Workshop on
DESIGN THINKING FOR IOT APPLICATIONS

P.S.R.ENGINEERING COLLEGE, SIVAKASI

INSTITUTION'S INNOVATION COUNCIL (IIC) &
IETE STUDENTS' FORUM (ISF)

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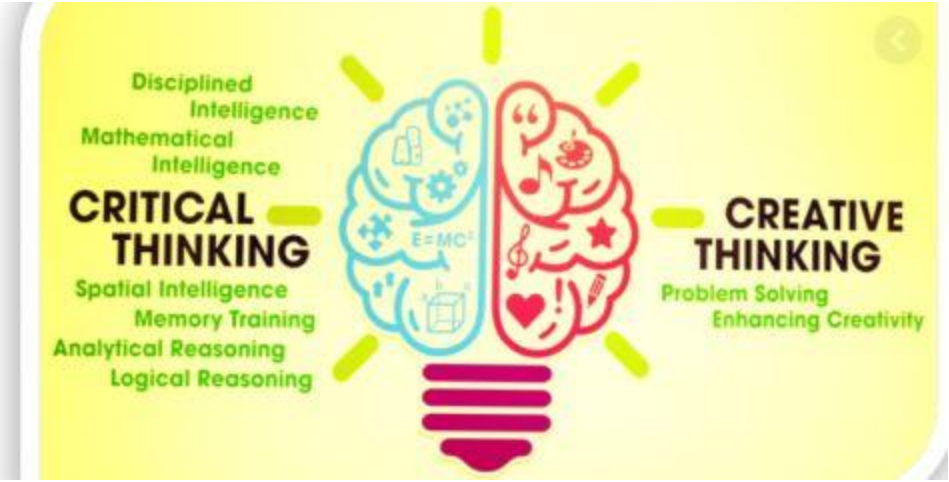
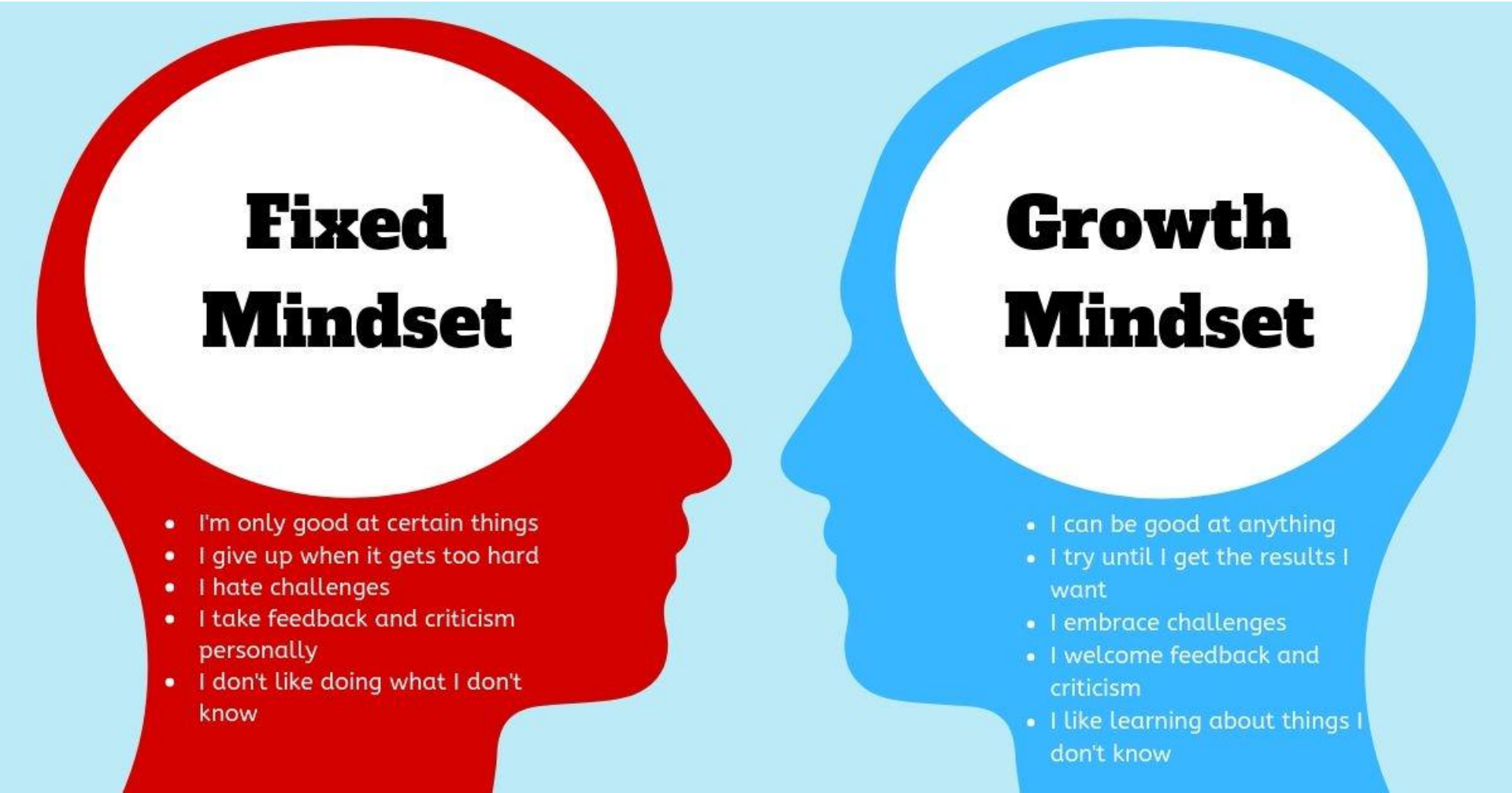
What is Design Thinking?



- An approach to problem solving that allows us to combine right-brain creative thinking and left brain analytical thinking

Where does it originate?

- Successful Managers had a “learning mindset”



Where we use it?

- Business Growth
- To develop new products and services
- To develop innovative ideas

Problems suitable for design thinking

- Wicked Problems – Data from past is not able to predict the future
- The decision involves human beings
- Group of people who see the problem differently have to come together to work toward a solution

Design Thinking Approach

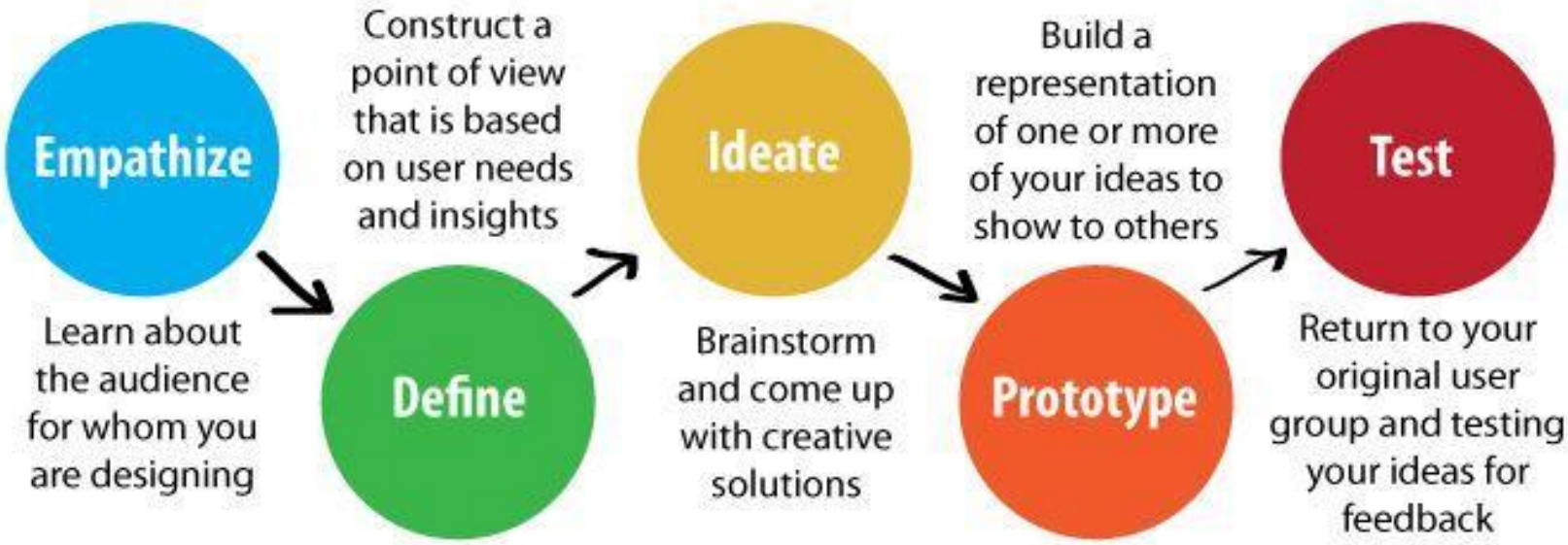
- It creates a set of collaborative tools that help people work together across differences
- It builds a common mental map across team members to find a good solution for a problem

- Design thinking offers an alternate path
- Ex. Suitcases with wheels, easy to pour upside down ketchup bottles
- Embracing Design thinking means customer is the real person with real problems, rather than a sales target.
- Researchers at Proctor & Gamble focused on improving detergents to clean floors. Design thinking pointed out a better answer - mop

Structured brainstorming

- Process of systematic and liberal generation of large volumes of ideas from participants
- ONE idea at a time in an atmosphere free of criticism and judgment from other participants
- The ideas obtained in a firm was 300 narrowed down to 23 and finally five made in market

Phases of Design Thinking



Principles of Design Thinking

❶ Leave titles at the door!

There is no hierarchy during a Design Thinking workshop.
Chef and other rolls are hung on the coat hook.

❷ Encourage wild ideas!

Let your imagination run wild. Any (supposedly) crazy idea
and every idea should be treated equally.

❸ Go for quantity!

Quantity before quality. Selected, analyzed and evaluated later.

❹ Build on Ideas of others!

There is no copyright. Ideas from others should be taken up,
supplemented or changed.

❺ Think human centered!

Design Thinking is first and foremost thinking about people and not about technology or business goals.

❻ Be visual and make it tangible!

Use drawings, illustrations, photos, videos, prototypes, etc.

❼ Avoid criticism!

Idea generation and evaluation must be strictly separated.

❽ Fail early and often!

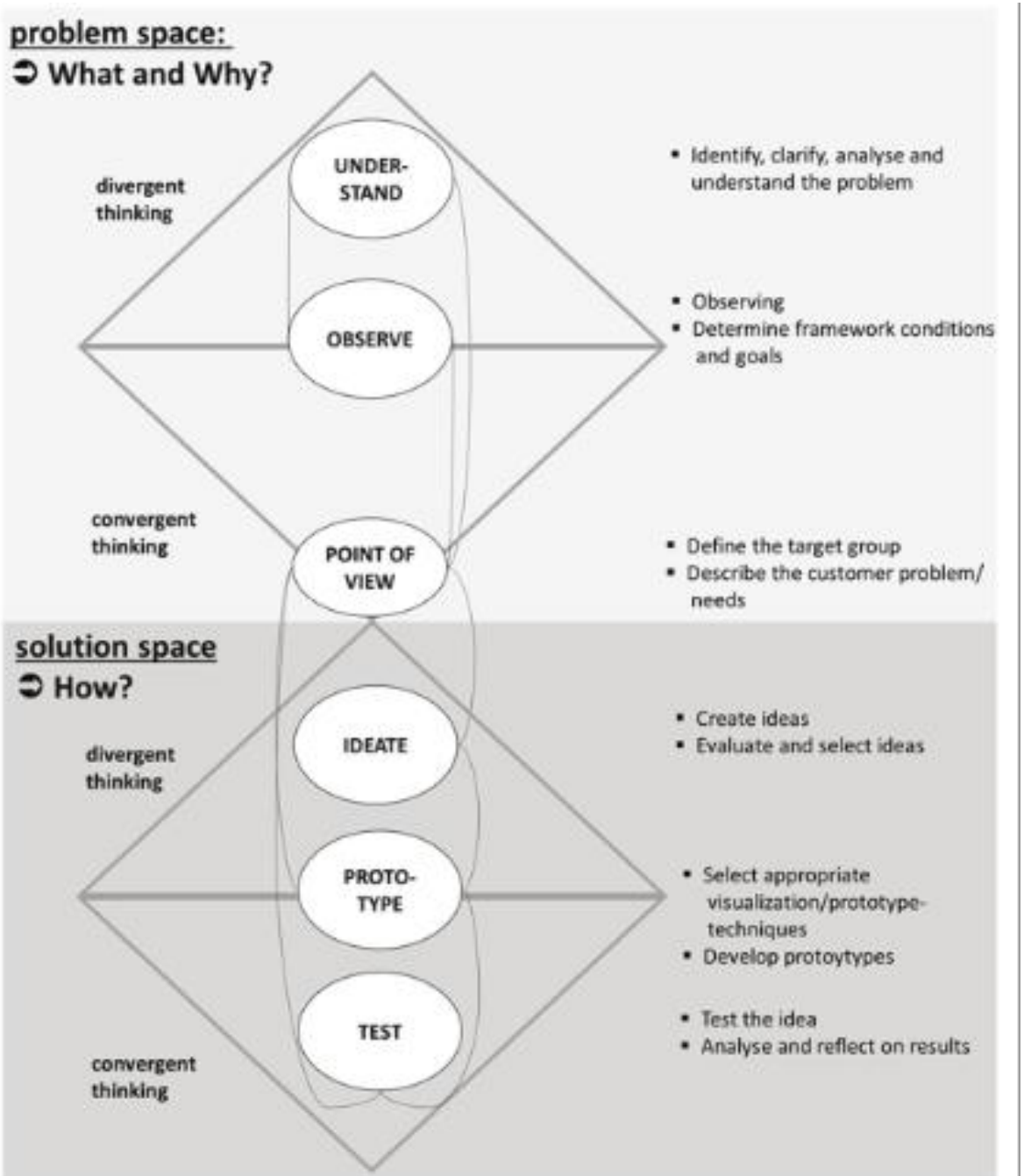
Failure means learning. Often failure means that you have learned a lot.

❾ Stay focused!

Set yourself limits, stick to the concrete tasks in the Design Thinking process**.

❿ Let`s have fun!

Developing new ideas in a team should be fun. Creativity needs this fun.


problem space:
➲ What and Why?
divergent thinking
UNDER-STAND
OBSERVE
convergent thinking
POINT OF VIEW
• Identify, clarify, analyse and understand the problem
• Observing
• Determine framework conditions and goals
• Define the target group
• Describe the customer problem/ needs
solution space
➲ How?
divergent thinking
IDEATE
PROTO-TYPE
TEST
convergent thinking
• Create ideas
• Evaluate and select ideas
• Select appropriate visualization/prototype-techniques
• Develop protoytypes
• Test the idea
• Analyse and reflect on results

Observation

observation dimensions	Explanation
SPACE	Describe in detail the premises or outdoor area in which the customer is staying.
ACTORS	Write down the names and the relevant information about the persons observed.
ACTIVITIES	Summarize the activities performed by the persons.
OBJECTS	Write down the objects that the persons use or find in the situation (furniture, PC, special equipment, etc.).
ACTS	Emphasize special individual actions of the customers.
EVENTS	Describe the events or situations in which the customers find themselves (meetings, small talk, customer talks, etc.).
TIME	Make a note of the order in which the individual activities/actions take place.
GOALS	Describe which goals the customers want to pursue concretely with their actions.
FEELINGS	In particular, write down the emotions of the customers in the various contexts.

Observation

3 How to observe

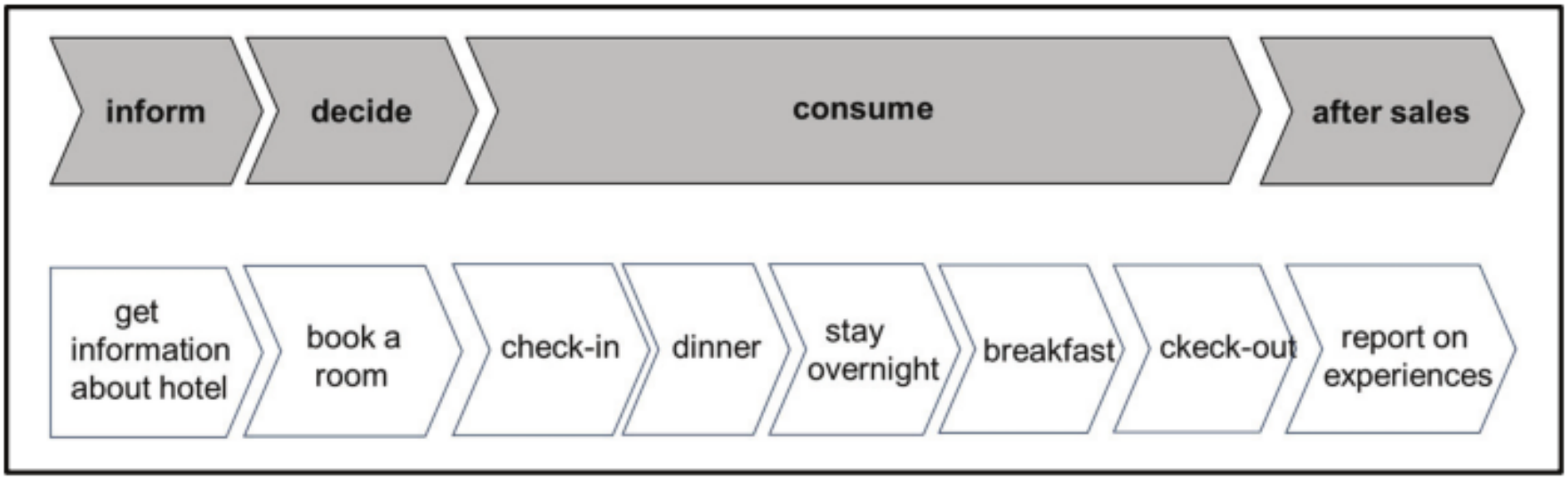
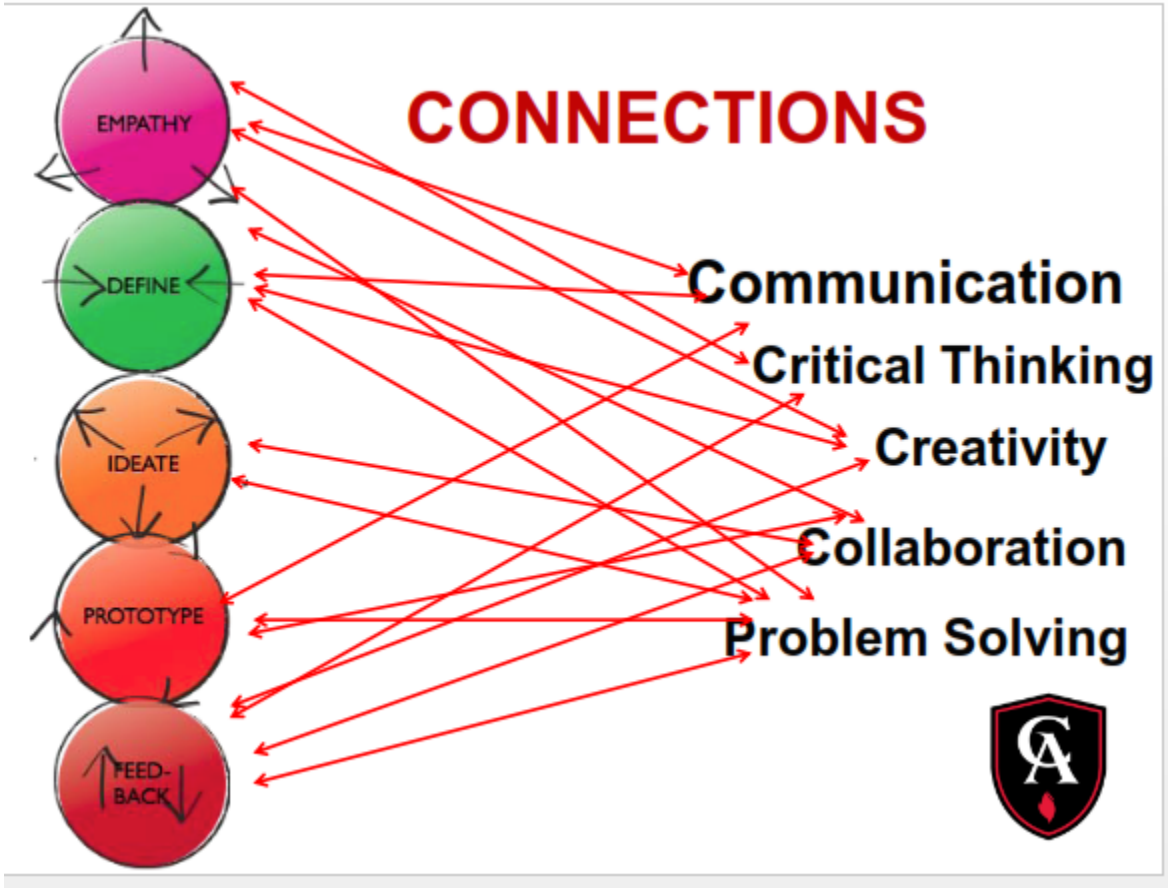


Figure 14: Phases of the Customer Journey with an example of a hotel stay

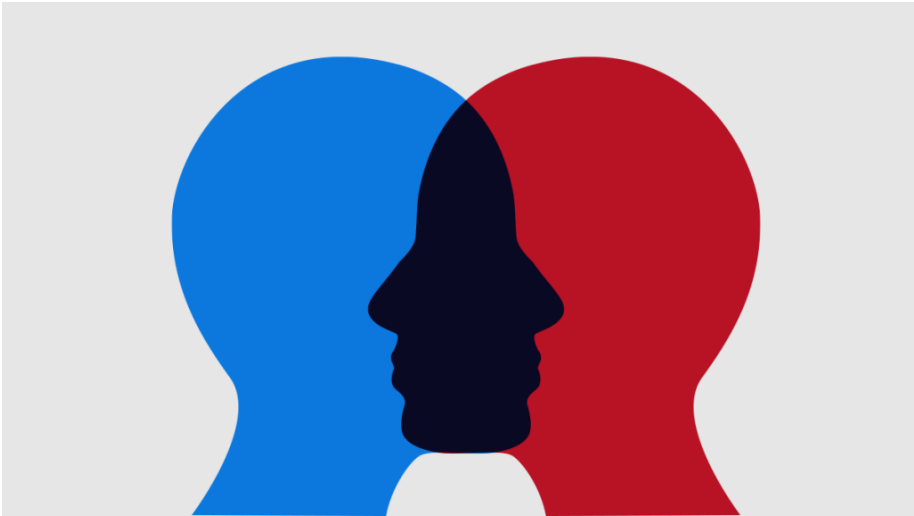
Ideas for improvement?: Customer benefit matrix		
make it easier?	**What can be simplified for the customers?**	
added value?	**How can they be given added value?**	
reduce risk?	**Where can their risks be reduced/minimized?**	
fun factor?	**Is it possible to add more fun and entertainment?**	
excite?	**What would excite customers?**	

Process of Design Thinking



Empathy

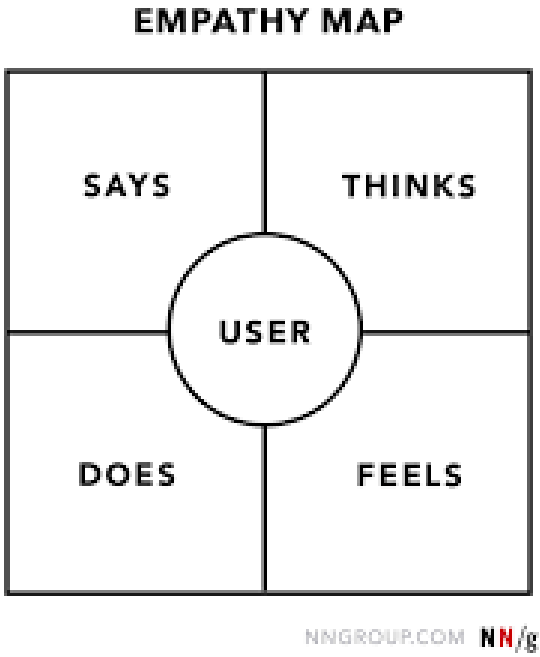
- The action of understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another person.

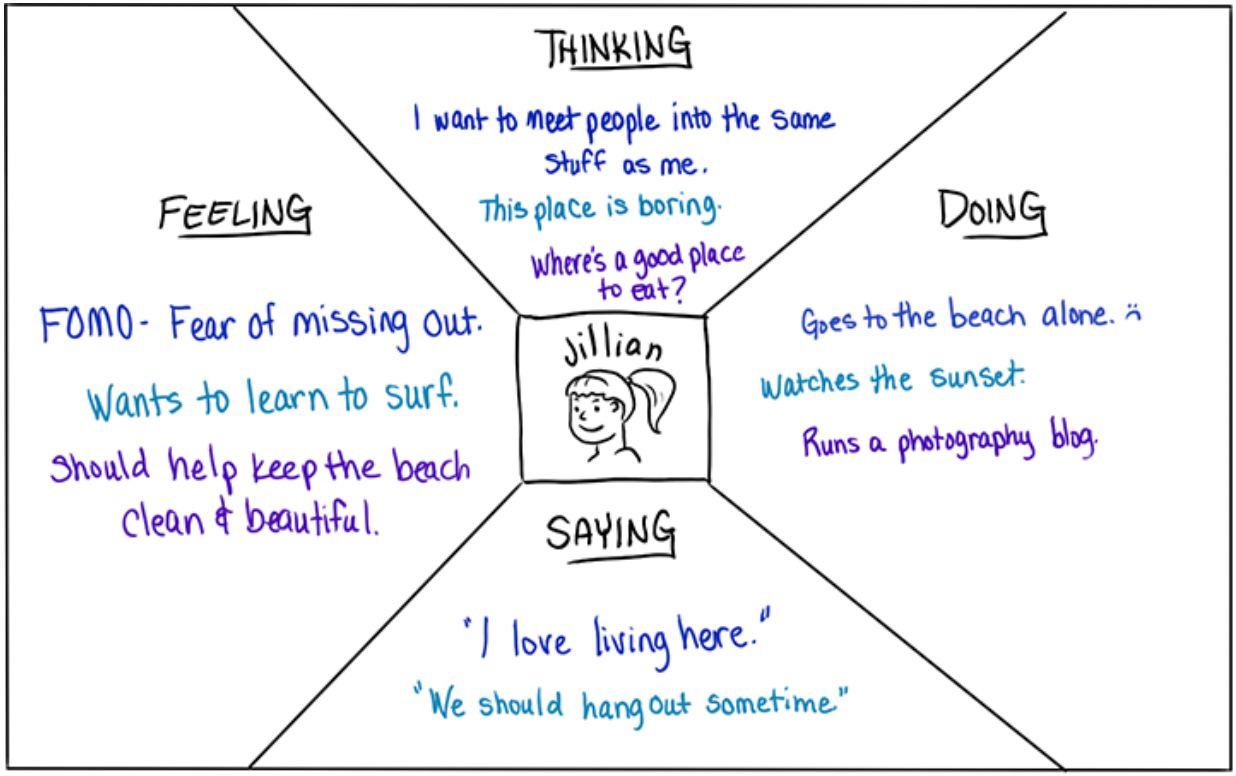


Practicing empathy

- Facial Expressions
- Assume a beginner's mindset (Listen but don't judge)
- Pay attention to body language
- Key empathy building methods – Empathy Interviews, Immersion and observation, extreme users

Empathy Map

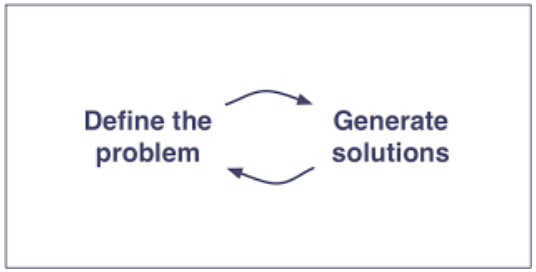




Jillian needs a better way to _____ because _____.

Define Problem

- Problem statement identifies the gap between current statement and the desired state of a process or product
- Example of problem statement
- “Our young working professional struggles to eat healthily during the week because she is working long hours. Our solution should deliver a quick and easy way for her to procure ingredients and prepare healthy meals that she can take to work.”



Good Problem statement

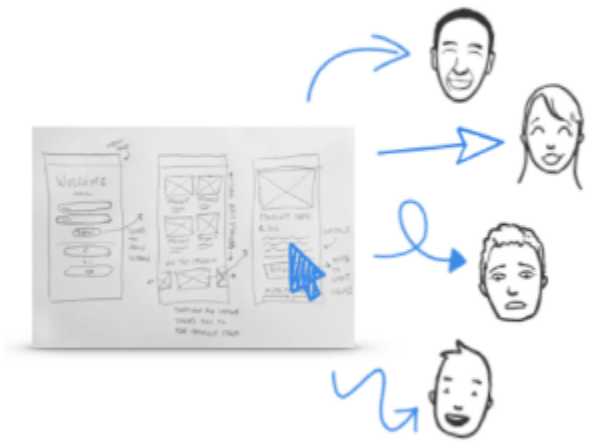
- Focus on user
- Keep it broad
- Make it manageable
- The four W’s
- Who is experiencing the problem?
- What is the problem?
- Where does the problem present itself?
- Why does it matter?
- Add How might we? to the problem statement?

Ideation – Generate Ideas

- The process of generating a broad set of ideas on a given topic, with no attempt to judge or evaluate them
- Prepare How might we? Questions
- Bodystorming
- Brainstorming
- Brainwriting
- Brainwalking
- Mindmapping
- User journey mapping

Prototype and Test ideas

Activity: Test your designs and gather feedback



What worked?	*What could be improved?*
Questions	*Ideas*

Few Problems for Design Thinking

- To improve traffic congestion in city
- To improve patient experience in hospitals
- To bring sanitation systems
- Smart home products
- Smart vehicles products
- Smart lighting
- Smart parking solutions
- Healthcare products

Few Problems for Design Thinking

- Waste Management
- Water Management
- Wearable devices
- Autonomous driving
- Smart farming
- Smart irrigation
- Industrial IoT
- Disaster Management
- Smart grids and energy management

Activities

- Take up the above problems one per group and go through all the phases
- Empathize
- Define Problem
- Ideate
- Prototype
- Test
- Come up with good solutions

THANK YOU