ITI0209: User Interfaces

02. Design Process: Design Thinking & Double Diamond

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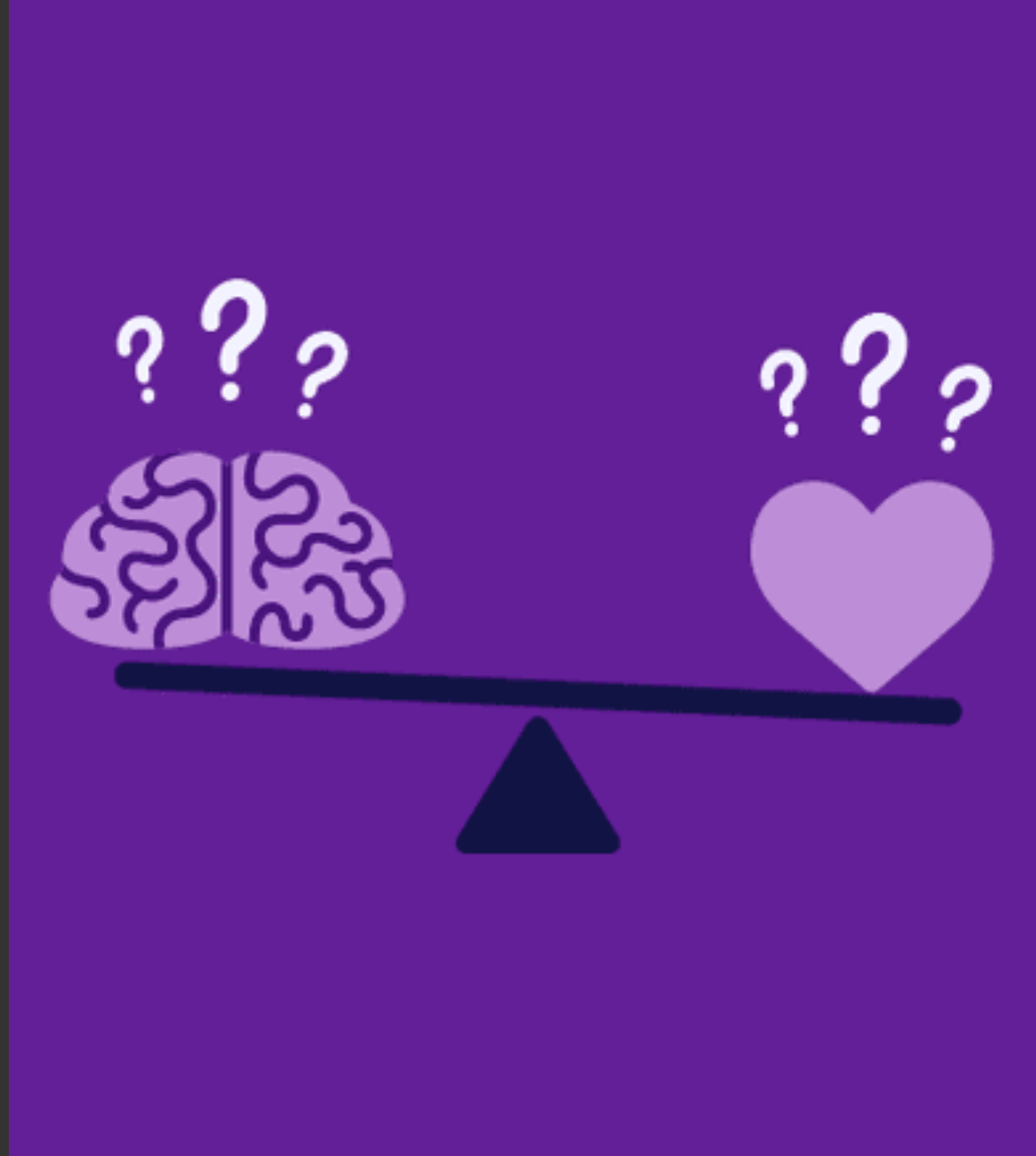
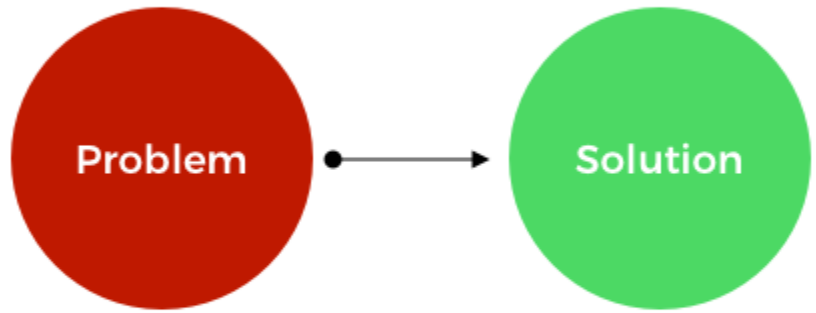
Spring 2026

Is UX Art or Science?



More Science than Art

- UX Design solves problems, art does not.
- Art is subjective. UX is objective.
- UX Design is based on the scientific method.
- UX Design can be taught and learned.

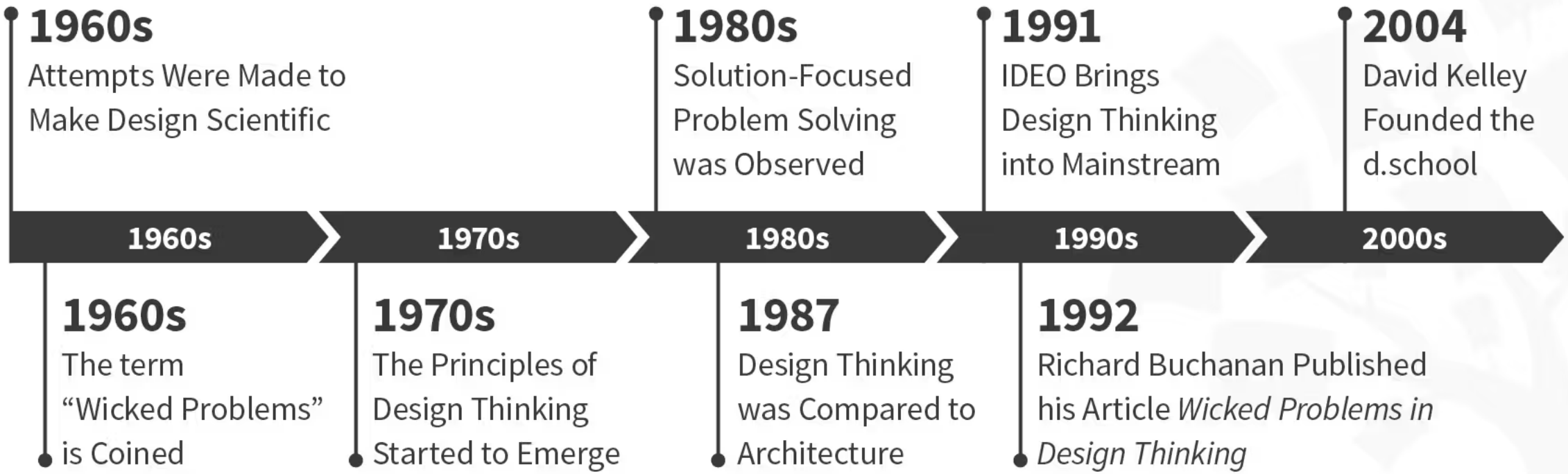


✕ Don't jump straight to solutions

Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.”

— Tim Brown, CEO of IDEO

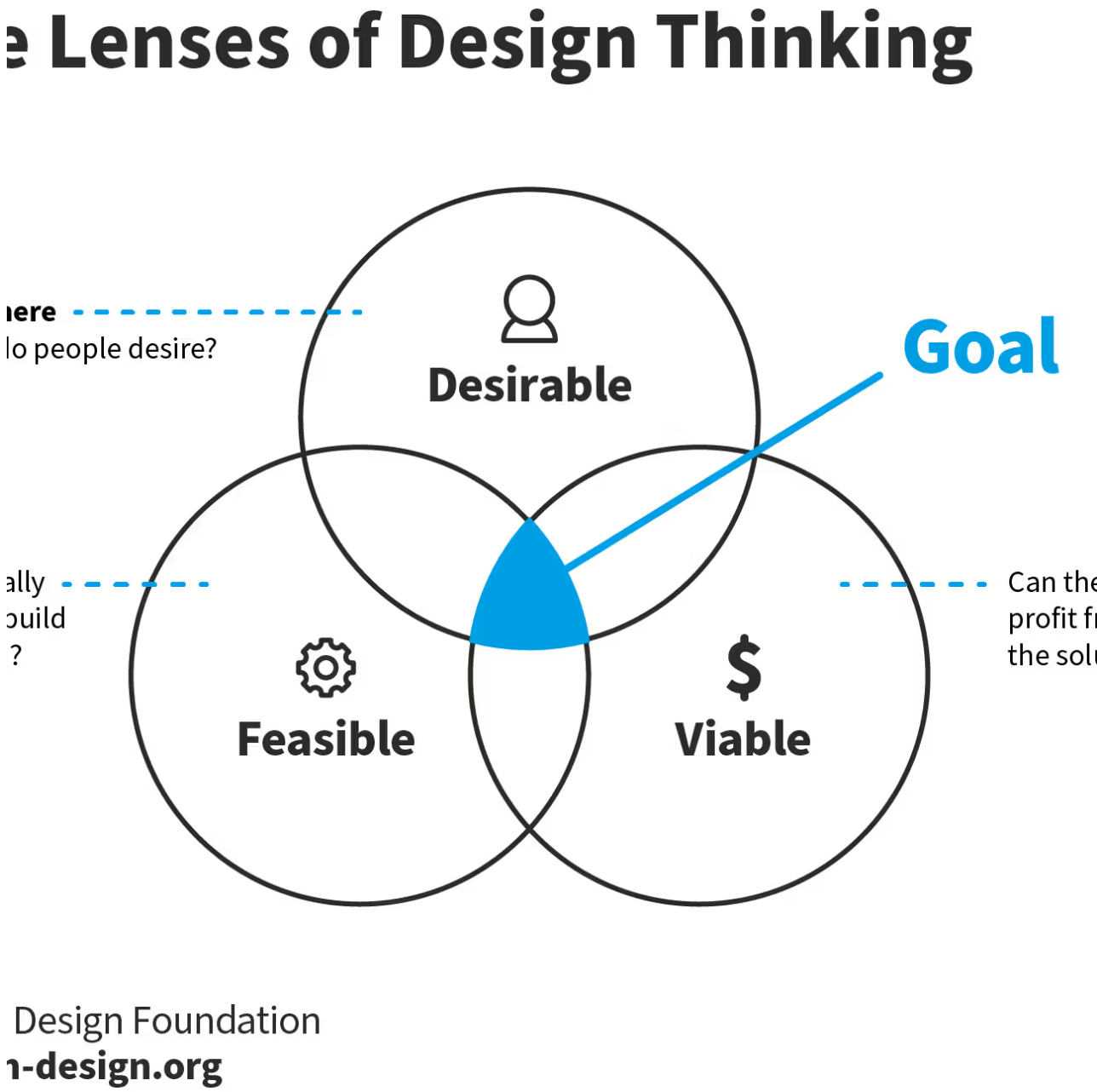
Design Thinking Process Timeline



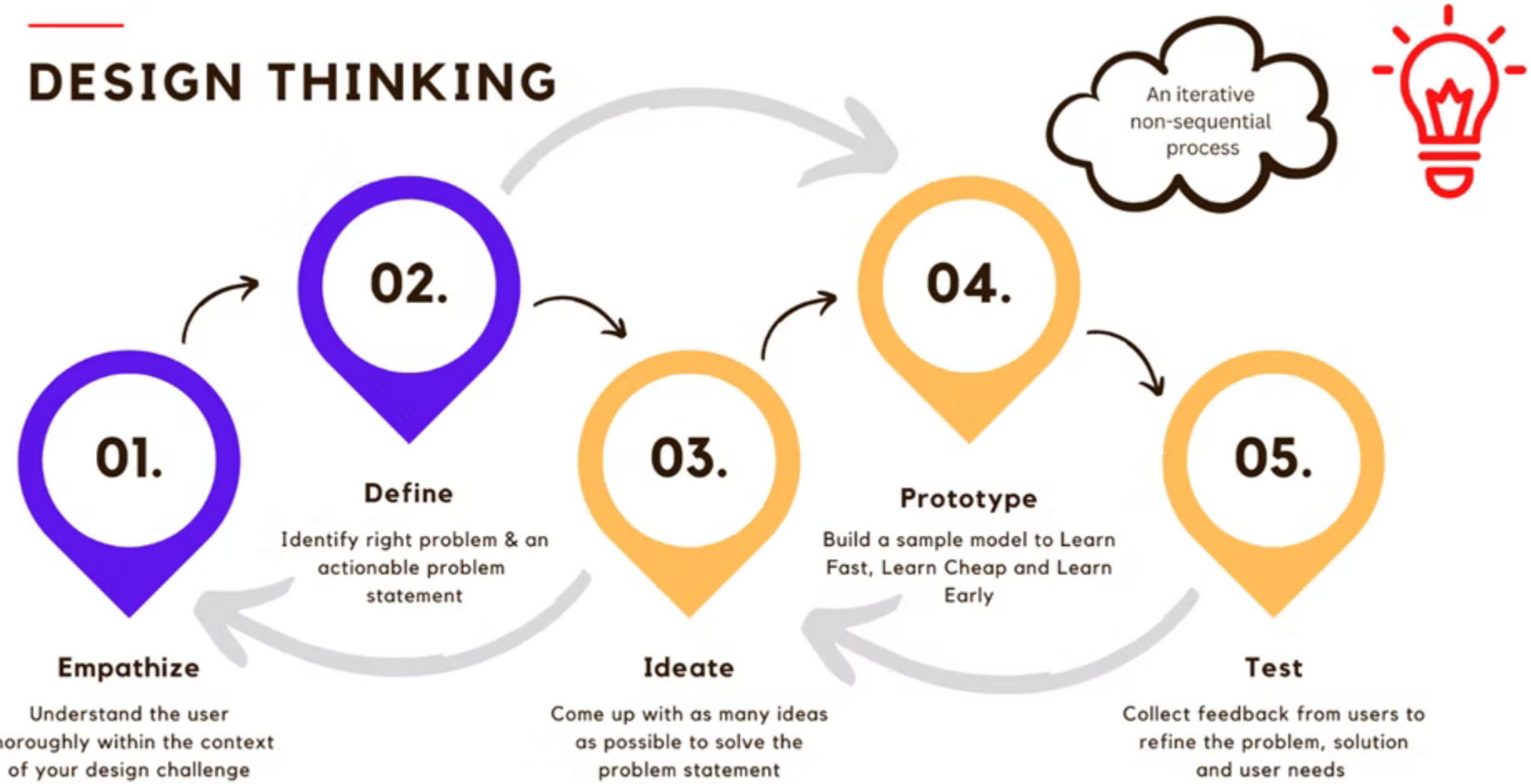
Wicked problems are complex, multi-faceted problems that cannot be solved with a single solution. They are often deeply rooted in emotion and can be hard to define. Wicked problems require out-of-the-box thinking in order to be solved effectively.

The design thinking process aims to satisfy three criteria: **desirability** (what do people desire?), **feasibility** (is it technically possible to build the solution?) and **viability** (can the company profit from the solution?).

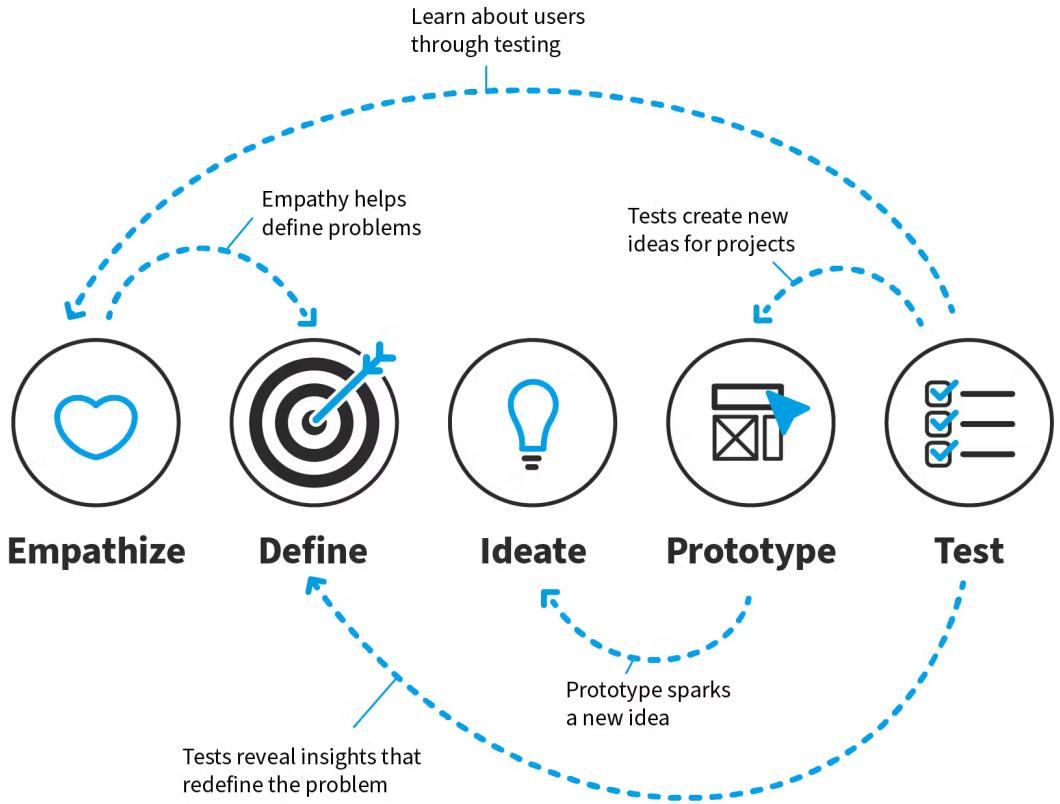
Teams begin with desirability and then bring in the other two lenses.



DESIGN THINKING



Design Thinking:
a Non-Linear Process



Interaction Design Foundation
interaction-design.org

Design Thinking vs Agile

Design Thinking focuses on problem finding through empathy and ideation to define the right solution.

Agile focuses on problem solving through iterative, rapid development.

Design Thinking determines what to build, and Agile determines how to build it efficiently.

https://i.imgur.com/bjcux5Z.png

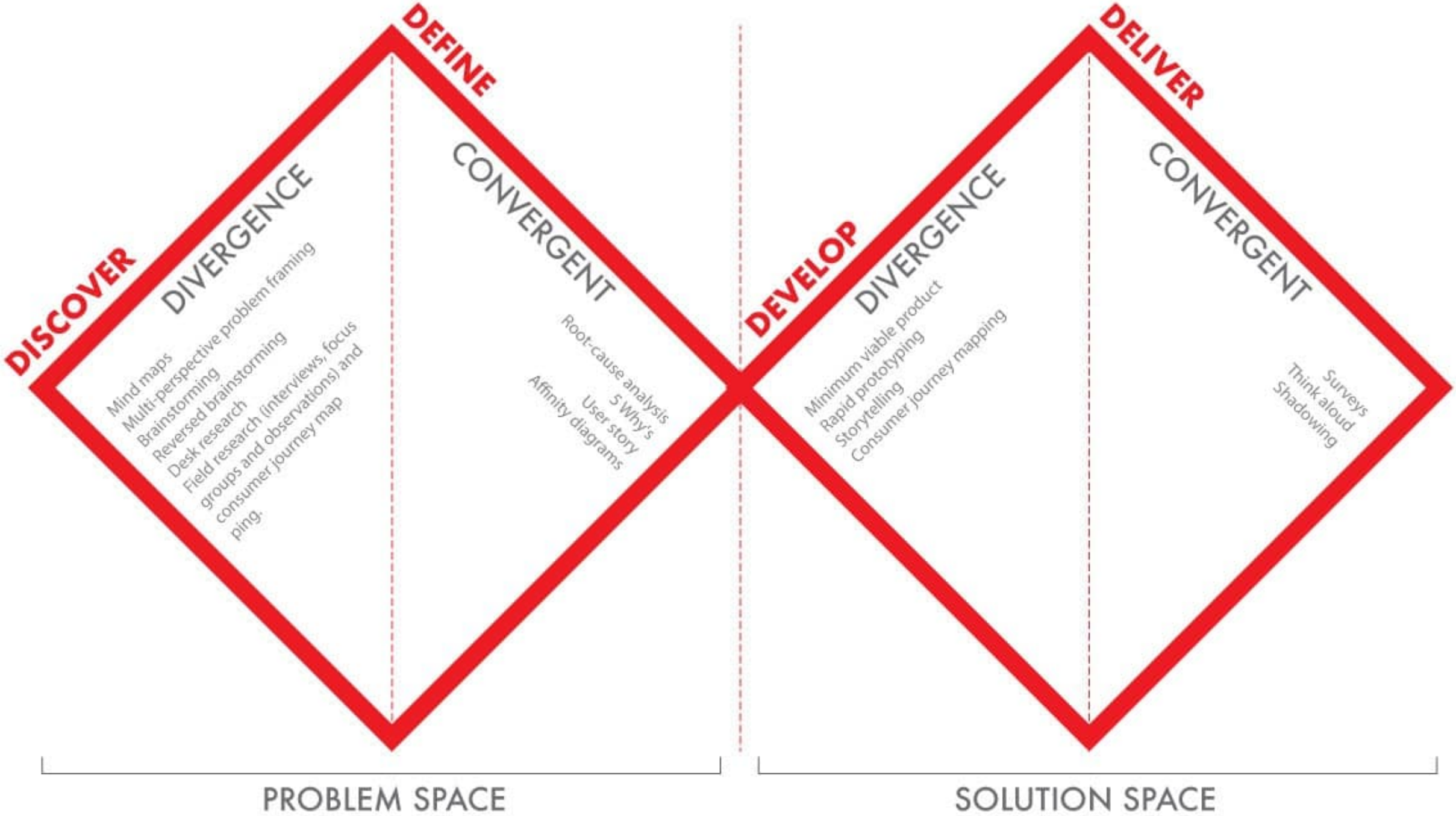
	Design Thinking	Agile
Origins	It primarily originates in design and borrows from multiple disciplines, including psychology, systems thinking, and business strategy.	It primarily originates from software development and borrows from disciplines such as manufacturing and project management.
Primary Focus	Problem-solving and innovative solutions.	Efficient product delivery.
Phase of Application	Usually, toward the beginning of a project. Aims to define the problem and test and pick a solution.	Usually, after teams have a clear solution. Aims to deliver that solution and continuously iterate on the live product.
Structure and Documentation	Fluid process, less formal and relatively lesser documentation.	Structured and formal process with extensive documentation.
End product	An idea or solution, usually with a prototype, may not be tangible.	Tangible, working product (usually software) shipped to end users.

Design Thinking is the *mindset and philosophy*.

Double Diamond is a *process model* structuring that mindset.

The Double Diamond is a simple visual map of the design process. The model is divided into 4 phases: Discover, Define, Develop and Deliver.

Like any of the Design Thinking methodologies, the process is iterative. This means that ideas are developed, tested and refined several times, with weak ideas dropped in the process.


DISCOVER
DEFINE
DEVELOP
DELIVER
DIVERGENCE
CONVERGENT
DIVERGENCE
CONVERGENT
Mind maps
Multi-perspective problem framing
Brainstorming
Reversed brainstorming
Desk research
Field research (interviews, focus groups and observations) and consumer journey map ping.
Root-cause analysis
5 Why's
User story
Affinity diagrams
Minimum viable product
Rapid prototyping
Storytelling
Consumer journey mapping
Surveys
Think aloud
Shadowing
PROBLEM SPACE
SOLUTION SPACE

1st Diamond (research): Discover & Define

Design the right thing →

2nd Diamond (implementation): Develop & Deliver

→ Design things right

Benefits

1. Avoid solving the wrong problem. Without the proper research, we can’t know what the real problem is and may instead end up solving an assumed problem.

2. Make problems tangible and therefore solvable. To make sense of any challenge, we need to frame the problem. Without knowing what the problem is, it can’t be solved.

3. Prevent skipping important steps. The process serves as a checklist and as an inventory of methods the team can apply to each project.

4. Uncover emerging challenges and opportunities. Research often reveals additional challenges and opportunities that we weren't aware of yet.

Benefits

5. Improve scoping to secure time and resources. With our checklist of steps in hand and an approximate understanding of the project outcome size, we can more efficiently scope projects and assign resources in advance.

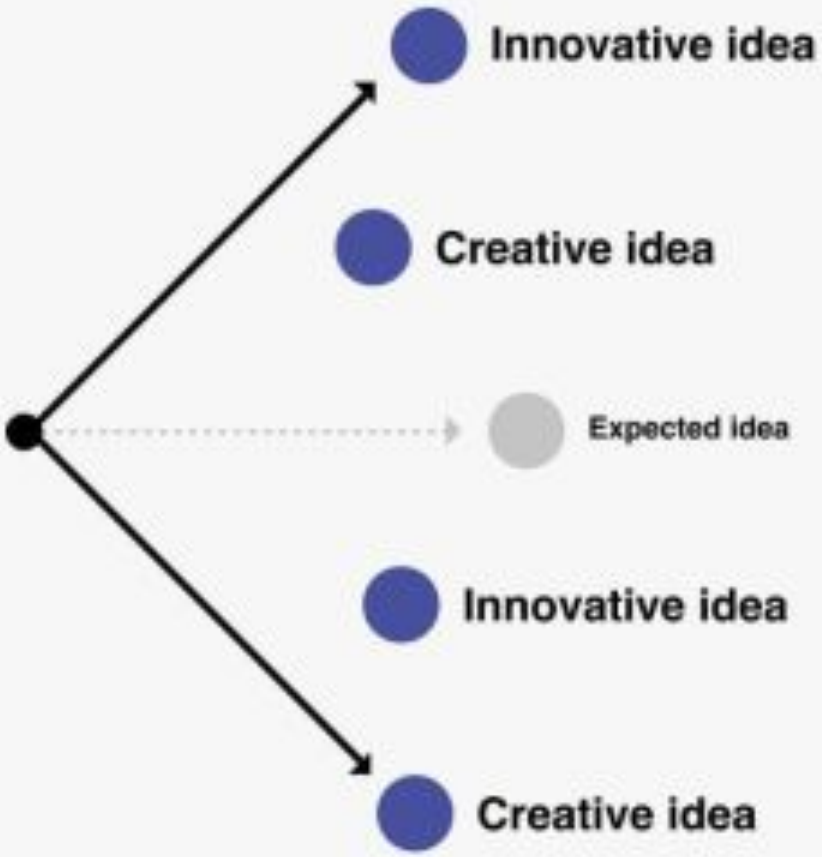
6. Create solid documentation for future reference. With the proper documentation we have lots of research to fall back on and use as a basis for future projects. It also encourages knowledge sharing between project contributors and stakeholders.

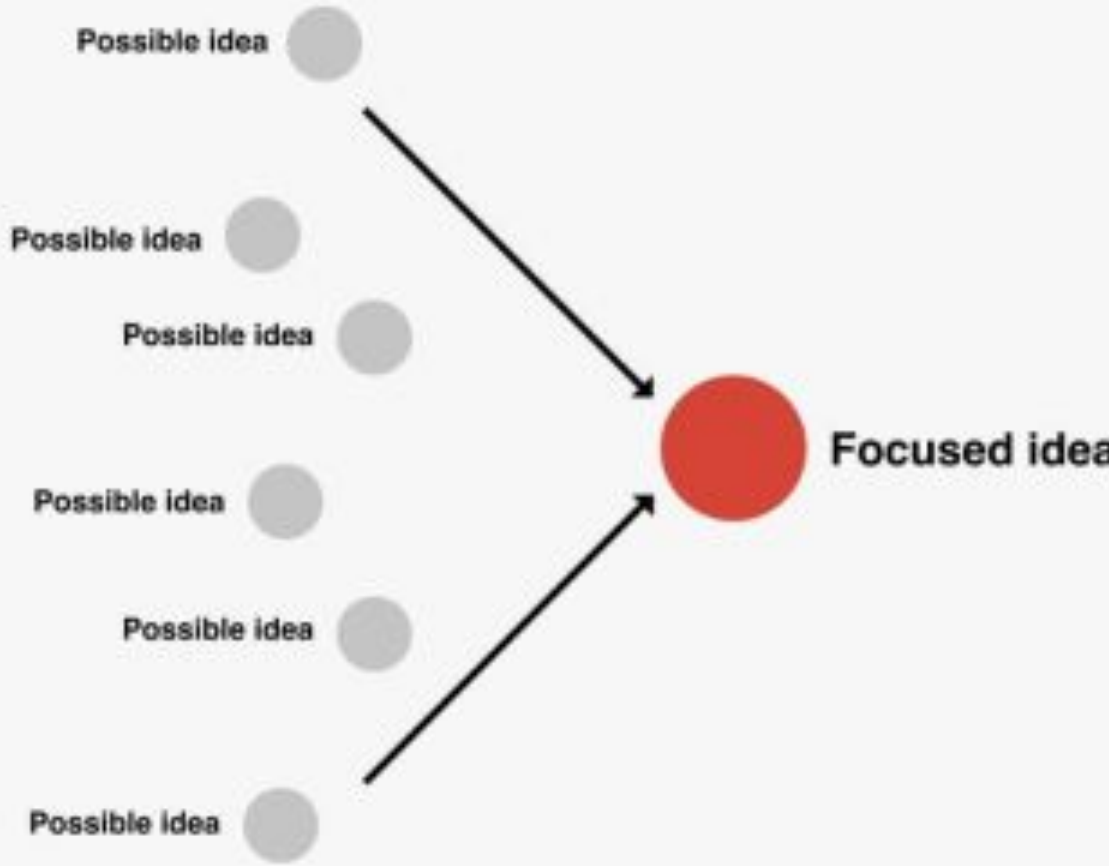
7. Broaden our perspective. The design methods applied during each phase encourage us to collect input from outside the product and design teams.

Divergent Thinking

vs.

Convergent Thinking





Diverging Phases (analyze)

During diverging phases it’s important to keep an open mind. Thinking broadly and without limitations lays the groundwork for not limiting your possibilities during the following converging phase.

Converging Phases (synthesize)

During converging phases you do the opposite. You bring your focus back, get your ideas organized, and make sense of your findings. This is when you begin identifying key problems (Phase 2) and viable solutions (Phase 3).

Phase 1: Understand/Discover *(diverging)*

Task: Identify the right problem to solve.

During the first phase, you gain a deep understanding of the problem you're facing, gather insight into the current condition, and build and challenge your understanding of the user's pain points and needs rather than merely assuming it. It involves speaking to and spending time with people who are affected by the issues.

It includes but not limited to:

- User goals, the user journey
- User pain points

  ...

Cast that wide net and try to collect as much applicable data as possible.

Phase 2: Define *(converging)*

Task: Define and frame the problem.

The goal of the second phase is to define and frame your problem by making sense of all findings from the first phase. During this phase you might also uncover potential opportunity areas. The insight gathered from the discovery phase can help to define the challenge in a different way.

It includes but not limited to:

- User personas, user stories
- Project brief and scope

  ...

The synthesized research should all tie back to your project goal & problems. Condense what you learned into diagrams, presentations, or documents.

Phase 3: Develop *(diverging)*

Task: Generate and evaluate solutions.

Throughout the third stage, you begin exploring possible solutions, generate as many ideas as possible, and evaluate them based on the framed problem. Give different answers to the clearly defined problem, seeking inspiration from elsewhere and co-designing with a range of different people.

It includes but not limited to:

- Wireframes, mockups
- User testing

  ...

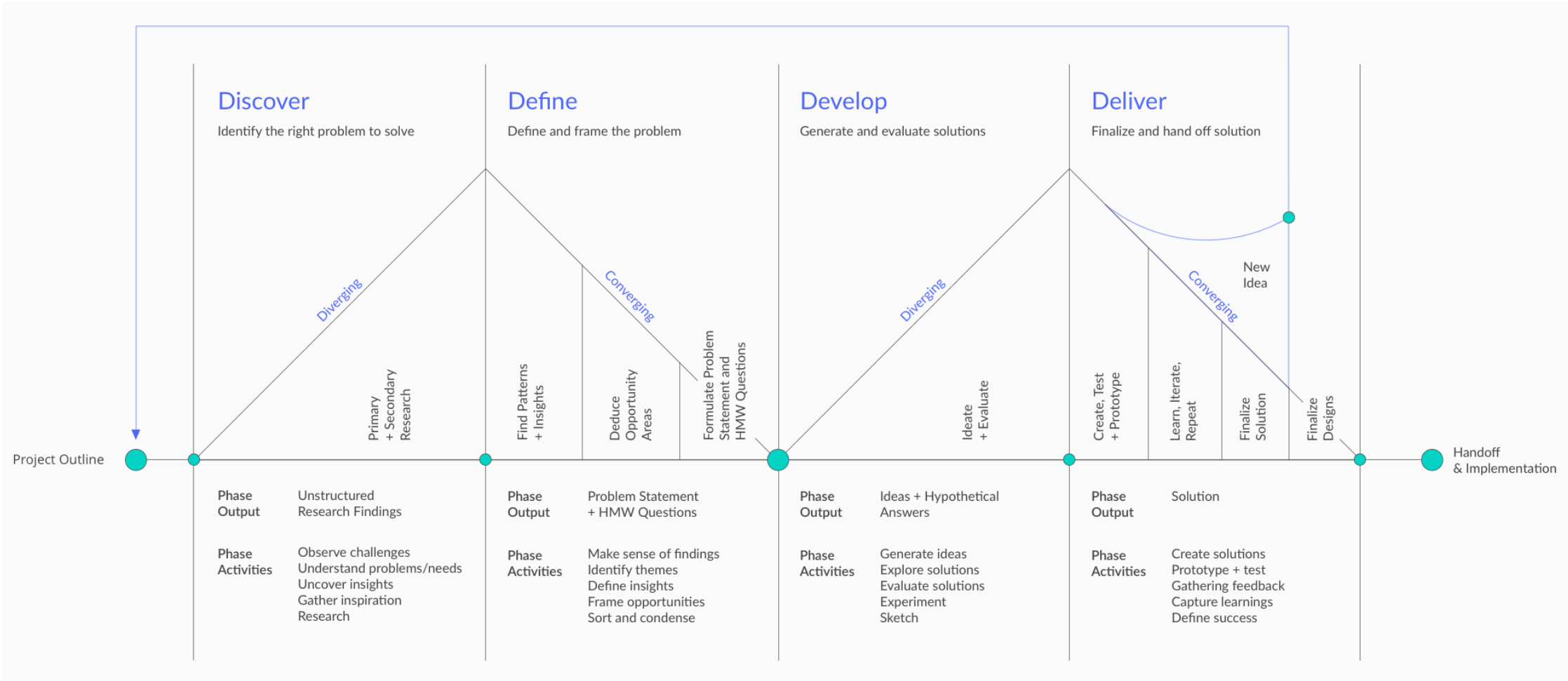
The development stage is a cycle between Implementation → Testing → Iterating.

Phase 4: Deliver *(converging)*

Task: Finalize and hand off solution.

During the last phase, initial ideas are narrowed down until the final solution is evaluated, iterated on, finalized, and delivered. Involves testing out different solutions at small-scale, rejecting those that will not work and improving the ones that will.

! Try to make sure that documentation is clear and in-depth enough for developers to read without any clarifications. It can’t hurt to do a final run-through with everyone to clear up questions and confusion.


Discover
Identify the right problem to solve
Define
Define and frame the problem
Develop
Generate and evaluate solutions
Deliver
Finalize and hand off solution
Diverging
Converging
Diverging
Converging
New Idea
Project Outline
Primary + Secondary Research
Find Patterns + Insights
Deduce Opportunity Areas
Formulate Problem Statement and HMW Questions
Ideate + Evaluate
Create, Test + Prototype
Learn, Iterate, Repeat
Finalize Solution
Finalize Designs
Handoff & Implementation
Phase Output
Unstructured Research Findings
Phase Activities
Observe challenges
Understand problems/needs
Uncover insights
Gather inspiration
Research
Phase Output
Problem Statement + HMW Questions
Phase Activities
Make sense of findings
Identify themes
Define insights
Frame opportunities
Sort and condense
Phase Output
Ideas + Hypothetical Answers
Phase Activities
Generate ideas
Explore solutions
Evaluate solutions
Experiment
Sketch
Phase Output
Solution
Phase Activities
Create solutions
Prototype + test
Gathering feedback
Capture learnings
Define success

https://www.google.com/search?q=ux+roles

UX roles

From sources across the web

- User experience design
- Researcher
- Visual communication design
- Product Designer
- Usability testing
- Head teacher
- UX writer
- Information architecture
- User researcher
- UI Designer
- Architect
- UX role
- Conduct UX research
- Design and prototyping
- Interaction design
- Collaboration and communication
- Creating user flows and wireframes
- Customer journey maps
- Personas
- Senior Product Designer
- UX unicorn
- Wireframes

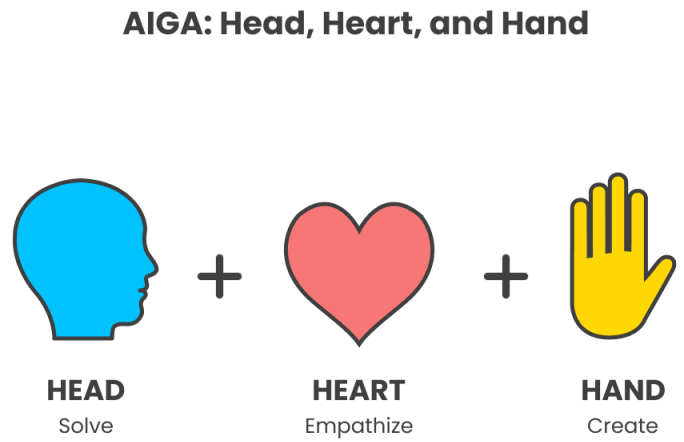
Different Roles

- User Experience (UX) Designer = Research + Design
- UI Developer = Design + HTML/CSS/JS
- Application Developer = Back-End + HTML/CSS/JS, etc.

The Head, Heart, and Hand

Approach by AIGA (American Institute of Graphic Arts)

- **Head** is the intellectual component. The team focuses on strategic thinking, problem-solving and the cognitive aspects of design. It involves research and analytical thinking to ensure that design decisions are purposeful.
- **Heart** is the emotional dimension. It emphasizes empathy, passion, and human-centeredness to understand the users' needs, desires, and experiences to ensure that designs resonates on a personal level.
- **Hand** is the practical execution of ideas, the craftsmanship, and the skills necessary to turn concepts into tangible solutions. This includes the mastery of tools, techniques, and materials, as well as the ability to implement and execute design ideas effectively.



Links

- Design Thinking (DT). https://www.interaction-design.org/literature/topics/design-thinking
- The Double Diamond model: what is it and should you use it?. https://www.justinmind.com/blog/double-diamond-model-what-is-should-you-use/
- Design Thinking models. The Double Diamond. https://empathizeit.com/design-thinking-models-the-double-diamond/
- Why the Double Diamond is the Most Precious Diagram in UX Design. https://evaschicker.medium.com/why-the-double-diamond-is-the-most-precious-diagram-in-ux-design-40db0476e5d2

Thank you! :)