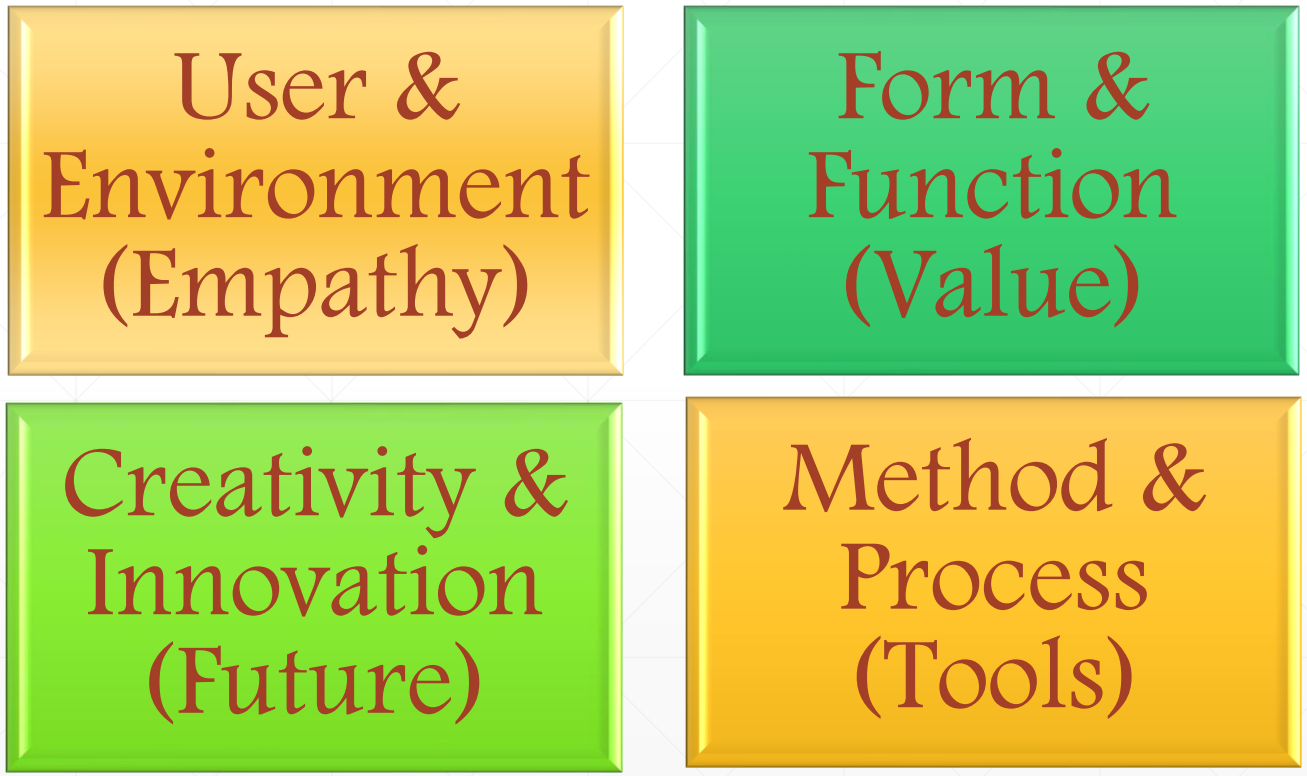
B19CBT502 / B23CBT303 DESIGN THINKING

UNIT I - INTRODUCTION

What is Design?

- In a nutshell, Design is about understanding needs and being sensitive to issues, identifying problems that need to be solved, and creating innovative appropriate solutions considering aspects of context, social concerns, sustainability and technology such that it makes a positive difference to life in our universe.

What is Design?



User & Environment

- Useful to the User
- Sustainable Solutions

Form & Function

- Good looking shape / form
- Works well

Creativity & Innovation

- Something New
- Innovative

Methods & Process

- Solve Problems
- Phase by Phase

Who is a Designer?

- A designer is a highly creative person who enjoys solving problems.
- The reason why they enjoy being creative is that they are sensitive to the needs of life and understand the extent of the issues in society and environment.
- This sensitivity allows a designer to be logical as well as creative and to think of opportunities for creative design solutions that enhance the lives of people and other living beings.

What is Design Thinking?

- Design thinking is a methodology that designers use to brainstorm and solve complex problems related to designing and design engineering.
- It is also beneficial for designers to find innovative, desirable and never-thought- before solutions for customers and clients.
- Basically, it converts a problem into a solution, and an idea into something useful.

Who is a Design Thinker?

- A Design Thinker is a person who applies the Design Thinking process to solve problems and find creative innovative solutions in any field or domain.
- Whether it is a simple problem or a complex problem, a design thinker finds creative ways to tackle them. If everyone could adopt this method to solve the problems then we would be moving towards a creative society that finds a solutions to many of its problems.

Design Thinking Process

- It involves six phases in the process of solving problems.

Phase1: Research	Phase 2: Analyse	Phase 3: Ideate	Phase 4: Build	Phase 5: Test	Phase 6: Implement
• Observe • Empathize • Study • Need Finding	• Understand • Synthesize • Define • Visualize • Mappings	• Create • Explore • Experiment • Concepts • Innovate	• Mock-up • Prototype • Develop • Detail	• Reflect • Test • Feedback • Iterate	• Reflect • Produce • Industry • Business • Enterprise

Design Thinking Process

- It involves six phases in the process of solving problems.

Phase1: Research	Phase 2: Analyse	Phase 3: Ideate	Phase 4: Build	Phase 5: Test	Phase 6: Implement
• helps you to identify needs and locate issues to be solved through the observation and research.	• Helps you to understand, define and analyse the problem area.	• Helps you to come up with several alternate creative Innovative solutions to the problem.	• Helps you to build mock-ups, creating scenarios, and then prototyping and detailing.	• Helps you to get feedback through evaluation and testing.	• Helps you to actualize and produce the solution so that it reaches and gets used by the users.

What is a Innovation?

- Innovation involves the implementation of something new and replacing or reframing the existing mindset.
- It is about translating concept, idea, thought, or invention into artefacts and services that create value in life. It is the process of transforming ideas into commercial reality.

What is a Invention?

- As compared to Innovation, Invention happens once in a while.
- However each invention may produce millions of innovative products – like the inventions of Wheel has produced and continues to produce innovative products for the benefits of mankind.

Why Design?

- Purpose of Design
  - Problem Solving
    - Design is a methodical approach to addressing challenges and finding effective solutions.
    - It involves understanding problems deeply and creating innovative ways to solve them.
  - User-Centered Focus
    - Design thinking emphasizes empathy, putting the user at the center of the problem-solving process.
    - By understanding the needs, behaviors, and experiences of users, designers can create solutions that are more effective and meaningful.

Why Design?

- Purpose of Design
  - Innovation
    - Design is crucial for innovation.
    - It encourages thinking outside the box and coming up with creative solutions that can lead to ground-breaking products, services, and experiences.
  - Competitive Advantage
    - Companies that embrace design thinking can differentiate themselves in the market.
    - Good design can enhance user satisfaction, brand loyalty, and overall business success.

Human-Centered Design

- **Empathy:**
  - Understanding users' emotions, experiences, and needs is foundational to design thinking. Empathy allows designers to see the world from the users' perspectives and create solutions that truly resonate with them.
- **Involvement:**
  - Involving users throughout the design process ensures that their needs are continuously considered. This includes conducting user research, interviews, and usability testing.
- **Iterative Process:**
  - Human-centered design is iterative. It involves continuously refining and improving solutions based on user feedback and changing requirements.

Economic and Social Impact

- **Economic Benefits:**
  - Design can lead to cost savings by creating more efficient processes, reducing waste, and enhancing user satisfaction, leading to increased sales and customer loyalty.
- **Social Good:**
  - Design thinking can address social issues and create solutions that improve quality of life. Examples include designing accessible products for people with disabilities or creating sustainable solutions to environmental challenges.
- **Community Engagement:**
  - Engaging with communities during the design process ensures that solutions are relevant and beneficial to those they are intended to help.

Design as a Strategic Tool

- **Strategic Planning:**
  - Design thinking can be integrated into strategic planning to align business goals with user needs. This approach helps in making informed decisions that drive long-term success.
- **Cross-Functional Collaboration:**
  - Design thinking promotes collaboration across different departments within an organization. This multidisciplinary approach leads to more holistic solutions that consider various perspectives and expertise.
- **Agility and Adaptability:**
  - The design thinking process is flexible and adaptable, allowing organizations to respond quickly to changes in the market or user needs.

Four Questions:

- What is the problem?
- Who are the users?
- What are the users' needs?
- How might we solve the problem?

Four Questions:

- **What is the problem?**
  - Objective: Identify and clearly articulate the problem you are trying to solve.
  - Methods:
    - Problem Statement: Write a clear and concise problem statement.
    - Root Cause Analysis: Use tools like the 5 Whys or Fishbone Diagram to identify the underlying causes of the problem.
    - Contextual Inquiry: Gather information about the context in which the problem exists.

Four Questions:

- **Who are the users?**
  - Objective: Identify the people who are affected by the problem and will be the end-users of the solution.
  - Methods:
    - User Personas: Create detailed profiles of typical users, including demographics, behaviors, needs, and goals.
    - Stakeholder Analysis: Identify all stakeholders involved, including primary users, secondary users, and other affected parties.
    - User Research: Conduct interviews, surveys, and observations to gather insights about users.

Four Questions:

- **What are the users' needs?**
  - Objective: Understand the specific needs, pain points, and desires of the users.
  - Methods:
    - Empathy Maps: Visualize what user say, think, feel, and do to understand their experiences and emotions.
    - Journey Maps: Map out the user's journey to identify touchpoints, pain points, and opportunities for improvement.
    - Needs Statements: Formulate clear statements that articulate the users' needs based on research findings.

Four Questions:

- **How might we solve the problem?**
  - Objective: Generate and explore potential solutions to address the problem and meet users' needs.
  - Methods:
    - Brainstorming: Conduct sessions to generate a wide range of ideas without judgment.
    - SCAMPER Technique: Use this method to think about how you can Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, or Reverse aspects of the problem or solution.
    - Prototyping: Create low-fidelity prototypes to quickly test and iterate on ideas.
    - Evaluation: Assess the feasibility, viability, and desirability of the proposed solutions through user feedback and testing.

Integrating the Four Questions in the Design Thinking Process:

1. Empathize:

- What is the problem? Understand the problem through user research.
- Who are the users? Identify and understand the users.
- What are the users' needs? Discover and articulate the users' needs.

2. Define:

- What is the problem? Clearly define the problem based on insights from the empathize phase.
- What are the users' needs? Refine the understanding of users' needs and align them with the problem definition.

Integrating the Four Questions in the Design Thinking Process:

3. Ideate:

- How might we solve the problem? Generate a broad range of ideas to address the defined problem and users' needs.

4. Prototype:

- How might we solve the problem? Develop prototypes of the most promising ideas to explore potential solutions.

5. Test:

- How might we solve the problem? Test the prototypes with users to gather feedback and refine the solutions.

Integrating the Four Questions in the Design Thinking Process:

- By consistently asking and answering these Four Questions throughout the design thinking process, designers can ensure they are focused on the right problems, understand their users deeply, and develop solutions that are effective, innovative, and user-centered.

Ten Tools:

- Design thinking employs a variety of tools to facilitate different stages of the problem-solving process.
- These tools help designers empathize with users, define problems, ideate solutions, prototype ideas, and test outcomes.

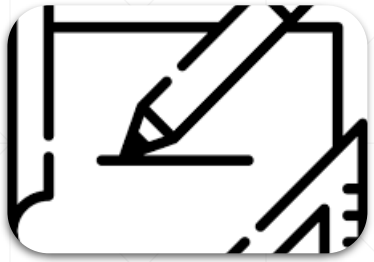
Ten Tools:

Empathy Maps

User Personas

Journey Maps

Brainstorming

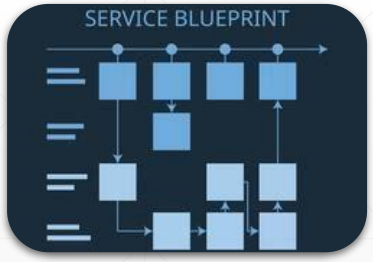


Sketching

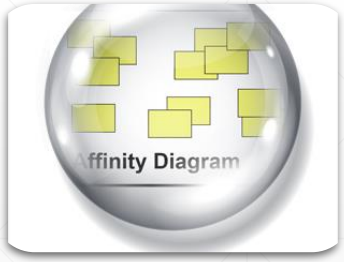
Prototyping

User Testing

Storyboarding



Service Blueprinting



Affinity Diagrams

Ten Tools:

1. Empathy Maps

- **Purpose:** To visualize what users say, think, feel, and do to gain deeper insights into their experiences.
- **Use:** Helps in understanding user emotions, motivations, and behaviors.
- **Components:**
  - **Says:** What the user says out loud in an interview or usability test.
  - **Thinks:** What the user is thinking throughout the experience.
  - **Feels:** The user's emotional state and reactions.
  - **Does:** The actions the user takes.

Ten Tools:

2. User Personas

- **Purpose:** To create detailed profiles of typical users based on research.
- **Use:** Helps in designing solutions that cater to specific user needs and preferences.
- **Components:**
  - **Demographics:** Age, gender, occupation, etc.
  - **Behaviors:** Habits, patterns, and routines.
  - **Needs:** Specific needs and goals of the user.
  - **Pain Points:** Challenges and frustrations faced by the user.

Ten Tools:

3. Journey Maps

- **Purpose:** To map out the user's experience with a product or service over time.
- **Use:** Identifies touchpoints, pain points, and opportunities for improvement.
- **Components:**
  - **Stages:** Different phases of the user's journey.
  - **Touchpoints:** Interactions between the user and the product/service.
  - **Emotions:** User's feelings at each stage.
  - **Pain Points:** Difficulties encountered by the user.

Ten Tools:

4. Brainstorming

- **Purpose:** To generate a wide range of ideas without judgment.
- **Use:** Encourages creative thinking and idea generation.
- **Components:**
  - **Quantity over Quality:** Focus on generating as many ideas as possible.
  - **Defer Judgment:** Avoid evaluating ideas during the brainstorming session.
  - **Build on Ideas:** Encourage participants to build on each other's ideas.

Ten Tools:

5. Sketching

- **Purpose:** To quickly visualize ideas and concepts.
- **Use:** Helps in communicating ideas and exploring different design directions.
- **Components:**
  - **Rapid Sketching:** Quickly drawing multiple versions of an idea.
  - **Storyboard Sketching:** Creating a sequence of sketches to represent user interactions.

Ten Tools:

6. Prototyping

- **Purpose:** To create tangible representations of ideas.
- **Use:** Allows for testing and iterating on ideas based on user feedback.
- **Components:**
  - **Low-Fidelity Prototypes:** Simple models like paper sketches or cardboard models.
  - **High-Fidelity Prototypes:** Detailed and functional models that closely resemble the final product.

Ten Tools:

7. User Testing

- **Purpose:** To gather feedback from real users on prototypes or products.
- **Use:** Helps in identifying usability issues and areas for improvement.
- **Components:**
  - **Usability Testing:** Observing users as they interact with the prototype.
  - **A/B Testing:** Comparing two versions of a product to see which performs better.

Ten Tools:

8. Storyboarding

- **Purpose:** To create a visual narrative of the user's experience.
- **Use:** Helps in understanding how users interact with the product/service over time.
- **Components:**
  - **Scenes:** Key moments in the user's experience.
  - **Characters:** Representation of the user.
  - **Actions:** Actions taken by the user.

Ten Tools:

9. Service Blueprinting

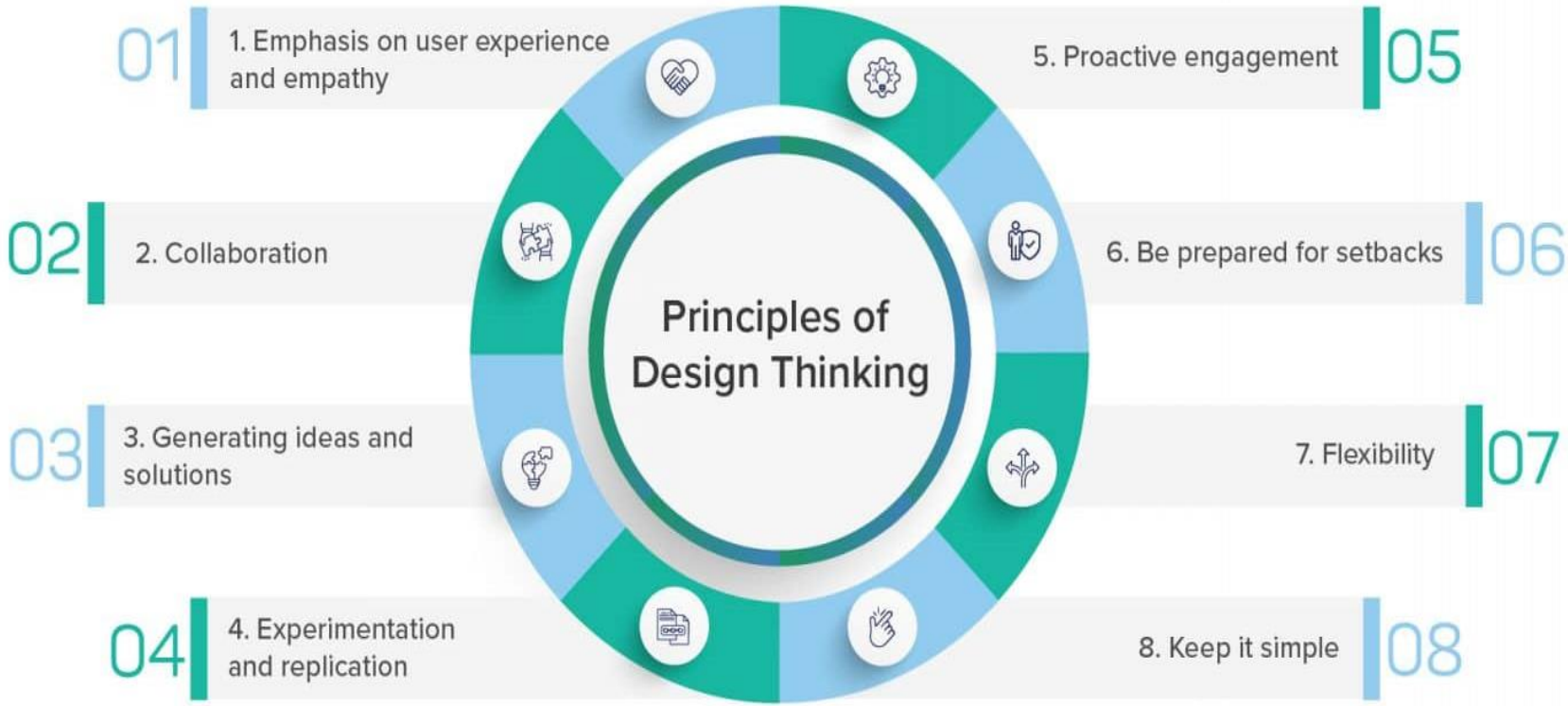
- **Purpose:** To map out the service process, including frontstage and backstage activities.
- **Use:** Helps in understanding the complexities of service delivery and identifying areas for improvement.
- **Components:**
  - **Customer Actions:** Steps taken by the customer.
  - **Frontstage Activities:** Interactions visible to the customer.
  - **Backstage Activities:** Behind-the-scenes processes.
  - **Support Processes:** Additional support functions needed to deliver the service.

Ten Tools:

10. Affinity Diagrams

- **Purpose:** To organize and categorize ideas and insights.
- **Use:** Helps in identifying patterns and relationships among ideas.
- **Components:**
  - **Collect Data:** Gather data from user research, brainstorming, etc.
  - **Group Ideas:** Organize ideas into groups based on similarity.
  - **Label Groups:** Create headings for each group to capture the essence of the ideas.

Principles of Design Thinking:



Principles of Design Thinking:

1. Emphasis on user experience and empathy

- Empathy allows designers to understand and connect with their users on a deeper level, enabling them to design products that cater to their needs, emotions, and aspirations.
- Design-centric organizations encourage teams to observe consumer behavior rather than making general assumptions and understand what people need and want, the emotional and psychological consumer experience, potential barriers, attitudes, and opportunities.
- Journey maps, persona creation, task analysis, and interviews are some ways to gather data from actual service users.

Principles of Design Thinking:

2. Collaboration

- Collaborative design is a process in which designers from different disciplines share their knowledge about both the design process and the design content.
- Design thinking supports collaboration between diverse, multidisciplinary teams, i.e., marketing and design teams, which may not usually work with, and ensures that you have actionable clues and guidance for the design process – that supports innovation!

Principles of Design Thinking:

3. Generating ideas and solutions

- Once the problem is identified, you start generating many ideas to drive your solutions since design thinking is a solution-based framework.
- Focus on developing as many ideas and solutions as possible.
- Ideation is not only a core design thinking principle but a crucial step in the design thinking process.
- Mind-mapping, brainstorming, and other creative methods can now be implemented in a way that all ideas are recorded for onward consideration.

Principles of Design Thinking:

4. Experimentation and replication

- Design thinking does not end with idea generation. You now have to develop prototypes, test the design, incorporate changes based on user feedback, etc.
- Design thinking can be a somewhat repetitive process as you identify flaws in the early versions of your proposed solution.

Principles of Design Thinking:

5. Proactive engagement

- Design thinking involves a highly proactive, action-oriented approach to problem-solving. Rather than theorizing about users' needs, design thinking encourages customer engagement to develop tangible prototypes and test them in real-world contexts.

Principles of Design Thinking:

6. Be prepared for setbacks

- When you're trying to change anything, or becoming more organized - it's important to be prepared for setbacks and challenges.
- Four steps to deal with setbacks and keep your goals on track:
    1. Acknowledge the setback.
    2. Figure out what went wrong.
    3. Get back on track.
    4. Don't give up.

Principles of Design Thinking:

7. Flexibility

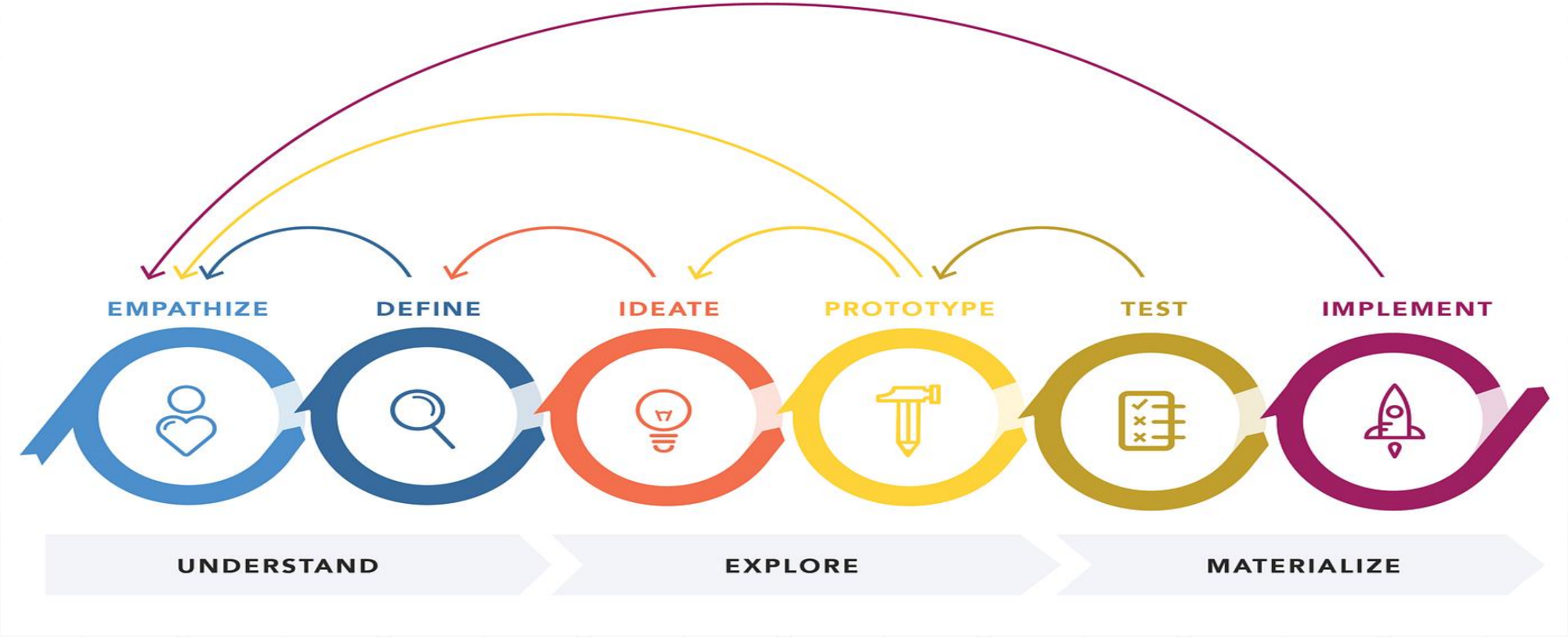
- Designing for flexibility is based on being prepared for changes to your system in the future.
- You may want to get more complex in the future or swap out an item or object for another one to match the scale of your project.
- Where designs are rigid, developers prefer to start working on an entirely new design than modifying the existing one. This impacts the time and costs of the project.

Principles of Design Thinking:

8. Keep it simple

- Keep it simple is a design principle which states that designs and/or systems should be as simple as possible. Wherever possible, complexity should be avoided in a system - as simplicity guarantees the greatest levels of user acceptance and interaction.
- Whether you're making products easy to use, streamlining processes, or communicating important information, a simple approach is often the most efficient and most effective.

Process of Design Thinking



Process of Design Thinking:

Empathize

Deeply understand the user's needs, pain points, and experiences.

1

2

Define

Frame the problem in a user-centric way to guide the ideation process.

Ideate

3

Generate a wide range of creative solutions without judgment.

4

Prototype

Build quick, low-fidelity models to test and refine concepts.

Test

5

Gather feedback from users to iterate and improve the solution.

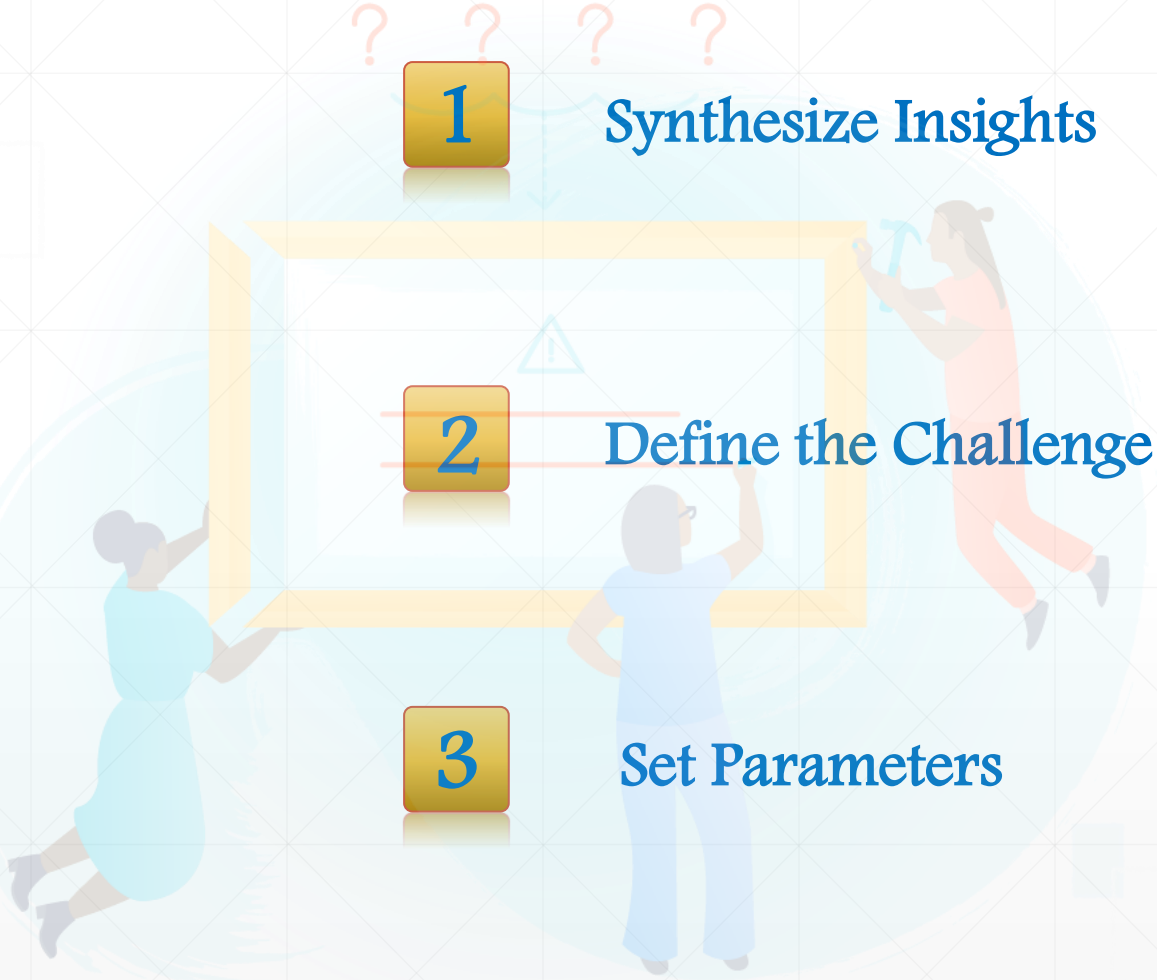
1. Empathize: Understanding the User:

1. **Observation**
   Watch users interact with products or services in their natural environment.

2. **Interviews**
   Ask open-ended questions to uncover user needs, motivations, and pain points.

3. **Immersion**
   Experience the user's journey firsthand to gain deeper insights.

2. Define: Framing the Problem:



1. **Synthesize Insights**
   Identify patterns, themes, and opportunities from the research data.

2. **Define the Challenge**
   Reframe the problem in a human-centric way to guide the ideation process.

3. **Set Parameters**
   Establish clear goals, constraints, and success criteria for the project.

3. Ideate: Generating Solutions:

Brainstorming

Generate a large quantity of diverse ideas without judgment or criticism.

Analogies

Draw inspiration from solutions in other domains to spark new ideas.

Rapid Sketching

Quickly visualize ideas to explore and communicate them effectively.

Collaboration

Engage diverse perspectives to foster creative synergy and new insights.

4. Prototype: Building and Testing:

4. Prototype: Building and Testing:

1. **Low-Fidelity Prototypes** — Quickly build inexpensive, low-resolution models to test core concepts.
2. **High-Fidelity Prototypes** — Develop more refined, functional prototypes to gather in-depth user feedback.
3. **Iterative Testing** — Continuously gather user feedback and refine the prototype to improve the solution.

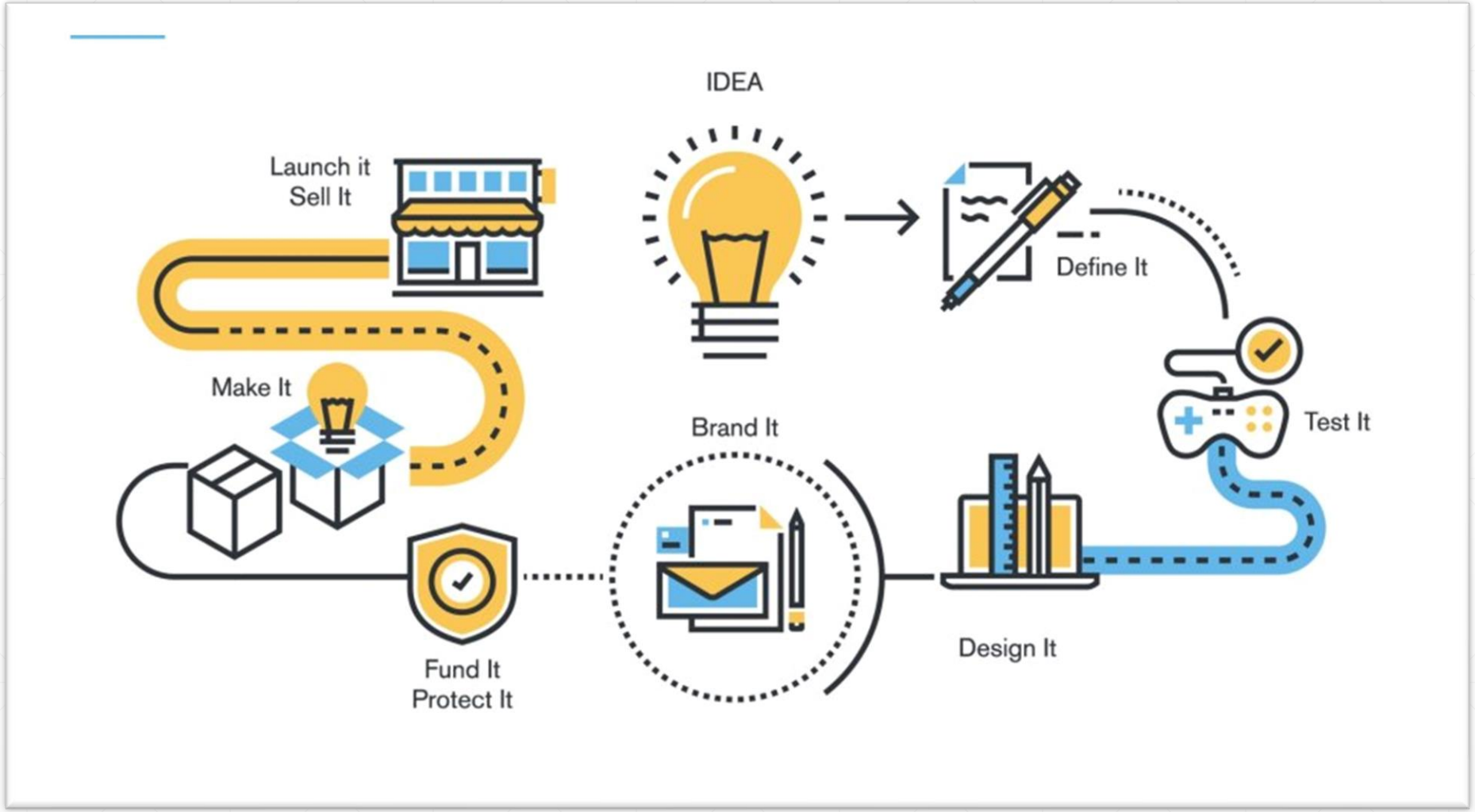
5. Iterate: Refining the Solution:

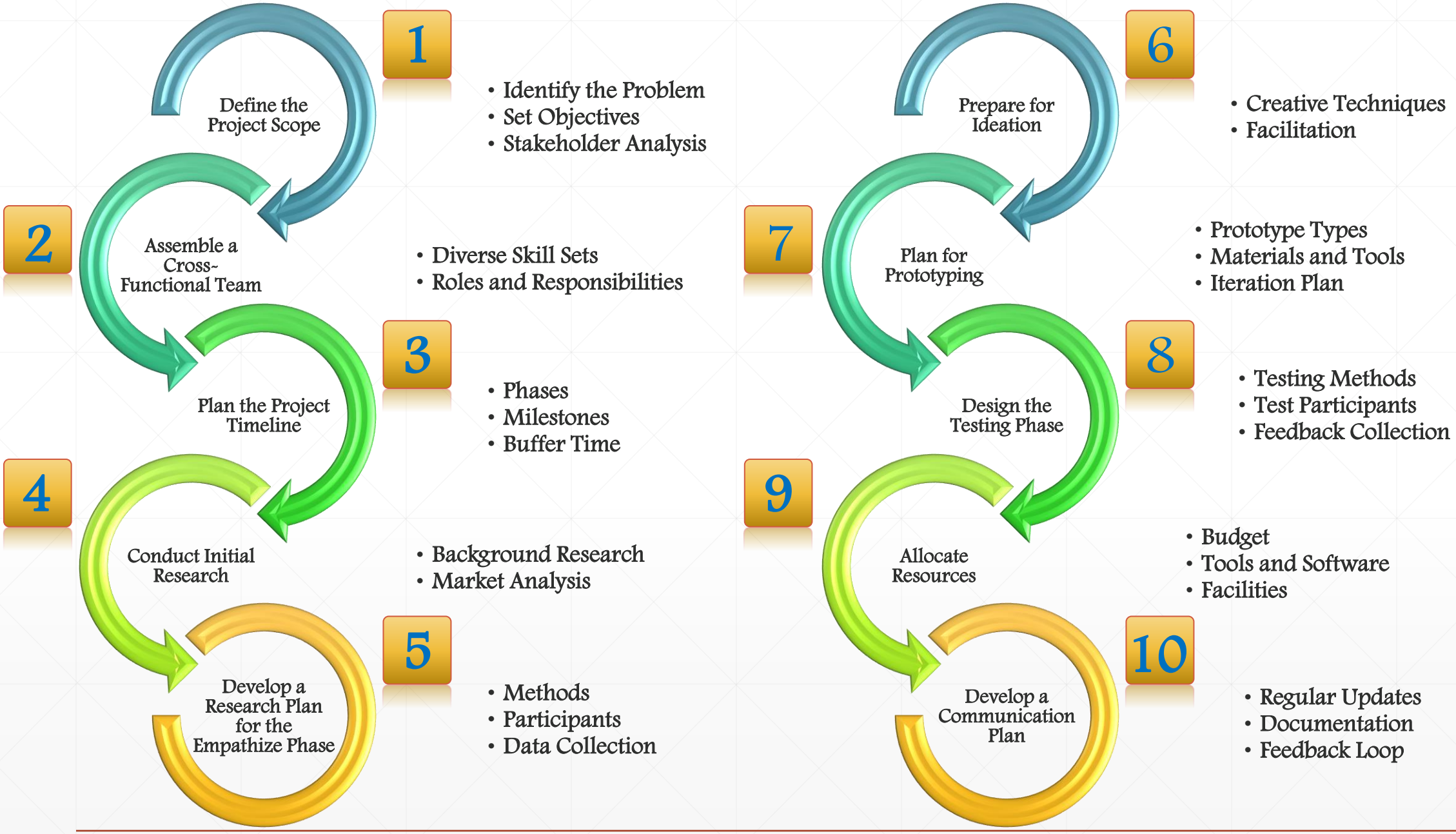
1. **Gather Insights**
   Analyze user feedback and identify opportunities for improvement.

2. **Incorporate Feedback**
   Refine the prototype and implement changes based on user needs.

3. **Test and Validate**
   Continuously test the updated prototype and gather more feedback.

How To Plan A Design Thinking Project?




1
Define the Project Scope
• Identify the Problem
• Set Objectives
• Stakeholder Analysis
2
Assemble a Cross-Functional Team
• Diverse Skill Sets
• Roles and Responsibilities
3
Plan the Project Timeline
• Phases
• Milestones
• Buffer Time
4
Conduct Initial Research
• Background Research
• Market Analysis
5
Develop a Research Plan for the Empathize Phase
• Methods
• Participants
• Data Collection
6
Prepare for Ideation
• Creative Techniques
• Facilitation
7
Plan for Prototyping
• Prototype Types
• Materials and Tools
• Iteration Plan
8
Design the Testing Phase
• Testing Methods
• Test Participants
• Feedback Collection
9
Allocate Resources
• Budget
• Tools and Software
• Facilities
10
Develop a Communication Plan
• Regular Updates
• Documentation
• Feedback Loop

Example Project Plan Outline:

Project Title: Redesigning the Onboarding Experience for New Employees

Project Scope:

- **Problem:** New employees find the onboarding process confusing and overwhelming.
- **Objectives:** Improve the onboarding experience to increase new employee satisfaction and reduce time to productivity.

Example Project Plan Outline:

Team:

- **Project Manager:** Oversees the project timeline and deliverables.
- **UX Researcher:** Conducts user research and gathers insights.
- **Designer:** Creates prototypes and designs.
- **Developer:** Builds and tests prototypes.
- **HR Representative:** Provides insights into the current onboarding process.

Example Project Plan Outline:

Timeline:

- **Empathize (Weeks 1-2):** Conduct user interviews and observations.
- **Define (Week 3):** Synthesize research findings and create problem statements.
- **Ideate (Weeks 4-5):** Conduct brainstorming sessions and generate ideas.
- **Prototype (Weeks 6-7):** Develop low-fidelity and high-fidelity prototypes.
- **Test (Weeks 8-9):** Test prototypes with new employees and gather feedback.
- **Iteration and Finalization (Weeks 10-11):** Refine solutions based on feedback and prepare final deliverables.

Example Project Plan Outline:

Research Plan:

- **Interviews:** Conduct 10 interviews with new employees.
- **Surveys:** Distribute surveys to 50 recent hires.
- **Observations:** Observe the on boarding sessions of 5 new employees.

Ideation Sessions:

- **Brainstorming:** Conduct 2 brainstorming sessions with the team.
- **Mind Mapping:** Create mind maps to explore different aspects of the onboarding experience.

Example Project Plan Outline:

Research Plan:

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Example Project Plan Outline:

Prototyping Plan:

- **Low-Fidelity:** Paper sketches and wireframes.
- **High-Fidelity:** Interactive digital prototypes using design software.

Testing Plan:

- **Usability Testing:** Conduct usability tests with 5 new employees.
- **Feedback Forms:** Distribute feedback forms to gather additional insights.

Example Project Plan Outline:

Budget:

- **Research Tools:** $500
- **Prototyping Materials:** $300
- **Participant Incentives:** $200
- **Miscellaneous:** $100

Communication Plan:

- **Weekly Meetings:** Hold weekly team meetings to discuss progress.
- **Stakeholder Updates:** Provide bi-weekly updates to stakeholders.
- **Documentation:** Maintain a project log with detailed notes and findings.