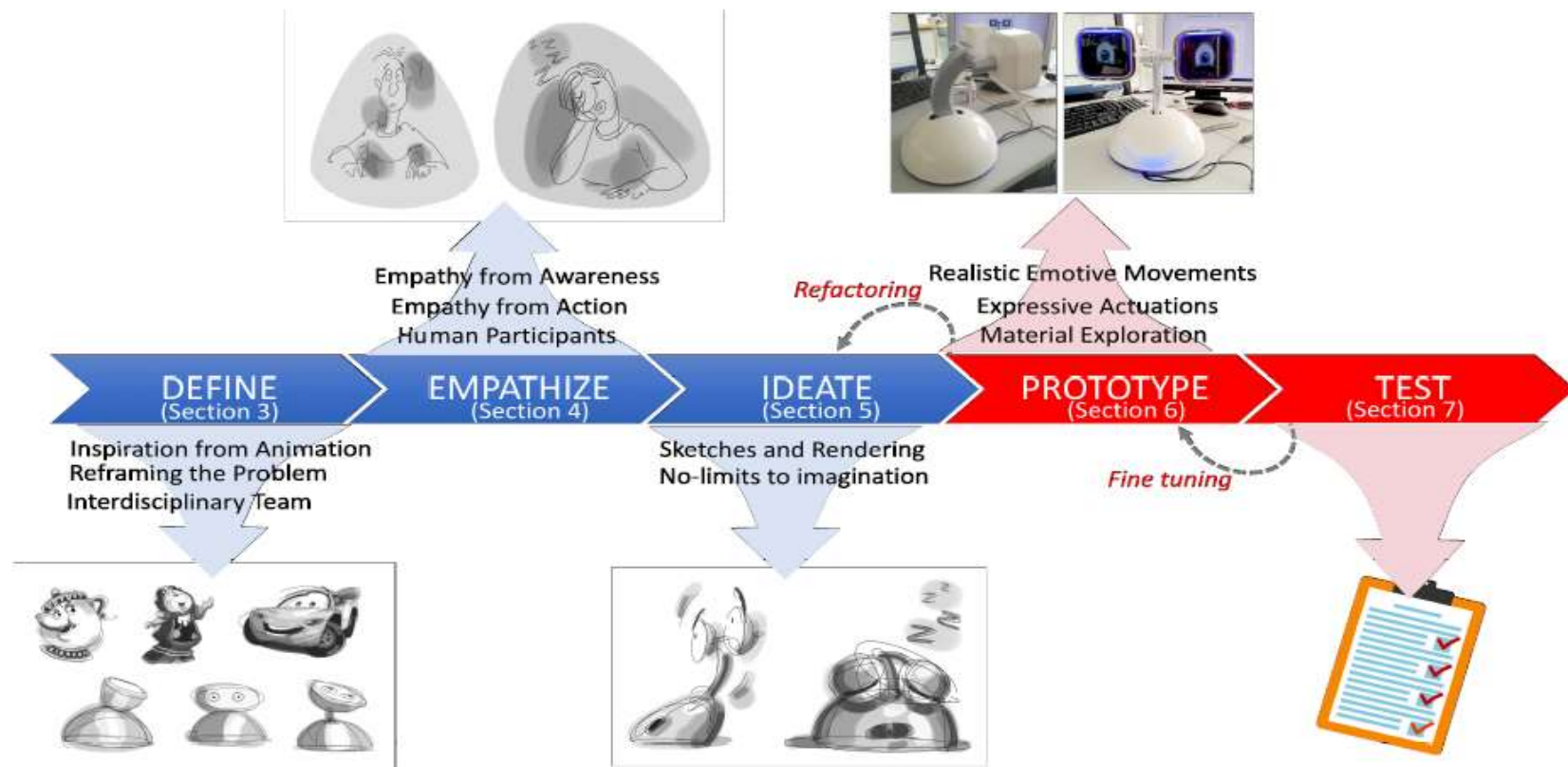


Source: Gomez, Randy, et al. "Haru: Hardware design of an experimental tabletop robot assistant." *Proceedings of the 2018 ACM/IEEE international conference on human-robot interaction*. 2018.

# Steps of Design Thinking

1. **EMPATHYZE**

2. **DEFINE**

3. **GENERATE IDEAS**

4. **DEVELOP PROTOTYPES**

5. **TEST AND IMPROVE**

# DESIGN THINKING: STEP 1

**Empathize Learn about the audience we are designing for**

This step consists of deeply understanding the needs of the consumers involved in solving what we are developing. It is important to observe the environment and put ourselves in the shoes of the people who are going to relate to our solution to generate solutions consistent with their realities.

To complete this stage there are many techniques to understand the problem and gather the information. The most used are: mind mapping, construction of **customer experience maps**, obtaining information through different sources, personal interviews, observation of users, etc

**Example:**

https://www.youtube.com/watch?v=IQtOgE2s2xI

# Expected output from STEP 1: Customer experience map

# DESIGN THINKING: STEP 2

## 2. Interpret and Define
**Focus the challenge based on the information obtained in the empathy stage**

The objective of this stage is **to identify problems**, the solutions of which will be key to solving the initial challenge and thus obtaining the innovative solution.

The techniques for this stage are **interpretation of the customer experience map**, empathy map, **cognitive immersion,** etc.

The **cognitive immersion** consists of understanding the existing reality, putting ourselves in the place of a typical user.

# Expected output from STEP 2: Identify Pains and Gains

From the **Customer Experience Map**, identify:

- **Unmet gains** – the benefits which the customer expects and needs, what would delight customers and the things which may increase likelihood of adopting a new product/service.

- **Unresolved Pains** – the negative experiences, emotions and risks that the customer experiences in the process of achieving their goals.

# DESIGN THINKING: STEP 3

## 3. Generate ideas

In this stage you have to move from the identified problems to the exploration of solutions.

The objective of this stage is to generate endless options. You do not have to stay with the first idea, you have to think beyond and eliminate any value judgment.

Remember, we are within the creative process, therefore the more open minded the better. Sometimes the most bizarre ideas are those that produce visionary solutions.

Some techniques to complete this stage: brainstorming," what if ... " questions, SCAMPER (Substitute, Combine, Adapt, Modify, Put other uses, Eliminate, Reduce).

# Expected output from STEP 3: Generation of ideas

In this stage you have to move from the identified problems to the **exploration of solutions**. In order to do so you will have to:

a. Conduct a group *brainstorming* exercise according to *methodology n-3-5*

b. Perform a *lateral thinking exercise* (**worst-case scenarios**):
   Define and specify the worst-case scenarios for reviewing and updating your ideas of the brainstorming exercise

c. Perform another *lateral thinking exercise* (**'What if...'**):
   Apply WHAT IF questions in order to learn from them and apply that learning also in reviewing and updating brainstorming ideas.

d. *Define a decision criteria* to evaluate your ideas and *select 3 ideas*.

# Expected output from STEP 3a: Brainstorming n-3-5

## Methodology n-3-5

Methodically, and without thinking about a final solution, generate the maximum number ideas possible, using the brainstorming methodology and we group them.

- N participants
- The first participant writes down three ideas (3)
- Use keywords and small sentences
- The first participant will pass their ideas to the next one
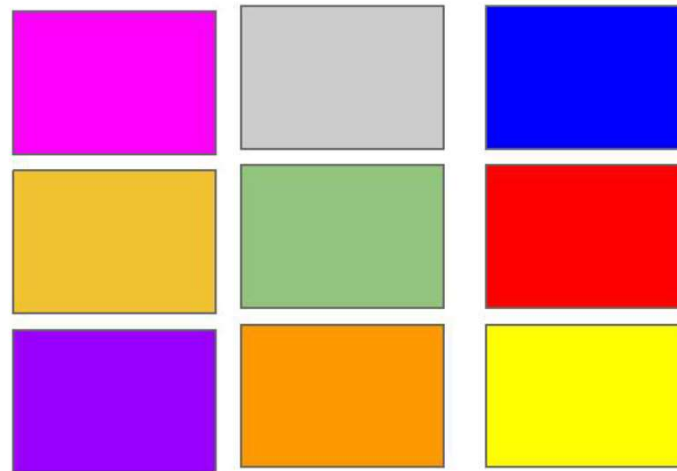- Each round lasts five (5) minutes

# Expected output STEP 3b: WORST-CASE SCENARIO

Carry out a **lateral thinking exercise** (**worst –case scenarios**)

Define and specify the worst-case scenarios to review and update the ideas arisen in the brainstorming exercise.

Worst posible scenarios: This is the worst that could happen to our customer...

# Expected output STEP 3c: WHAT IF?

## EXAMPLE
Based on the identified challenge, put yourself in the user's point of view and break down the challenge into smaller parts and ask questions that open the space for solutions.

## Challenge
Redesign the waiting area of an airport.

## Point of view
A couple of parents with three children rush to the gate to find that their flight has been delayed. They must entertain the children so as not to irritate the rest of the passengers, already frustrated by the delay.

## Examples of WHAT IF questions:
- Explore the opposite: **WHAT IF** make waiting the most exciting part of the flight?
- Question an assumption: **WHAT IF** eliminate the waiting time?
- Create an analogy from need to context: **WHAT IF** make the airport like a spa? And like a playground?
- Change the status quo: **WHAT IF** make noisy kids less annoying?

# Expected output STEP 3d: DECISION CRITERIA AND VALUE PROPOSITION

In this stage you have to move from the identified problems to the **exploration of solutions**.

- Define a **criteria to evaluate** your improvement ideas.

- Explain which **3 products/services you have selected** and how they create gains and relieve pains for your customer. This is:

  - **Gain creators** – a description of how the product or service creates customer gains and how it offers added value to the customer.

  - **Pain relievers** – a description of exactly how the product or service alleviates customer pains.

# DESIGN THINKING: STEP 4

## 4. Develop prototypes

In this stage we go from the universe of debates and exploration to the universe of reality.

Before launching the idea, the product or the service, it is important to **build the prototype** of the final idea generated - this makes the ideas tangible and **helps us to visualize and understand the solutions**.

The prototype **will help us discover what works**, what doesn't, and highlight the elements that we need to **improve** or **modify** before the final launch.

# DESIGN THINKING: STEP 5

## 5. Test and improve

During this stage,we will **test the prototypes** created with the consumers involved.

This phase is crucial as it will tell us **where the faults are**, **what we can improve** and it will point out any shortcomings.

During this phase we will finish **outlining our idea** until it becomes the **final solution**.