

BEYOND
CIRCULAR
DESIGN

SKILLS
FOR SYSTEMIC
CHANGE

Colophon.

Circular Design Training Program

LAB University Of Applied Sciences
LAB.FI

ESTONIAN DESIGN CENTRE
DISAINIKESKUS.EE

DESIGN & ILLUSTRATIONS
ANDRESSA MORO

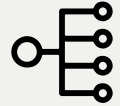


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Index

BDC: Skills for systemic change

01 Systems			1
02 People			2
03 Business			3
04 Design Field			4
05 Design Process			5

Curriculum

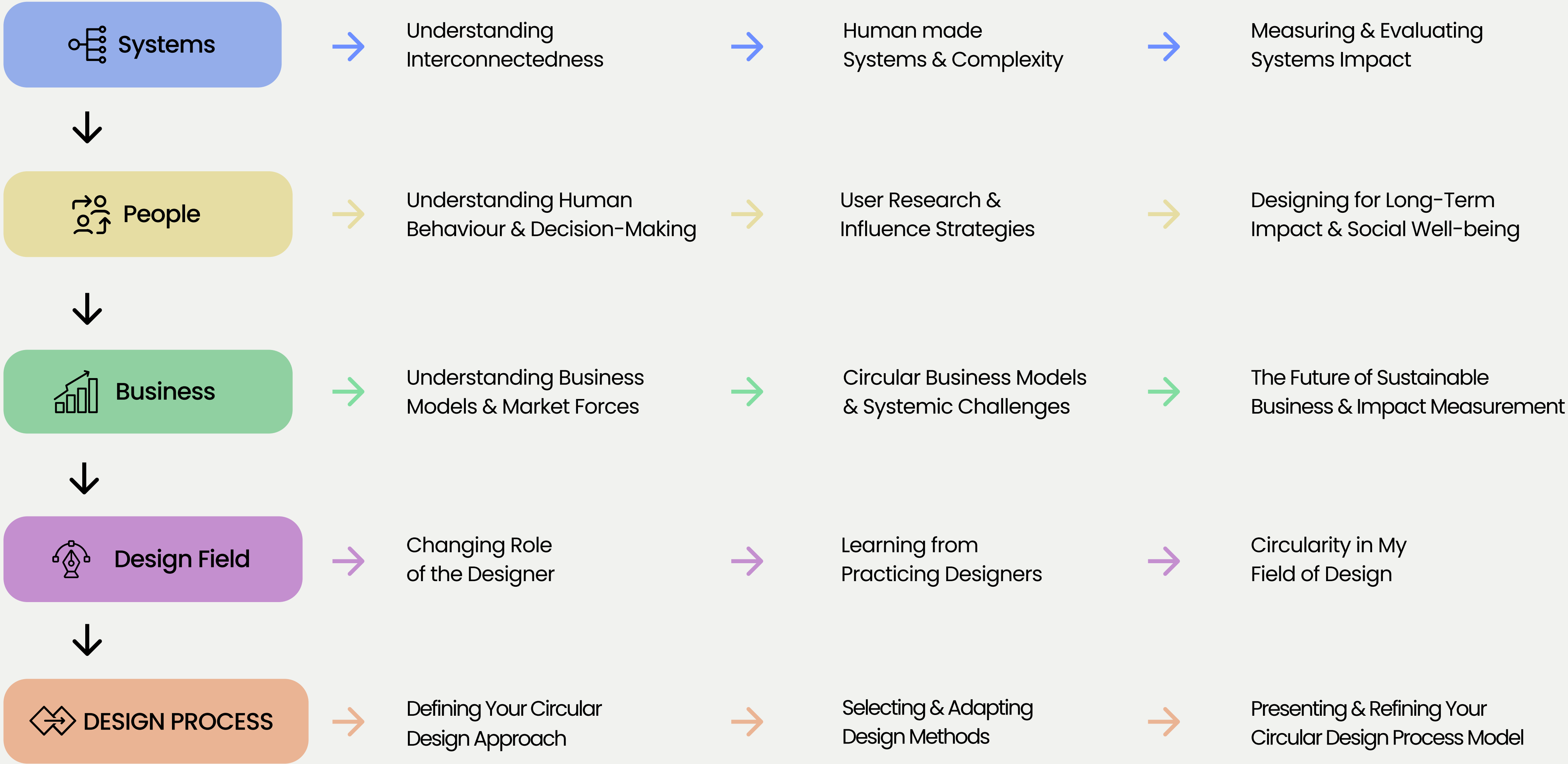
The curriculum aims to equip designers to evolve into circular design leaders within their respective industries. It focuses on understanding the shifting role of designers, learning from those already implementing circular design principles, and effectively integrating circularity into specific design fields. It also seeks to empower designers to navigate obstacles, capitalize on opportunities, and drive the transition towards a circular economy. Ultimately, it promotes the development of future-oriented design skills.

Designers today face the urgent challenge of creating solutions that are not only circular but also ecologically responsible and aligned with our planet's limits. This course facilitates a perspective shift—from problem-focused thinking to a system-level understanding—by embracing sustainability as a holistic, transformative approach.

Rather than focusing solely on the circular economy, this course encourages a broader consideration of ecosystems, biodiversity, planetary boundaries, and long-term resilience. Through five interconnected modules—**Systems, People, Business, Design Field, and Design Process**—participants explore how design can respond to ecological limits, human behaviour, and business realities.

The curriculum challenges participants to move beyond human-centred design and adopt a planet-centred mindset, fostering inclusive, adaptive, and regenerative design processes.

This comprehensive approach equips designers to integrate systems thinking, behavioural insights, and regenerative business models directly into their real-world practice, redefining their role in shaping a future that supports both human and planetary well-being.

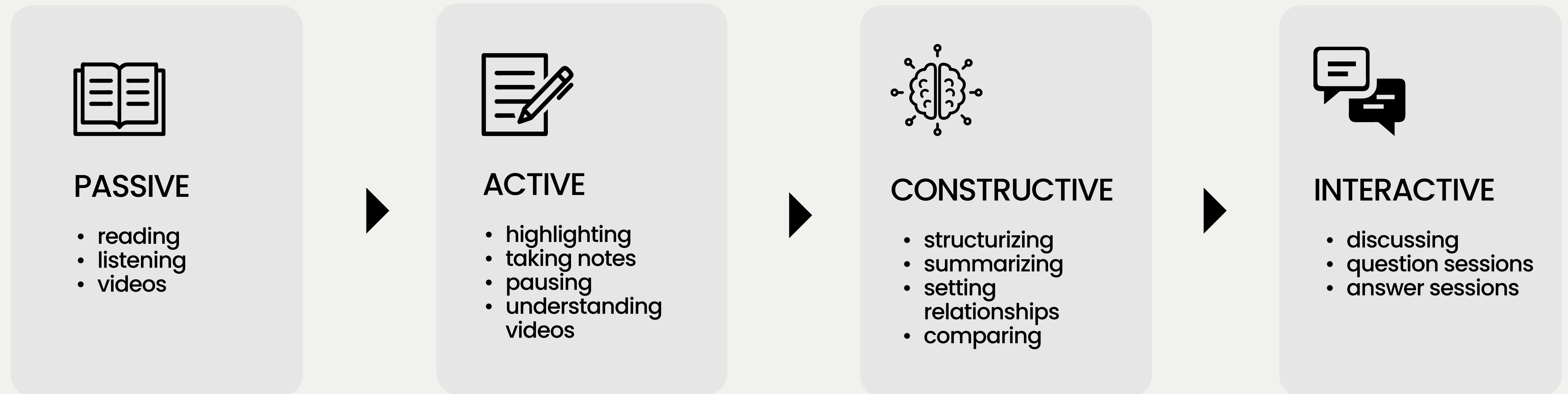


How do we learn?

The ICAP framework aligns with how the human brain learns by encouraging active and constructive engagement with information, which is crucial for building robust neural connections. Our brains are not passive recipients of information; they learn best when they actively process, organize, and connect new concepts to existing knowledge. The ICAP model, which stands for Interactive, Constructive, Active, and Passive, recognizes this by proposing that learning is most effective when students are interactive and constructive.

In essence, the ICAP framework provides a clear structure for designing learning experiences that move beyond passive consumption to the kind of active, constructive, and interactive engagement that mirrors the brain's natural and most effective learning processes. This course material also encourages using the productive failure design and delayed expert knowledge to actually reach the bottom layers of icebergs for professional growth and new layers of insight.

ICAP FRAMEWORK



ADAPTED FROM CHI, (2009)
<https://doi.org/10.1080/00461520.2014.965823>

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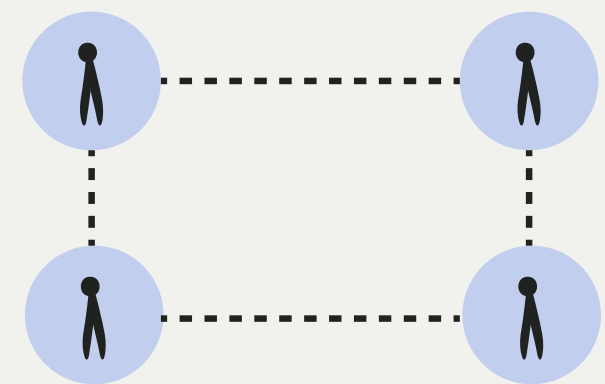
SYSTEMS

The world is built on natural, social, and technological interconnected systems. Designers must move beyond focusing on individual problem and consider how things function within larger systems. This module introduces systems thinking as a core skill for sustainable design, helping designers create solutions that work within ecological, social, and economic boundaries.

This module explores designing for systems, beginning with an ecological foundation that emphasizes natural systems, interconnectedness, and environmental sustainability. It then applies systems thinking to human-made systems, analysing their complexities, material flows, and unintended consequences. The module also provides methods for evaluating the impact of system-level interventions, examining governance, policy, and tools for assessment and adaptation.

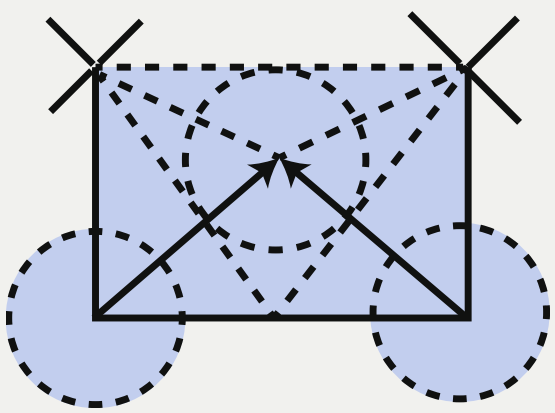
Understanding Systems

ORDER & CONTROL



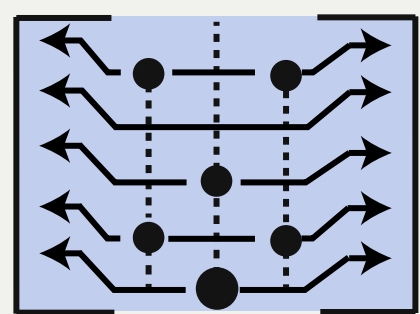
The world is neat, measurable, and fixable. Problems have single causes—and simple solutions. But blind to hidden connections.

NESTED COMPLEXITY



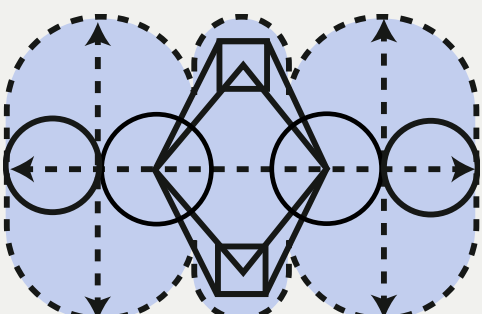
This view sees systems within systems. Complexity grows—but it can be understood and managed if we look closely enough.

FRACTURED SYSTEMS



There's no single truth—only fragments. Different groups see different systems. Nobody shares the same picture of the problem.

ENTANGLED HYBRIDITY



Everything is tangled with everything else. No pure categories. Systems are messy, alive, unpredictable.

(1.1) BASICS OF ECOLOGY

Understanding Interconnectedness

Understanding natural systems, their interconnectedness, and ecological sustainability.
The need to shift from linear to circular thinking. The necessity of working with planetary boundaries
Nature as an efficient, self-regulating system

What

1. Ecosystem Dynamics:

How ecosystems function, including the flow of energy and matter

2. Trophic Levels & Food Webs :

The relationships between producers, consumers, and decomposers in an ecosystem.

3. Resilience & Adaptation :

How ecosystems recover from disruptions and adapt over time.

4. Material & Energy Flows :

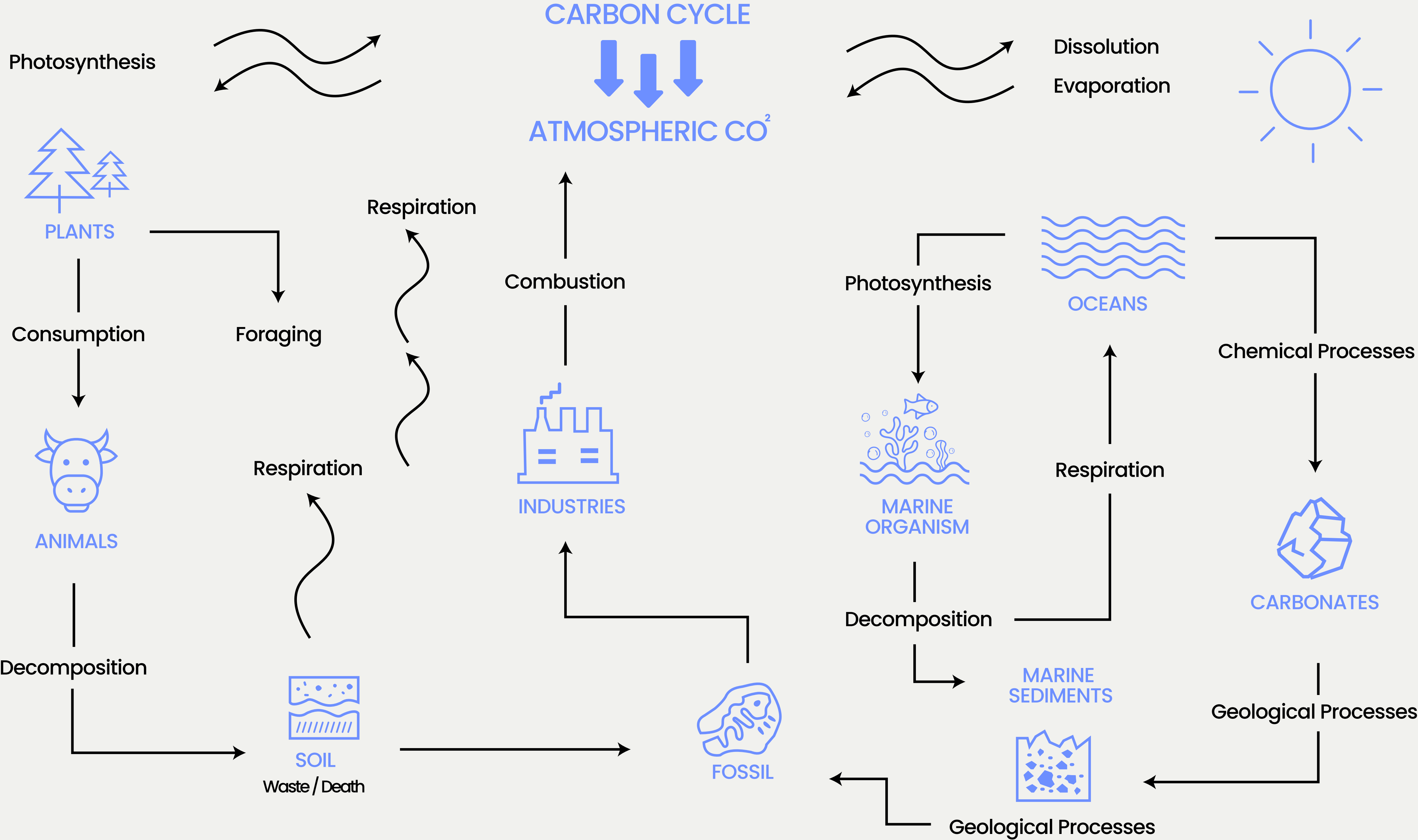
Understanding nutrient cycles (carbon, nitrogen, water)

How

- 1. Systems Thinking in Ecology:**
Identifying feedback loops and dependencies in nature.
- 2. Ecosystem Mapping :**
Creating visual models of energy and material flows in a given ecosystem.
- 3. Biomimicry & Bio-Inspired Design:**
Studying natural systems to apply similar principles in human design

Learning outcomes

1. Know what sustainability is from an ecological perspective
2. Be able to measure impact by analyzing ecological interconnections
3. Understand how systems thinking applies to natural systems
4. Define and draw material flows in nature (nutrient cycles, carbon cycle)



(1.2) BASICS OF ECOLOGY

Human-Made Systems and Complexity

Analysing the complexities, material flows, and unintended consequences of human-made systems.

Why?

1. The increasing complexity of global challenges (climate, economy, tech)
2. The need for systems awareness in decision-making
3. Understanding the impact of interconnected decisions
4. From analysis to synthesis
5. Complex Systems & Emergence – How human systems develop, grow, and adapt similarly to ecosystems.
6. Unintended Consequences – Why interventions in systems often create unforeseen challenges (e.g., traffic congestion paradox)

What?

1. Circular Economy Principles:

The shift from linear (take-make-waste) to circular (reuse-repair-recycle) systems

2. Urban Metabolism:

Cities as living organisms with inputs (resources) and outputs (waste, emissions).

3. Industrial Symbiosis:

How businesses can work together like ecosystems, exchanging waste as resources.

How?

1. Causal Loop Diagrams (CLDs):

Showing reinforcing and balancing feedback in human systems.

2. Visualizing Systems & Connections:

Using diagrams and info design to map how components of a system relate.

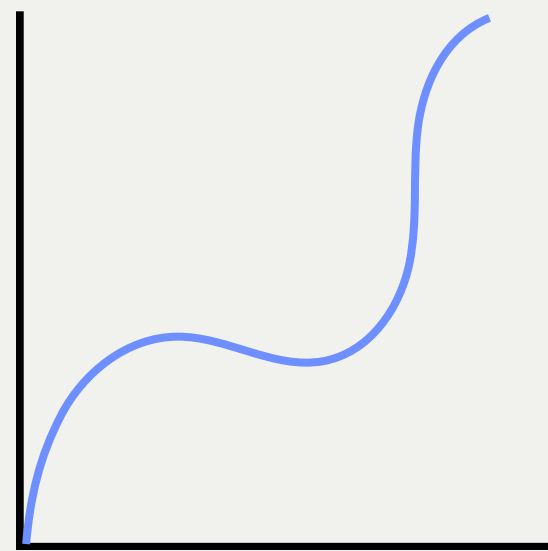
3. Network Mapping:

Identifying key actors, dependencies, and leverage points in a system.

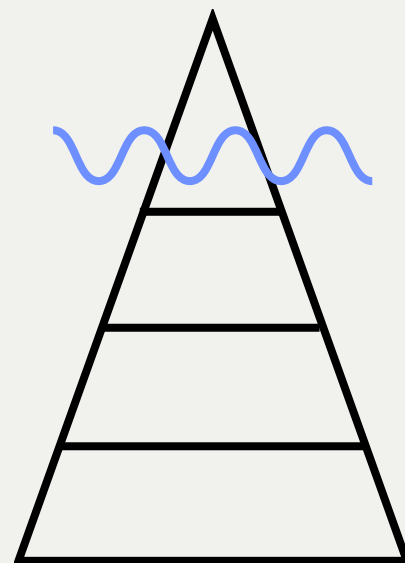
Learning outcomes

1. Understand how systems thinking works in human-made environments
2. Analyse material flows in industrial and social systems
3. Be able to justify the need for a systematic approach in design
4. Identify and apply the right tools for mapping and intervention

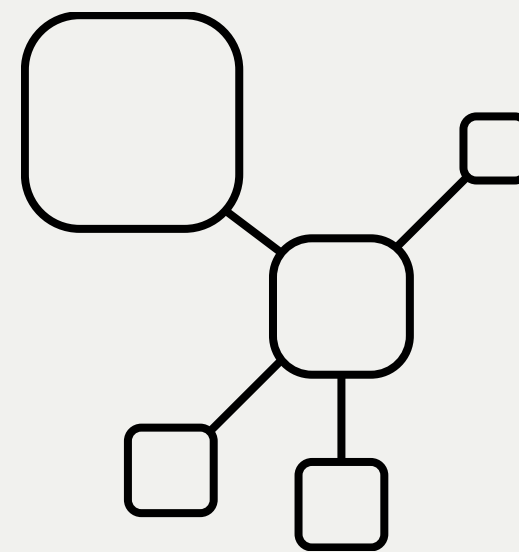
TYPES OF SYSTEM MAPPING



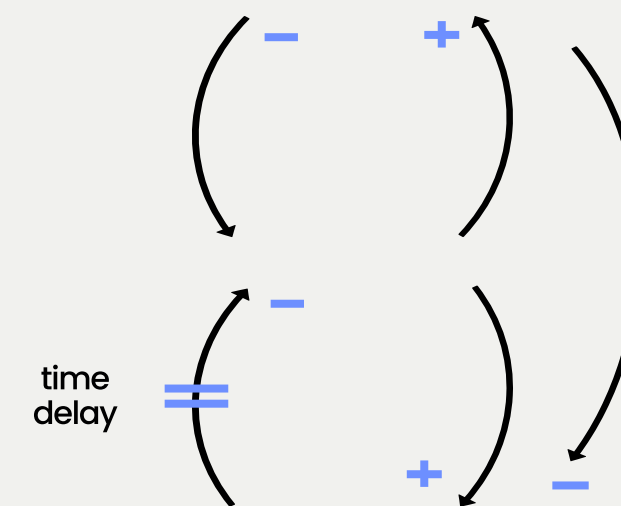
BEHAVIOUR OVER TIME



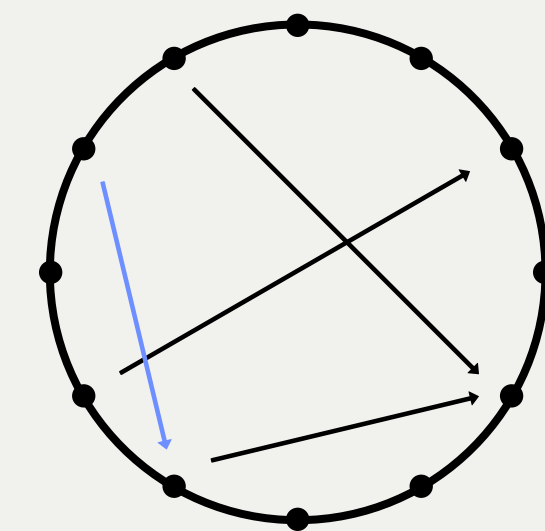
ICEBERG MODEL



CLUSTER MAP



CASUAL LOOP
DIAGRAM



CONNECTED CIRCLES

ADAPTED FROM DISRUPT DESIGN, (2017)

(1.3) BASICS OF ECOLOGY

Measuring & Evaluating System Impact

Evaluating the impact of system-level interventions, examining governance, policy, and tools for assessment and adaptation. The challenge of long-term systemic change, the role of policy and incentives in shaping systems and the need for adaptable, resilient solutions in governance and society.

What?

- 1. Life Cycle Thinking:**
Understanding the total environmental impact of a product/system from extraction to disposal.
- 2. Sustainability Metrics & Indicators:**
Defining what sustainability means in measurable terms.
- 3. Uncertainty & Data Limitations:**
The challenge of making decisions with incomplete or imperfect information.
- 4. Regulatory Frameworks:**
Overview of EU tools and sustainability policies affecting design decisions.
- 5. Interpreting Impact Data:**
How to translate carbon footprints, energy usage, and material flows into meaningful insights.

How?

1. Life Cycle Assessment (LCA):

Showing reinforcing and balancing feedback in human systems.

2. Material Flow Analysis (MFA):

Using diagrams and info design to map how components of a system relate.

3. Bill of Materials (BOM) Mapping:

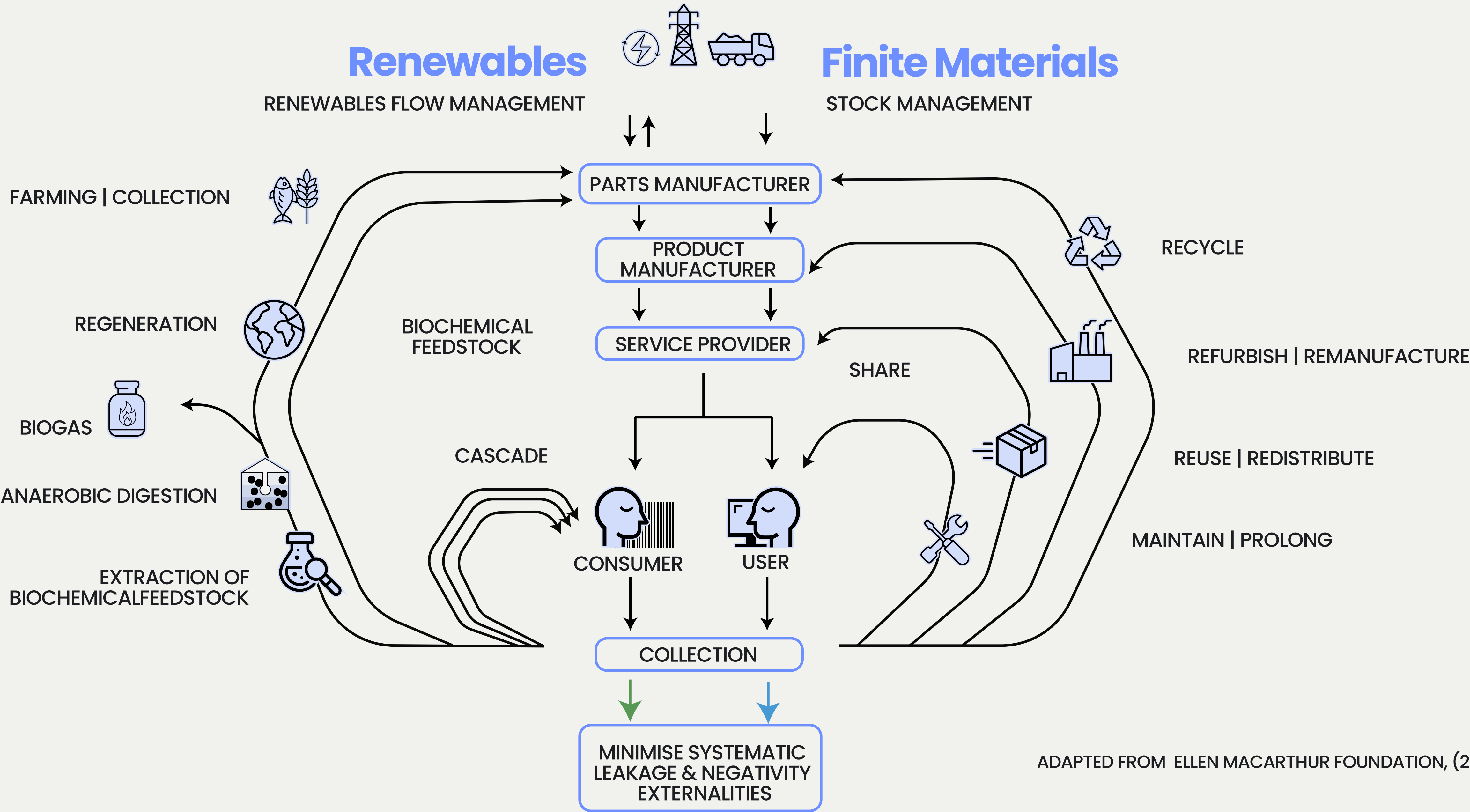
Identifying key actors, dependencies, and leverage points in a system.

4. Critical Tool Evaluation:

Comparing existing sustainability measurement tools and identifying their strengths/weaknesses.

Learning outcomes

1. Be able to analyze system-level interventions (e.g., carbon taxes, urban planning)
2. Understand how systems are managed and governed (policies, incentives, regulations)
3. Apply methods for forecasting change and adapting systems over time



ADAPTED FROM ELLEN MACARTHUR FOUNDATION, (2012)

(02)

PEOPLE

Design does not exist in isolation—it shapes and is shaped by human behavior, biases, and cultural context. Understanding how people think, decide, and act, including psychological, social, economic, and contextual factors, is essential for creating compelling and impactful solutions.

This module explores the critical role of human behavior, biases, and cultural context in design. It gives students the knowledge and skills to understand how people think, decide, and act. It enables them to create effective and impactful solutions that promote long-term behavior change and social well-being. The module provides methods and skills to understand why people behave the way they do identify and map user behaviors and their connection to needs and environments, and apply behavioral models to design challenges.



(2.1) PEOPLE

Introduction to Human Behaviour in Design

Understand why people behave the way they do (cognitive biases, social norms, motivation). Identify and map user behaviours and their connection to needs and environments. And, apply behavioural models (COM-B, heuristics) to design challenges.

Why?

1. Current crises are humans problem – from good intention to action.
2. Need the shift in behaviours and to change the norms.
3. Cognitive biases shape habits and choices.

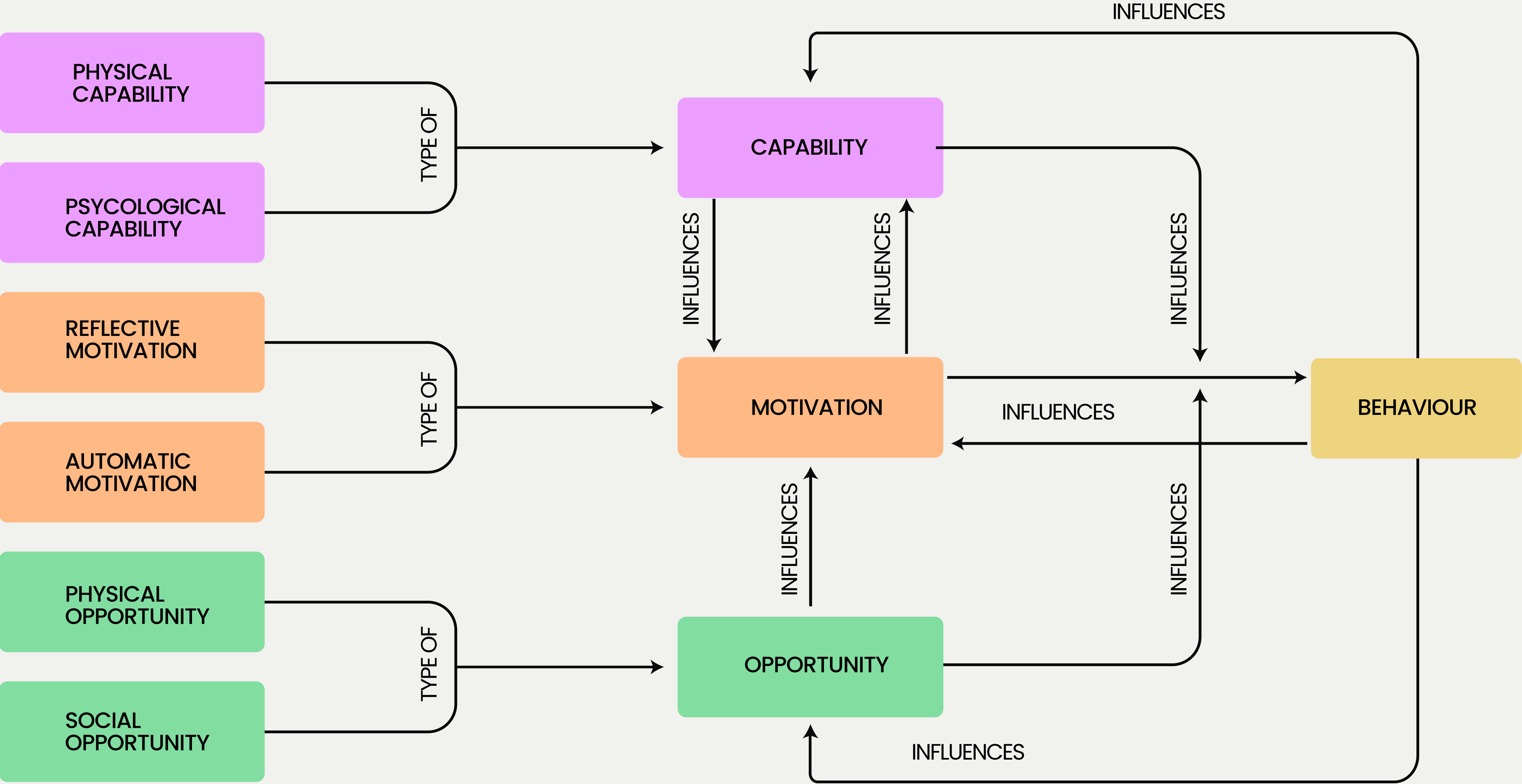
What?

1. The Science of Decision-Making (System 1 & System 2 thinking).
2. Cognitive Biases & Heuristics.
3. Cultural Norms & Social Influence.
4. Behavioural Patterns & Motivation.

How?

1. COM-B Model.
2. Behaviour Mapping.
3. Empathy Mapping.

COM-B MODEL



(2.2) PEOPLE

User Research & Influence Strategies

Understand how to conduct user-driven research and analyse findings. Recognize how cultural differences and social norms affect behaviour. Apply gamification, nudging, and influence techniques responsibly.

Why?

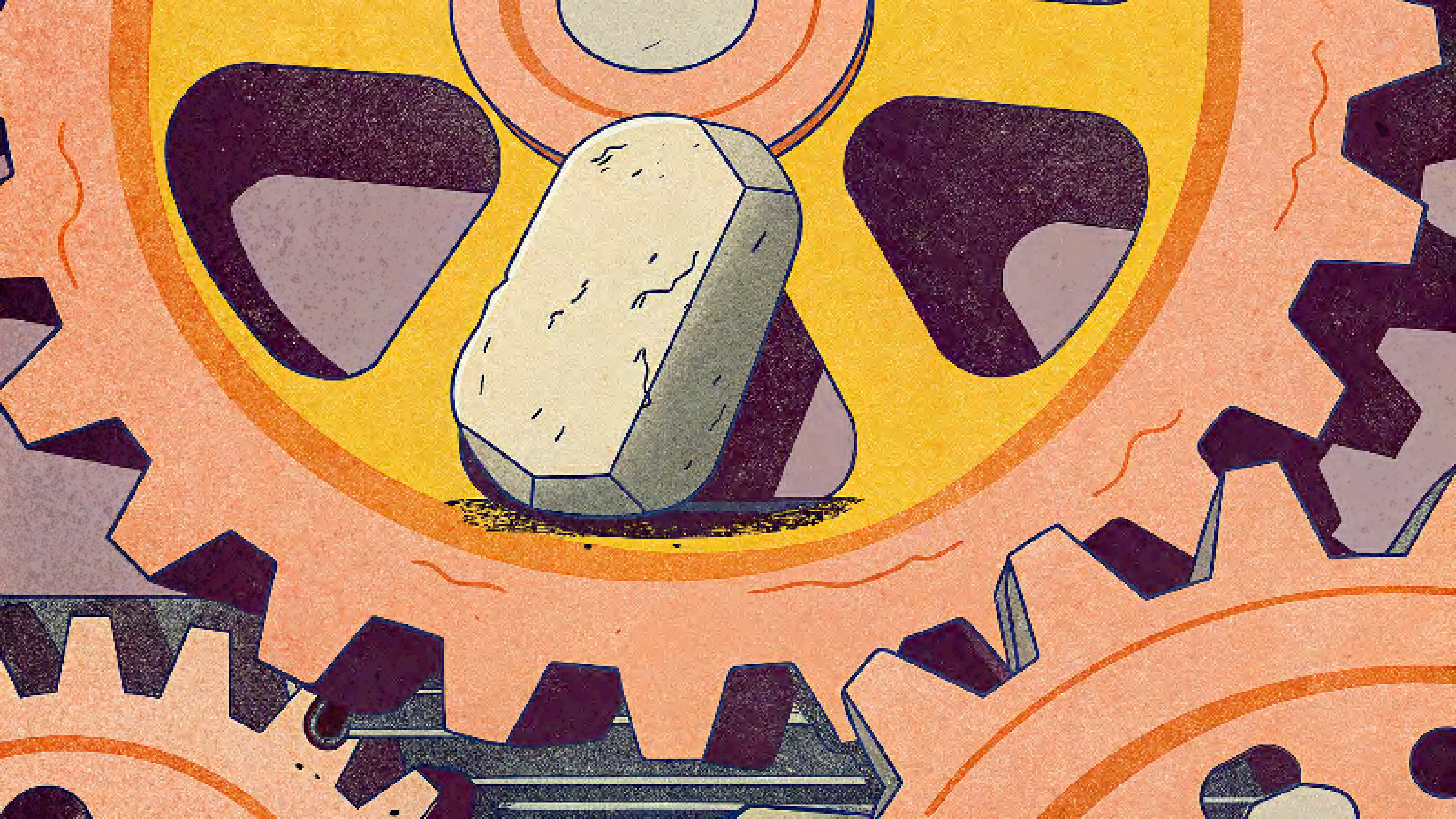
1. How to make sustainability sexy.
2. Ethics. Nudging vs manipulation.
3. Social contexts in development.

What?

1. User-Centred vs. User-Driven Research.
2. Market & Social Trends (macro, micro, mega trends).
3. How Behaviours Are Sustained or Changed.
4. Ethical considerations of nudging and manipulation.

How?

1. Gamification.
2. Research & User Interviews.
3. Design With Intent (Lockton's Toolkit).



(2.3) PEOPLE

Designing for Long-Term Impact & Social Well-being

Design for long-term behavioural shifts, not just short-term engagement. Justify why influencing user behaviour is necessary for sustainability. Analyse how different eco-crises impact different social groups. Design for social well-being.

Why?

1. The need for lasting solutions.
2. The intersection of social well-being and sustainable design.
3. Sufficiency within earth boundaries.

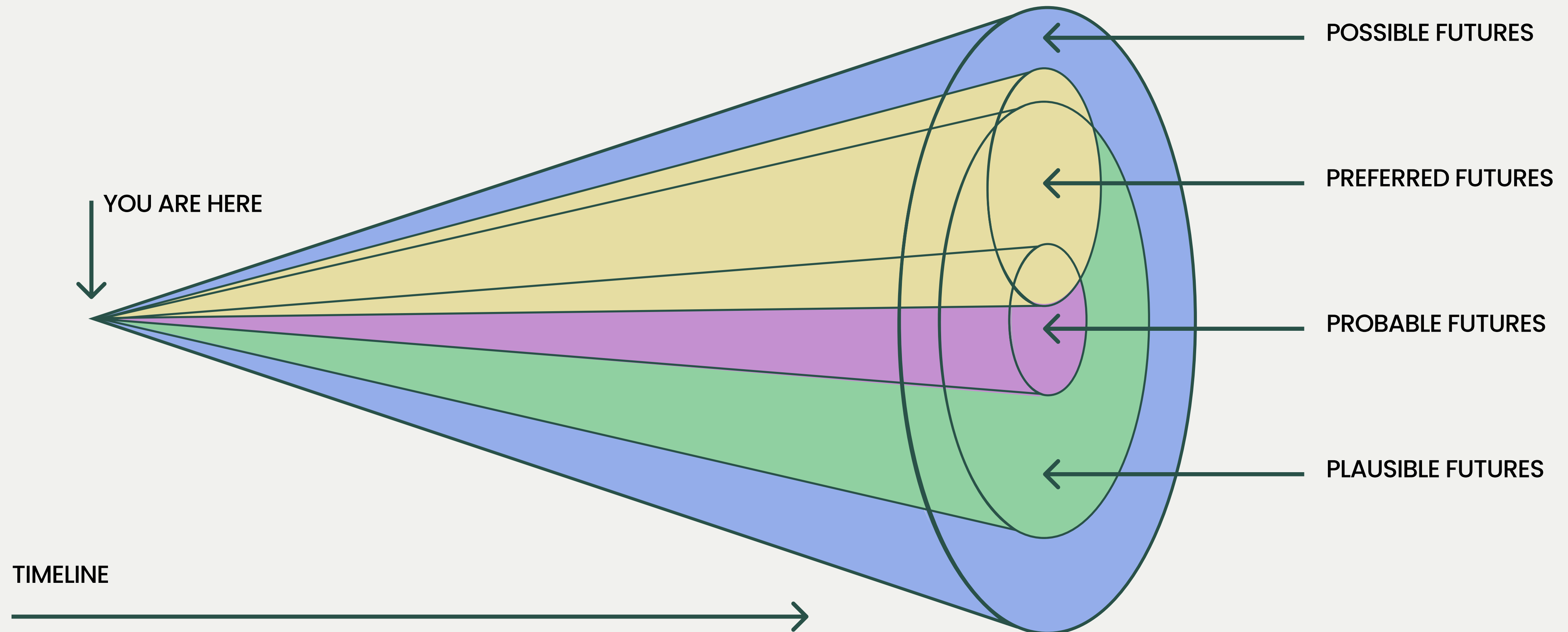
What?

1. How to Create Lasting Value.
2. Sufficiency & Post-Growth Design.
3. Design for Social Well-being.
4. The intersection of social well-being and sustainable design.
5. The growing movement toward sufficiency and mindful consumption.

How?

1. Holistic User Perspective.
2. Systems Mapping for Behaviour Change.
3. Post-Growth & Circular Business Models (from consumer's perspective).
4. Future foresight.

FUTURE FORESIGHT



ADAPTED FROM HANCOCK & BEZOLD, (1994)

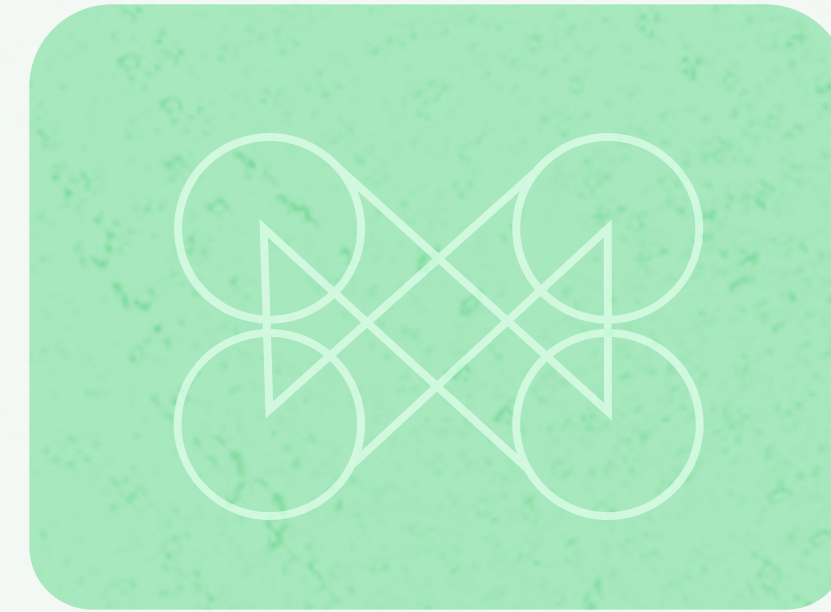
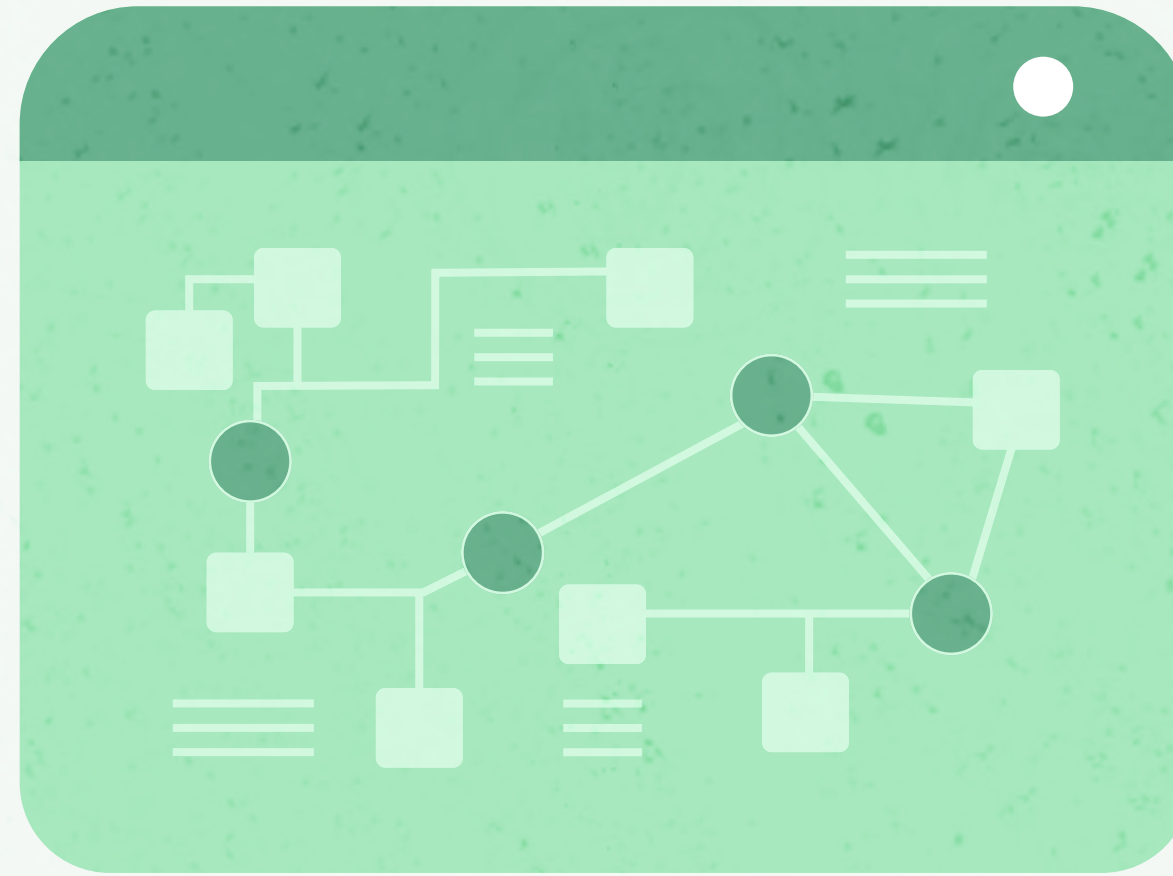
(03)

BUSINESS

Designers play a crucial role in shaping businesses, ensuring they are resilient, sustainable, and future-proof. Understanding business models, regulations, and systemic challenges is essential for influencing decision-making in companies.

This module focuses on developing sustainable and regenerative business practices through design. It introduces sustainable business practices, providing an overview of sustainability in business and emphasizing the importance of integrating sustainability into business models.

The module empowers designers to create resilient, sustainable, and future-proof businesses by providing them with the knowledge, tools, and perspectives needed to understand business models, navigate challenges, and drive the transition to circularity and sustainability.



(3.1) BUSINESS

Understanding Business Models & Market Forces

Understand how different business models function. Identify barriers to circular business success. Apply basic business model mapping techniques

Why?

1. Many businesses struggle to transition to circularity despite its necessity.
2. Understanding business models helps designers create meaningful proposals.
3. Regulations are changing slowly, but companies must prepare early.

What?

1. How Businesses Work:

Basics of business models, value creation, and market forces.

2. Systemic Thinking in Business:

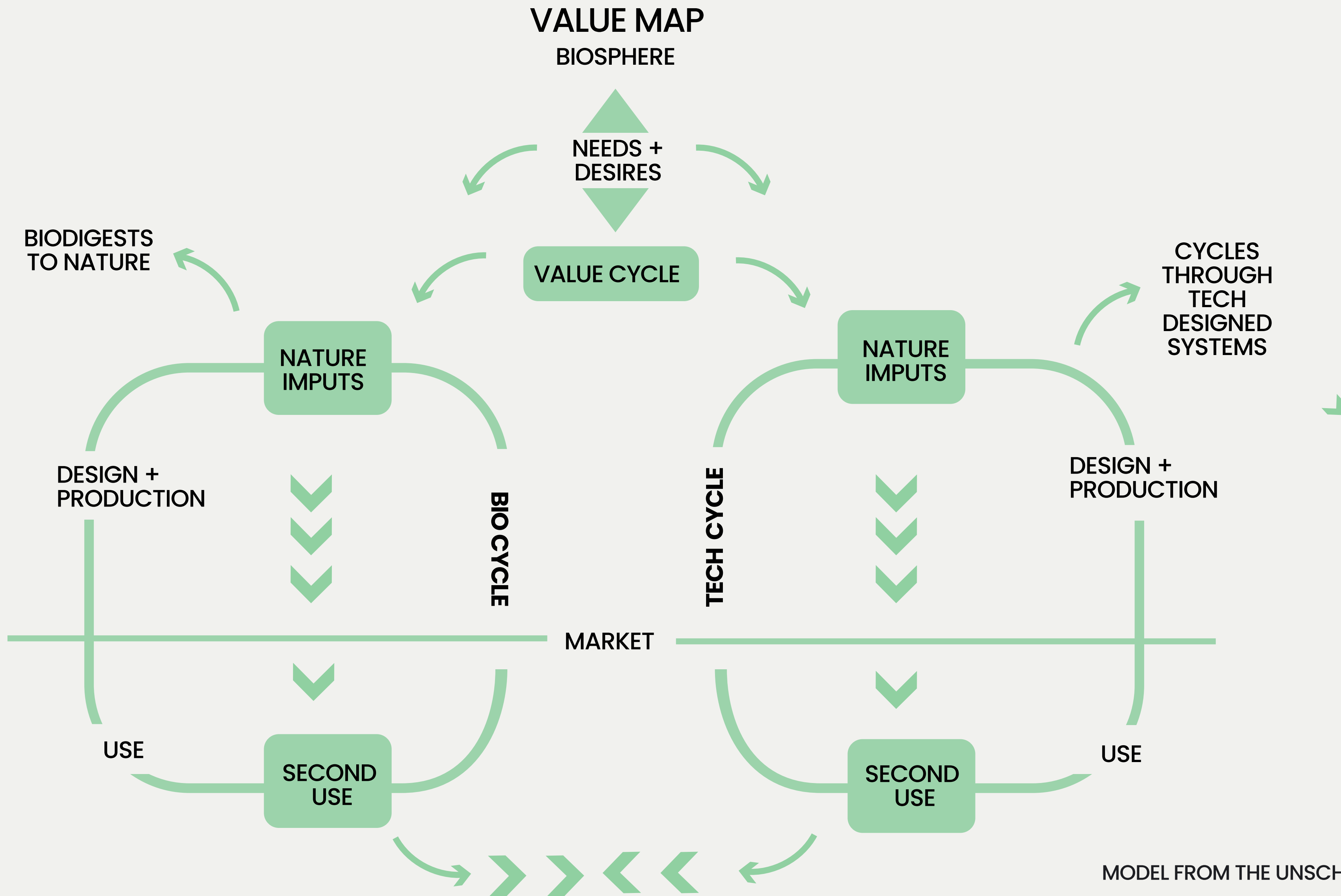
How businesses intersect with political, economic, and environmental systems.

3. Resilience in Business:

How companies stay competitive and adapt.

How?

- 1. Business Model Mapping :**
Identifying key components of a business and the potential for circularity.
- 2. Competitor Benchmarking :**
Comparing business strategies to identify gaps and opportunities.
- 3. Regulatory Landscape Analysis:**
Understanding how upcoming regulations shape business strategy.
- 4. Greenwash spotting**
Identifying misleading sustainability claims.



(3.2) BUSINESS

Circular Business Models & Systemic Challenge

Identify policy and economic challenges for circular businesses. Apply circular business model frameworks. Develop and justify business model adaptations.

Why?

1. Designers help companies to define and redefine the value proposition.
2. Lack of clarity in circular business transition.
3. Economical and political influence to business transition (feasibility).

What?

- 1. Different Circular Business Model Concepts :**
Closed-loop, product-as-a-service, regenerative models.
- 2. Linear vs. Circular Business Models :**
What distinguishes them and why circularity is challenging.
- 3. The Challenge of Implementing Circularity :**
Supply chain difficulties, financing, customer adoption.
- 4. Why Circular Start-ups Struggle?**
Barriers like funding, scalability, policy gaps, and consumer habits.

How?

- 1. Systems Mapping for Business:**
Identifying economic and policy influences on business models.
- 2. Circular Business Model Canvas:**
A tool for mapping business opportunities within circularity.
- 3. Co-Creation with Businesses:**
Engaging businesses in circular strategy workshops.



(3.3) BUSINESS

Future of Sustainable Business & Impact Measurement

Understand how businesses measure impact (ESG, sustainability reports). Apply future foresight techniques to business innovation. Create value in a business by applying circular principles

Why?

1. The impact of a business is becoming as important as profit.
2. Designers need to be able to communicate their value to business stakeholders.
3. Transition to sustainable business models.

What?

- 1. Impact Measuring Tools (ESG & Beyond):**
How businesses track environmental and social progress.
- 2. Future Foresight & Business Innovation:**
Anticipating shifts in consumer behaviour, policy, and technology.
- 3. Designing for Sufficiency:**
Moving away from growth-driven business models.

How?

1. ESG & Circularity Impact Metrics:

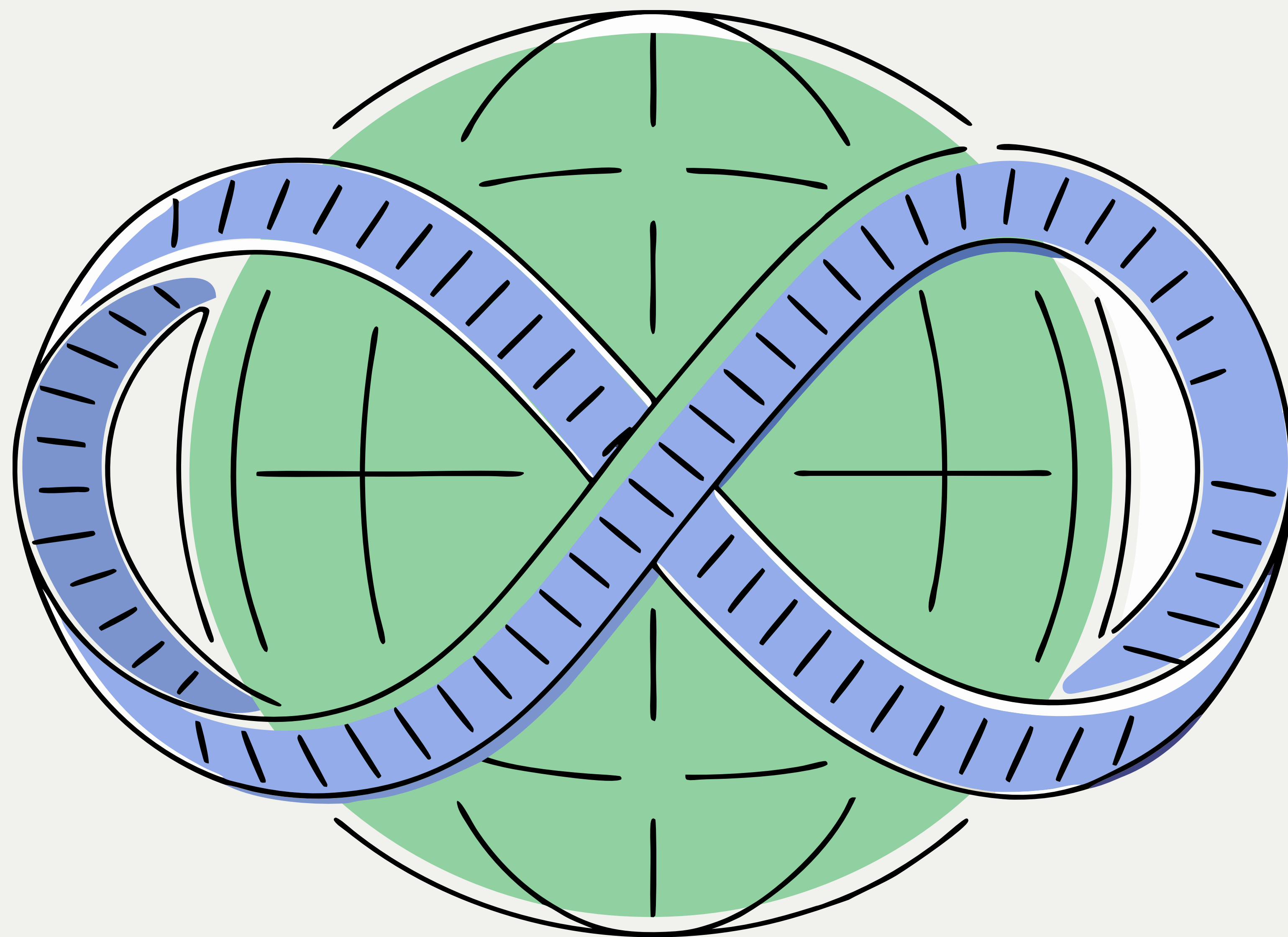
Evaluating business performance beyond financial profit.

2. Scenario Planning & Speculative Design:

Exploring possible futures for businesses.

3. Future foresight:

Identifying emerging trends and weak signals to guide strategic decision-making.



(04)

DESIGN FIELDS

The role of designers is shifting from product creators, problem solvers to system thinkers. Designers must adapt, learn from others, and apply circular and sustainable design within their own field of expertise. This module prepares designers to navigate this evolving landscape and effectively integrate sustainability and circularity into their specific design fields.

This module equips designers to meet the sustainability challenge by supporting them in transforming into circular design leaders within their specific industry. It offers learning from pioneering designers, guidance on navigating the unique obstacles and opportunities in their field, and expertise to drive the transition towards a circular economy. The module equips designers with the ability to adapt to design's evolving role, learn from practicing designers, and effectively integrate circular design principles into their specific fields.



(4.1) DESIGN FIELDS

Changing role of the designer

Understand how different business models function. Identify barriers to circular business success. Apply basic business model mapping techniques

Why?

1. To help designers understand how their role is changing in the context of a circular economy and to identify the new skills required.

What?

- 1. From Object-Maker to System Thinker:**
How the designer's role is evolving.
- 2. Designers as Circular Change-Makers:**
Moving beyond aesthetics to strategy and impact.
- 3. Industry-Specific Knowledge & Skills:**
Why circular design requires field-specific expertise.
- 4. Designer as the Facilitator:**
Enabling collaboration, aligning stakeholders, and guiding co-creation processes

How?

1. Stakeholder Mapping:

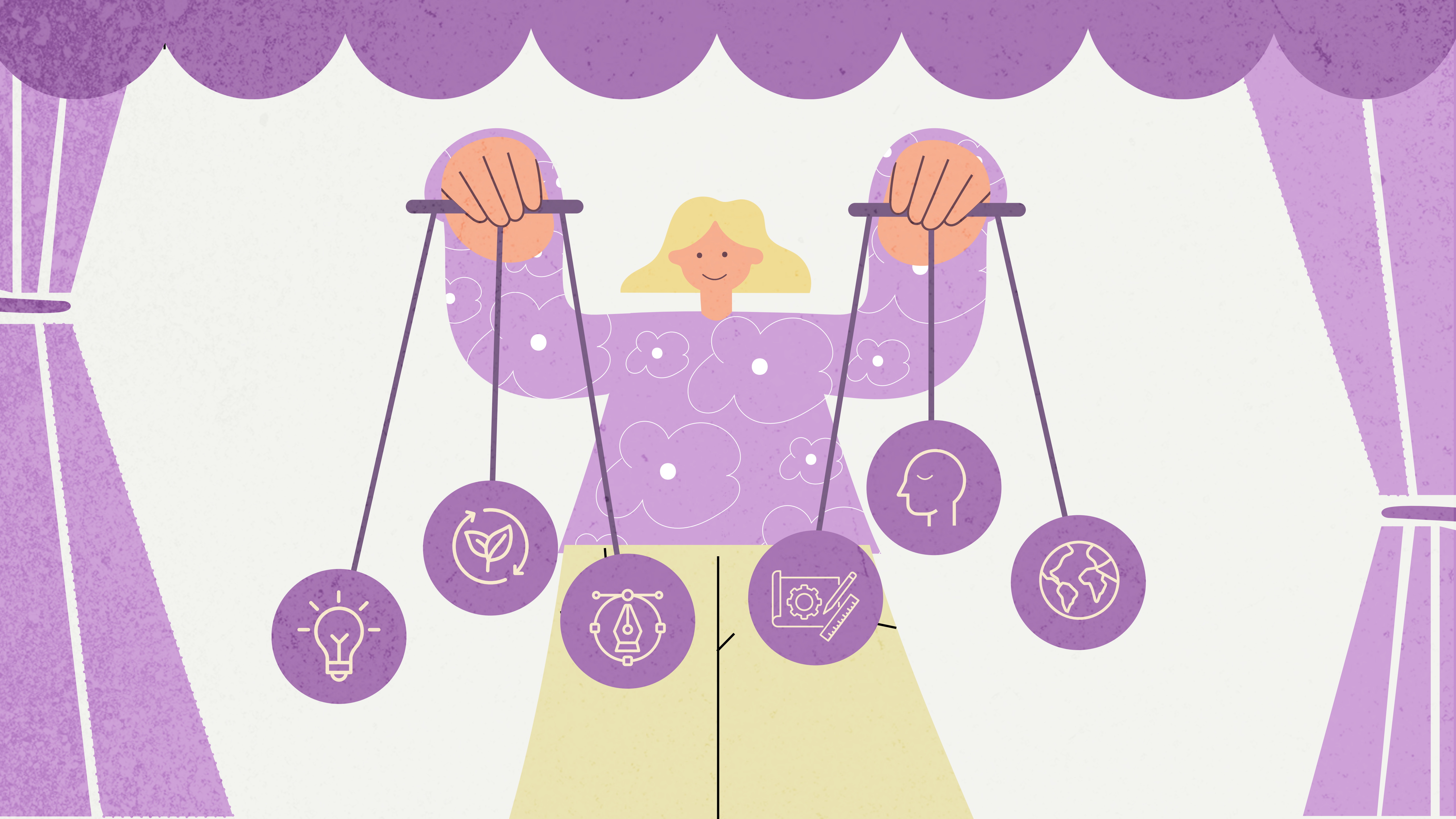
Understanding how designers collaborate with businesses, policymakers, and users.

2. Comparative Analysis of Designer Roles:

Studying how designers in different fields approach circular challenges.

3. Mapping Circular Gaps & Opportunities:

Identifying areas where circularity is underdeveloped.



(4.2) DESIGN FIELDS

Learning from practicing design

Analyse how different design industries define and implement sustainability. Identify what skills are needed to transition into circularity. Understand real-world challenges and successes from designers applying circularity.

Why?

1. To provide designers with practical insights and knowledge from those who are already implementing circular design principles

What?

- 1. Which design is circular?:**
Circular design principles.
- 2. Case Studies from Practicing Designers:**
Interviews with professionals who transitioned to circularity.
- 3. Business-Designer Collaborations:**
How companies and designers co-create circular solutions.

How?

- 1. Interviewing a Practicing Designer:**
Conducting a short conversation to gather insights.
- 2. Coaching Methodology:**
Helping others by asking the right questions.
- 3. Reflection & Application:**
Translating learnings into your own field.
- 4. Skill Gap Analysis:**
Identifying what you need to develop to work in circular design.



(4.3) DESIGN FIELDS

Circularity in my field

Recognize the challenges and potential of circularity in one's own design field. Position oneself as a circular designer within their field. Develop a future foresight perspective on circularity in one's practice. Conduct industry-specific research on circular opportunities

Why?

1. To enable designers to recognize the specific challenges and opportunities for circularity in their own design fields and to position themselves as circular design practitioners.

What?

1. Industry-Specific Needs & Challenges:

Why some fields struggle more than others to transition from linear to circular..

2. Materials, Systems & Processes:

What defines circularity in your specific field.

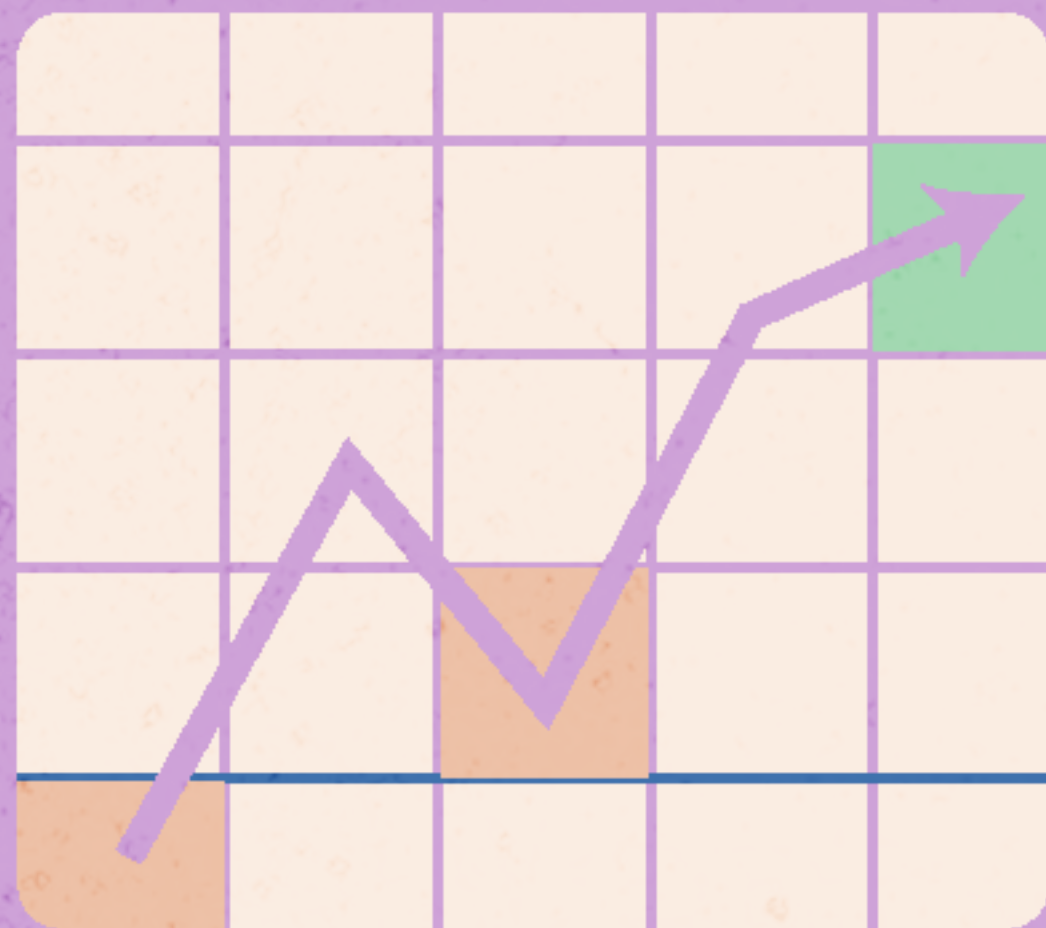
3. Future Foresight:

Predicting how industries will evolve.

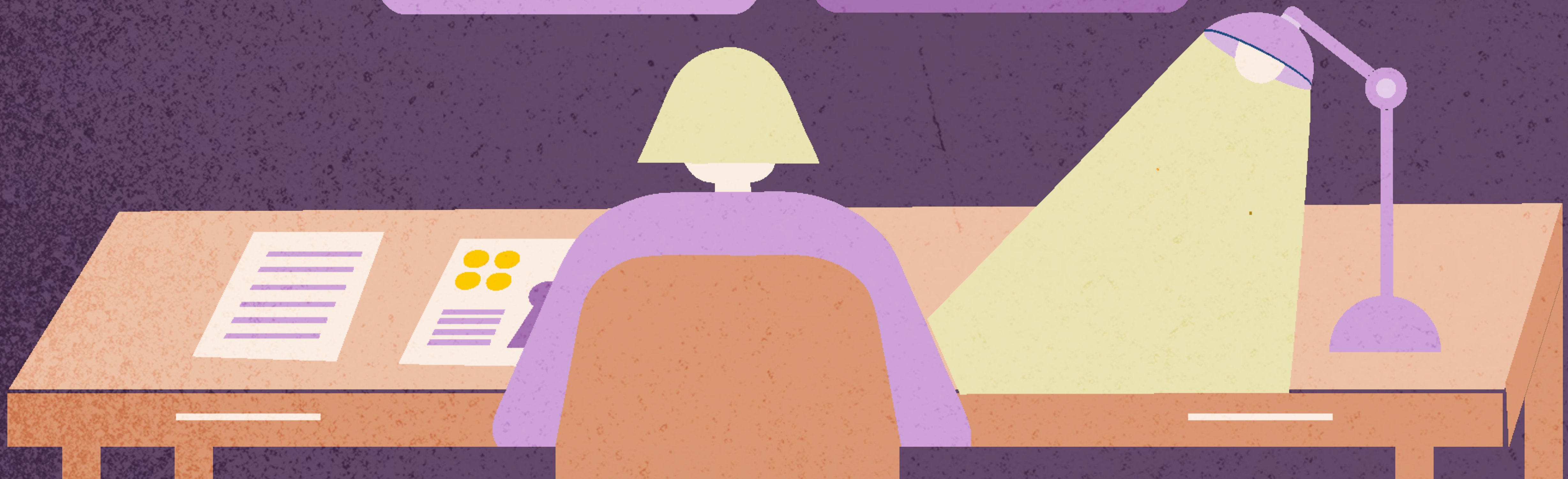
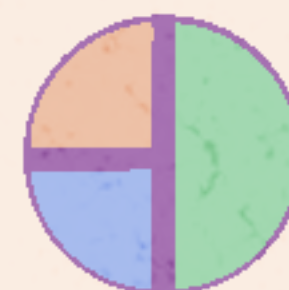
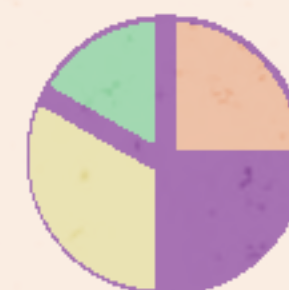
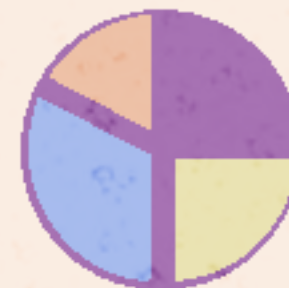
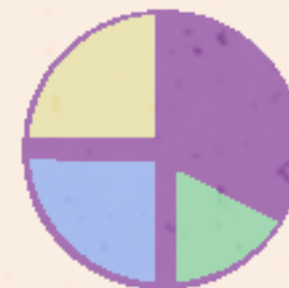
How?

- 1. Stakeholder Mapping:**
Identifying key players and decision-makers in a specific industry.
- 2. Future foresight:**
From finding signals to scenarios.
- 3. Industry Benchmarking:**
Comparing different sectors to find circularity gaps.
- 4. Industry Research:**
Conducting secondary research on circularity in your field

TRENDS



SCENARIOS



(05)

DESIGN PROCESS

This module guides designers in integrating their learning into a unique design process, strategy, and career path that aligns with their individual strengths and values, all within the context of sustainability and circularity. It synthesizes the principles of circularity, sustainability, and systems thinking introduced in previous modules, equipping designers with a transformative approach. Designers are challenged to move beyond human-centred design and adopt a planet-centred perspective, fostering inclusive processes that create sustainable outcomes within planetary boundaries.

The module also provides the knowledge and skills necessary to apply circular economy and sustainability principles in practice. Designers will learn to develop and implement systemic solutions that address complex global challenges.



(5.1) DESIGN PROCESS

Defining Your Circular Design Approach

Understand different design process models and how they apply to circularity.
Identify which aspects of circularity align with your values and skills.
How you learn? Develop a draft framework for your own circular design process.

Why?

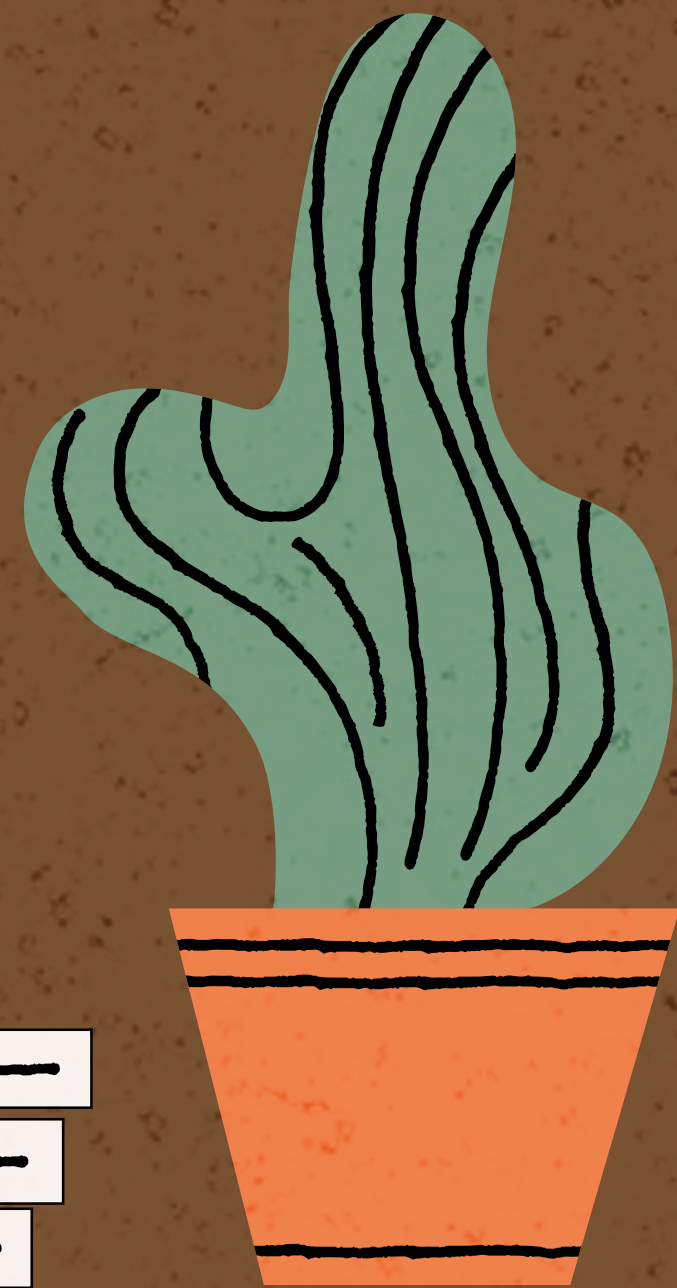
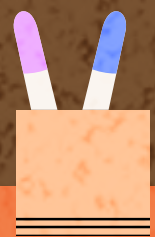
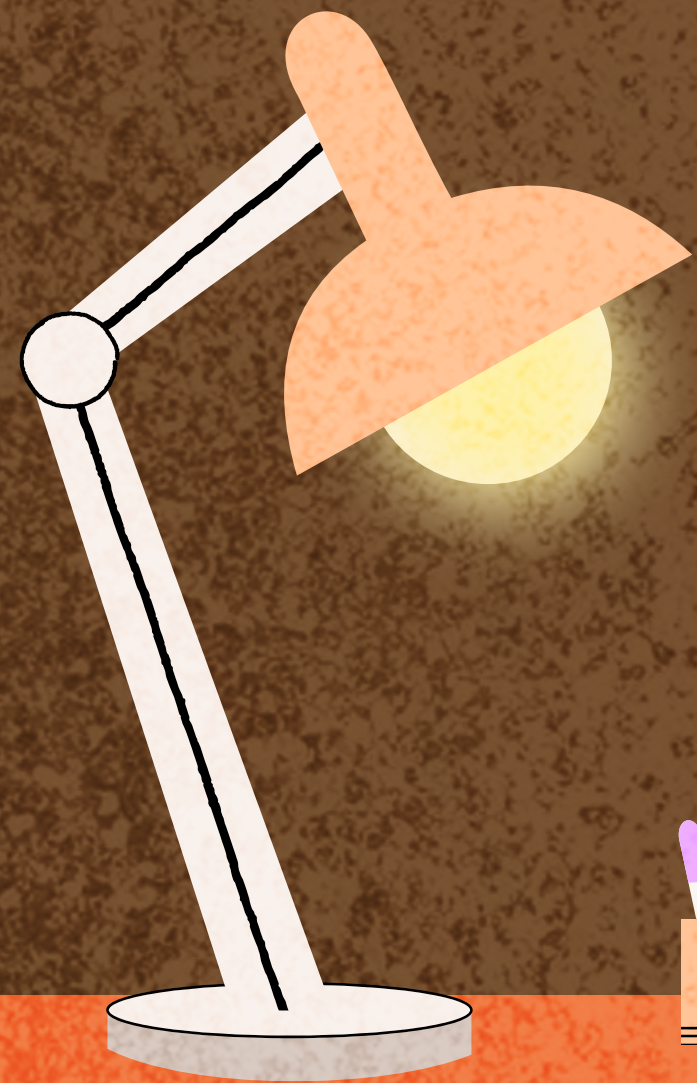
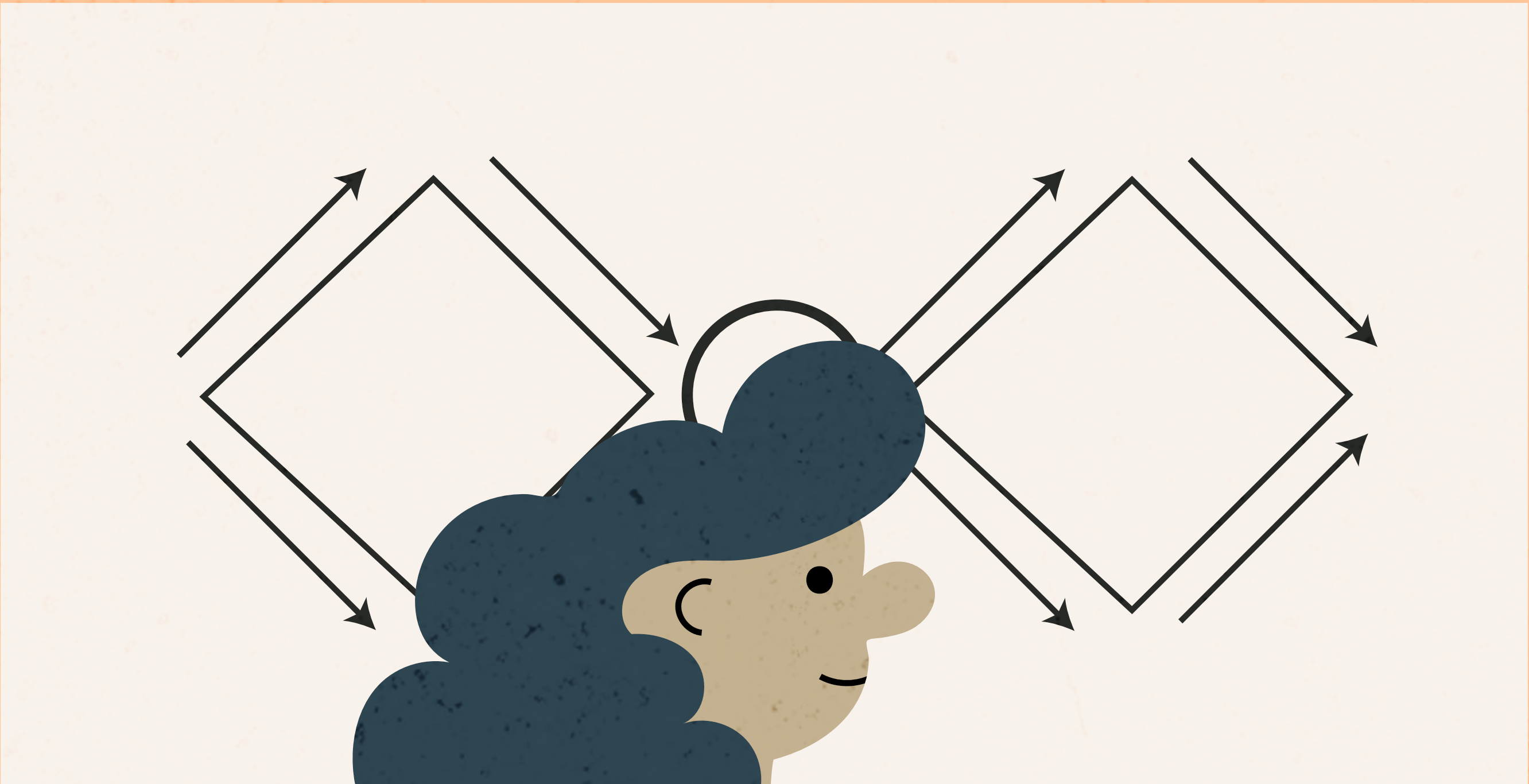
1. To help designers understand various circular design process models and identify how these models can align with their personal values and skills, leading to the development of a draft framework for their own circular design process.

What?

- 1. Existing Design Process Models:**
Comparing traditional and circular design processes.
- 2. Personal Design Philosophy:**
Aligning sustainability with your own practice.
- 3. Systems Thinking in Individual Practice:**
Integrating business, people, and environmental perspectives.

How?

- 1. Self-Reflection & Skill Mapping:**
Understanding your design strengths and gaps..
- 2. Comparative Analysis of Process Models:**
Evaluating different approaches to find what works for you.
- 3. Drafting a Personal Circular Design Framework:**
Structuring a design strategy unique to your practice.



(5.2) DESIGN PROCESS

Selecting & Adapting Design Method

Understand how different methods fit into circular design. Choose the right methods to support your design process. Develop a structured workflow that aligns with your values.

Why?

1. To enable designers to understand how different design methods fit into circular design, and to choose and adapt these methods to create a structured workflow that supports their values and design process.

What?

- 1. How to Present Your Design Process:**
Structuring and explaining complex ideas.
- 2. Adapting Your Process for Different Audiences:**
Communicating with businesses, policymakers, and users.
- 3. Iterating & Improving Your Framework:**
Learning from feedback and real-world application.

How?

- 1. Service Blueprinting:**
Structuring your design workflow and stakeholder interactions.
- 2. Roadmap creation:**
Planning step-by-step processes for your work.
- 3. Method Mix & Selection:**
Choosing tools that fit your specific practice.



(5.3) DESIGN PROCESS

Presenting & Refining Your Circular Design Process Model

Adapt your approach based on audience and context. Effectively present and justify your circular design strategy and iterate your design process for continuous improvement.

Why?

1. To equip designers with the skills to effectively communicate and justify their circular design strategies to diverse audiences, and to establish a process for iterative improvement of their design approach.

What?

- 1. How to Present Your Design Process:**
Structuring and explaining complex ideas.
- 2. Adapting Your Process for Different Audiences:**
Communicating with businesses, policymakers, and users.
- 3. Iterating & Improving Your Framework:**
Learning from feedback and real-world application.

How?

- 1. Storytelling for Designers:**
Structuring presentations for clarity and engagement.
- 2. Feedback Loops & Iteration:**
Refining your process based on practical testing.
- 3. Design Process Documentation:**
Creating a portfolio-ready format for your methodology.



Conclusion

A successful transition to circularity requires more than new tools — it calls for a fundamental shift in mindset. Designers must embrace their evolving role as facilitators, strategists, and change agents, capable of navigating complexity and driving transformation across systems. This course structure aims to prepare participants for that role by providing the knowledge, frameworks, and perspectives needed to design beyond individual objects and towards systemic impact. It encourages participants to question existing practices, engage stakeholders, and prototype new ways of working.

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