New European Bauhaus Academy

Design Thinking and Green Skills for Common Futures

Module 2 - Human-Centered & Participatory Design Thinking

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Circular Bio-based Europe Joint Undertaking

Bio-based Industries Consortium

Co-funded by the European Union

This course is part of the **New European Bauhaus Academy South Hub**, designed to empower professionals, students, and young with future-ready knowledge and skills. Through participatory and interdisciplinary methods, the course integrates the core values of the New European Bauhaus: sustainability, inclusivity, and aesthetics.

Organized by:
SocialTech Lab (Coordinator, Cyprus)
SURF Lab (University of Cyprus, Cyprus)
Karma Mixed Reality Lab (Koç University, Turkey)
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Human-Centered & **Participatory** Design Thinking

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Course Outline

Lecture 2.1 – **The Logic of Design Thinking**
Lecture 2.2 – **Empathy & Problem Framing**
Lecture 2.3 – **Ideation & Creativity Techniques**
Lecture 2.4 – **Prototyping & Testing Basics**
Lecture 2.5 – **Participatory Design Approaches**

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Lecture 2.1

The Logic of Design Thinking

Design Thinking is a human-centered, recurrent problem-solving approach used to generate innovative solutions to complex and ambiguous challenges. It means thinking like a designer and following **a step-by-step process**—much like the design process itself.

This approach involves deeply understanding users, questioning assumptions, reframing the problem, and then building and testing prototypes. Popularized by Stanford University, the **five-phase** model typically includes: **Empathize, Define, Ideate, Prototype, and Test.** These phases are not strictly linear; teams move back and forth as needed—an iterative, non-linear workflow.

(Martin, 2009; Brown, 2008; Liedtka, 2018)

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Lecture 2.1

The Logic of Design Thinking

*"a human-centered approach to innovation—a **designer's mindset** that integrates the needs of people, the possibilities of technology, and the requirements for business sustainability."*

Tim Brown (CEO of IDEO)

The term **wicked problem** refers to complex challenges whose boundaries are unclear and where multiple stakeholders and variables interact. Such problems demand that teams think outside the box, move quickly into action, and iterate continuously—hallmarks of the design thinking mindset.

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Lecture 2.1

The Logic of Design Thinking

Design thinking operates on a logic distinct from classical scientific problem-solving. While the scientific method leans primarily on deduction and induction, design thinking is often linked to **abductive reasoning**—reasoning toward the best plausible explanation.

Rather than drawing definitive conclusions from existing data, designers ask **“what might be?”** to imagine possible solution scenarios and move forward on well-grounded hypotheses. This stance embraces uncertainty and advances by exploring creative possibilities.

As ***Roger Martin*** notes, decisions are guided by a vision of what might be, which **invites bold experimentation.**

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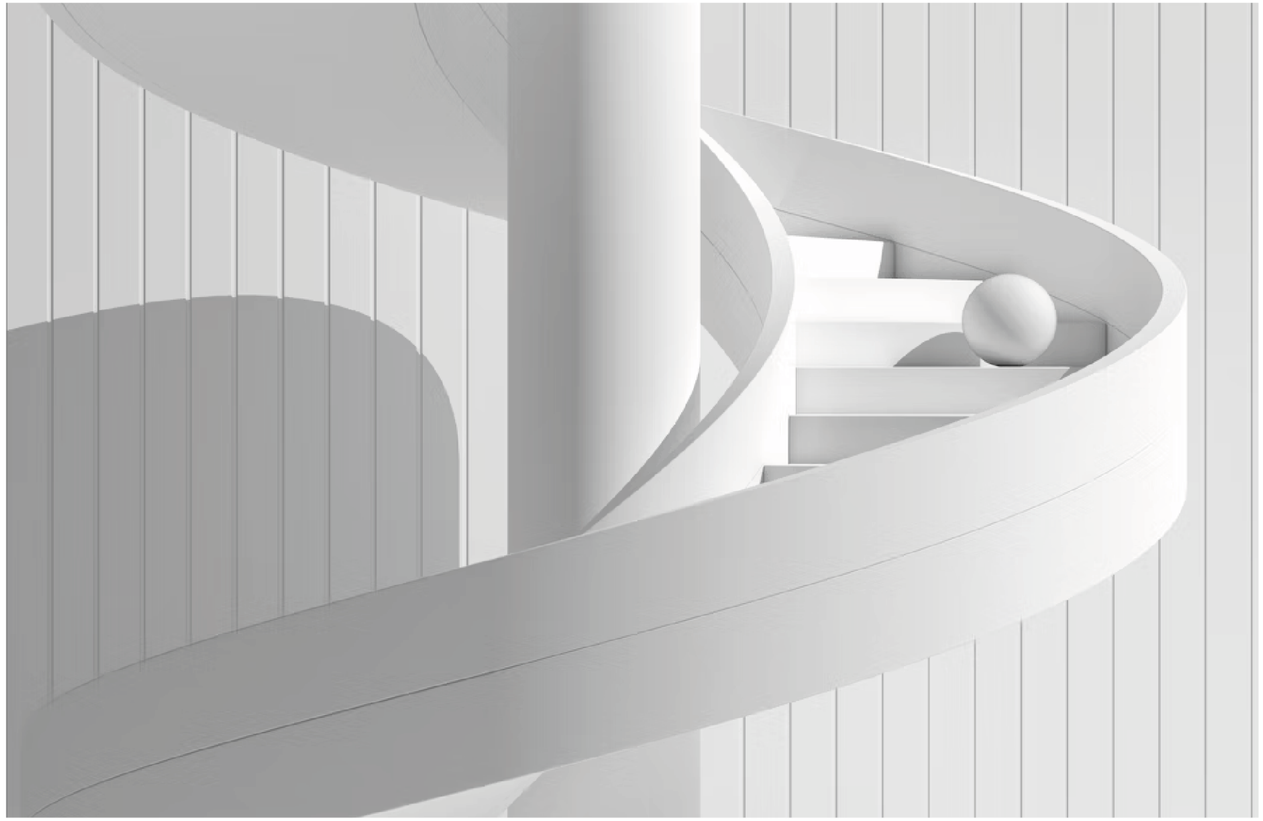
Lecture 2.1

The Logic of Design Thinking

Studies show it can dial down cognitive traps like over-optimism, egocentrism, and status-quo bias. ***Why?*** Because it shifts the conversation from **“what can we build?” to “what do people actually need?”** and pushes us to build real empathy with users. When we reframe the problem through the **user’s eyes,** we uncover insights that traditional approaches often miss.



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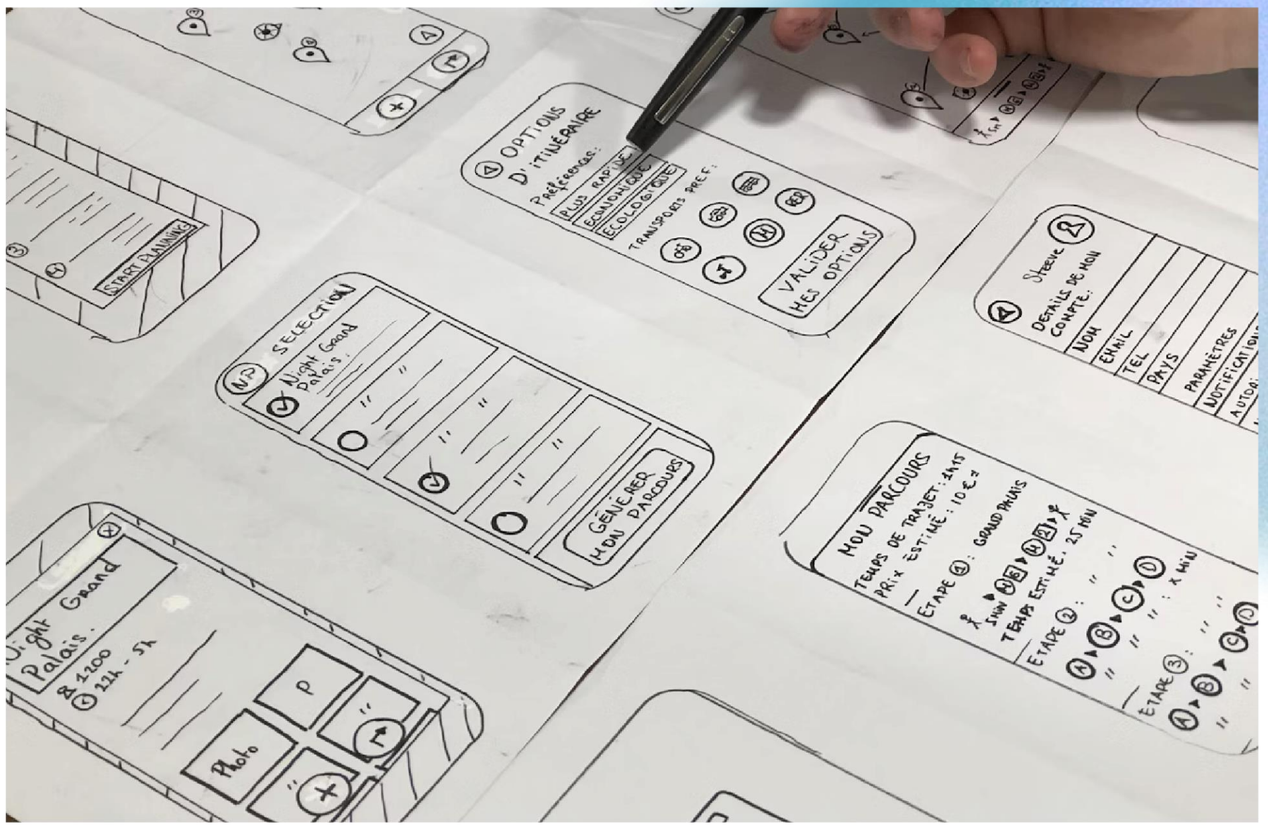
Lecture 2.1

The Logic of Design Thinking

In short,
design thinking enables creative problem-solving in the face of uncertainty through a flexible cycle of exploring, prototyping, and learning.

That's why it's now **used far beyond design**—from business to social innovation—as teams and organizations adopt a designer's mindset to drive human-centered innovation.



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Lecture 2.2

Empathy & Problem Framing

The first step in design thinking is empathy—and it's what keeps the whole process truly human-centered. **Empathy means putting yourself in your users' shoes and trying to see the world through their eyes.**

In practice, empathy asks us to park our own assumptions and tune into **users' feelings, motivations, and needs.** We talk to people, observe them in their real contexts, and **collect insights from their everyday routines.**

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Lecture 2.2

Empathy & Problem Framing

Why is empathy so critical? Because without it, designers often define the problem through their own lens or faulty assumptions. **Empathy** helps a designer set aside subjective biases and **frame the problem with a user-centered lens.** That way we avoid the biggest mistake at the start of any design process: **trying to solve the wrong problem.**

There's even a famous saying: **"If I had an hour to solve a problem, I'd spend the first 55 minutes understanding the problem and the remaining 5 minutes looking for solutions"** (often attributed to Einstein).

Problem framing is the process of discovering what the real, worth-solving problem actually is. Early in a project, the true issue is often fuzzy or hidden; stakeholders may have misdefined it from the outset.

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Lecture 2.2

Empathy & Problem Framing

Findings from the empathy phase set the foundation for the next step, **the Define stage.** Here the team synthesizes user needs and insights to craft a problem statement or design question. The goal is to establish a point of view that clarifies the **design's target.** A problem statement is often a single sentence that includes the user, their need, and the key insight—for example: **"X needs to ___ because ___."**

This ensures the team stays focused on the right challenge before jumping to solutions. In design thinking, getting the problem definition right is as important as solving it—if not more. As the BYU Design Review puts it: **"The essence of design is to reframe the problem, not just solve it. First learn what the real problem is; don't accept the current framing without questioning it."**

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Lecture 2.2

Empathy & Problem Framing

For example, think about a common complaint: a whole building of people saying the elevators are too slow. An engineer might label this a technical **“elevator speed problem”** and hunt for a faster motor or a better algorithm. A designer using an empathy lens would frame it as a human experience: **“People are getting bored and feel they’re wasting time while waiting.”** Now the problem becomes **“the boredom of waiting for the elevator.”**

Unsplash I Hermes Rivera

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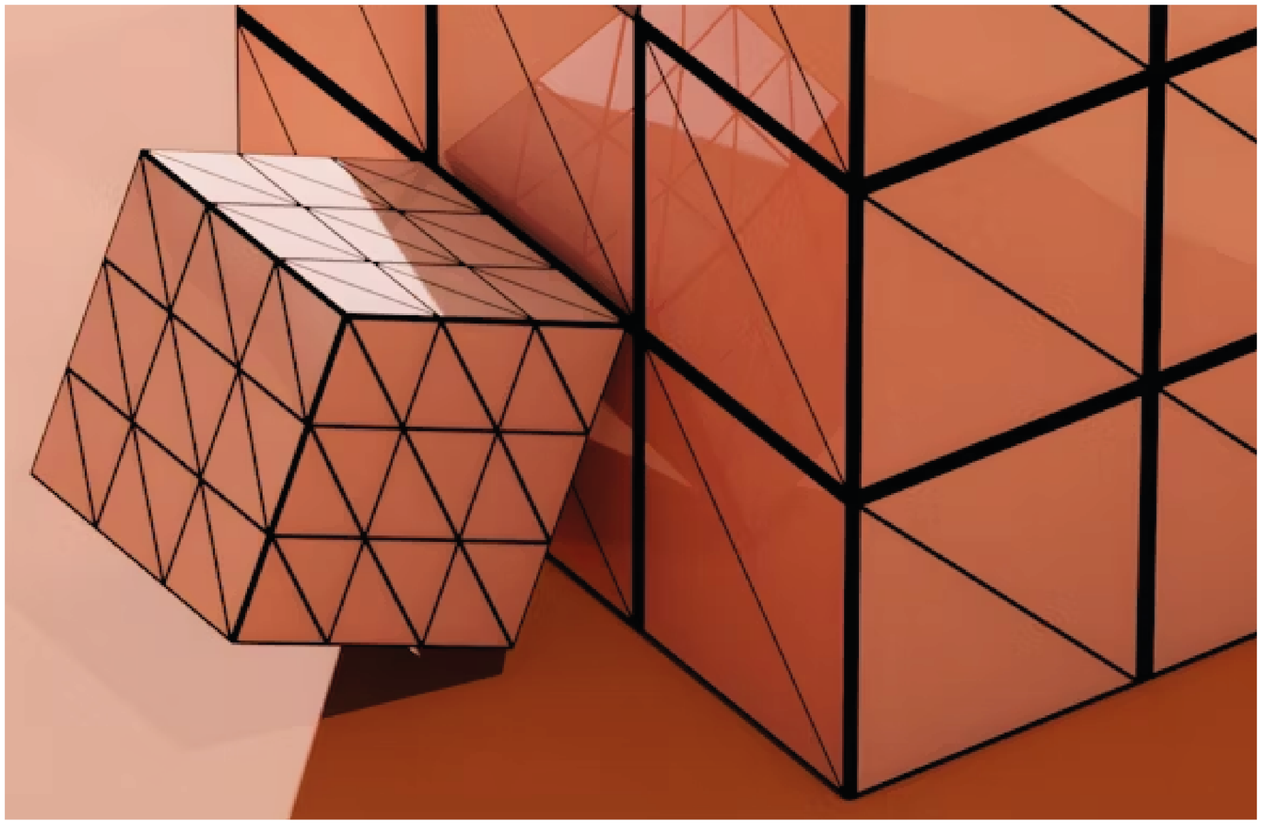
Lecture 2.2

Empathy & Problem Framing

In this new frame, opportunity-driven questions pop up—like **“How might we make the waiting experience more enjoyable?”**—and in the classic example the solution wasn’t to speed up the elevator at all, but to add mirrors in the waiting area so people stayed engaged and the complaints stopped.

This shows **how a human-centered,** empathy-led lens can unlock very different—and often more effective—solutions. In short, empathy and a clear problem definition are the foundation of human-centered design. Insights gathered in the field clarify the scope of the issue and what it means for users, helping the team answer the real question:

“What should we solve?”



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Let’s think this through together:

Pick a simple problem from your own life (for example, being late to work/school in the morning). First, define the problem from your own point of view. Then, using empathy, reframe it from the perspective of another person involved in the situation (e.g., someone you live with).

Pay attention to how the definition changes.
This exercise helps you experience how different perspectives reshape the problem frame.

Lecture 2.3

Ideation & Creativity Techniques

Following the problem-definition stage, the design thinking process moves into **ideation**. This is a creative phase where the goal is to generate as many diverse solution ideas as possible. The main aim is to expand the potential solution space and uncover innovative, unconventional directions for the problem. In practice, teams often rely on techniques like brainstorming during ideation.

Unsplash I Curated Lifestyle

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Lecture 2.3

Ideation & Creativity Techniques

Brainstorming is a popular technique for generating the widest possible list of ideas for a question or problem. To make classic brainstorming sessions work, **a few core rules** have been established. Advertising executive **Alex Osborn** **(who coined the term in the 1950s)** suggested the following to boost creativity:

Non-judgment

during the session no idea is criticized, evaluated, or commented on

Quantity over quality

the more ideas the better—at this stage the aim is volume, not perfection

Build on others' ideas

participants can add to, combine, and remix others' suggestions to create new ones

Freewheeling

encourage wild, out-there ideas

Don't worry about repeats

it's okay if similar ideas come up—don't let duplicates slow the flow

Visualize

whenever possible, write or sketch ideas, use post-its

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Lecture 2.3

Ideation & Creativity Techniques

Beyond brainstorming, structured creativity methods like **SCAMPER** are super useful during ideation. Coined by Bob Eberle and inspired by Alex Osborn's work, SCAMPER is an acronym where each letter prompts a **different way to systematically tweak an existing idea or product**:

S **Substitute:** can we swap out a component, material, person, or process?

C **Combine:** what happens if we merge two or more elements or bring in another concept?

A **Adapt:** can we borrow a solution that works in another context and tailor it to this problem?

M **Modify:** can we change the properties; what if we exaggerate it or strip it down?

P **Put to Another Use:** can we repurpose the idea for a different audience or context?

E **Eliminate:** what if we remove parts—can we simplify by cutting nonessential pieces?

R **Reverse:** can we change the order or flip the process?

For example, take a city's bike-sharing system:

Substitute:	**Combine:**	**Adapt:**	**Modify:**	**Put to another use:**	**Eliminate:**	**Reverse:**
what if we place stations in totally different spots (say, outside cafés instead of bus stops)?	could we integrate bike rentals with public transit cards?	what practices from other cities could we adopt (like the first 30 minutes free)?	what if we switch to electric-assist bikes?	could we also offer guided tourist tours using the same bikes?	what if we remove sign-up hurdles (forms, extra steps) to boost usage?	nighttime ridership is low—what if we introduce off-peak discounts?

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Lecture 2.3

Ideation & Creativity Techniques

“How Might We” Questions (HMW) bridge the gap between problem definition and ideation in design thinking; they shift us from a limiting problem statement to an opportunity-focused mindset and help break a defined challenge into solvable pieces and sub-opportunities. A handy formula is:

“How might we + [action verb] + for [target user] + so that [desired outcome].”

For example, if the problem is “Older adults struggle to use digital banking,” possible HMW prompts could be: “How might we make digital banking easier and safer for older adults so they can handle their finances without difficulty?” and “How might we make banking apps accessible for older users so even those less comfortable with technology can use them confidently?” The power of HMW is that it nudges teams from a **“this is a problem” mindset to a “this is an opportunity” mindset.**

“How” implies there is a solution and gives the team creative confidence; **“might”** signals flexibility and experimentation—ideas may or may not work, and that’s okay; **“we”** emphasizes collaboration and building on each other’s thinking.

As Tim Brown explains:
the “how” part instills confidence that a solution exists, the “might” part says ideas could work or not and that’s fine, and the “we” part says we’ll do it together and build on one another’s ideas. HMW turns insights from the Define phase into doors that open directly into brainstorming—essentially reframing the problem into a “Could we achieve X by doing Y?” format.

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Let's put this into practice:

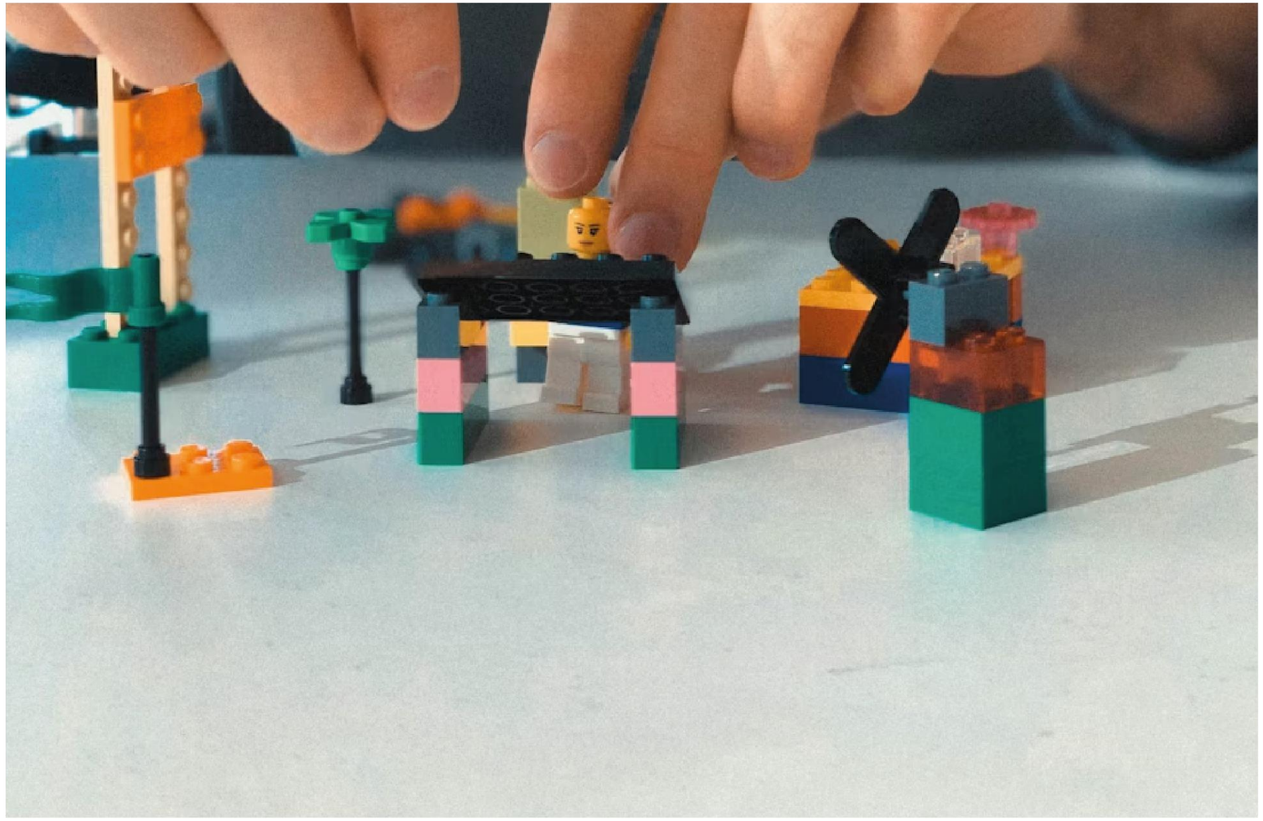
Take a problem from your daily life (it could be the one you defined in Lecture 2.2) and write 2–3 "How might we…" questions about it. For example, if your problem is "I'm late for work in the mornings," your HMWs might be "How might we make leaving the house on time in the morning easier?" or "How might we turn waking up to the alarm into a fun experience?"

Notice how these prompts shift your mindset—from focusing on the problem to spotting opportunities.

Lecture 2.4

Prototyping & Testing Basics

Ideas from ideation only become real solutions when they're made workable and validated by users. That's why the next step in design thinking is **prototyping and testing.** A prototype is a **quick,** tangible model or experiment that brings a concept to life—it doesn't need to be a full copy of the final product or service; it can simply represent specific aspects we want to explore. Testing is the process of evaluating those prototypes—ideally with real users, or at least within the team—**to gather feedback and learn what to improve.**



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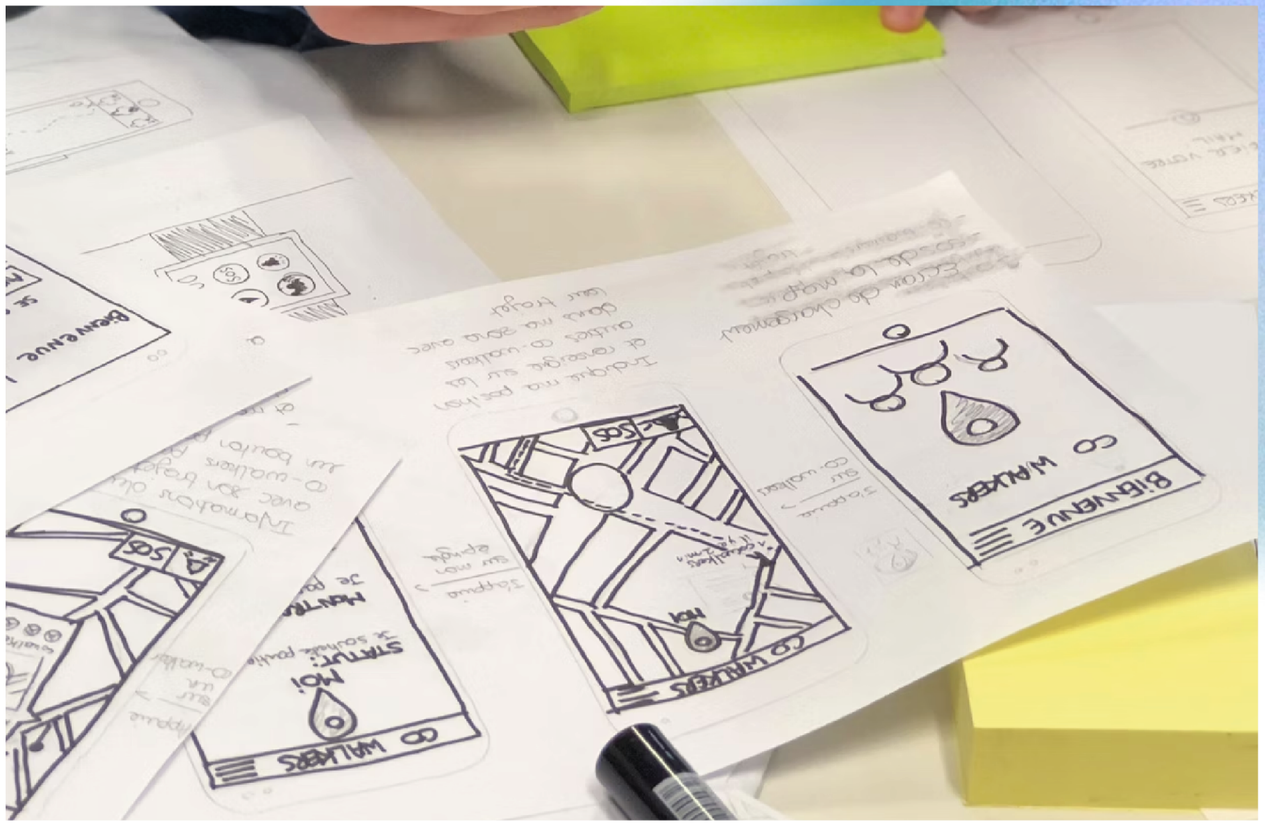
Lecture 2.4

Prototyping & Testing Basics

Prototypes pull our ideas off the page and into the real world, where we can get feedback that actually matters. Prototyping lets teams **“fail early, learn early”—the whole “fail early, succeed sooner”** mantra—so we can spot flaws or gaps on a small model before we pour big resources into building the whole thing. As David Kelley puts it, the point of prototyping is to experiment—making something forces you to ask questions and make choices. In practice, building a prototype prompts the team to ask, **“What would it take to make this real?”** and turns uncertainty into something we can test.



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Lecture 2.4

Prototyping & Testing Basics

In prototyping, mistakes—and even **“failed” prototypes—are not just okay; they’re expected and useful, because every failure is a safe learning opportunity.** Many prototypes flop and send the team back to the drawing board, and that’s precisely the point: early, low-cost failures act like a lifesaver, preventing waste of time, money, and resources. In other words, discovering early that an idea doesn’t work gives you a chance to fix it.

Unsplash I Zhouxing Lu

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Lecture 2.4

Prototyping & Testing Basics

Prototypes are generally grouped by fidelity—how closely they resemble the final product—into low-fidelity and high-fidelity.

Low-fidelity (low-fi) prototypes are simple, quick, and light on detail. Think rough **paper sketches, a UI mocked up with post-its, roughly cut cardboard models, or a fast digital wireframe.** They're often black-and-white or hand-drawn with limited interactivity. The goal isn't polished visuals or exact features, but to quickly test the core concept or user flow. For example, you might use a paper prototype to try out an app's screen transitions and menu structure—letting someone "navigate" by moving between paper screens to experience the flow.

High-fidelity (hi-fi) prototypes look and feel a lot like the final product and usually include detailed visuals and **interactivity—colors, real content, high-resolution graphics, clickable buttons, even animations.** The goal is to give users an experience that's as close to the real thing as possible. For example, a hi-fi mobile app prototype would show full screen designs, and when a user taps a button it takes them to the next screen—potentially with transition animations, too.

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Lecture 2.4

Prototyping & Testing Basics

A designer can spend a lot of time when working in detail on a high-fidelity prototype—for example, designing screens with pixel precision—and if fixing an issue that surfaces there requires major changes, a lot of effort gets wasted. Designers can also get carried away with visual polish or animations and drift from core usability goals, burning time; in short, chasing the **“perfect prototype”** can stretch the timeline.

In most design processes, you start by testing ideas quickly with low-fidelity prototypes to tackle the basics, then step up fidelity gradually: show a paper prototype to five or six users and collect feedback (spotting usability issues or points of confusion), move to a more developed digital prototype and test again, and finally run final validations with something that feels almost like the real product. That way, through **try fast – learn – refine cycles,** the product steadily matures.

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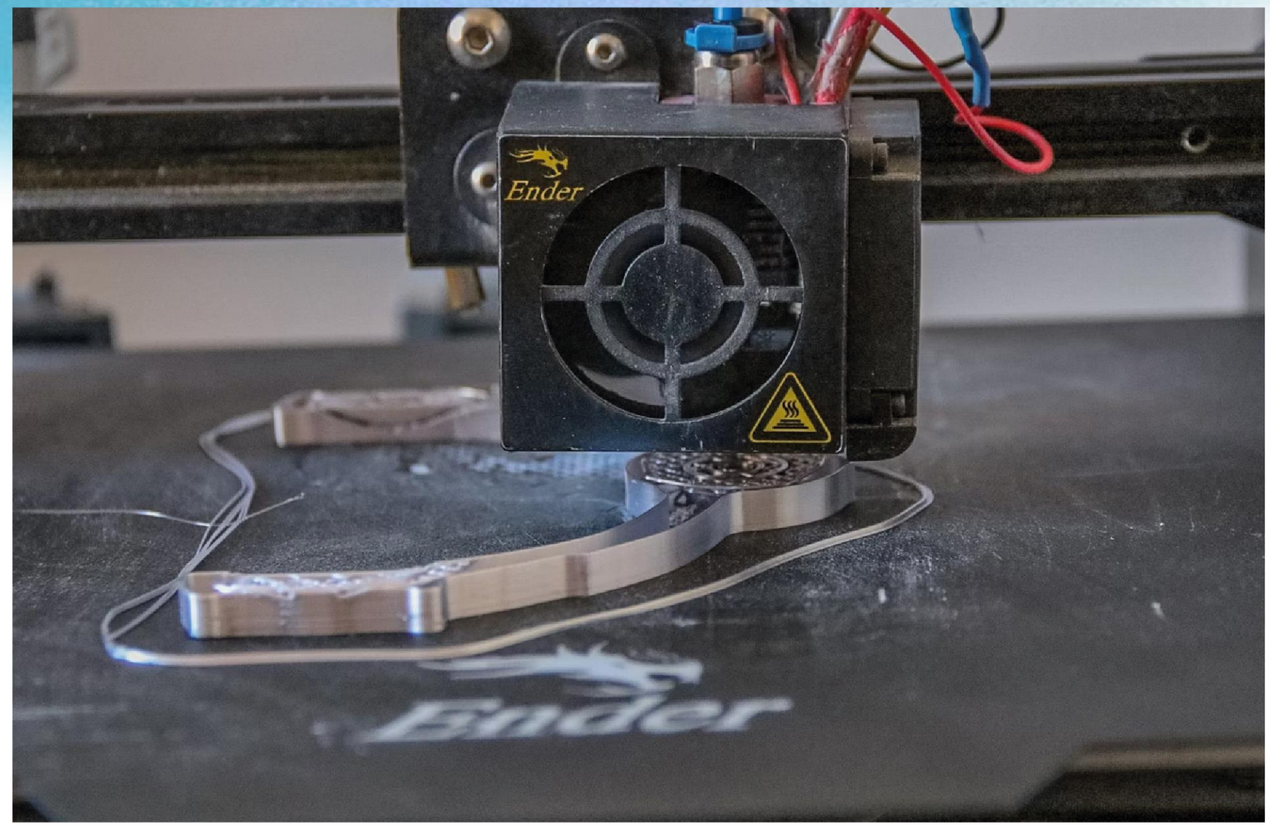
Lecture 2.4

Prototyping & Testing Basics

In design thinking, the culture around prototyping and testing is basically **“don’t be embarrassed by mistakes—learn from them.”** Prototypes force us to ask, **“Does this idea actually work for users, and where does it stumble?”** and testing gives us the answers. The key is to run tests with real users whenever possible and listen openly to their feedback. Sometimes the insights you uncover mean you need to redefine the original problem itself. For example, if people testing your app prototype reveal they see the problem differently than you assumed, it may be time to go back and update the problem statement.

That flexibility is built into design thinking: every test result can send you back to any earlier stage—reframing the problem, generating new ideas, and iterating forward again.



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Let’s try this right now:
Pick one idea from your ideation session and make a quick low-fidelity prototype. If it’s an interface, sketch the screens on paper; if it’s a service, write a simple scenario; if it’s a physical product, mock it up with LEGO or cardboard. Then test it yourself—walk through it step by step like a user—or show it to a friend and ask them to complete a task.

What did you learn? What signals did this simple prototype give you about how to improve the idea? This exercise helps you feel how prototyping speeds up your thinking and sharpens your next move.

Lecture 2.5

Participatory Design Approaches

Design thinking is often described as a human-centered process—designers put the user at the core and build empathy to craft solutions on their behalf. Participatory design takes that a step further by turning users and stakeholders into active partners in the process. **Born in Scandinavia in the 1970s,** it first gained visibility through democratic practices like workers and managers **co-designing new workplace systems.** Today, participatory design shows up everywhere from urban planning to software, and it means the people affected by what's being designed take part meaningfully. In simple terms, it's a family of methods where end users actively participate: they don't just share needs and step aside; they co-create with the team and **have a voice in decisions.**

Participatory processes not only produce solutions that fit people's needs, they also build participants' design skills and confidence. When a community is involved in designing its own solutions, capacity and a sense of ownership grow—people move **from being the "objects" of design to becoming its subjects.**

Unsplash I Héctor J. Rivas

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Lecture 2.5

Participatory Design Approaches

Benefits (Advantages):

Solutions that fit needs and gain adoption:

The biggest upside of participatory design is that outcomes are far more likely to match people's real needs. Because users are in the process, they bring the details designers might miss—cultural nuances, everyday practices, workarounds—so the final product or service aligns closely with reality. People also own what they help create, so they're more inclined to use it and less resistant to change.

Empowerment and capacity building:

Participants don't just walk away with a design; they learn and gain confidence. Along the way they build skills in problem-solving, teamwork, and creative thinking. In workshops with disadvantaged communities, people often realize "I can help design the solution," feel heard, and become more civically engaged. In healthcare, for instance, when both doctors and patients take part, patients share lived experience and co-create fixes while clinicians deepen their empathy.

A richer pool of ideas and perspectives:

When you bring different stakeholders together, you get a multi-voiced environment that goes beyond any single discipline—and that boosts innovation potential. Users can surface creative ideas designers might never consider; designers can then shape and develop those ideas. In practice, collective intelligence is usually richer than any one expert's view. Co-designing leads to more innovative and inclusive solutions precisely because it blends perspectives.

Greater acceptance and implementability:

Because stakeholders are involved from the start, the worry of "Will end users accept this?" largely fades by the time the project ships. People have already contributed their ideas.

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Lecture 2.5

Participatory Design Approaches

Challenges (What to watch out for):

Time and cost:

Participatory design often takes longer and needs more resources than a traditional process. Bringing diverse stakeholders together, hearing their ideas, and building common ground takes patience—think meetings, workshops, and the logistics that enable full participation (transport, food, childcare, etc.).

Power dynamics and participation quality:

Inviting everyone to the table doesn't guarantee equal voice. If power imbalances aren't managed, louder participants can dominate. Sessions need careful facilitation to create a safe space where all voices are heard. Tactics like gamified activities, small-group breakouts, and anonymous voting help. If the group is diverse in age, gender, culture, or language, plan extra support to bridge communication gaps.

Expectation management:

When people contribute, expectations naturally rise—"If they asked for my input, I'll see it in the outcome." If constraints (budget, technical limits) lead to different decisions, disappointment can follow.

Not always appropriate:

In urgent crises (e.g., disasters, pandemics) you sometimes need rapid decisions; long, multi-stakeholder codesign isn't feasible. In highly specialized, technical domains, the scope for lay input may be limited.

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Example:
Participatory Urban Design in Barcelona
BARCELONA'S SUPERBLOCKS

City Changers, Michele Castrezzati

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BARCELONA'S SUPERBLOCKS

City Changers, Michele Castrezzati

Hands-on Role-Play: Let's Co-Design a Square —
To experience participatory design, imagine this quick role-play: there's a small underused square in your neighborhood and the city wants to revitalize it. A participatory workshop has been set up and you're invited.

Pick a role:
-a local resident (citizen),
-a city planner/municipal official, or a designer/architect.

Grab paper and a pen—or, if you're a group, each person takes one role—and generate ideas for the square from all three perspectives. What does the resident want to see (green space, benches, maybe a small market)? What constraints and goals does the official bring (budget, safety, ease of maintenance)?

What creative solutions can the designer propose (modular seating, rainwater-harvesting features, etc.)? Run a short brainstorm together; let each role share ideas, then combine them into a single concept sketch for the square. This is a mini simulation of a multi-disciplinary, multi-stakeholder design process. Look at the final sketch: if one person had designed it alone, it probably wouldn't be this inclusive. That's the point of participatory design—by designing together, we get to better outcomes together.

Unsplash | Muzammil Soorma

Unsplash I jake grella

In this module, we looked at the logic of design thinking (2.1) through a human-centered lens and connected the pivotal role of empathy in framing the right problem (2.2) to insights from the field; then we opened up opportunity spaces with “How might we…?” prompts and systematized creative thinking using techniques like brainstorming and SCAMPER (2.3). We saw why moving from low- to high-fidelity prototypes and running test cycles is the strongest engine for “learning early,” bringing ideas to life quickly and learning with users (2.4). Finally, we discussed how participatory approaches that make communities co-creators—like Barcelona’s Superblocks—boost adoption, inclusivity, and sustainability (2.5).

In short, aligned with New European Bauhaus values, beauty, sustainability, and inclusivity come together in a holistic design practice that starts with empathy, expands with HMW, learns through prototyping, and matures through co-creation. I invite you now to take a one-minute pause in your own context and jot down (i) whose perspective you’ll use to reframe the problem, (ii) two HMW questions you’ll ask, and (iii) a quick low-fidelity prototype you’ll sketch right away—because “green skills” for our common future grow only in a collaborative, iterative, and evidence-based design culture.

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