<div align="center">

Unit 2
Design Thinking Process

</div>

Syllabus:Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development.

1. Introduction to Design Thinking

Design Thinking is a human-centered approach to innovation and problem-solving. It involves understanding user needs, challenging assumptions, and redefining problems to create innovative solutions.

2. Design Thinking Process

a) Empathize

➢ Understand users through research, interviews, and observations.
➢ Gather insights into user behavior, pain points, and expectations.
➢ Tools: User research, surveys, ethnographic studies.

1. Empathy is a core value of design thinking .it is also the first step in the design thinking process.
2. Empathic research and design is not concerned with facts about the user, such as their age or location.
3. It focuses on their feelings towards a product and their motivations in certain situations.

Empathy Tools

Empathy maps are mappings that make sense of and describe various aspects and processes associated with a product or services.

Types of Mapping:
1. Empathy Mapping
● Empathy Maps help team members understand the user's Mindset
● An **Empathy Map** is a collaborative Visualization used to articulate what is know about a particular user.
● It externalizes user knowledge in order to Create a shared understanding and
 Aid in decision making.
● Empathy maps widely used is a powerful, fundamental tool for design communities.

Format:
➢Traditional empathy maps are spilt into **four** quadrants.

➢ **The four quadrants are say, Thinks, Does and Feels with the user or persona in the middle.**

➢ Empathy Maps provide a glance into who a user is as a whole and are not chronological or sequential.

EMPATHY MAP

Characteristics:

The map is split into 4 quadrants: Says, Thinks, Feels, Does.
It shows user's perspective regarding the tasks related to the product.
It is not chronological or sequential.
There is one empathy map for each persona or user type (1:1 mapping).

Process:
How to build an Empathy Map
1. Define scope and goals:
2. Gather materials
3. Collect research
4. Individually generate sticky notes for each quadrant

Example of Empathy Map-2:
Context: Students are not enjoying teaching process in school
Description: Everybody goes to school but still there is too much of unemployment even when there are so many job opportunities. Somewhere there is a gap between what is been taught and being learnt.
Stakeholders:
• stakeholders-Employees with 2-3 years of experience
• No. of interviewed :3
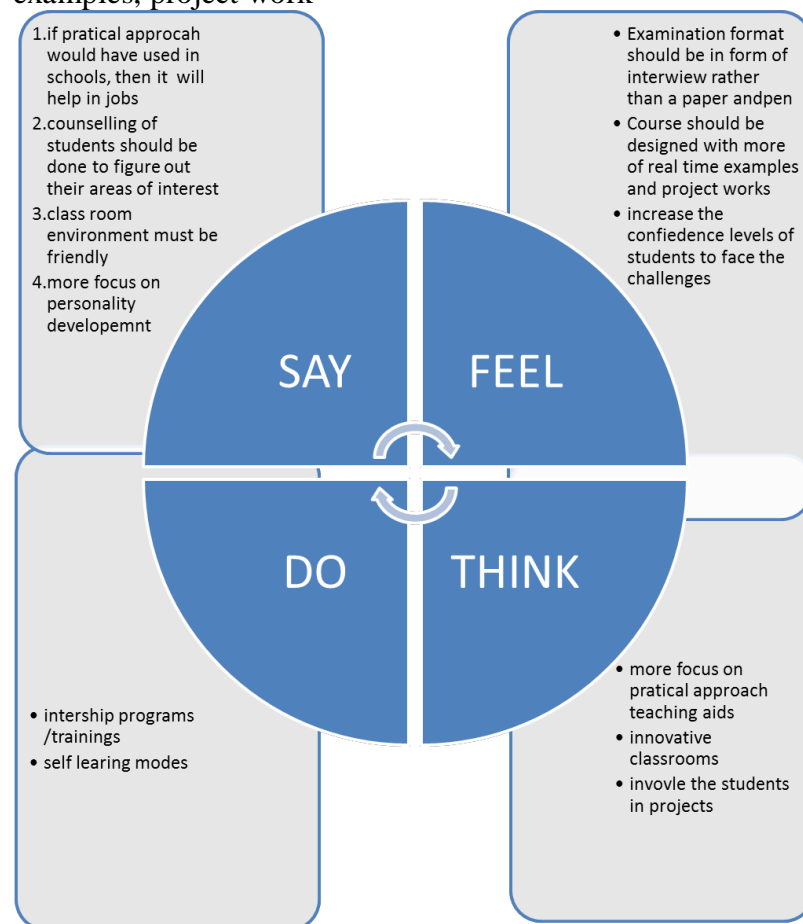• Average age:27

Focus areas during Interview:
• Mode of teaching in schools
• How does things taught in school help them at their workplace?
• Do they feel that they benefited by things taught in school?
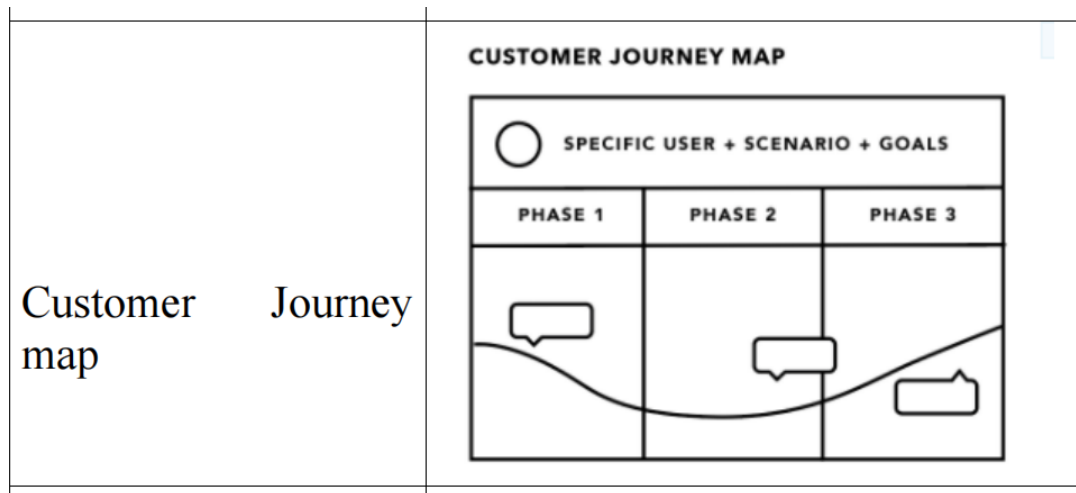
Observations from one of the interviews:
• Approach which is used in school to teach is totally theoretical, while in workplace it is totally practical
• Innovative & practical approach should be used while designing study material.
• Counselling should be done for students to figure out their interest areas
• Promotion to a higher class should be done based on learning level
• Course should include more of project work, by taking real life examples
• Examination pattern needs be in a form of interview rather than written pattern
• Schools need to focus more on personality development for students
• Environment of classroom needs to be changed to a friendly place where exchanges of ideas take place

Insights:
• Use working models which resembles filed work activities
• The teaching mode consists the practical approaches
• Change the exam patterns
• Textbooks and material should consist innovate teaching method and more real time examples, project work

SAY
1. if pratical approcah would have used in schools, then it will help in jobs
2. counselling of students should be done to figure out their areas of interest
3. class room environment must be friendly
4. more focus on personality developemnt

FEEL
• Examination format should be in form of interwiew rather than a paper andpen
• Course should be designed with more of real time examples and project works
• increase the confidence levels of students to face the challenges

DO
• intership programs /trainings
• self learing modes

THINK
• more focus on pratical approach teaching aids
• innovative classrooms
• invovle the students in projects

2. Customer journey Mapping

Customer Journey map	**CUSTOMER JOURNEY MAP** ◯ SPECIFIC USER + SCENARIO + GOALS PHASE 1 | PHASE 2 | PHASE 3

Customer Journey map
Customer journey maps Focus on a specific customer's interaction with a product or service.

Customer Journey Mapping:
Definition:
A customer or user journey map is detailed record of how a customer experience a specific task, product, or service.
Or
A Customer Journey Map is a visualization of the process that a person goes through accomplish a goal tied to a specific business or product or service.
Or
A Customer journey map is research-based tool. It examines the story of how a customer relates to the business, brand, or product over a time

Characteristics
• It is used for understanding and addressing customer needs and pain points
• Journey mapping starts by compiling a series of user goals and actions into a timeline skeleton.
• The skeleton is fleshed out with user thoughts and emotions to create a narrative.
• Then the narrative is condensed into a visualization used to communicate insights that will inform Design Processes.
• It could either be constructed based observations and interviews with end users or it could be something ask the customer to draw out and explained.
• Each journey map should contain the journey that a customer goes through and could be either closely relevant or even tangential to the focus of the design project
• A customer journey map can help to build empathy towards the users as designers try to experience what they go through

Customer Journey Map Template

	Scenario	Goals & Expectations
Attach a photo here		

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Customer goals	**Customer goals**	**Customer goals**	**Customer goals**	**Customer goals**	**Customer goals**
Customer thoughts and emotions	**Customer thoughts and emotions**	**Customer thoughts and emotions**	**Customer thoughts and emotions**	**Customer thoughts and emotions**	**Customer thoughts and emotions**
Opportunities & ideas to improve	**Opportunities & ideas to improve**	**Opportunities & ideas to improve**	**Opportunities & ideas to improve**	**Opportunities & ideas to improve**	**Opportunities & ideas to improve**
Internal ownership	**Internal ownership**	**Internal ownership**	**Internal ownership**	**Internal ownership**	**Internal ownership**

Rules for Creating Successful Journey Maps:
• Successful journey maps require more than just the inclusion of the "right" elements
• Journey mapping should be a collaborative process informed by well defined goals and built from research.

Rules: Establish the "why" and the "what."
identify the business goal that the journey map will support. Make sure there are clear answers to these basic key questions before you begin the process:

Base it on truth
Journey maps should result in truthful narratives, not fairy tales. Start with gathering any existing research, but additional journey-based research is also needed to fill in the gaps that the existing research This is a qualitative-research process

Collaborate with others
he activity of journey mapping (not the output itself) is often the most valuable part of the process, so involve others. Pull back the curtain and invite stakeholders from various groups to be a part of compiling the data and building the map

Don't jump to visualization
The temptation to create an aesthetic graphic or jump to design can lead to beautiful yet flawed journey maps. Make sure the synthesis of your data is complete and well-understood before moving to creating the visual.

Engage others with the end product. Don't expect to get "buy-in" and foster interest in your journey map by simply sending a lovely graphic as an email attachment Make it a living interactive document that people can be a part of. Bring up your story in meetings and conversations to promote a narrative that others believe in and begin to reference

b) Analyze (Define)

Synthesize findings from the empathize phase.

Identify key problems and user needs.

Formulate a clear problem statement.

Tools: Affinity mapping, root cause analysis, problem framing.

In the **Design Thinking** process, the **Define** stage is pivotal for transforming insights gathered during the Empathize phase into a clear, actionable problem statement. This stage focuses on synthesizing information to understand users' needs and challenges, setting the foundation for effective solution development.

Key Objectives of the Define Stage:

1. **Synthesize Insights:** Organize and analyze data collected from user interactions to identify patterns and key themes.
2. **Identify Core Problems:** Distill the information to pinpoint the fundamental issues users face.
3. **Develop a Problem Statement:** Craft a concise, human-centered problem statement that encapsulates the core challenge to be addressed

Example: Designing a Mobile App

1. **Empathize:** Conduct interviews with potential users to understand their challenges with existing apps.
2. **Define:** Analyze the interview data to identify that users find current apps unintuitive and difficult to navigate.
3. **Problem Statement:** "Users need an intuitive and easy-to-navigate mobile app to enhance their experience."

5 STEPS OF THE DESIGN THINKING PROCESS

EMPATHIZE · · > DEFINE · · > IDEATE · · > PROTOTYPE · · > TEST
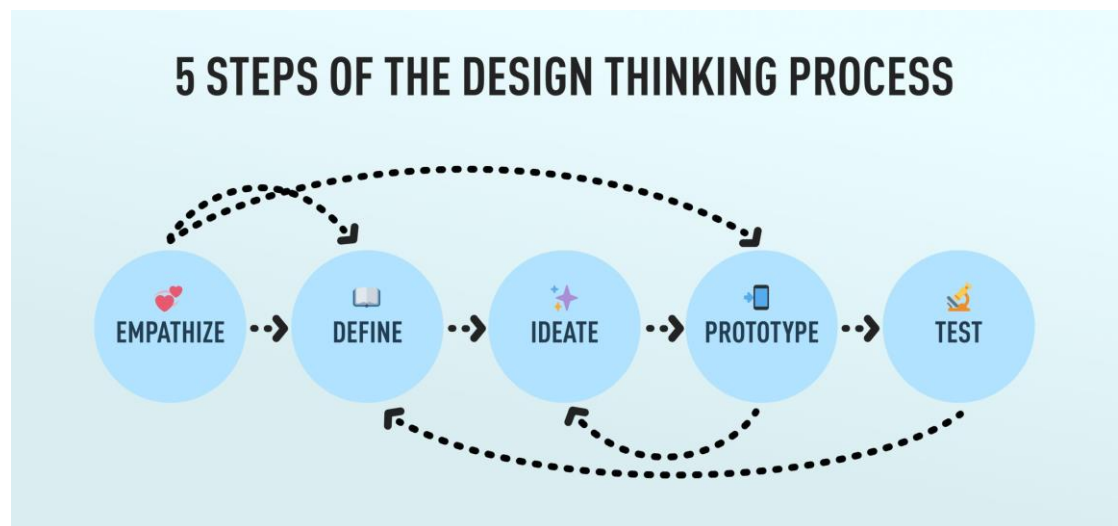
c) Ideate

Generate a broad range of creative solutions.

Encourage brainstorming and lateral thinking.

Evaluate and shortlist the most promising ideas.

Tools: Mind mapping, SCAMPER technique, brainstorming sessions.

In the **Design Thinking** process, the **Ideate** stage is where creativity and innovation converge to generate a wide array of potential solutions to the problem defined in the previous stage. This phase encourages open thinking and risk-taking to explore diverse ideas without immediate judgment.

Key Objectives of the Ideate Stage:

1. **Generate Ideas:** Encourage free-thinking to produce a broad spectrum of ideas.
2. **Challenge Assumptions:** Question existing beliefs to uncover new perspectives.
3. **Explore Alternatives:** Consider various approaches to address the defined problem.

Common Techniques Used in the Ideate Stage:

- **Brainstorming:** A group activity where participants freely share ideas without criticism.
- **SCAMPER:** A method that prompts thinking through Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, and Reverse.
- **Mind Mapping:** Visual representation of ideas and their connections.
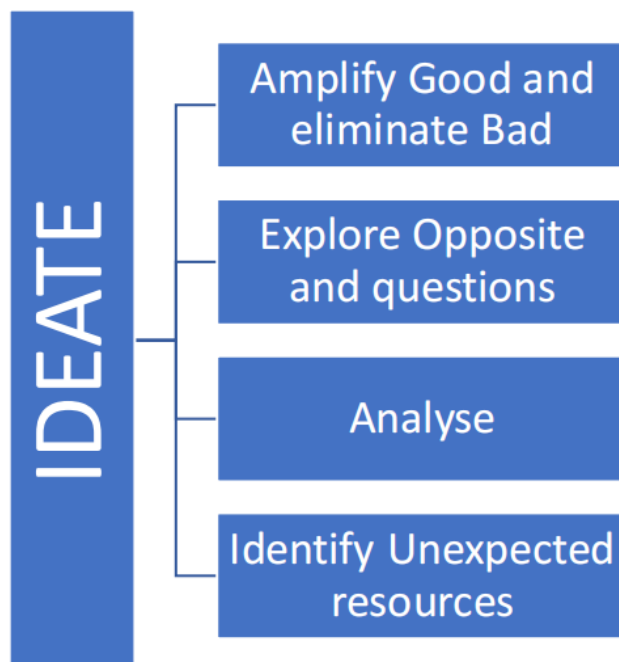
d) Prototype

Develop low-cost, simple versions of ideas to test feasibility.

Iterate based on feedback and refine concepts

Tools: Wireframes, mockups, 3D models, role-playing.

Prototyping as a creative tool requires the design team to clarify a solution concept's intentions and make decisions regarding what the concept is and is not.

Why prototype:
☐ Communication &discuss ideas with stakeholders.
☐ Develop requirements and /or specifications.
☐ Learning and problem solving
☐ Evaluate interface effectiveness for communicating conceptual models.
☐ Further Develop conceptual and physical design
☐ Save time and money.

Four Qualities of Prototyping:
The Qualities of prototyping are:

Representation
This form of the prototype is mainly structured for presentation and keynote uses. That may be a paper-pen, digital or code precision.
The fidelity of the prototype is defined here.
It explains the level of details, realism, and final design. Such as

Interactivity
The functionality opens for the user. i.e fully functional, partially functional or no interactions at all Evolution
The life cycle of the prototype. some are built to re iterate and reiterate until it is precisely done, and some are just designed and thrown it away after the certain outcome is made.
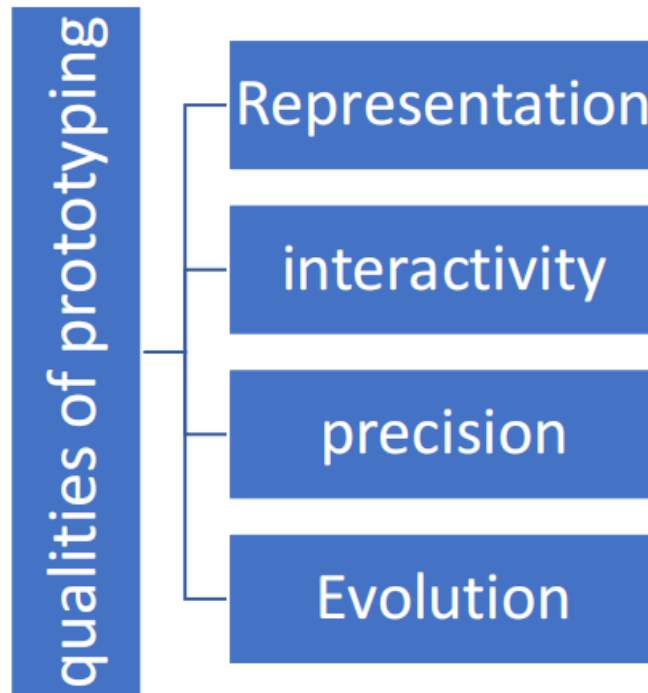
Low-Fidelity Prototyping:
- Low-Fidelity prototyping is intended to provide designers with Basic model or example of the product that requires testing.
- With a low-Fidelity prototype, it is likely going to be incomplete or utilize a limited number of its intended features.
- The low-fidelity prototype-Known as **low-tech**, **low-fi** or **lo-fi** prototype, is a semi-finished prototype that focus on function, structure, process, and provides the simplest framework and elements of web/app.☐
- It can even be constructed using materials such as **wood**, **paper**, and **metal** that are not intended to be used for the finished article.
- Low -Fidelity prototypes are usually simple and in-expensive ways to communicate.
- Low -Fidelity prototyping is used generally show the overall shape of the design idea and the primary functionalities
- when design a low-fidelity prototype it can be inexpensive, quick, and simplified version of what the final product will be.
- Low-Fidelity means that the prototype does not have a lot of detail, no images, or colors. ☐
- ☐

Advantages of low fidelity prototypes:
☐ Low cost
☐ Fast
☐ Easy to demonstrate, co-operate and iterate
☐ Easy to get feedback
☐ Easy to detect and tackle potential issues

Disadvantages of low-fidelity prototyping:
Uncertainty during testing.

Limited interactivity.

High-Fidelity Prototyping:
- The fidelity of the prototype refers to the level of details and functionality
- built into a prototype.
- A high-fidelity (sometimes referred as high-fi or hi-fi) prototype is a computer-based interactive representation of the product in its closest resemblance to the final design in terms of details and functionality.
- The high in high-fidelity refers to the level of comprehensiveness that allows designers to examine usability question in detail and make conclusions about the user behaviour.
- High-fidelity prototypes appear and function as similarly as possible to the
- actual product.
- Teams usually create high-fidelity prototypes when they have a solid understanding of what they are going to build, and they need to either test it with real users or get final-design approval from stakeholders.
- High-fidelity prototypes are designed to look and operate similarly to the finished product

Characteristics of high-fidelity prototypes:
Visual design
Content
Interactivity

Advantages of high-fidelity prototype:
1. Meaningful feedback during usability testing: .
2. Testability of specific UI elements or interactions:
3. Easy buy-in from clients and stakeholders

Disadvantages of high-fidelity prototypes:
1.☐ Higher costs.
2.☐ Timing and misunderstanding.

e) Test & Iterate

Evaluate prototypes with real users.

Gather feedback and make improvements.

Repeat the process to refine the solution.

Tools: Usability testing, A/B testing, pilot programs.

1.The testing phase allows the designers to gain the feedback and insights that may not be possible without testing their prototypes.
2.Through these tests, designers will be able to identify aspects of their prototype that did not work well, or the end user did not find the functional or pleasing.
3.These failures give the designers the opportunity to fix and improve the aspects of their prototypes.

4.In the testing phase, Design thinking teams tests prototyped solution with users representing the target personas.

5.Feedback from this stage would be fed back to the define the stage to redefine the problem.

6.The test report is especially important as this gives the input for corrections.

7.The test report should have the following fields.

☐ Feature code
☐ Test data
☐ Test case number
☐ The proficiency level of the user
☐ Result test case wise

8.There are four aspects that designers need to consider when testing with end users

1. The prototype
2. Context and scenario
3. The interaction between the user and designer
4. The process and method used to observe, capture feedback, and reflect.
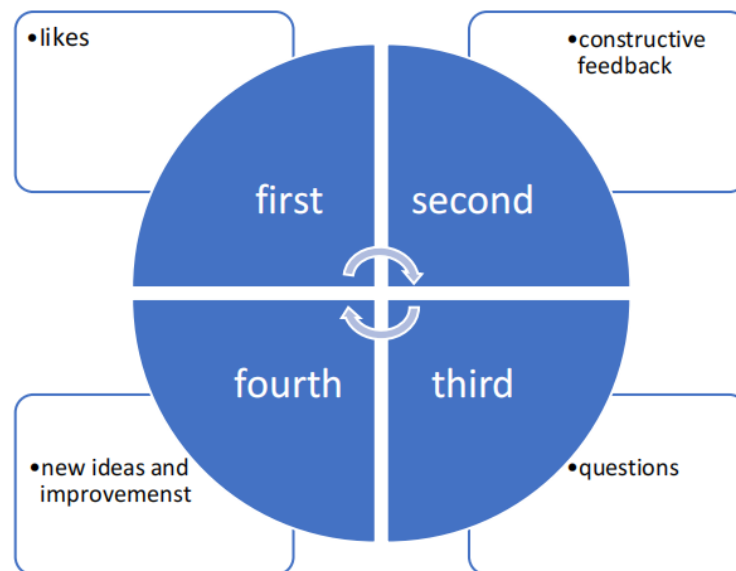
- Testing a solution with limited number of users who represents the target personas is much better than testing with many random users.
- The optimum number of users that should be included in the testing phase is eight or ten per persona.
- Finding the users who represent the target personas is one of the most challenging parts of the testing phase.

3. Implementing Design Thinking in Driving Inventions

Identify gaps in the market through deep user research.

Refine problems to focus on real-world issues.

Encourage ideation for innovative product solutions.

Use prototyping to validate ideas before full development.

Continuously test and iterate to improve functionality.

4. Design Thinking in Social Innovations

User-Centered: Focus on community needs.

Co-Creation: Involve stakeholders in brainstorming and prototyping.

Sustainability: Ensure long-term impact and viability.

Scalability: Develop solutions that can be adapted or replicated across regions.

5. Tools of Design Thinking

a) Personas

Fictional characters representing different user types.

Helps in understanding user behavior and expectations.

b) Customer Journey Map

Visual representation of user interactions and experiences.

Identifies pain points and opportunities for improvement.

c) Brainstorming

Encourages idea generation without immediate criticism.

Uses techniques like "How Might We" questions to expand possibilities.

d) Prototyping

Early-stage models to test ideas.

Can be digital (wireframes, mockups) or physical (models, sketches).

e) Product Development

Iterative process of refining a product based on user feedback.

Ensures the final solution effectively addresses the core problem.