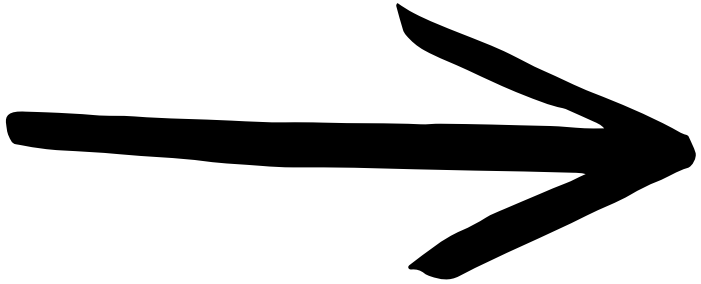
Design Thinking: A Human-Centered Approach to Problem Solving

A Strategy for Innovation Grounded in User Experience

Lavin, Spring 2026

ENGINEERING DRIVEN



DESIGN DRIVEN

PRODUCT CENTRIC

CUSTOMER CENTRIC

MARKETING FOCUSED

USER EXPERIENCE FOCUSED

INNOVATION HAS SHIFTED DESIGN

Why Design Thinking Matters

- Many products fail because teams fall in love with solutions, not problems

- Design thinking reduces risk by aligning solutions with real user needs

- Used successfully across industries: healthcare, fintech, government services, what else?

Example: Hospital reduced readmission rates by redesigning discharge instructions with patients

Great design has that “wow” factor that makes products more desirable and services more appealing to users.

Designing is more than creating products and services; it can be applied to systems, procedures, protocols, and customer experiences.

https://www.creativityatwork.com/design-thinking-strategy-for-innovation/

The Design Thinking Mindset

- Beginner's mind: Suspend judgment, stay curious
- Embrace ambiguity: Problems are often ill-defined, and that's okay
- Show, don't tell: Prototypes spark better conversations than documents
- Inclusive collaboration: Diverse voices lead to better ideas
- Redefine Value, Change Culture, Reinvent Business Models

It's not just what it looks like and feels like. Design is how it works.

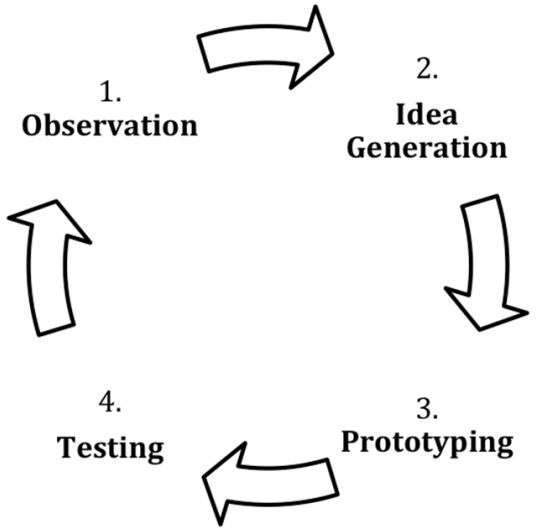
"... a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity..."

The Five Phases of Design Thinking

Empathize → Define → Ideate → Prototype → Test

- Not strictly linear - you'll often loop back based on what you learn
- Each phase reduces uncertainty in a specific way
- Human-centered throughout the entire process

Norman:



DESIGN THINKING

A FRAMEWORK FOR INNOVATION

EMPHATHISE

What is the problem?
Define the challenge &
explore the human context

IDEATE

Why is it important?
Brainstorm ideas good & bad,
dont stop at the obvious

CONTEXT

FORM

DEFINE

Why is it important?
Research, observe, understand
& create a point of view

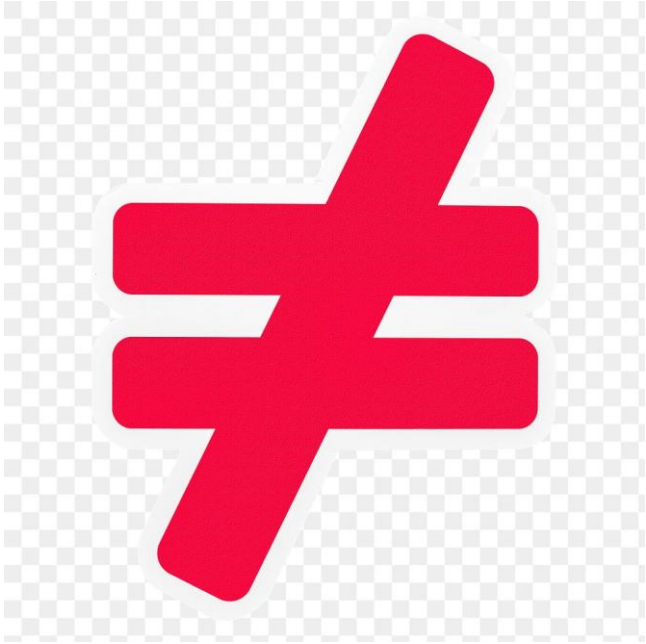
TEST

Does it work?
implrement the product, show, &
dont tell, start to refine the product

PROTOTYPE

How do we create it?
Start creating, experiment,
fall cheap, & fast

DESIGN THINKING



CRITICAL THINKING

Phase 1 - Empathize: Understanding People

Goal: Understand users' needs, thoughts, emotions, and motivations

How Do We Do This?

User interviews, contextual inquiry, shadowing, diary studies

Tools: Empathy maps, journey maps to visualize pain points

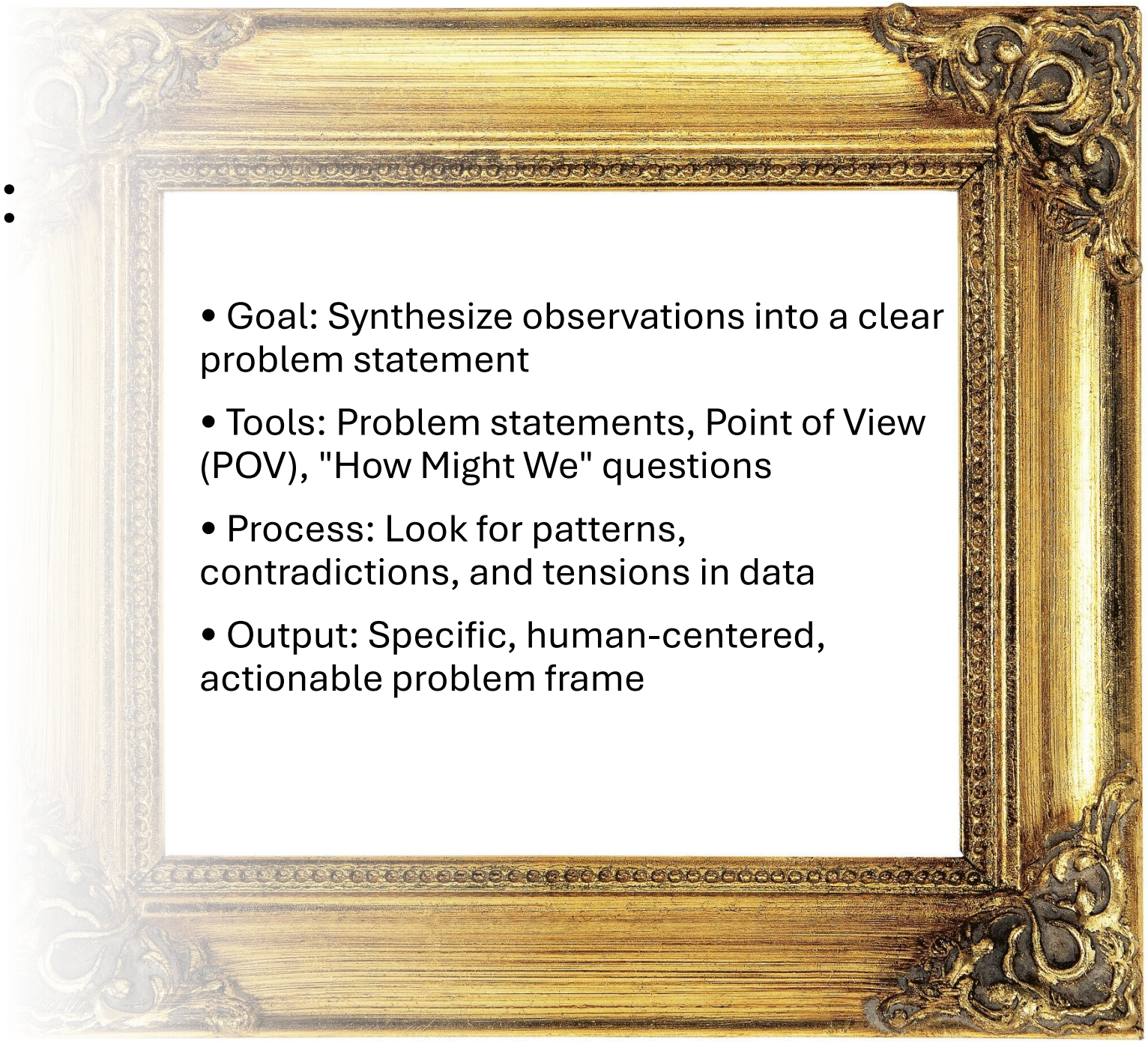
Key insight: Seek behaviors and workarounds, not just what people say

Empathize - Best Practices

- Ask "why" repeatedly to reveal underlying motivations
- Observe what people do, not just what they say
- Look for extreme users and edge cases
- Avoid leading questions and confirmation bias
- Focus on emotions and context, not just tasks

Understand the needs of your users!

Phase 2 - Define: Reframing the Problem



- Goal: Synthesize observations into a clear problem statement
- Tools: Problem statements, Point of View (POV), "How Might We" questions
- Process: Look for patterns, contradictions, and tensions in data
- Output: Specific, human-centered, actionable problem frame

Define - Problem Statement Examples

Weak Problem Statements

- "Make onboarding faster"
- "Improve the app"
- "Increase user engagement"

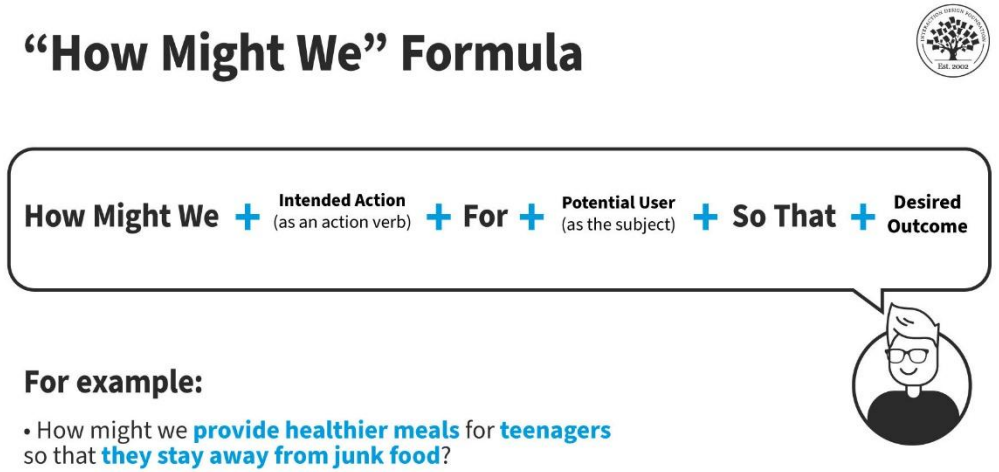
Strong Problem Statements

- "First-time freelancers need confidence in setting up payouts because financial uncertainty breeds anxiety"
- "Busy parents need quick meal solutions that kids will actually eat"

A strong problem statement will serve as a foundation for your design.

HMW Statement

- A "How Might We" (HMW) statement is a design thinking tool that reframes challenges as open-ended, optimistic questions to spark creative solutions, turning problems into opportunities for innovation by asking, "How might we [achieve something] for [someone]?"



https://www.interaction-design.org/literature/topics/how-might-we

Phase 3 - Ideate: Generating Solutions

- Goal: Generate a wide range of creative solutions
- Methods: Brainwriting, Post Its, SCAMPER, Worst Possible Idea
- Process: Diverge first (quantity over quality), then converge
- Key principle: Defer judgment while generating ideas

The SCAMPER model

Seven perspectives to provoke creative solutions to challenging problems.

S

Substitute

Replace a part, material, or process with something else.

C

Combine

Join elements, ideas, or functions together in new ways – or find a new element you can merge with.

A

Adapt

Modify something to better suit a new purpose, person or context.

M

Modify

Enlarge, reduce, change the shape, or alter attributes. Can a small change have a big effect?

P

Put to another use

Rather than changing the thing itself, consider changing the context it exists in.

E

Eliminate

Remove elements, simplify, or pare down to essentials.

Is less more?

R

Reverse

Flip the script, re-order your priorities, invert cause and effect, and turn it all upside-down.

SET CLEAR GOALS

ENCOURAGE THE PARTICIPATION OF

ACTIVE TIME MANAGEMENT

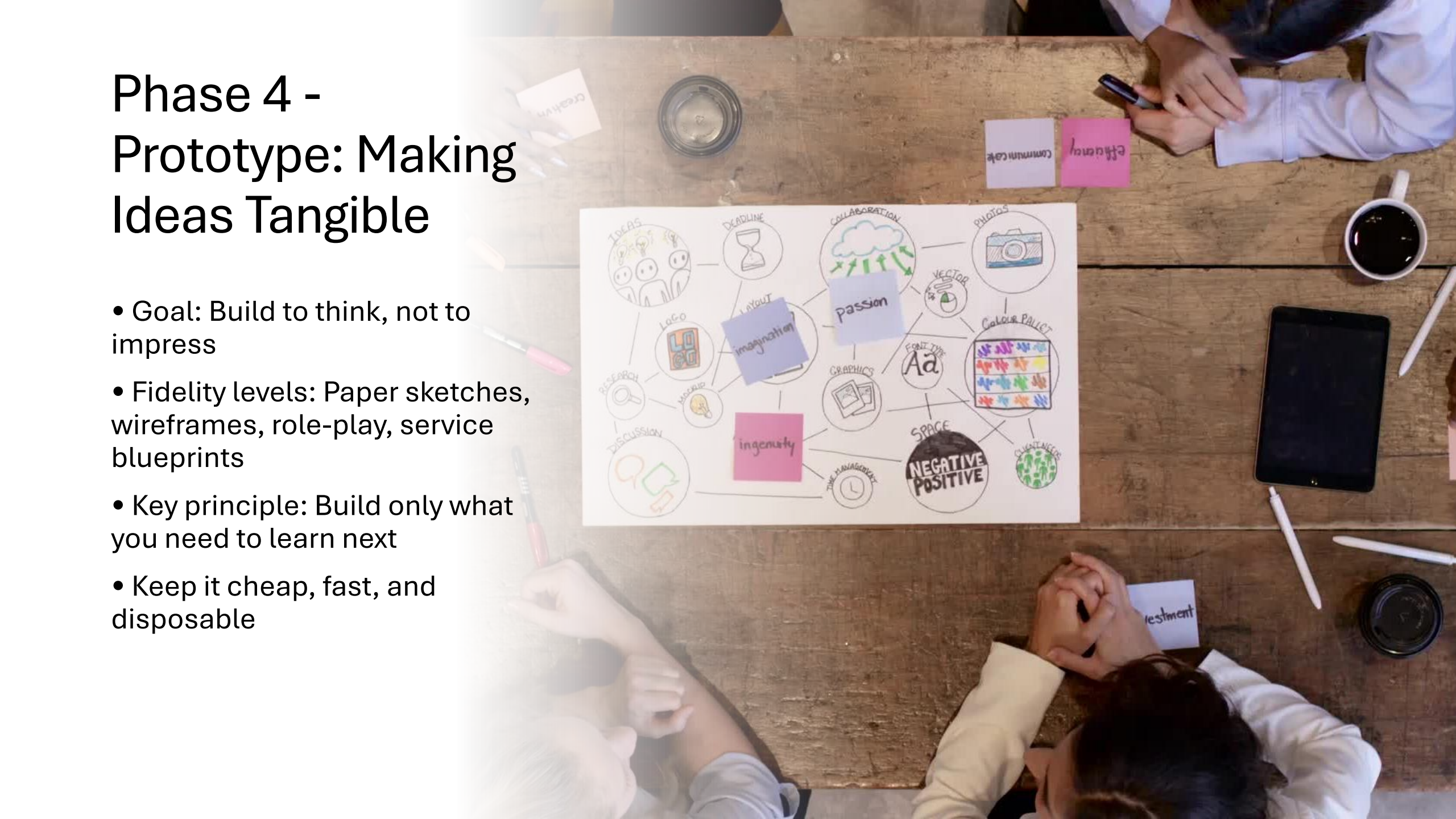
INCLUSIVE AND SAFE ENVIRONMENT

Ideate - Prioritization Techniques

- Impact vs. Effort matrix for quick sorting
- Assumption mapping to identify riskiest ideas
- Use constraints to spark creativity ("one-day build," "no code")
- Focus on learning, not perfection

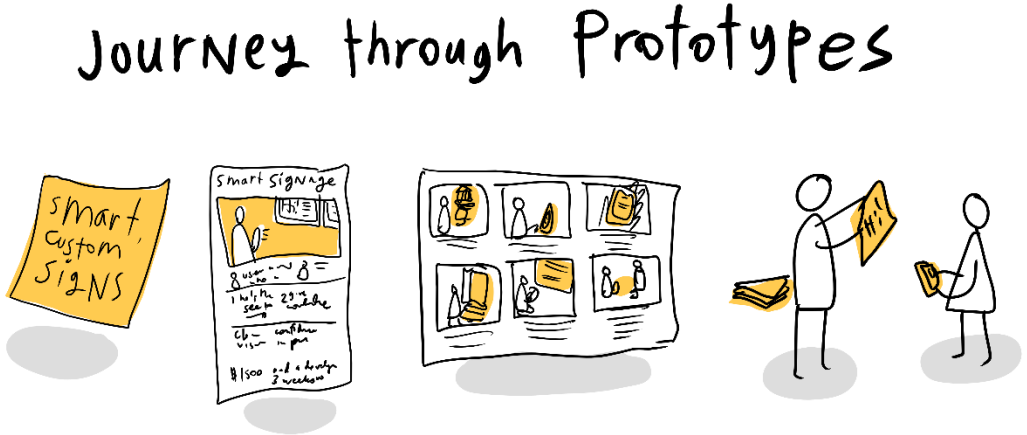
Phase 4 - Prototype: Making Ideas Tangible

- Goal: Build to think, not to impress
- Fidelity levels: Paper sketches, wireframes, role-play, service blueprints
- Key principle: Build only what you need to learn next
- Keep it cheap, fast, and disposable



Prototype - Common Pitfalls

- Overbuilding: Adding unnecessary features too early
- Polishing: Making it look finished before testing core assumptions
- Confusing fidelity with maturity
- Building in isolation without user input
- Falling in love with the prototype instead of the learning



Phase 5 - Test:
Learning Through Experimentation

- Goal: Learn, don't validate existing beliefs
- Methods: Usability tests, A/B tests, concierge MVPs, Wizard-of-Oz
- Define success metrics and decision thresholds beforehand
- Be open to being wrong - that's where the learning happens

Test - Effective Learning Questions

- What surprised us during testing?

- What contradicted our assumptions?

- What will we change based on this learning?

- What new questions emerged?

- What should we test next?

Integration with Agile and Business

- Use design thinking upfront for problem discovery
- Continue throughout sprints for ongoing discovery
- Translate insights into backlog items and measurable outcomes
- Create alignment rituals: research readouts, design reviews, demo days

Key Concept: Iteration

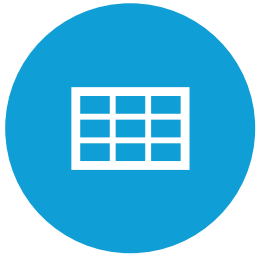
Common Pitfalls to Avoid

- Skipping research due to time pressure
- "We are the user" fallacy
- Treating brainstorming as the whole process
- Over-indexing on solution validation vs. learning
- No decision rules for tests leading to endless pilots

Your Design Thinking Toolkit

- INTERVIEW GUIDE TEMPLATES

- JOURNEY MAP CANVAS



- "HOW MIGHT WE" WORKSHEET

- ASSUMPTION MAPPING TEMPLATE

- EXPERIMENT PLANNING CANVAS

- PROTOTYPE PLANNING GUIDE

a design mindset is not problem-focused´

it`s solution-focused and action-oriented.

it involves both analysis and imagination.

Mini-Activity: 10-Minute Design Sprint

Challenge: "How might we help new students feel confident in their first week?"

- 2 min: Write 3 user needs (assumptions)
- 4 min: Post It Note Brainstorm
- 2 min: Select the best ideas
- 2 min: Define a scrappy prototype and one learning metric

Design Thinking: Critical Success Factors

Leadership

People

Processes

Environment

Next Steps and Action Items

- Pick a live problem from your current work
- Schedule 3 user conversations this week
- Draft 5 "How Might We" questions for your challenge
- Plan one low-fidelity prototype test
- Share learnings with your team

Questions and Discussion

- Where does your team typically get stuck - problem framing or idea convergence?
- What would a 1-week design sprint look like for your area?
- What's one bias you'll watch for in your next user test?
- How will you integrate design thinking into your current workflow?