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for Sustainable
Development

SOCIAL INNOVATION PROJECT 3: PROTOTYPING

Dr. Daniel J. Kruse

Dr. Mona Mirtsch

Prof. Dr. Britta M. Gossel

Eberswalde University for Sustainable Development

Today‘s agenda

10:00 – 10:30	Formalities SIP 3
10:30 – 11:00	Reflection DT Workshop
11:00 – 11:30	Quiz
11:30 – 12:30	Theoretical Background: Design Thinking

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Key data of SIP 3

	SIP 3
Semester	2nd
ECTS-Credits	6 ECTS / 4 SWS
Binding nature	mandatory participation (team)
Language	German/ English
Time required	180h (45h presence/ 135h self-directed learning and assignment preparation)
Examination performance	100 % learning portfolio

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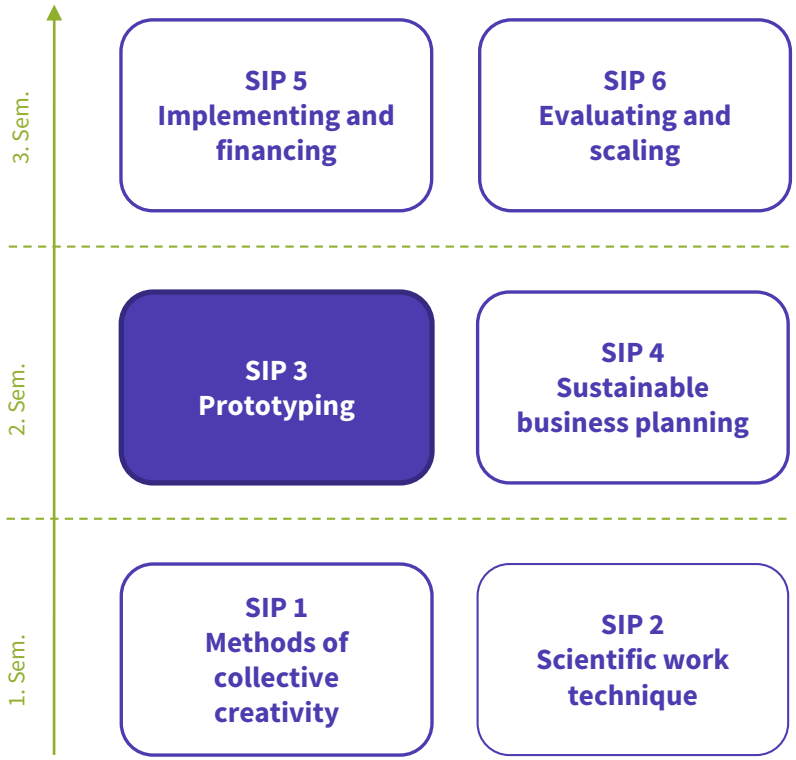
2. Aims & Scope

2.1 Overall goal

- Starting with the social business ideas developed in SIP 1, students evaluate their products / services with potential clients.
- Students develop in several loops prototypes of their products / services, based on clients‘ and stakeholders‘ feedback (prototypes or minimum viable products / MVPs).
- Students understand needs and expectations as well as willingness to pay of their future clients to that extent that they develop a product / service „ready for market“.



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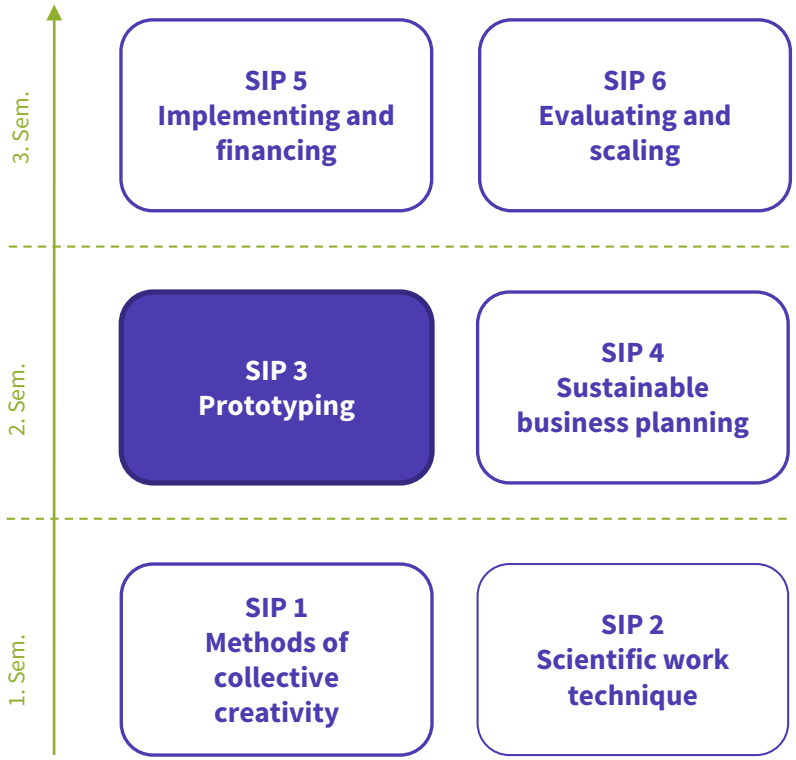
2. Aims & Scope

2.2 Learning goals

- LE1: Understanding Design Thinking
- LE2: Knowing clients‘ challenges and needs based on easy & fast research
- LE3: Exercise build-test-learn / design thinking loops with potential clients
- LE4: Measure willingness to pay of potential clients with a prototype / MVP
- LE5: Make decisions based on research
- LE6: Being able to reflect own entrepreneurial mindset and ideas.
- LE7: Building of prototypes/MVPs as testable hypotheses



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3. Examination performance

Learning Portfolio (100%)

- T1: Learning Portfolio Prototyping (80%) Team
- T2: Reflection Logs (20%) Individual

4. Content

The students…

- **Learn** about Design Thinking approach,
- **Empathize** with user and/or clients‘ needs using personas, empathy maps and customer journey maps to understand and **define** their needs related to their sustainable business idea,
- **Ideate**, iterate and specify solutions to meet those needs and develop them further,
- **Prototype** the developed solutions for tangible evaluation,
- **Test** the prototypes with stakeholders regarding acceptance, usability and willingness to pay,
- Collect and analyze **feedback** from potential clients, and other stakeholders to precise their business model
- **…to develop as viable sustainable innovative product or service.**

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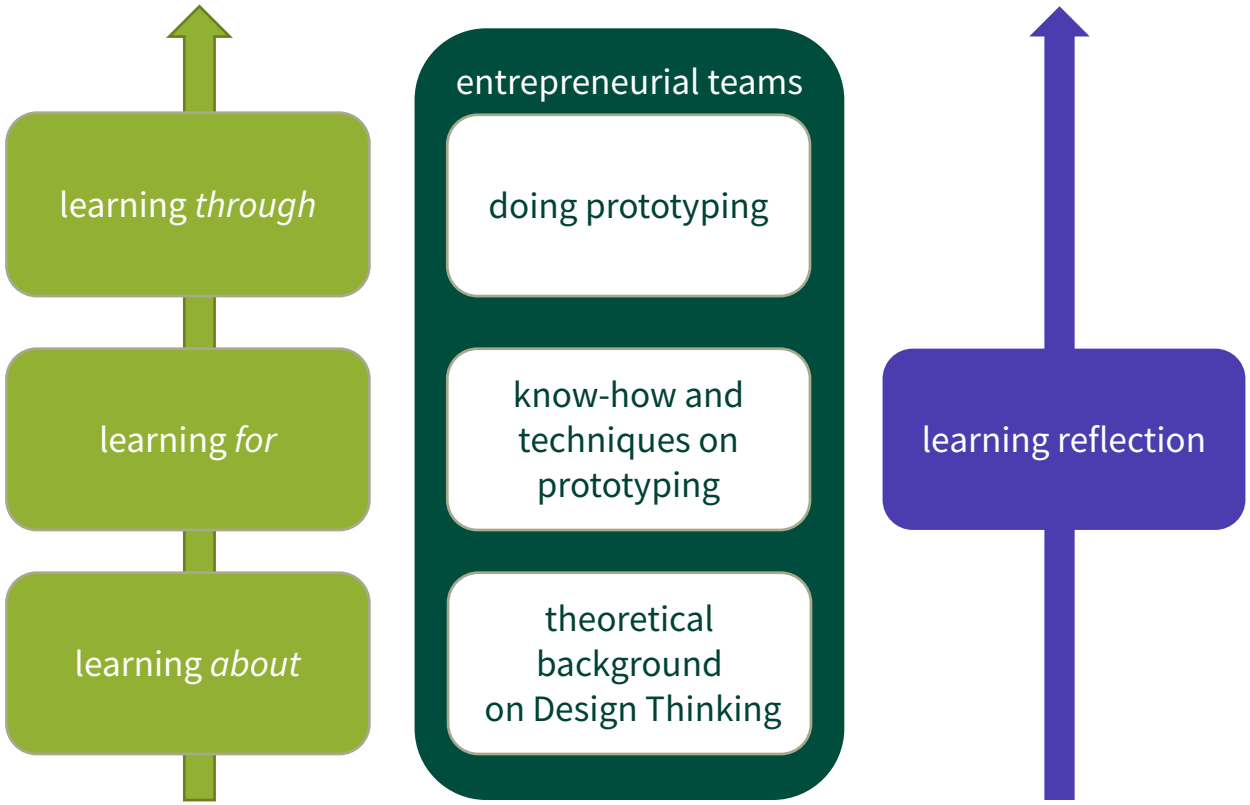
5. Didactical approach



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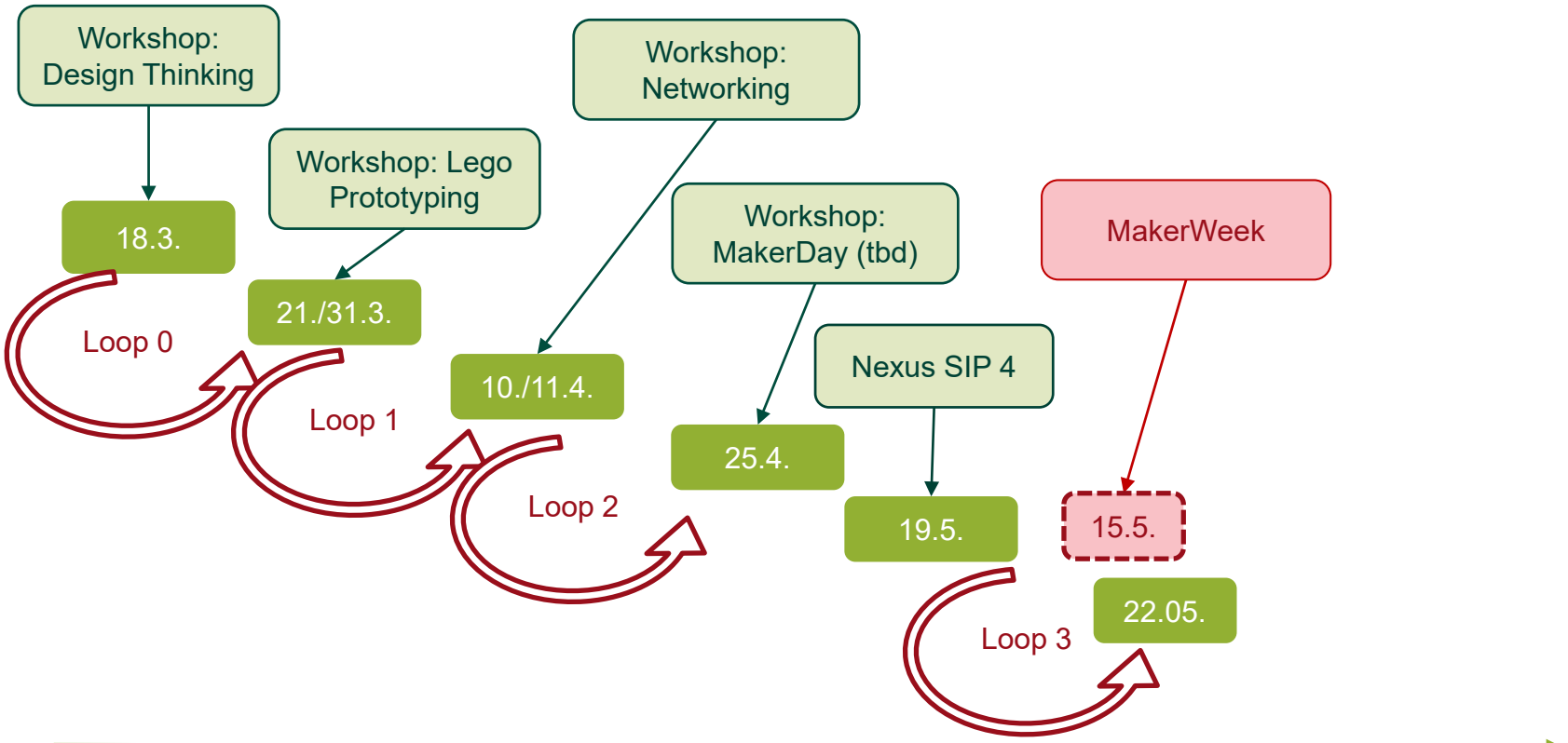
6. Schedule

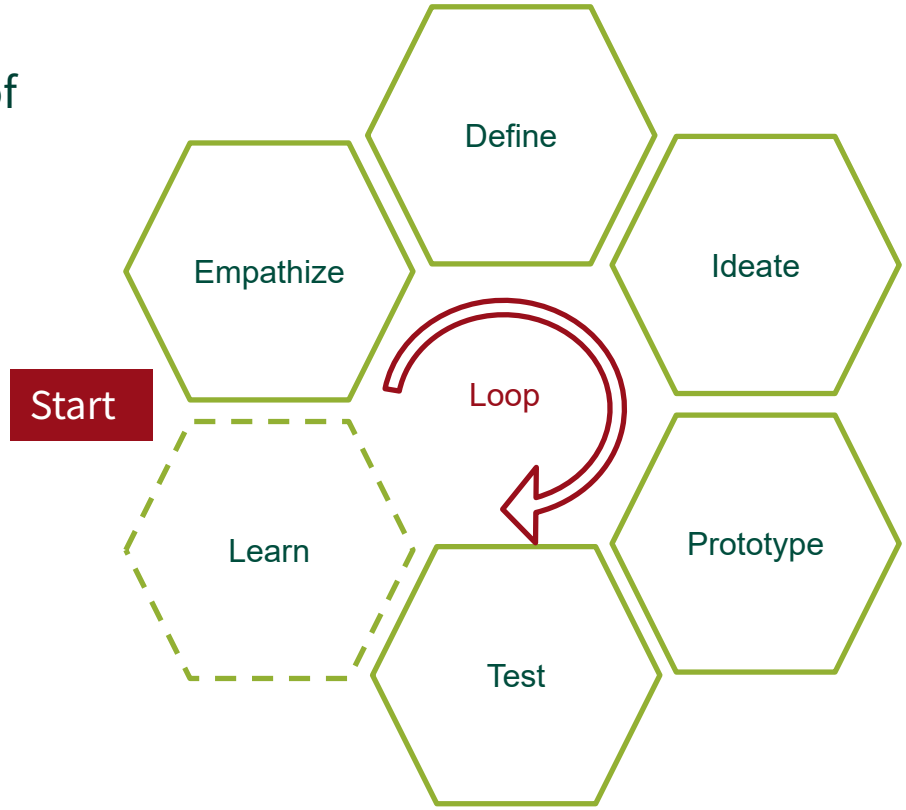


6. Schedule

- What is a Loop?

A Loop is the complete process of Design Thinking with all stages:

- Empathize
- Define
- Ideate
- Prototype
- Test



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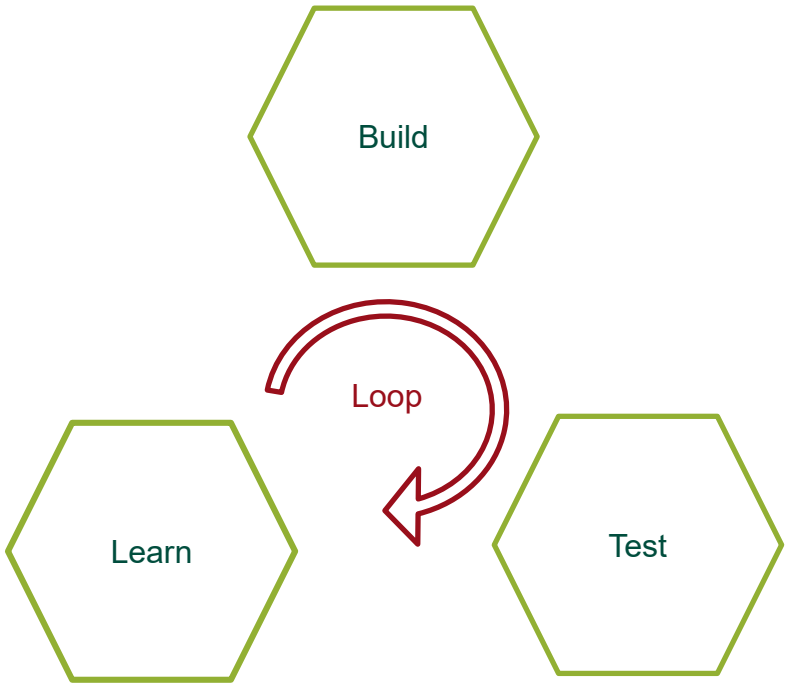
6. Schedule

- What is a Loop?

This approach integrates the Lean Startup process (Eric Ries):

- Build
- Test (Measure)
- Learn

The goal of the build-measure-learn cycle is **learning** (Ries, 2011).



Ries, E. (2011). The lean startup: how today's entrepreneurs use continuous innovation to create radically successful businesses. New York: Crown Business

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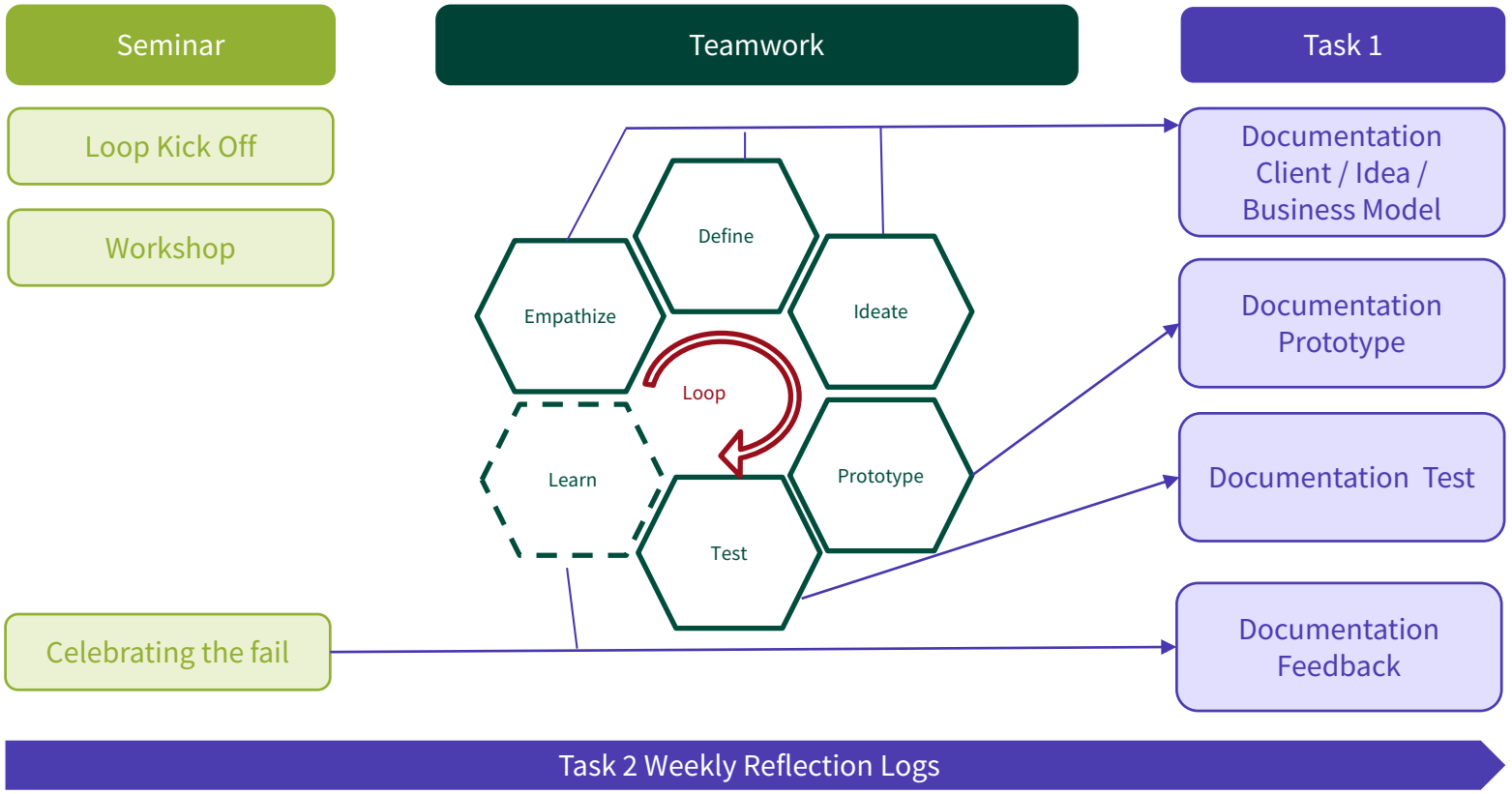
6. Schedule

- What happens exactly during one Loop?



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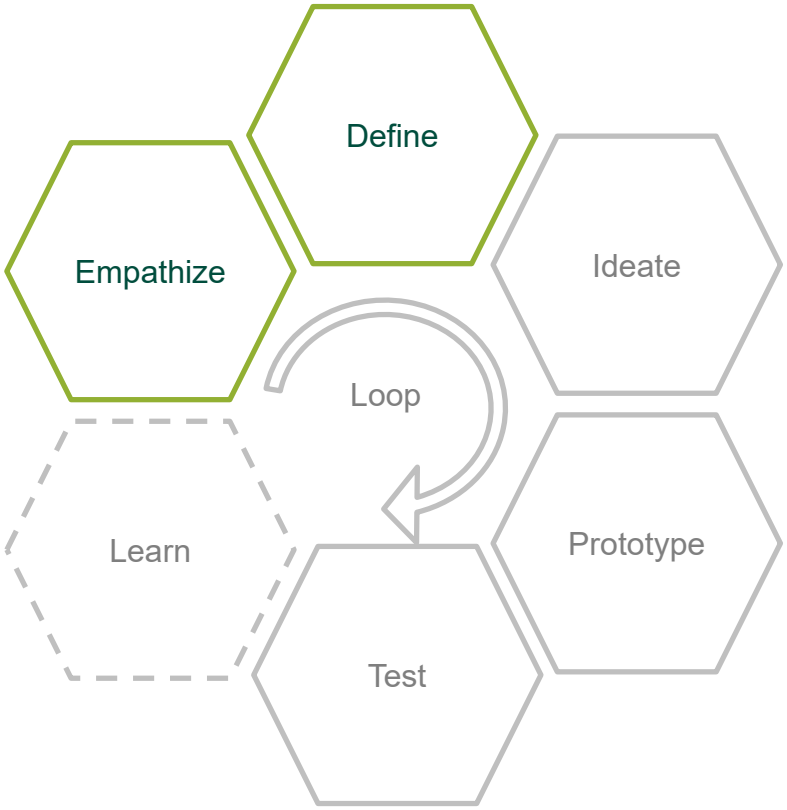
SIP 3 Loop Process

Documentation of customer & idea (T1):

Outlining the data collection developed during the Empathize & Define stages to solve your challenge:

- What are the needs of potential customers (Empathize & Define)?
- How do you describe these potential customers using **personas, empathy maps, or customer journey maps**?



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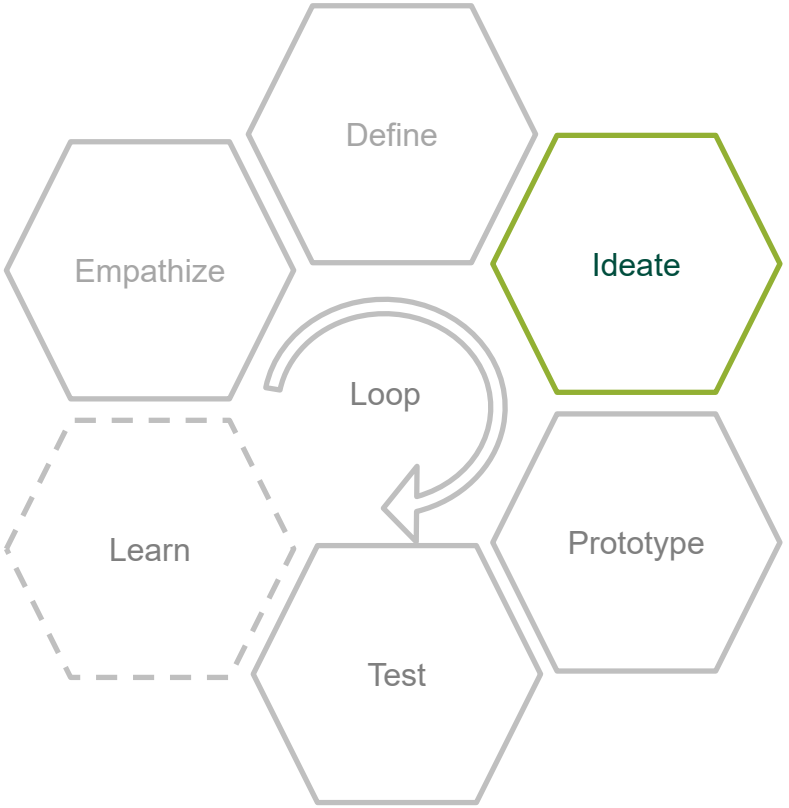
SIP 3 Loop Process

Documentation of customer & idea (T1):

Outline your ideation process and briefly describe the idea (Ideate stage) that the team starts with answering the questions:

- What is the product/service?
- Who are the potential customers?
- What is the social impact?
- What is the business model (who pays how much for what)?



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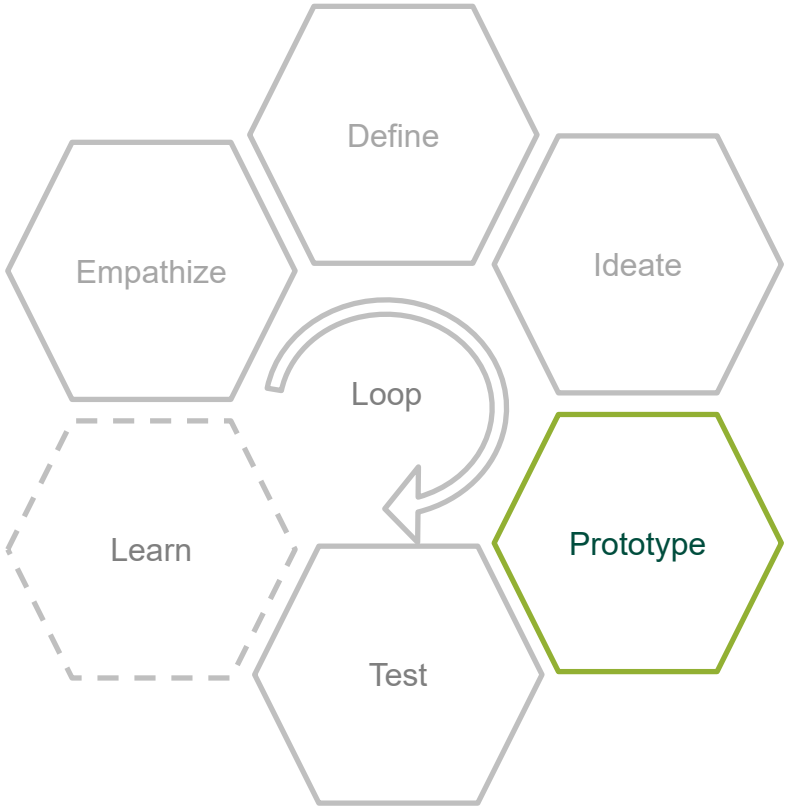
SIP 3 Loop Process

Documentation Prototype (T1):

A prototype of the product/service is developed; partly with the help of impulses/workshops within the course:

- Visual representation of the respective prototype (photos with caption/explanation).
- Description of the core functions of the respective prototype.



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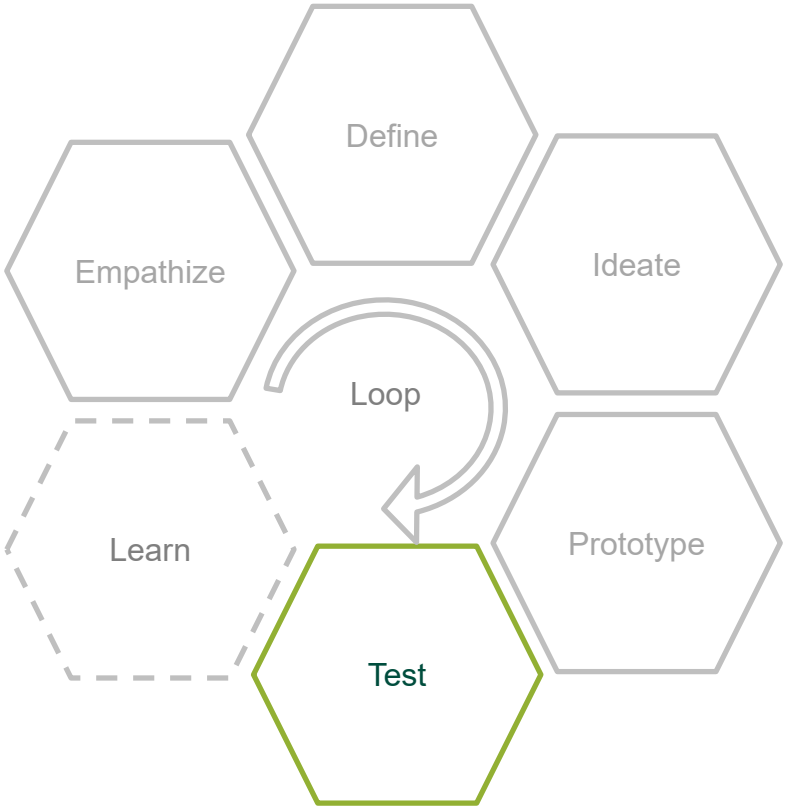
SIP 3 Loop Process

Documentation Test (T1):
After the prototype has been developed, a test should be conducted and documented. The documentation shall include the test setup and results:

- Description of test setup (date, location, participants, planned procedure, data sought, methods of data collection).
- Description/presentation of collected data (e.g. interview protocols, questionnaires).
- Description of results (concrete product improvements or changes).



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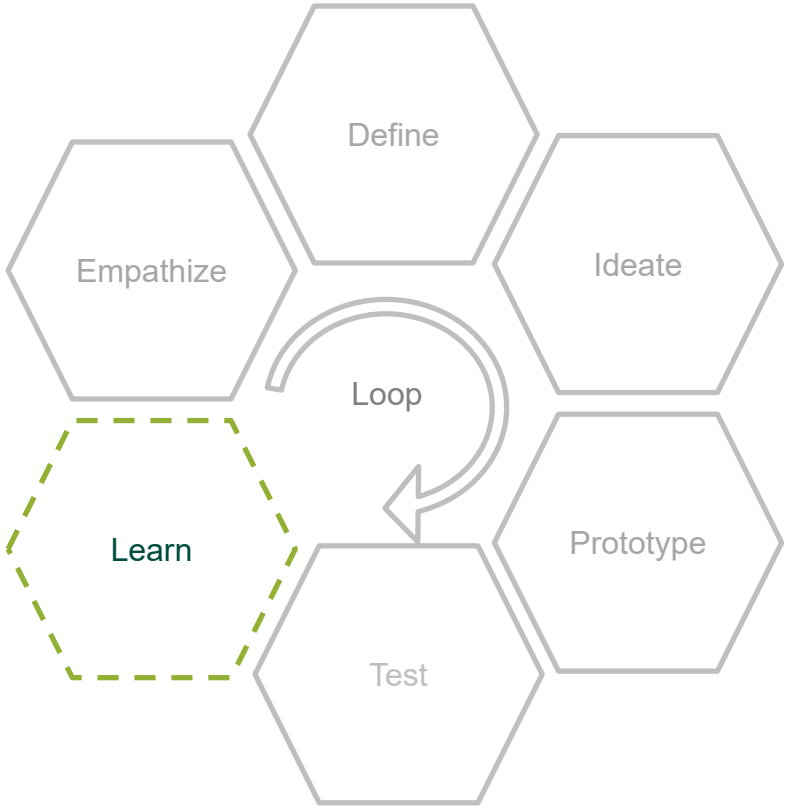
SIP 3 Loop Process

Documentation Feedback (T1):
After testing, the team solicits further feedback in the sense of 360° feedback (e.g., from customers, suppliers, team members, other stakeholders).

Students have to talk to at least two more stakeholders regarding their impact and business model.

Documentation of feedback includes:

- Description of the 360° feedback setting (date, location, participants, process, methods if applicable).
- Description of the feedback results.



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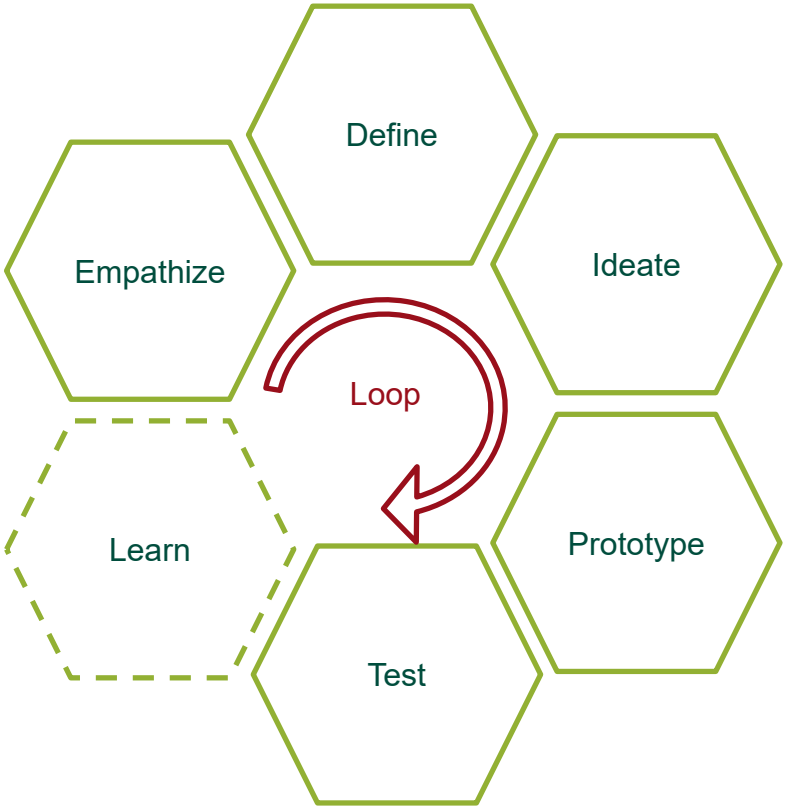
Transfer Theorie zu Praxis: 4 Loops Design Thinking

At the end of each loop:

„Celebrating the fail“

5-10 min pitch on the topic: With regard to which assumptions of the loop did the team whoppingly fail?

- ... to the product/service
- ... to customers
- ... to the social impact
- ... to the business model



„Design Thinking is Painstorming“

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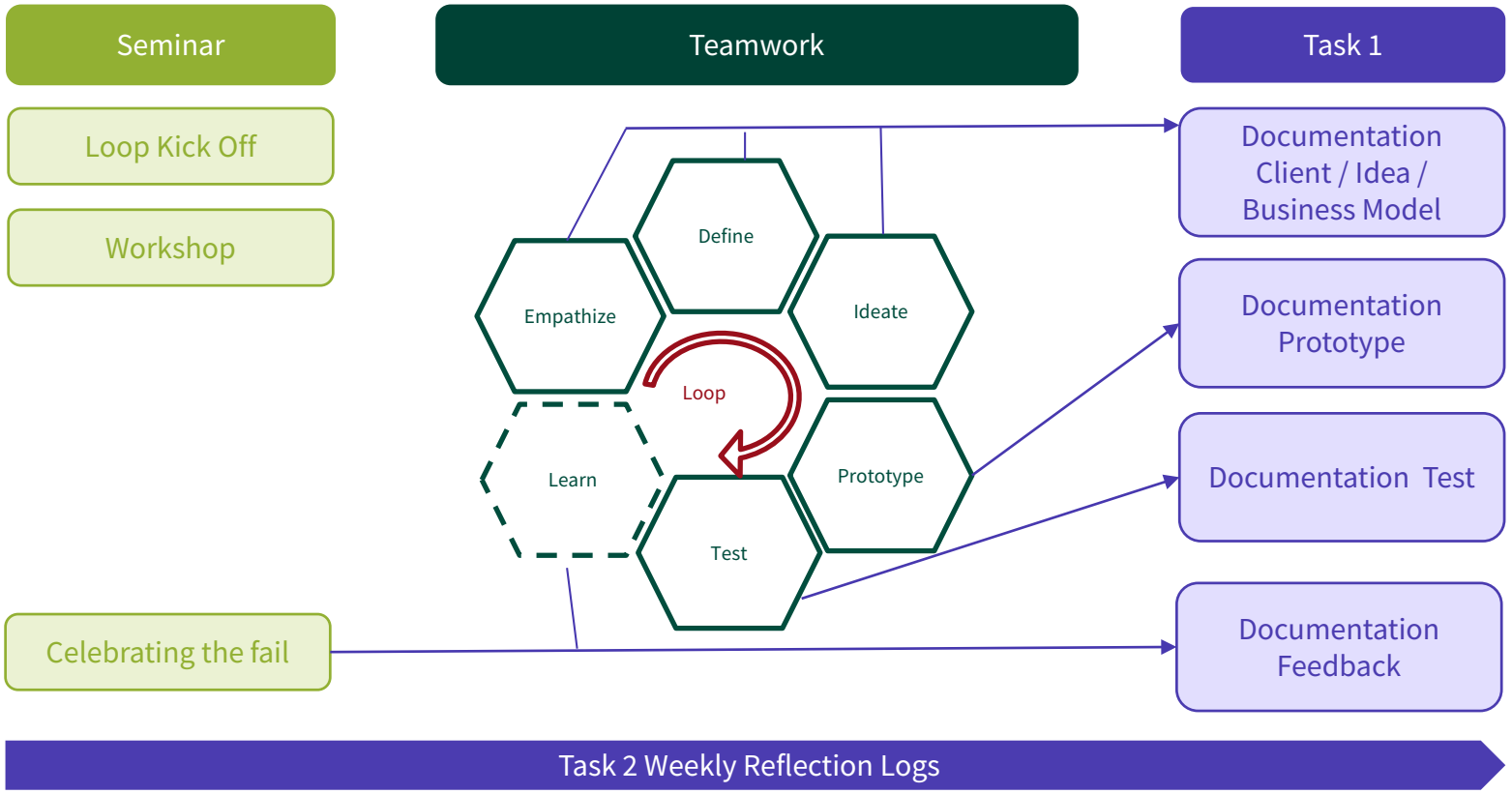
6. Schedule

- What happens exactly during one Loop?



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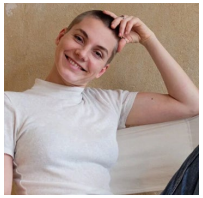
6. Schedule

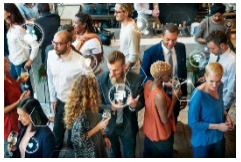
- **Workshop 1: Design Thinking (Camilla Rackelmann, Lina Ewert)**
  - Learning the methodology

BI Berliner Ideenlabor

- **Workshop 2: Lego (Serious) Play**
  - Prototyping

- **Workshop 3: Networking (Arian Ajiri, SEND)**
  - How to network




Social Entrepreneurship Netzwerk Deutschland

- **Workshop 5: Maker Day (Your turn)**
  - Organising several stakeholders to test prototype

- **Workshop 4: Nexus SIP 4 (Startup Lab)**
  - Pitch Your Green Idea (board game)

6. Schedule

Maker Day (Loop 3)

- Students acquire in advance at least 4 different stakeholders including their first potential customers, invite them and actually try to sell their services.
- Location: Up to you

Save the date: May 12-16, 2025 (flexible)

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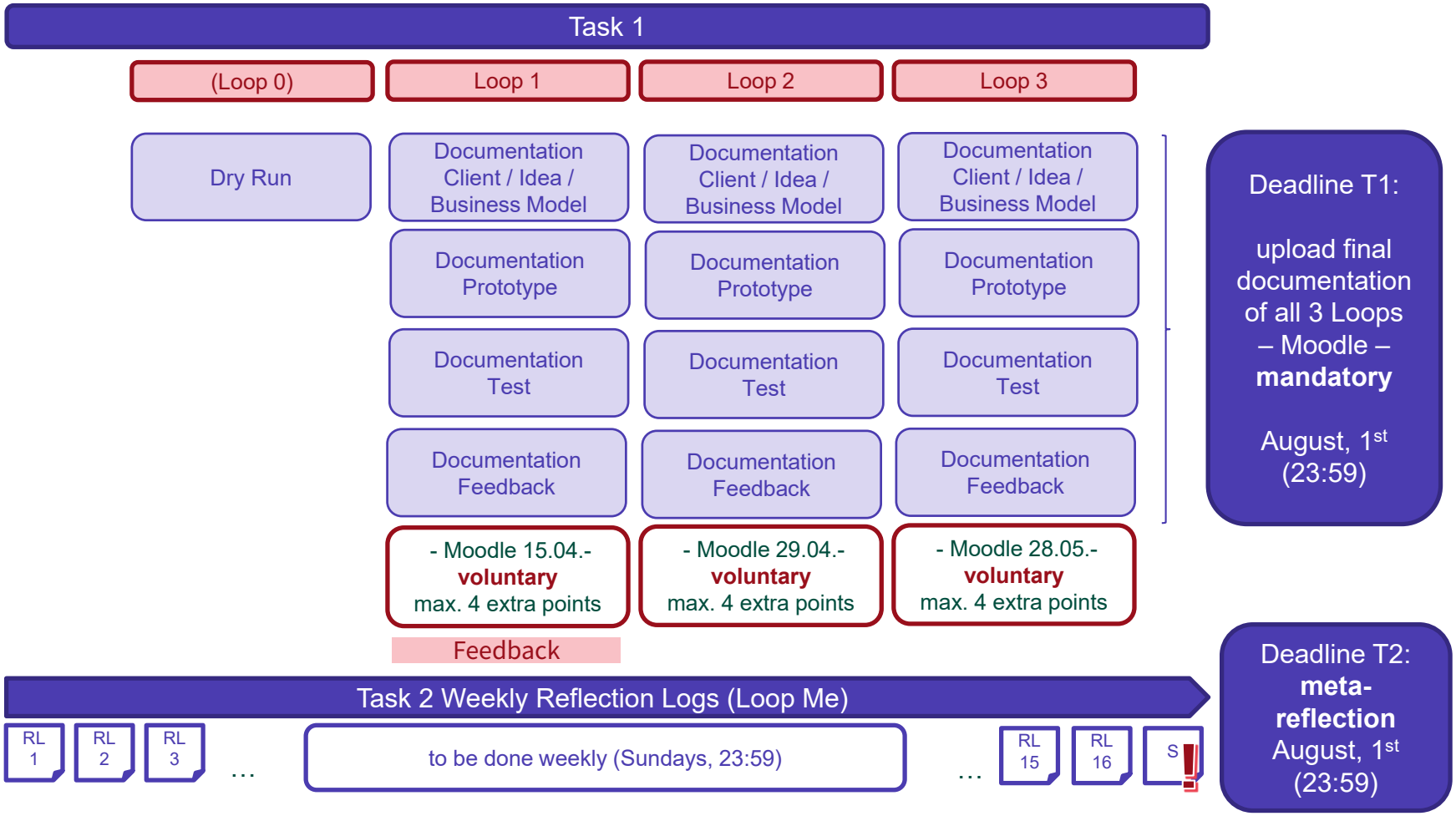
7. Tasks



7. Tasks

- Only 2 tasks, with deadline August, 1st (23:59) both.

- Task 1
  - *Mandatory* final submission.
  - *Voluntary* interim submissions after every loop (option: up to 4 extra points per loop) .

- Task 2
  - *Mandatory* weekly RLs & final submission (meta-reflection).

8. Learning Setting

- Seminars
  - online/present in 10 sessions
- Moodle
  - All course materials (slides, literature list etc.)
  - Specific task descriptions (T1-T2) + upload to submit

Stay on track:

Main result of SIP 3 shall be a product / service „ready to market“ including a clear vision of a social business model.

Completion of T1 & T2 shall help you to reach this goal.

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This is your SIP3 Team

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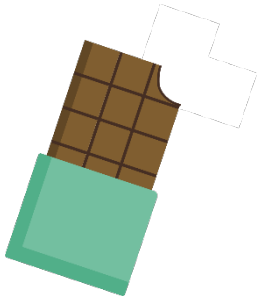
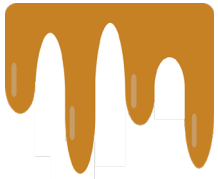
Reflection DT workshop: Toffifee Methode



WAS WAR SÜß WIE SCHOKOLADE?
Oder auch – „Was war besonders gut?“ / „Was hat euch gefreut?“
In dieser Kategorie sammelt ihr alle Themen, die im Workshop positiv waren. Hier nennt ihr Platz für Lob an einzelne Personen aus eurem Team, Ergebnisse oder Leistungen.

WELCHE NUSS HABEN WIR GEKNACKT?
Oder auch – „Welche Herausforderungen haben wir gemeistert?“ bzw. „Welche Hindernisse haben wir überwunden?“
In dieser Kategorie ist Platz für alles, was für euch herausfordernd im Workshop war. Nennt hier Hindernisse, schwierige Situationen oder auch Ungewisses – alles, was ihr gelöst habt.



WAS IST KLEBEN GEBLIEBEN?
Oder auch – „Was haben wir gelernt?“ oder auch „Was nehmen wir mit?“
Sammelt ihr dieser Kategorien Learnings, die ihr im Workshop gesammelt habt. Was nehmt ihr mit? Was wollt ihr mit eurem Team teilen? Worauf solltet ihr zukünftig achten?

https://boldcollective.de/toffifee-retro/

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Quiz Design Thinking

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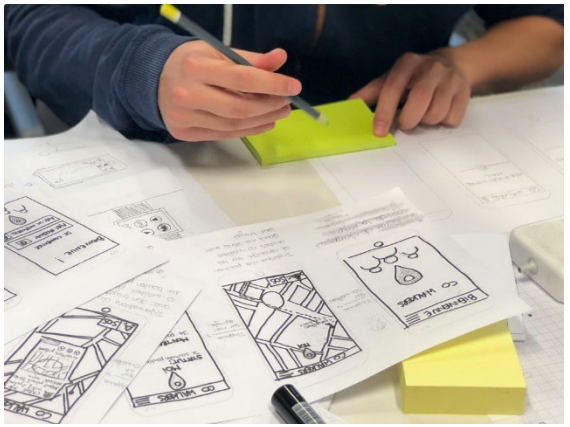
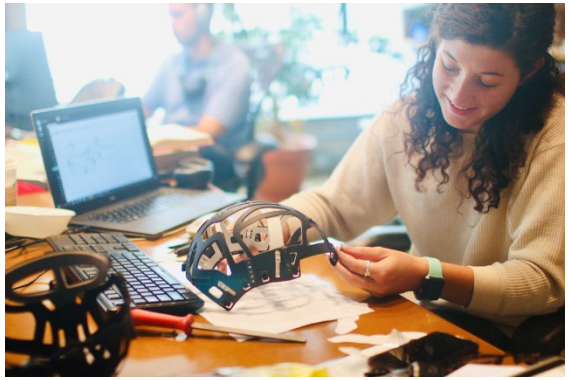
Prototyping = Design Thinking

A prototype

- visualises mental ideas;
- supports the comprehension of complexity;
- enables communication, thus removing cultural and linguistic barriers;
- always contains a specific question and is limited due to given constraints;
- tests functionalities and requirements;
- creates a basis for common understanding of the idea that should be realized;
- localises users' interests and/or
- allows analysing users' interaction with the object.





Ängeslevä J. et al. (2016) The Results of Rethinking Prototyping. In: Gengnagel C., Nagy E., Stark R. (eds) Rethink! Prototyping. Springer, Cham.

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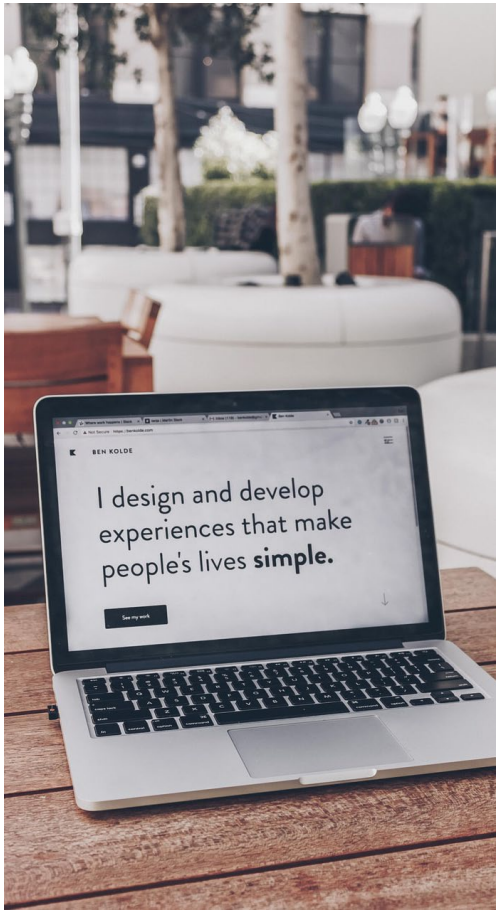
What is design thinking?

- Design thinking is a creative problem-solving approach—or, more completely, a *systematic and collaborative approach for identifying and creatively solving problems*
- Design thinking draws from **a wide field of disciplines** including software development, engineering, anthropology, psychology, the arts, and business
- Design thinking as it exists today has **co-evolved across a variety of disciplines and industries over the last 50 years**
- Its practices have been codified, integrated, documented, and championed by leading **design firms** (such as IDEO) and **academic institutions** (such as Stanford's d.school), and have increasingly been adopted by **industry** and popularized by the **media** under the shared umbrella of design thinking.



Verganti, R., Dell'Era, C., & Swan, K. S. (2021). Design thinking: Critical analysis and future evolution. *Journal of Product Innovation Management*.

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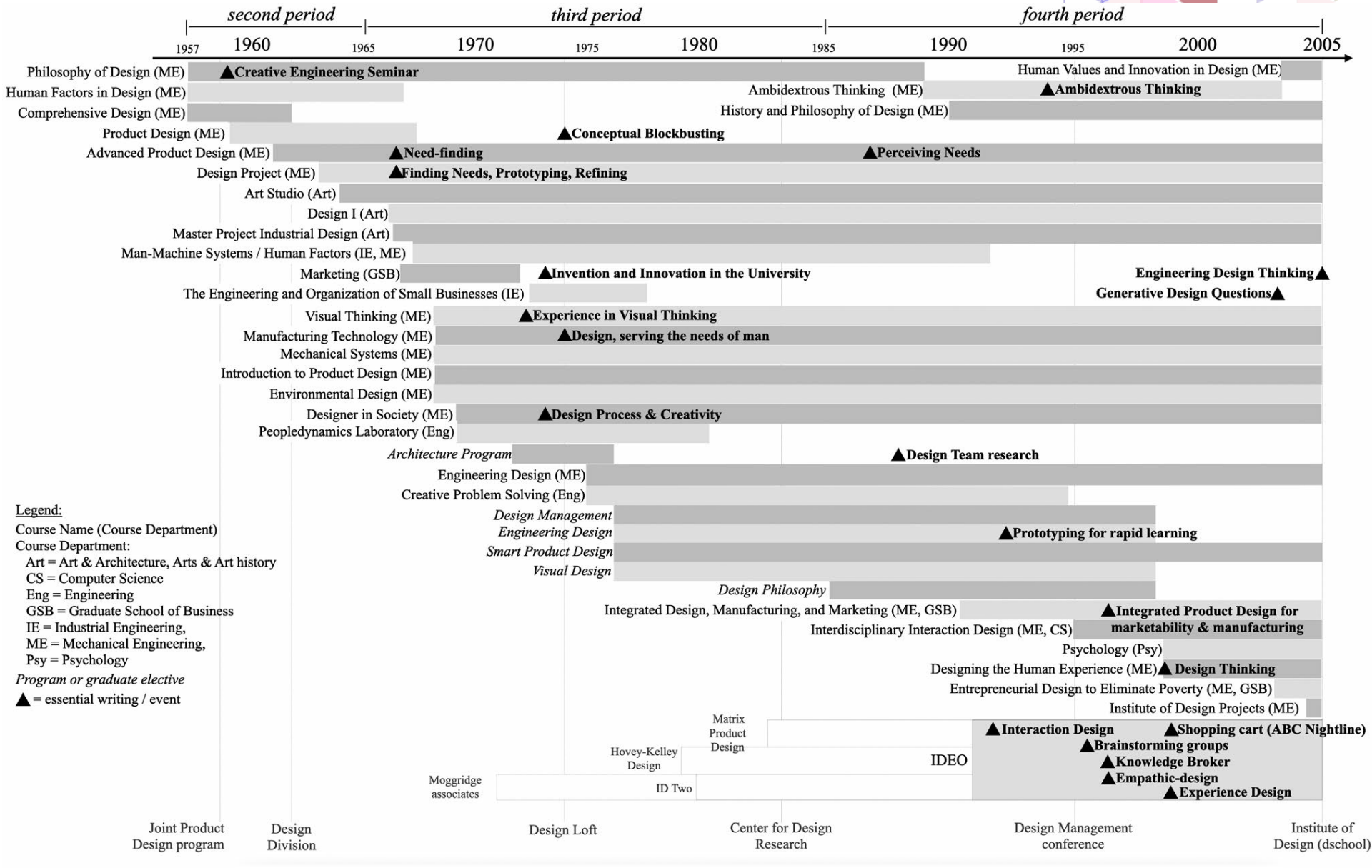
Auernhammer, J., & Roth, B. (2021). The origin and evolution of Stanford University's design thinking: From product design to design thinking in innovation management. *Journal of Product Innovation Management*.



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The diffusion of design thinking

- The term **“Design Thinking”** dates back to the 1987 book by **Peter Rowe**; “Design Thinking.” He describes that how engineers and architects approach a problem differs significantly.

- In the early 90s, cognitive scientist **Don Norman** joined the team at **Apple** as their **User Experience Architect**, making him the first person to have UX in his job title.

- In a 1999 broadcast of ABC’s ***Nightline***, anchor Ted Koppel announced a video that in the following two decades would have a remarkable impact on the practice of innovation: **“The Deep Dive,”** a 20-min clip illustrating how influential **design firm IDEO** realizes innovation through Design Thinking.

IDEO

Auernhammer, J., & Roth, B. (2021). The origin and evolution of Stanford University’s design thinking: From product design to design thinking in innovation management. *Journal of Product Innovation Management*.

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The diffusion of design thinking

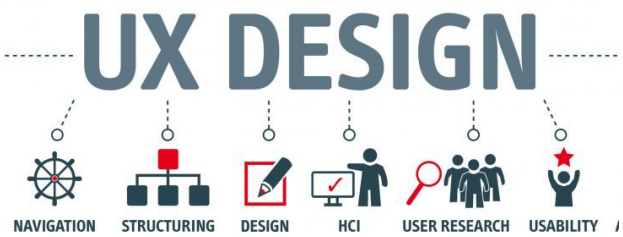
DESIGN THINKING
MASTER CLASS

Harvard Business Review

Design Thinking
Thinking like a designer can transform the way you develop products, services, processes—and even strategy. by Tim Brown
From the Magazine (June 2008)

BCG

McKinsey & Company



- Since then, "The Deep Dive" and other similar tutorials have been a centerpiece in **MBA innovation classes** and executive programs on strategic transformation.
- **Books and articles** on Design Thinking have proliferated in the business press (Brown, 2008; Martin, 2009)
- The **major management consultancies** have acquired design firms to expand their offerings into Design Thinking.
- **Corporations** have invested in design, hiring designers, and using Design Thinking as a backbone for cultural change

Auernhammer, J., & Roth, B. (2021). The origin and evolution of Stanford University's design thinking: From product design to design thinking in innovation management. *Journal of Product Innovation Management*.

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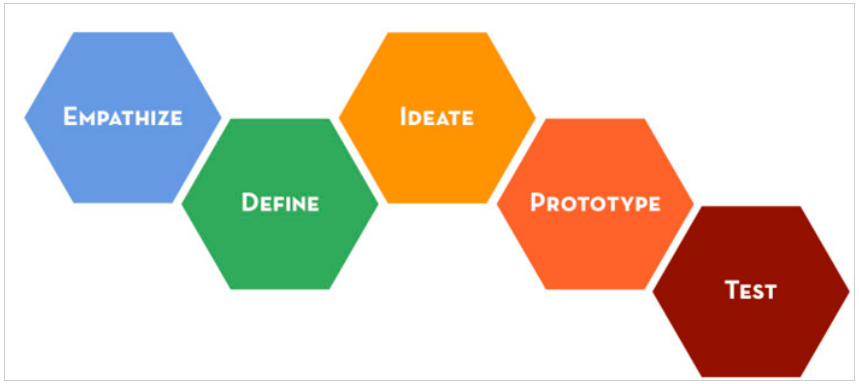
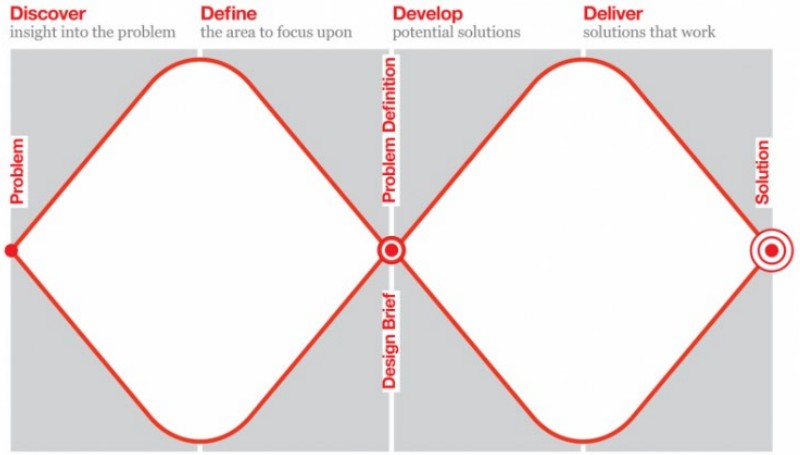
Different ideal processes

This brought about an industry trend in which different schools of Design Thinking emerged with their own mix of methodologies and their own description of the ideal process: **Stanford d.school of design** with their five phases, the **Luma Institute** with their three-tiered approach, or **The British Design Council** with the Double Diamond are some of the best known examples.





Judit Kun (2018). The evolution of Design Thinking — and How Might We sell it?. Medium. https://fiunary.medium.com/the-evolutoin-of-design-thinking-and-how-might-we-sell-it-61ec97c35c65

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DESIGN THINKING AS A PARADIGM SHIFT AND A MINDSET SHIFT

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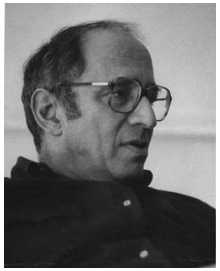
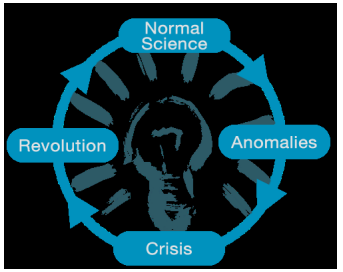
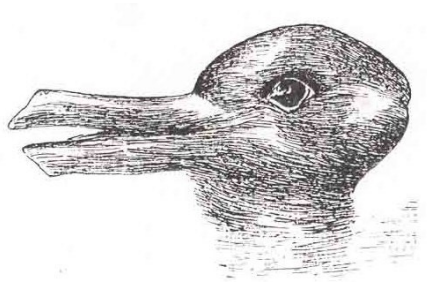
Design thinking as a paradigm

- Design Thinking is a paradigm - “To be located in a particular paradigm is to view the world in a particular way” (Burrell & Morgan, 1979, p. 24)
- A paradigm induces one of possible ways to practice within a problem area, and it can demonstrate superiority in a given context (until other superior paradigms emerge or until the context changes).
- It is one of the many possible ways to practice design. It implies assumptions (e.g., that innovation can be the result of one clearly identified process), and especially a constellation of beliefs, values, and techniques that coalesce around some very specific principles (Liedtka, 2015; Micheli et al., 2019; Seidel & Fixson, 2013; Verganti et al., 2020)







DT as a paradigm shift

		INNOVATION I	INNOVATION II
PEOPLE	Who does the designing?	Trained designers	Everybody designs
	Team composition	Homogeneous experts	Diverse teams using participatory methods
	Outside stakeholders	Managed at arm's length	Strategic partners
PROCESSES	Problem framing	Problems are known	Problem definitions evolve
	Expectations on answers	One "best" big idea that can be proved	Portfolio of small bets to be tested in the real world
	The conversation itself	Debate among competing alternatives	Dialogue in pursuit of insights, opportunities, and learning

The shift from Innovation I to Innovation II.

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Innovation I vs Innovation II

Innovation I (old paradigm):

- is isolated in experts and senior leaders, decoupled from the everyday work of the organization
- innovation is about big breakthroughs done by special people
- design is mostly about aesthetics or technology

Innovation II (democratizing of innovation):

- we are all responsible for innovation - everybody in an organization has a role to play
- Innovation isn't only about big breakthroughs; it is about improving value for the stakeholders we serve
- we acknowledge two truths: first, it is often impossible to tell early in the life of an innovation just how big or small it will someday be; and, second, many small things can add up to something big.

Design thinking makes Innovation II possible by encouraging distinct shifts in mindsets and behaviors, i.e. the way in which the involved individuals and stakeholders identify problems and seek solutions.

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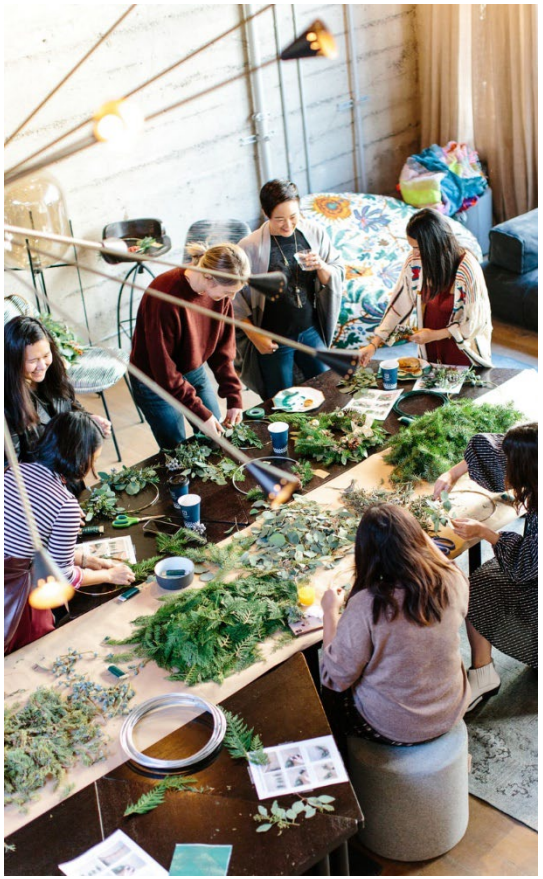
Human-centeredness

- design decisions are driven by *maximizing meaningfulness for the user* instead of business viability and technical feasibility
- although products and technologies are clearly critical to ultimately addressing customer needs, they are viewed as *enablers of solutions* that follow from customers' needs
- Human centered is always where we start—with **real people**, not demographic segments
- the DT process *begins* by understanding the user, their problems, pain-points, and desires - DT emphasizes the importance of **deep exploration** of the people whose lives we want to improve before we start generating solutions



Liedtka, J., Salzman, R., & Azer, D. (2018). *Design thinking for the greater good*. Columbia University Press.

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Ideation

- **Quantity matters**: good solutions to a problem are more likely to emerge if many ideas are identified and explored
- **Multiple options**: We want to manage a portfolio of new ideas because we are guessing about our stakeholders' needs and wants and may be wrong sometimes.
- **Possibility driven**: We ask the question "What if anything were possible?" as we begin to create ideas.
- **Subject-field expertise does not matter**: good solutions are more likely to emerge if approaching a problem unencumbered by expertise and by taking unusual perspectives
- **Cross-disciplinary and collaborative***:* Using diverse teams with a wide variety of backgrounds and training – including participants external to the organization—such as customers, suppliers, and other subject matter experts—for select modes or activities.

Verganti, R., Dell'Era, C., & Swan, K. S. (2021). Design thinking: Critical analysis and future evolution. *Journal of Product Innovation Management*.

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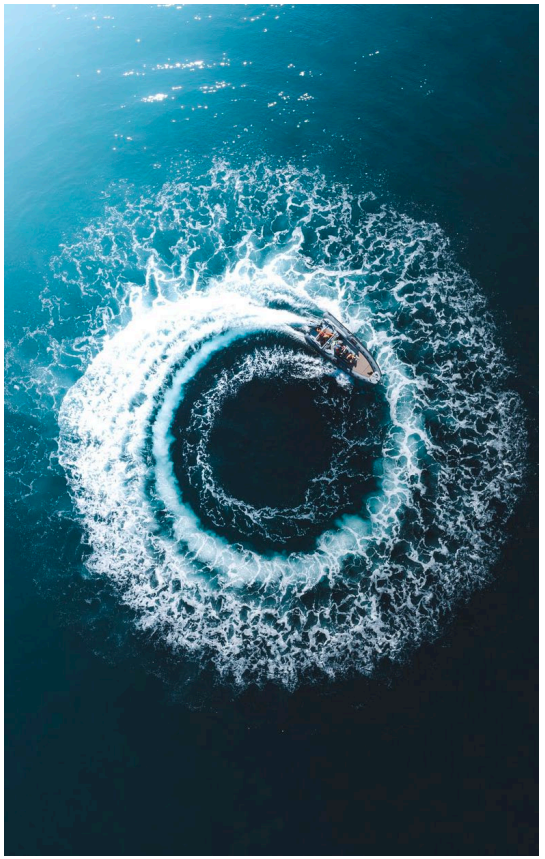
Iteration & Flexibility

- **Iteration:** The DT process conducts cycles of real-world experiments to refine ideas - we don't expect to get it right the first time: we expect to iterate our way to success.
- **Failure:** Early design mistakes are just ways to iterate toward better solutions
- **Prototypes:** learning iterations are based on visual and material representations of the solutions rather than on abstract design models and representations.
- **Multimodal communication skills:** A willingness to communicate and work in various modalities, including verbal, visual, and tactile. Design thinkers sketch and create prototypes, without being constrained by a perceived lack of ability or skill.
- **Flexibility and comfort with ambiguity***:* Design thinking is best suited to addressing ambiguously defined problems and opportunities, and requires great flexibility with respect to both content and approach
- **Holistic and integrative:** Although details are important, design thinkers are also able to see and consider relationships, interactions, and the connections between seemingly disparate ideas.



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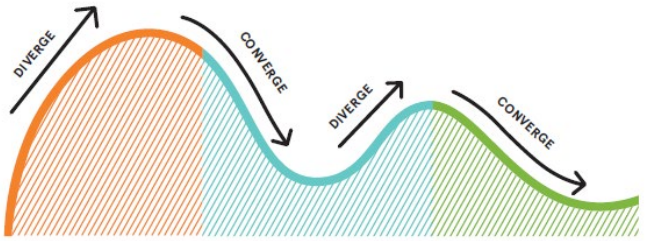
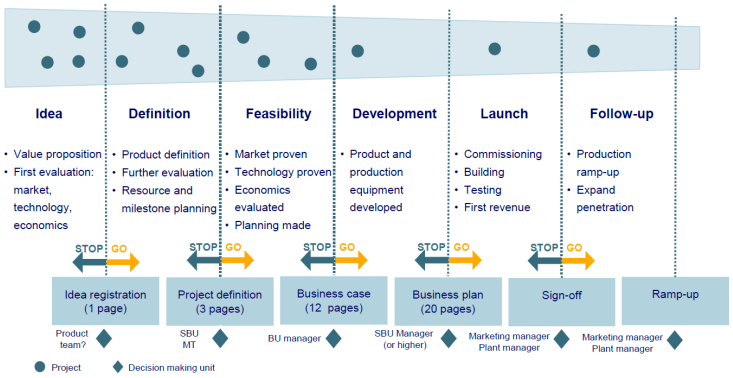
Nonlinearity as the centerpiece of design thinking

- As various researchers have observed, (e.g. Beckman & Barry, 2007) all Design Thinking processes seem to *"begin with analytic phases of search and understanding, and end with synthetic phases of experimentation and invention"*
- Design thinking is **intentionally nonlinear**: Designers, whether in the arts or industry, tend to explore and solve problems through iteration.
- This is in contrast to a linear process, such as the **traditional Stage-GateTM new product development (NPD) process**, in which prototyping is typically done toward the end of the process to reflect the culmination of the development phase and to explore manufacturability, rather than as a mechanism for gaining market feedback.





Verganti, R., Dell'Era, C., & Swan, K. S. (2021). Design thinking: Critical analysis and future evolution. *Journal of Product Innovation Management*.

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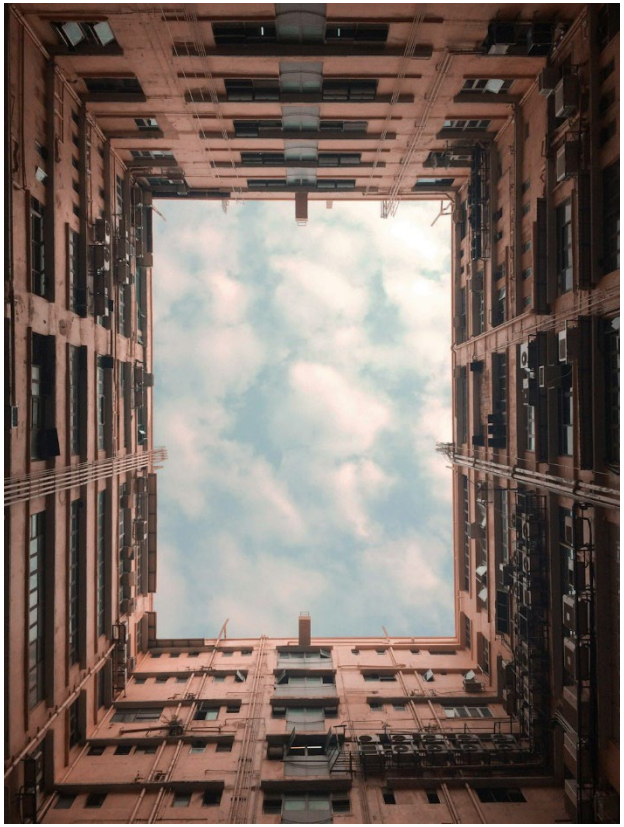
(Non-)linearity as a trap

- The lack of consensus regarding its process and concepts led to a wider sense of confusion and critique as Design Thinking became more popular

  (Kimbell, 2009; Johansson-Sköldberg, Woodilla and Çetinkaya 2013)

- And this had direct implications for practitioners. Nussbaum, a former advocate of Design Thinking argues (2011), that these processes helped "package" and sell Design Thinking, but companies molded them to fit their own, linear way of working, thus rendering it useless.

- The question of why companies turned Design Thinking into a linear process could be answered with the assumption that companies prefer predictability and being able to plan projects definitively.



Shift in mindset neccessary

Judit Kun (2018). The evolution of Design Thinking — and How Might We sell it?. Medium. https://fiunary.medium.com/the-evolutoin-of-design-thinking-and-how-might-we-sell-it-61ec97c35c65

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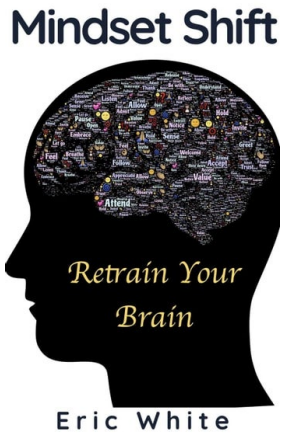
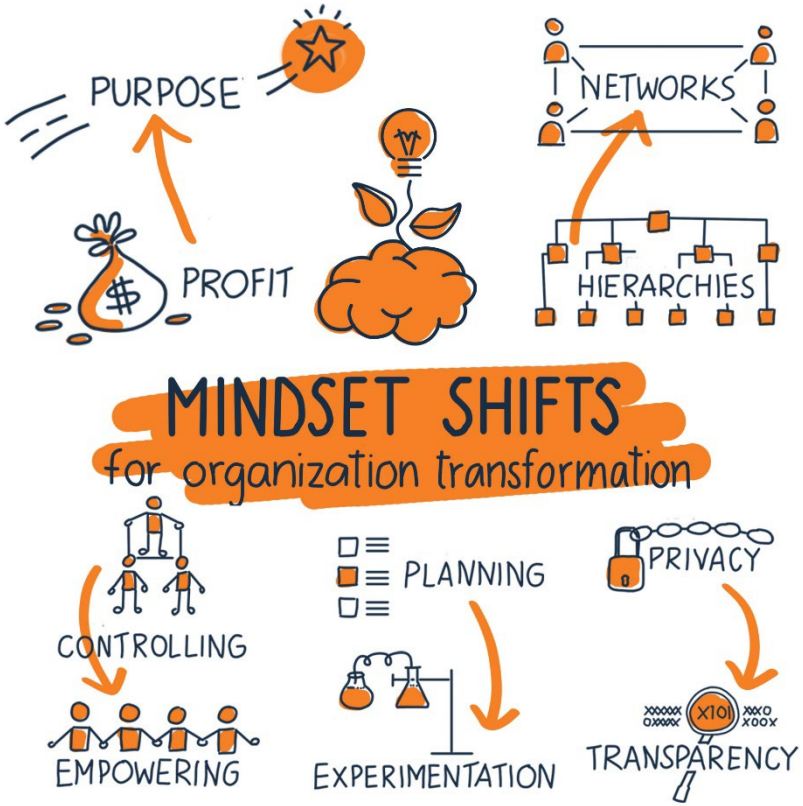
Mindset shifts





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TASK: READ „A TALE OF TWO MANAGERS“ (PDF ON MOODLE)

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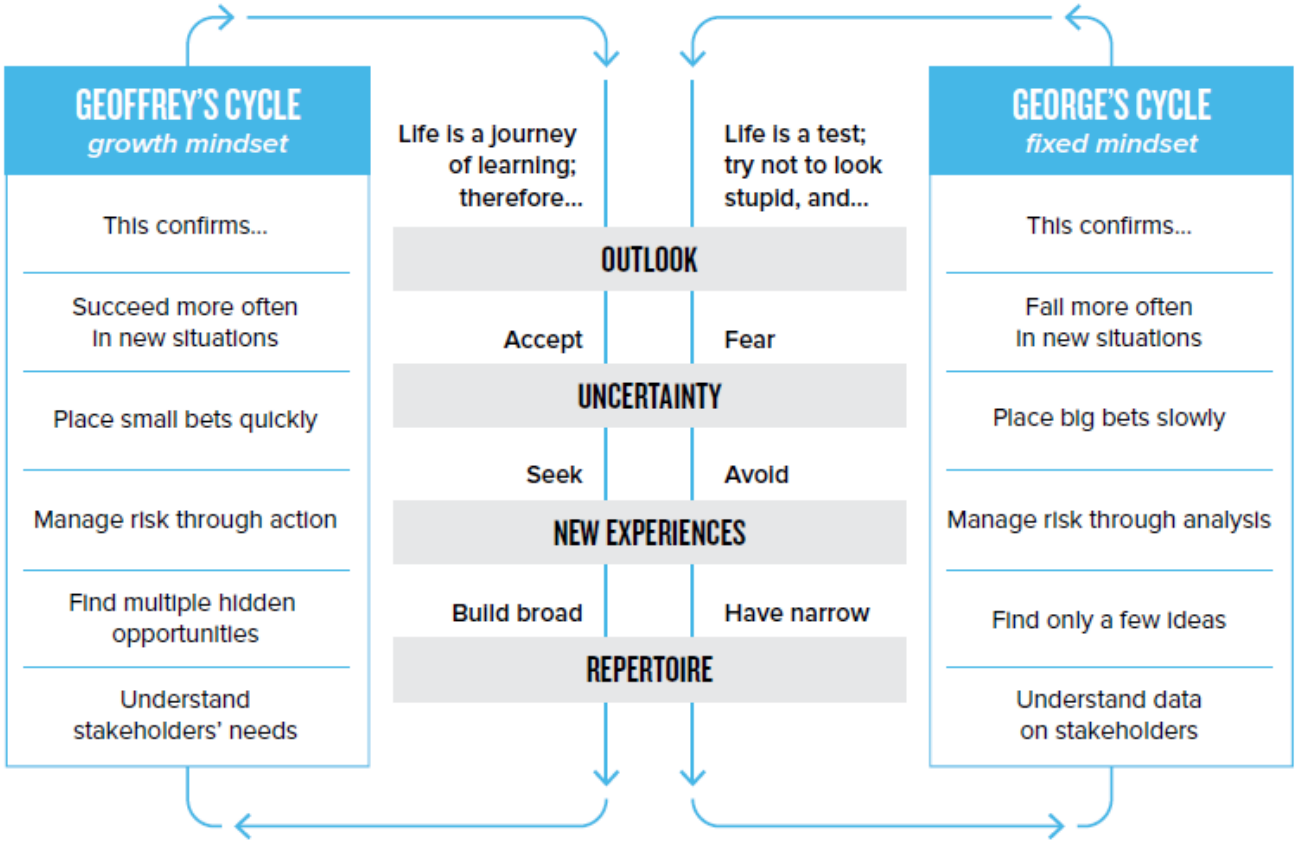
Two types of mindsets: growth vs fixed



George's and Geoffrey's self-sustaining cycles.

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GROWTH & FIXED MINDSET: HOW TO COMBINE THE BEST OF BOTH WORLDS

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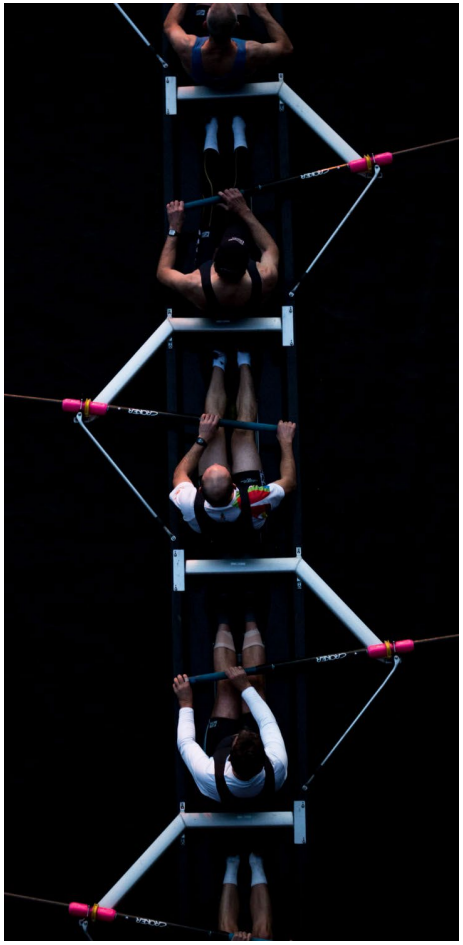
Working together

- **Most of us** find ourselves somewhere on a **continuum between George and Geoffrey**, depending on circumstances.
- Design thinking offers an opportunity **to enhance the skills of each** — to help George envision more creative futures and to help Geoffrey better navigate the bureaucracy.
- **The point is not that we need George to *become* Geoffrey.** What Geoffrey enjoys intuitively —**a learning mindset, empathetic understanding of stakeholders, an experimental approach to solving problems** — is what design thinking's methodology and tool kit are all about.
- **Design thinking can help George comfortably emulate the innovation-oriented behaviors that make Geoffrey effective, and Geoffrey can learn how to better utilize George's analytical and testing skills.**



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The best of both worlds

- **Improving the dialogue** between George and Geoffrey is essential, so that they can work together and bring their individual strengths to innovation conversations rather than regard each other with suspicion and create gridlock.
- The merger of ideas and everyday realities in successful innovation requires both the **expansive thinking** of Geoffrey and the **hard-eyed critical analysis** of George.
- **George's gift is his ability to see clearly the constraints limiting any idea's feasibility**. Trouble is, his **timing is often wrong**.
- He rushes to **point out constraints** as soon as an idea surfaces. This kind of skepticism **prevents initial concepts** from being developed into something better and casts a pall on the enthusiasm of the idea generation process itself.
- **Innovation, in its earliest stages, is fragile. A gust of negativity will often kill it**.
- **The key for George and Geoffrey is to learn respect for what the other brings, so that George's analytical approach is introduced at the right time—during idea testing, not idea generation.**

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Additional materials in moodle

2

INSPIRATIONAL DESIGN BRIEFING

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10

DESIGN THINKING FOR NON-DESIGNERS: A GUIDE FOR TEAM TRAINING AND IMPLEMENTATION

Victor P. Seidel
Babson College
Sebastian K. Fixson
Babson College

Example Design Thinking process "spaces," "modes" or "phases" (illustrated linearly for comparison)

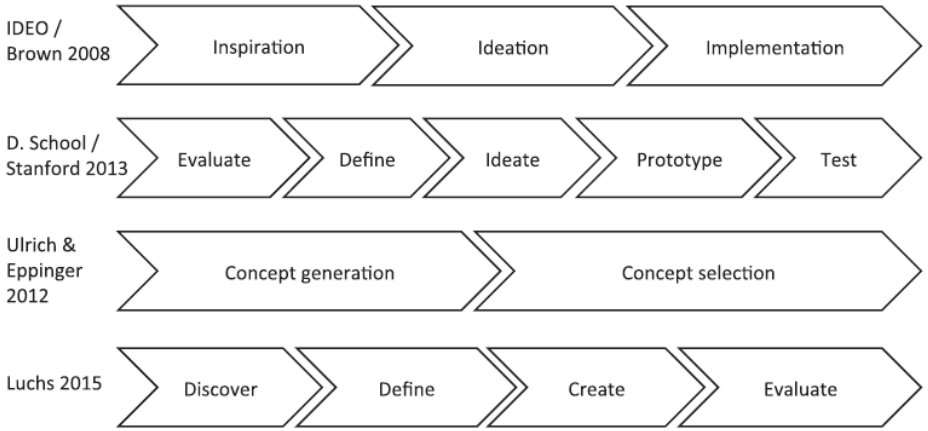

Illustration of changing emphasis of tools spanning the process:

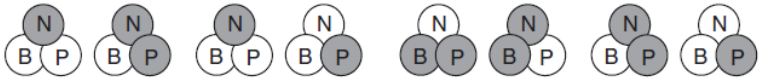

Figure Key:
N = Needfinding tools
B = Brainstorming tools
P = Prototyping tools
Shaded area indicates greater use of tools