Based on deep empathy, design thinking is a deeply human process that taps into abilities we all have, but are overlooked by more conventional problem-solving practices. It relies on our ability to be intuitive, recognise patterns, and construct ideas that are emotionally meaningful as well as functional.

A concept is innovative if it meets human needs (Desirability), is implementable (Feasibility) and can sustain the business (Viability).

The success of a Design Thinking project is often credited to the way the project team is formed. It often involves getting people from multi-disciplinary backgrounds and engaging users early in the project.
Design thinking framework

The 4 Phases of Design Thinking

1. **sense and sensibility** → preparing the mind

2. **empathy** → understand user context → generate insights → define statement of need

3. **ideation** → generate ideas → develop ideas to concepts → select design concept

4. **prototype** → build prototypes → get user feedback → test & improve

© Singapore Polytechnic I 2018
Design Thinking:
Sense and Sensibility
DT Tool: SPICE

- Broadens understanding of the issue
- Encourages you to consider different aspects from the user’s perspective
- Helps in crafting project statement and coming up with interview questions
• Start by learning more about pressing issues in Singapore – what are they about? Who needs help in this issue? What are contributing factors? What is currently being done to help the people involved?

• Look into your heart – choose an issue you feel for. Who do you want to make life better for?

• Craft your project statement – this will be your “North Star” as it will map out the issue you are trying to solve and who you are seeking to help.

• Suggested start:
  – Each team member to write down issues to appeal to them
  – Shortlist one issue that the team likes best (voting helps if the team can’t decide)
  – Identify the possible user for the issue
  – Use the DT tool SPICE to look at the issue from the user’s perspective
Crafting your project statement

HELPFUL TIPS:
- Research to understand the issue helps shape the project statement.
- Project statement should not include solutions.
- Broader scoping of the problem allows for better exploration during the interviews.
- After the interviews, project statement can be refined once you get a better sense of the real problem!

Crafting a project statement

- **Decide on a verb**
  What are you seeking to do with the user? Support? Empower? Encourage? Words like “educate” are a no-no as they hint at a solution.

- **Identify the primary user from a community in need in Singapore**
  Not an individual but a group of individuals, e.g., housewives, low-income elderly, youth.

- **Articulate the problem to be tackled**
  Be clear on the problem to be addressed. Think of the problem at the individual or behavioural level and avoid policy issues (e.g., instead of tackling “traffic congestion,” consider instead how the user experience on public transport can be improved).

Example

How can we help ex-offenders to reintegrate into our society?
Crafting your project statement

Consider the above themes for the competition. Examples:

- How can we help parents in Singapore develop stronger parent-child bonds?
- How can we help youth in Singapore stay mentally and emotionally strong when faced with challenges and setbacks?
- How can we encourage Singaporeans to revive the kampung spirit in our society?
- How can we help the elderly maintain close community relationships?
- How can we help the elderly go about their daily activities?
- How can we encourage Singaporeans to reduce food wastage?
- How can we encourage Singaporeans to lead healthier lifestyles?
Design Thinking: Empathy
The empathy stage is about gaining a deep understanding of what a user experiences, so that we can come up with solutions that tackle the root causes of problems, not just the symptoms, and create real human change.

**Putting yourself into the user’s shoes:**
How can we step into the shoes of the users and see things from their point of view, not ours? Besides observing users in their natural setting, interviews will allow you to gather data about your users and understand them and their circumstances better.

**INTERVIEWS**
It is best to conduct face-to-face interviews to discover your user and their needs. During the interview:

- **Probe** to uncover the truths behind their human story
- **Observe** their non-verbal cues as well as pick out observations of their natural setting
- **Record** all the interview data for analysis (word for word)

Conduct interviews in pairs or groups of three. Decide on the role each member is to play (interviewer, note-taker, observer).
Interviewing: Types of questions

A  CLOSED-ENDED


Good for: Speed, Accuracy, Focus

For: Age, gender, health status, hobbies, marital status, occupation, qualification, race, religion

B  OPEN-ENDED

“Tell me more about…”, “Why…” “Why is that important to you?”

Good for: Non-leading, non-limiting, diverse/rich information

For: Aspirations, inspirations, motivations, pain points, personal habits, social life
Crafting interview questions

**WHAT KIND OF INFORMATION DO WE NEED TO FIND OUT ABOUT THE USER?**

**DEMOGRAPHICS / HABITS**

- Collect information on:
  - Age, Gender, Marital Status
  - Occupation
  - Hobbies
  - Personal Habits / Practices
  - Social Life

- Sample Questions:
  - Describe your typical weekday/weekend.
  - What do you like to do during your free time?
  - Why do you like to do these activities?
  - What is most important to you in life? Tell me more...
  - Etc.

**PERSONAL MOTIVATIONS**

- Collect information on:
  - Aspirations
  - Inspirations
  - Motivations
  - Pain Points

- Sample Questions:
  - What drives/motivates you? Tell me more...
  - What do you look forward to? Why? Tell me more...
  - What frustrates/upsets you the most? Tell me more about that experience.
  - Etc.

**AREAS RELEVANT TO THE PROBLEM STATEMENT**

- Collect information on areas related to the project statement:
  - Motivations
  - Pain Points
  - Etc.

- Sample Questions:
  - Share an experience when ....?
  - If there are no constraints, how would you change ...?
  - Any areas of improvements...?
  - Describe your best and worst experiences....
  - Etc.
Useful data allows us to:
• Derive insights about the user
• Distil the critical needs related to the project statement

So what makes useful data?
From observation and interview data, write down points that you think are interesting or significant, e.g., comments, a story or quotation from your interviewee, observations you made.

Write one data point per post-it note. Do not summarise or interpret. Use word for word, as spoken by the interviewee.
Star the ones that you feel are especially important. Place them on your canvas for discussion.

I prefer to stay out because it is very warm staying at home.

Mostly, I sit at the senior citizen corner because it's windy there and the chair is comfortable.

Too bad raining cannot stay there because the rain comes in.

Another useful data...

Another useful data...
Discuss and cluster data points (according to common themes) according to key learning points about the user or your insights. To derive insights, ask questions like why the user is saying this.

Further cluster the insights to derive your user’s needs. Crafted as “I need…”, the need statement should address a gap in the user’s experience and not contain any solutions.

Insight #1
I do not use the senior activity corner when it rains because it splatters on me and the furniture.

Need #1
I need a place for activity that is not affected by rain or shine.
PERSONA

- Is a fictional but “real character” based on consolidation of real data from a group of users

- Is an accurate representation of the user’s profile (capturing the user’s behaviour, beliefs, motivation, pain points, needs)

- Serves as a useful common reference for the project team during the project and to evaluate your concept
**Persona creation**

- **Name**
  - Catchy & descriptive name (e.g. Frustrated Felix)

- **Profile**
  - Short paragraph to describe him
    (Demographics: age, occupation, marital status, family size, lives with who, etc.)
  - Likes/dislikes (2-3 points)
  - Beliefs (3 key points)
  - Challenges (3 key points)
  - Motivations (3 key points)
  - Defining quote (what he would say)

- **Needs**
  - List the Persona’s top three needs

Include photos that help you visualize the key points stated in your persona.
Design Thinking: Ideation
Ideating for your persona

• Generate a large volume of ideas, develop these ideas into concepts and select one final concept to work on.

• Start with the critical user needs distilled from the data analysis.

• Brainstorm ideas on how to meet these needs.

• Draw inspiration from ideas around you.

• Think about how you can push the boundaries or improve on existing solutions. What will make your idea more unique?
The ideation process

1. Revisit your Persona’s needs
2. Brainstorm and generate ideas around each need
3. Cluster ideas to form concepts

Problem statement: How can we help the elderly stay safe in their home environment?

User’s Need
I need to feel safe and confident using my toilet at home.

Think about Parameters
- Help Frail Fanny feel safe and confident
- Ensure Frail Fanny doesn’t fall down
- Frail Fanny’s toilet must be fall-safe

Ideas
- Have a touchscreen in every room with programmed help numbers
- Voice-activated equipment to minimise Frail Fanny’s movements
- Floors that auto-dry to minimise slippery surfaces
- Walls that will inflate to catch her if she falls
Rules for effective brainstorming

1. Defer judgement
2. Go for quantity
3. Encourage *wild* ideas
4. Build on other people’s ideas
5. Stay focused
6. Do not dwell
7. Be visual
8. Stand up

1 idea per post-it

Personal coach who provides guidance

Sketch to communicate
Your concept should be a seamless integration of different elements. Make all the elements work together to form a new and improved experience for your Persona!

Separate elements

Integrated / seamless concept = new improved experience for your Persona
Cluster related ideas
- Place similar or related ideas together to form clusters
- Develop one cluster into a concept

Cluster “best for Persona” ideas
- Place team’s choices of what works best for Persona together
- Develop cluster into a concept

“Forced” associations
- Randomly select ideas and place them together
- Develop cluster into a concept
Clustering ideas into concepts

- Assistive devices for fall prevention
- Re-cluster if you have to. Play around with ideas!
- Ways to seek immediate help
- Physical designs that are safe and fall-preventive
Clustering “best for persona” ideas

Which ideas meet the Persona’s needs best?

Which ideas improve the Persona’s daily experience?

Which ideas are the most practical for the Persona?

- Have a touch-screen in every room with programmed help numbers
- Voice-activated equipment so to minimise Frail Fanny’s movement
- Walls that will inflate to catch her if she falls
- Floors that auto-dry to minimise slippery surfaces
- CONCEPT: Smart automated home that helps Frail Fanny stay safe and in control
Select the top concept using these guidelines:

1. Does the concept address the **Persona’s needs**?
2. Is it **breakthrough**?
3. Does the concept **enhance** the user’s **experience**?

**In addition, is it:**

**Desirable:**
- Will your user want it?
- Does your user feel positive using it?
- Is it easy to use?

**Feasible:**
Can it be done now or in 5-10 years?

**Sustainable:**
Will your idea last?
Are there short-term and long-term gains?
Design Thinking: Prototyping
Prototyping

- Brings your ideas to life
- Shows how your concept is used
- Allows you to explain your concept and collect feedback

Prototyping is about communicating your concept in the form of a user’s experience.

What should you create to explain how your user will experience and benefit for your solution?
Why do we prototype?

1. Empathy
2. Define
3. Ideation
4. Develop

- Generate more ideas
- Refine our point of view

Feedback connection points.
Physical models
Consider using **storyboards** to illustrate the details of the touch points in your journey map.

You can also use a **photo essay** to illustrate your user’s experience.

---

**Storyboards**:

She was scrolling Facebook one day, she notices that her co-workers keep talking about a website. Curious, she decides to check it out.

**Photo Essay**:

Ms Lim and her friend both went to the Pasir Ris Community Centre to collect items for spring cleaning.

Ms Lim and her friend had a great experience of volunteering and finds it inspiring.
Final Words:

Consider whether your solution has addressed
• your project statement
• persona’s needs

Why not talk to your user to find out:
• What works
• What doesn’t work
• What can be better

We wish you all the best in creating solutions for a better tomorrow!