

DESIGN THINKING 101



The Design Thinking Paradigm

Begin at the Beginning

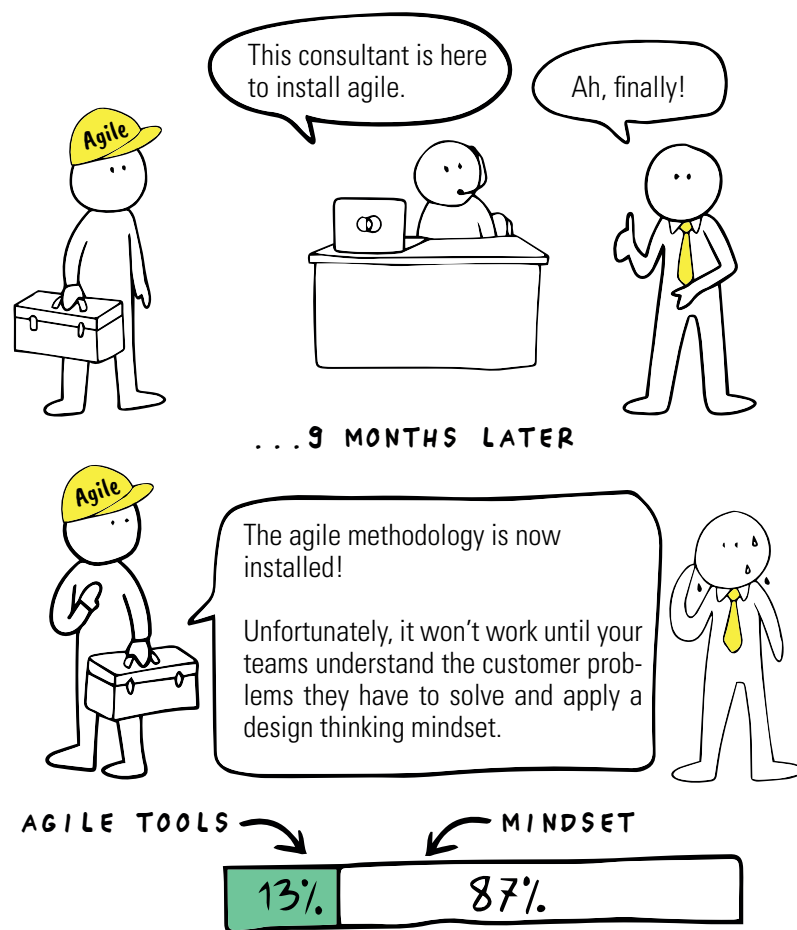
Design thinking has evolved in recent decades. Originally, it was specifically focused on the re(design) of products, services, and processes. Today design thinking is a mindset that is the basis for business model innovation, value proposition design, and the design of entire business ecosystems within the framework of design thinking for business growth.

However, design thinking also supports digital transformation and testing new organizational models in which radical collaboration takes place across the known silos in the company, ultimately establishing the team-of-teams concept. Design thinking is increasingly influencing strategy work in which strategic directions and ambitions are iteratively developed on the basis of customer needs.

Especially where offers that are new for the customer and new for the market are defined, Design Thinking can unleash its full potential. In addition, many companies have realized that agile alone is not enough. Teams need to understand where a problem originates, what the customer needs are, and what the purpose of the potential solution is. This means that beginning at the beginning becomes the credo for the successful realization of market opportunities and exponential growth.

This is one of the reasons why design thinking has become an incredibly popular approach in small and large organizations. However, it requires a certain type of mindset. Everyone who wants to re(design) their work and create better products, services, or new experiences for their users/customers might benefit from applying certain attitudes that can empower their thinking and creativity.

Too often, design thinking is assumed to be part of the agile toolbox, and companies realize too late that their teams need additional skills in exploring the problem space.



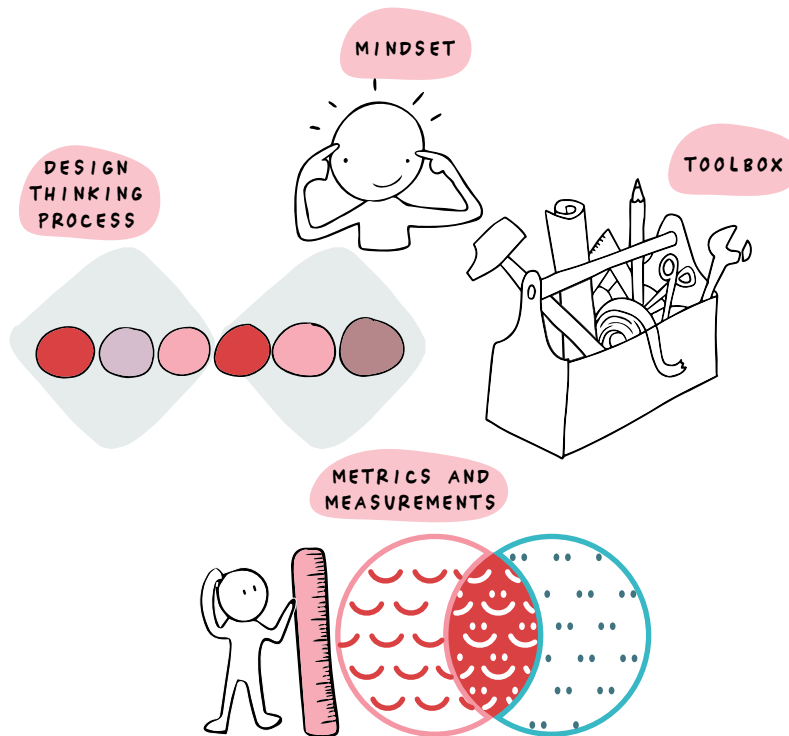
The design thinking mindset is based on the core beliefs that the teams in the exploration of the problem space and solution space rely on an overarching collaboration and focus on thinking from the perspective of the customer's/user's needs. Based on the gains, pains, and jobs to be done of a potential customer/user, new solutions are iterated. As already noted, it is important to first explore the appropriate problem before solutions are developed.

Collaboration in design thinking is based on a bias toward action. The team comes together in “doing” mode to either gather new insights, build a prototype, or test it. Many design challenges in the business context today have digital components or target growth opportunities in business ecosystems. However, this also means more complexity in the projects, which has to be accepted by all involved. Such projects also require varying mental states, usually involving a combination of design thinking, lean start-up, systems thinking, and scale methodology. An approach that was also highlighted by Ash Maurya in the preface of this book as an innovation framework that marries various concepts in the realization of innovations.



The Innovator's Essentials

This 101 on design thinking presents an initial overview of the design thinking mindset, process, tools, and appropriate metrics. The metrics are part of a minimum viable set of exploration metrics, which can help, especially in the EXPLORE phase to select ideas, to measure the creativity of teams, and to steer a design challenge and an innovation project at the project and meta levels. The metrics have the purpose of making better decisions and deriving the next actions and iterations. They should not limit creativity, nor should they obscure the target to finish design challenges and projects at an early phase.



The tools and methods presented are a means to an end, meaning the metrics as well as the tools are always to be adapted to the respective situation.

The central element in design thinking, however, is the mindset (see page 62). It is the linchpin of agile customer development, the way teams work together, and how solutions are iteratively developed starting from a problem statement.

For many of us, no matter our age or years on the job, the ability to explore and learn from our respective experiments has often been forgotten. And in most cases, our education at schools and universities discourages the detailed questioning and examination of facts, but solutions are quickly sought and implemented.

This is one of the reasons why in design thinking there is usually no team of experts working iteratively on solutions to wicked problems. A group of experts usually tends to solve the problem in a known way due to their experience, which often only leads to incremental improvement and innovation.

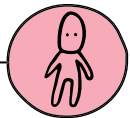
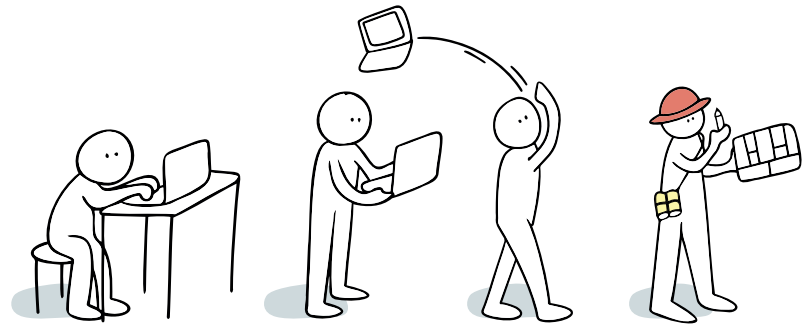
Experience and research shows that in interdisciplinary teams there is a better mix of many skills and domain know how, which helps to take different perspectives on the problem and potential solutions.

The best performing design thinking teams are those in which the team members have attitudes that are:

- **Open to a world of possibilities** and “what if...?” questions
- **Free of preconceptions** about how something will work
- **Filled with curiosity** to understand things more deeply
- **Free of expectations** about what will happen
- **Open to failing early and often**, while learning quickly

The Design Thinking Mindset

The Stanford d.school design thinking mindset presented here is the basis for many manifestations that are applied in the field of design thinking today. In the context of digitalization, design thinking for business growth, and an expanded design lens, elements such as the acceptance of complexity and the application of variable thinking states have been added to elements presented below.



FOCUS ON HUMAN VALUES

Build up empathy for the customer/user or other stakeholder the team is designing for. Explore the needs, pains, gains, and jobs to be done, and obtain feedback.



SHOW, DO NOT TELL

Communicate the vision and prototypes in a meaningful way by creating an experience, applying illustrative visuals, and telling a powerful and inspiring story.



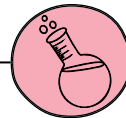
CRAFT CLARITY

Develop a coherent vision out of a wicked problem to solve. Frame it in a way to inspire the team and to fuel ideation.



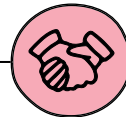
BIAS TOWARDS ACTION

Move the idea forward together with the team. Maintain a bias toward doing and making over thinking and meeting.



EMBRACE EXPERIMENTATION

Prototyping is not just a way to validate an idea with the customer/user, it is an integral part of the design thinking process. Ideation, prototypes, and testing are to be understood as one entity to think and learn about a potential market opportunity.



RADICAL COLLABORATION

Create teams with different T-shapes, thinking preferences, backgrounds, and points of views. Breakthrough solutions and innovations emerge from diversity and ad hoc collaboration.



BE MINDFUL OF THE PROCESS

Know and communicate where in the design thinking process the team is right now. Decide about the appropriate tools and methods to use and remember what the objectives are.

Design thinking is often incorrectly categorized as an innovation method, but it is actually a mindset of finding the appropriate problem as a starting point for developing solutions that matter for customers/users.

Extract Long-Term Value

Design thinking is the basis for long-term value. It provides the foundation of the appropriate topics that allow us to become more meaningful to the customer. Moreover, design thinking has a transformative character that allows us to establish a design-led organization that uses the design thinking paradigm from the elaboration of critical functions and experiences to the definition of growth strategies. The agile toolbox uses elements, tools, and methods from design thinking in many respects, but primarily has the task of developing the validated prototypes quickly and purposefully and testing

them on the market. For agile and the related tasks other skills are needed and metrics are also changing. Finally, lean thinking (EXPLOIT) focuses on efficient implementation and forms the basis for later scaling, which allows the customer base to grow exponentially and costs to remain moderate. However, applying the well-established exploitation metrics for increasing operational efficiency and reducing waste in an effort to measure the ability of extracting long-term value will remove any chance of breakthrough discovery, invention, and transformation.

DESIGN THINKING

→ EXTRACT LONG-TERM VALUE

BY APPLYING DISTINCT CAPABILITIES
AND METRICS...

- to understand users and potential customers, their pains, gains, and jobs to be done, preferences, behavior, and needs
- to establish a design-led organization moving from product-centric to more personalized and customized services, products, and experiences
- to react closer and faster to improve and react to new customer behaviors and market changes

AGILE

→ DEVELOP & TEST RAPID

BY APPLYING DISTINCT CAPABILITIES
AND METRICS...

- to drive project speed and predictability with small, frequent delivery increments
- to establish a collaborative business and IT management framework
- to establish a new risk management engineered directly into an agile execution life cycle

EXPLOIT

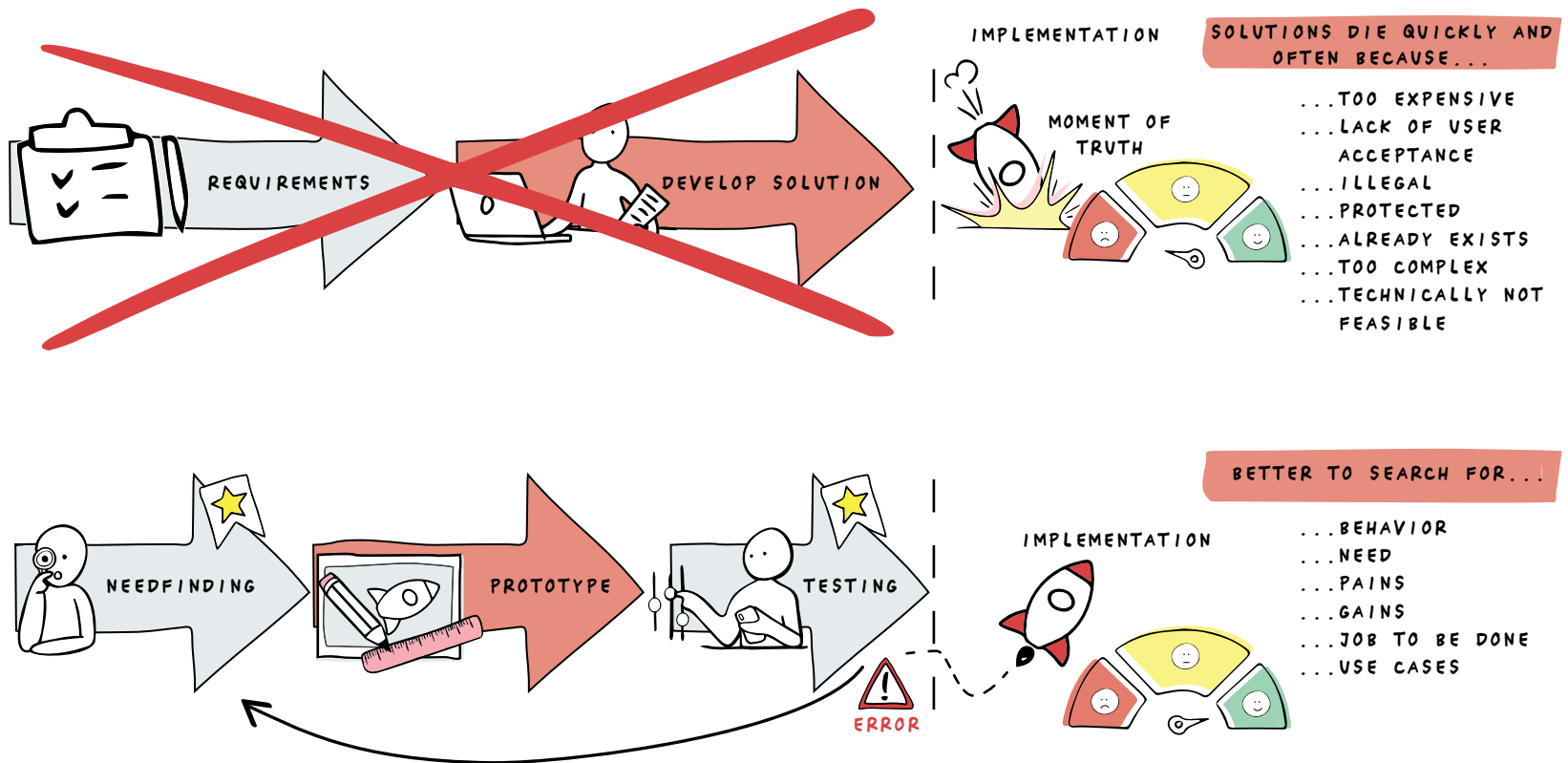
→ RUN CHEAP

BY APPLYING DISTINCT CAPABILITIES
AND METRICS...

- to drive realization, knowing when to turn and when to persevere and grow a business with maximum acceleration
- to allow a principled approach to phases of exploiting, sustaining, and retiring portfolio elements

No Shortcuts - Do Not Start with Just Building Solutions Agile

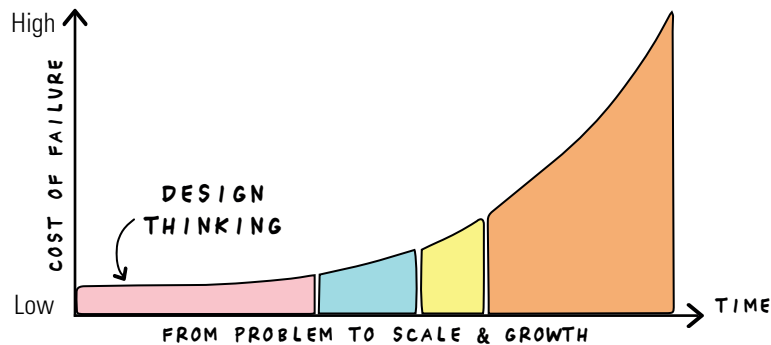
In our efficiency-driven organizations, we often try to take shortcuts because the exploratory work is time-consuming, and many teams have to leave their comfort zone for the interaction with the potential customer/user. However, the respective phases of the design thinking micro cycle and macro cycle (see page 69) are central to the subsequent success of problem/solution and product/market fit. Solutions based on our own assumptions without customer validation often die quickly, because customer behaviors, needs, pains, gains, and jobs to be done have not been considered.



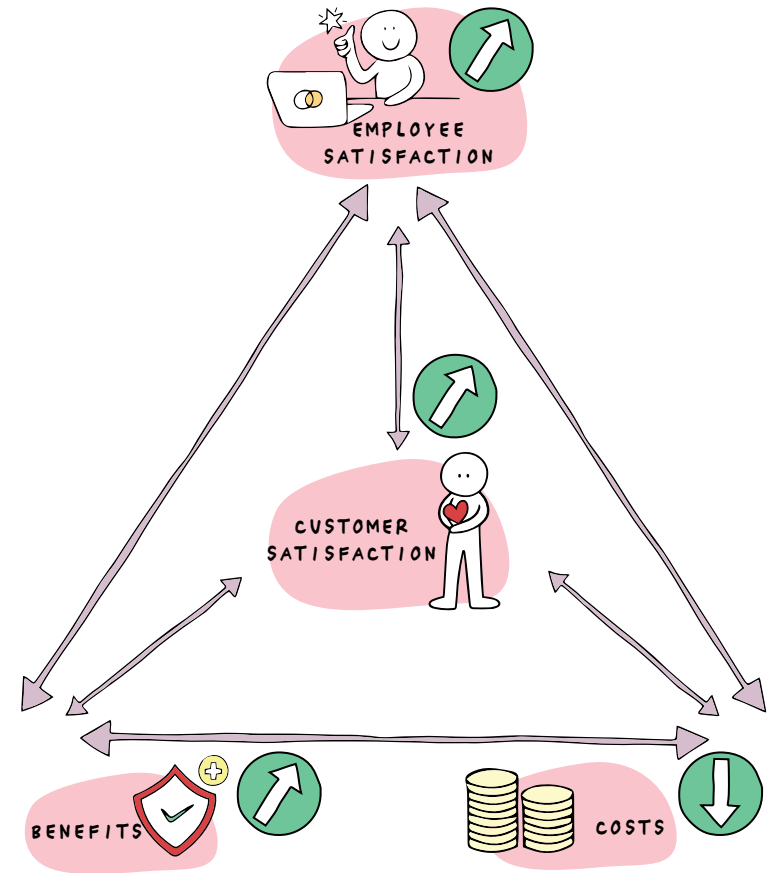
Why Start with Design Thinking

Impact of Benefits, Cost, Customer, and Employee Satisfaction

The importance of design thinking in the search for the appropriate problem and in the development of solutions that meet the needs of the customer is best illustrated by looking at the risks and costs of changes, resistance, or customer feedback over the course of a typical innovation project. The cost of changing requirements increases over the course of the project. Major changes toward the end, or even in the implementation phase of an innovation project, are much higher than doing the design thinking homework early in the process.



The impact on customers and the associated bottom line is self-evident. Therefore, organizations and companies are well advised to equip their teams with the appropriate skills and create structures in which iterative work on the problems can be done early on, and a pivot can be carried out by the design thinking team, so that expensive delays can be avoided, competitive advantages can be realized, and exceptional customer experiences can be created. See the typical impact on various factors on the next page. In addition, morale and employee satisfaction can be kept high by applying design thinking principles. Thus, the design thinking mindset becomes the basis for agile delivery models, which are better at dealing with change, and thus helps significantly reduce costs and resistance in later phases of project work for all project types.



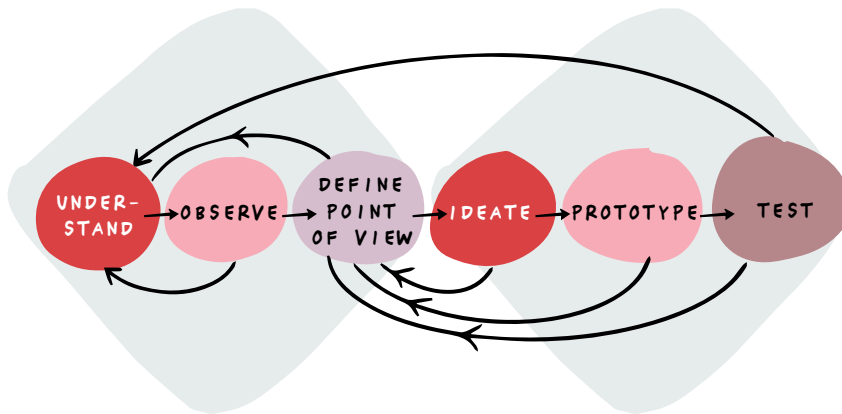
Design thinking has a positive effect on several levels and also saves massive costs for later changes to the product, service, or customer experience.

Typical Impact on (Re)design, Innovation Success, and Employee and Customer Satisfaction as Phases of Innovation Projects Elapse

	NEEDFINDING	PROTOTYPING	TESTING	IMPLEMENTING
PROCESS COSTS AND COSTS FOR CHANGES	\$	\$	\$	\$
TIME REQUIRED FOR CHANGES	• Hours to days	• Days to weeks	• Weeks to months	• Months to years (sometimes never)
RESISTANCE TO CHANGE	• Low	• Medium	• Medium to high	• High to very high
AGILITY AND EFFORT TO PIVOT	• Observing and understanding create many points of view, which provide the basis for ideation and quick feedback from potential customers.	• Depending on the resolution of a prototype, changes might be accommodated with low to medium costs and resistance to change becomes more likely.	• Solution testing and tests on finished prototypes operate in many cases with already defined functions and experiences. Major changes are expensive and need extended approval.	• Pivoting after implementing is in many circumstances a new innovation project, which needs additional resources or major re-engineering or development of solution.
INDIVIDUAL AND TEAM MOTIVATION	• A new design challenge is energizing the teams, awakening curiosity, and inspiring them to be creative.	• Enthusiastic teams retain their creativity, think through problems, and design radical new solutions.	• Many iterations and rework frustrate teams, and often, motivation is lost if this state continues for too long.	• Pessimism is widespread as employees resist realigning entire projects or the subsequent changes are very costly and time-consuming.
IMPACT ON CUSTOMER SATISFACTION AND BOTTOM LINE	• Discovering of new or changing customer/user needs.	• De-risk potential of failure.	• Major changes in evolving and higher maturity.	• Market flop has impact on revenues, brand image, retention, and acquisition.
RECOMMENDATION AND MINDSET TO BE APPLIED TO AVOID NEGATIVE IMPACTS	✓ Problem exploration and definition are key.	✓ Fail fast, fail cheap.	✓ Test frequently and in every iteration.	✓ Plan implementation while hunting for opportunities.

The Design Thinking Micro Process

The design thinking process exists as a process representation in countless variants. In the end, however, it always has the same purpose: to serve as a basis for knowing where the team currently stands in order to plan the next appropriate interactions with the customer, team, or other stakeholders. In all books of this design thinking series, the process is taken as a basis, which is also used by the pioneers and the active design thinking community at Stanford University, the d.school, and in many of the leading companies worldwide. The connecting lines of the Double Diamond make it clear that work is done in several iterations in the process. They also show that the understanding and observing steps form one entity, while the ideation, prototyping, and testing steps form another entity. In both cases, new insights are collected, which results in a new point of view. The design thinking process is usually started with a problem statement or an already formulated “How might we...?” (HMW) question, which already suggests an opening for new solutions and at the same time contains the problem and the already known customer/user needs.



In addition, the Double Diamond provides orientation. It divides the design thinking process into the problem space and the solution space. The individual phases are briefly described below.

Understand

In the first phase of the microcycle, we want to learn more about the potential user, their wishes, and the tasks to be fulfilled. At the same time, we sharpen the creative framework for which we want to design solutions. To define the design challenge, we use *why* and *how* questions, for example, to further open or narrow the scope (see page 108). Tools such as the empathy map and viable metrics to track the constant interactions with customers/users (see page 110) or categorization of critical assumption (see page 109) support this phase. Likewise, different jobs to be done can be compared and evaluated (see page 112). The subsequent phases and tools help the team to successively learn more about the potential customer/user. Professional design thinking teams measure how confident the team is to work on the problem space.

Observe

Only reality shows whether the assumptions about customers/users (e.g., as represented in a persona or several juxtaposed personas [see page 114]) are validated, and therefore it is best to go where potential users are. Various tools help in observing customers/users in the real environment or context of the problem at hand. Criteria for comparing personas might be formulated, quantified, and measured. The findings from the observe phase will help in the next phase (i.e., developing or improving the persona and in creating a new point of view). When the team talks to potential customers/users to learn more about their needs, open-ended questions should be asked if possible, and a question map should be used. A structured interview guide can also be helpful, but that usually only confirms the assumptions that prevail in the team.

Define Point of View

In this phase, the team focuses on evaluating, interpreting, and weighing the collected findings. It is essential to understand that analysis and synthesis often occur at the same time in design thinking (see page 119). Synthesis creates the bigger picture and forms the basis for experimenting and applying concepts. By structuring the analysis, the problem is framed, while synthesis is emergent, helping to create connections that identify breakthrough ideas and opportunities (see page 118).

This eventually culminates in the synthesis of the results (the point of view). The point of view is usually formulated as “How might we” question, to make a statement based on the findings according to the following pattern:

Name of the user/ persona: (who) _____
needs: (what is needed/desired) _____
in order to: (job-to-be-done/outcomes) _____
because: (insight/finding) _____

Ideate

After the team has defined the point of view, the IDEATE phase takes place. Ideation serves to find solutions to the defined problem. Usually, different forms of brainstorming or specific creativity techniques, such as working with analogies, are used for this purpose (see *The Design Thinking Toolbox*, pages 151-184). Simple dot-voting tools; scoring of ideas in terms of desirability, feasibility, and viability (see page 121); and the application of business value versus the urgency matrix help to cluster and finally select the ideas. The assumptions of ideas are later tracked with each experimental prototype (see page 122).

Prototype

Building prototypes helps the team to test the ideas or solutions quickly, and without risk, with the potential customers/users. Digital solutions in particular can be prototyped with simple paper prototypes or mockups. The tools are as easy as can be: craft materials, paper, aluminum foil, strings, glue, and scotch tape are often enough to make our ideas tangible and experienceable. Prototypes range from critical-experience prototypes to final prototypes. Ideation, building, and testing are each to be considered as a joint and interlinked activity. They cover the so-called solution space.

Test

Testing should take place after each prototype is built, or even when individual functions, experiences, or characteristics have been developed. The most important aspects of testing are that there is interaction with the potential user/customer and that the results are documented accordingly. Here, for example, the number of prototype iterations per feature can be measured. The measurement per feature gives the impression of a vanity metric, but it is still important because it enables a comparison between projects, regardless of the size of the project or the feature set. In addition to conventional user testing, it is possible to use digital solutions for testing nowadays (e.g., online tools in the context of A/B testing). This allows prototypes or individual functionalities to be tested quickly and with a large number of users/customers. From the tests, the team receives feedback that helps them to improve the prototypes. Competing prototypes with regard to novelty might be compared with the exploration grid (see page 125). The design thinking team should continue to learn from this process and develop prototypes further until the potential customers/users are fully convinced of these ideas. If that fails, the team should abandon or change the prototype.

Reflect

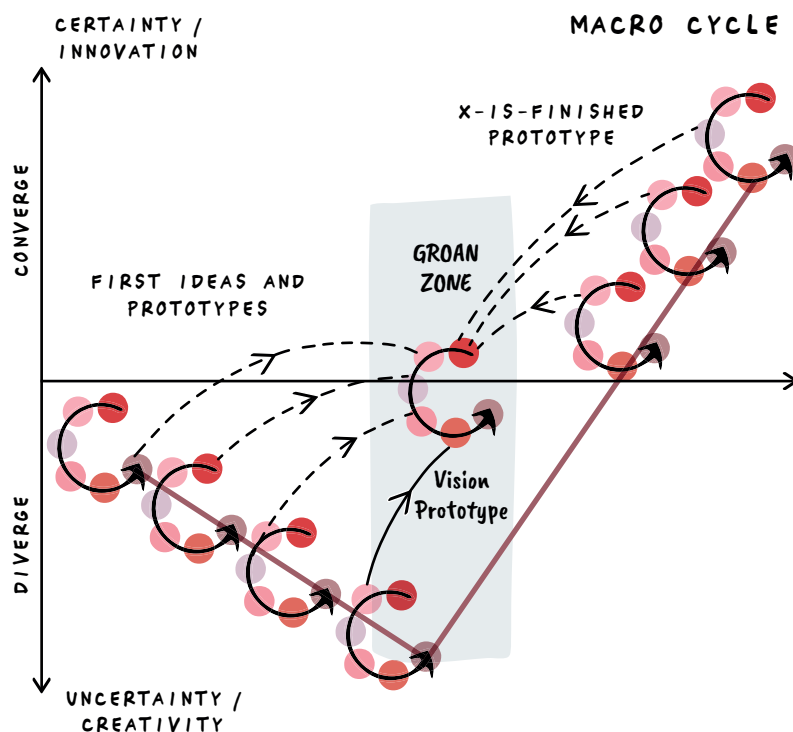
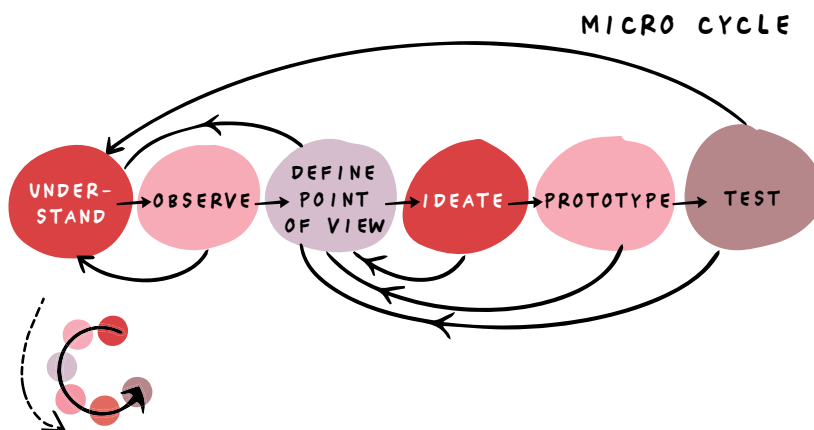
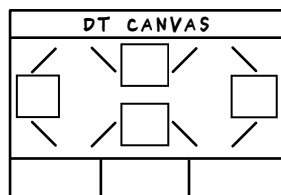
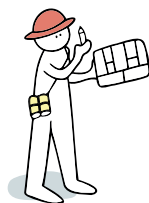
Reflection is a constant companion in design thinking, as it helps the team to learn and to improve the project work. The so-called retrospective sailboat or feedback rules based on “I like, I wish, I wonder” support this mindset.

The Design Thinking Macro Cycle

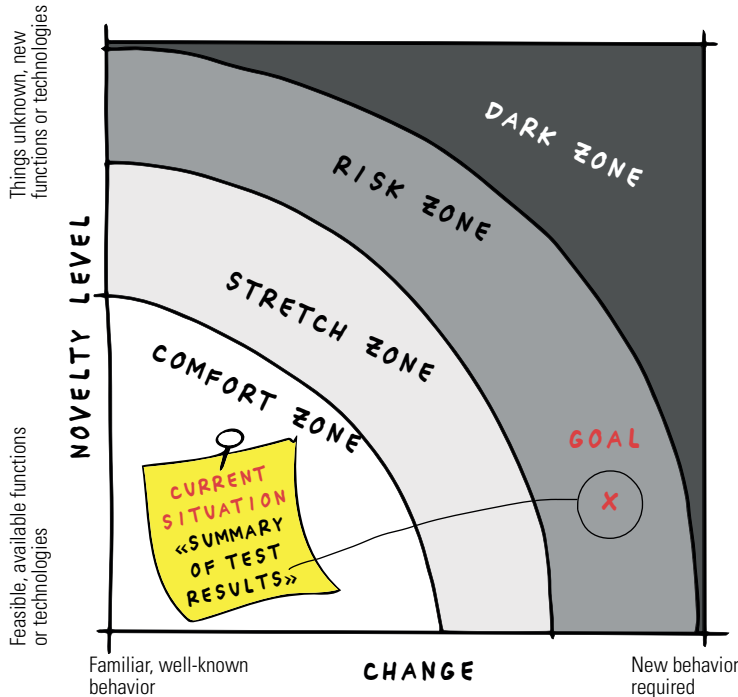
In many design thinking 101 discussions, only the design thinking micro process is presented. In some cases, this leads to the assumption that the micro process is only completed once and that the design thinking activities are completed at the end of the process. However, in most cases, the micro process is repeated several times, and, depending on the novelty of the solution, feedback from customers/users, and corresponding new insights, it is decided which elements require more attention or demand more extensive activities from the team in order to increase creativity.

The goal in the divergent phase of the macro cycle is, for example, to generate as many and as wild ideas as possible, and, ultimately, prototypes that help sharpen the vision. In the converging phase, the prototypes become more concrete and high fidelity. The functional prototype, for example, helps to test the problem/solution fit for individual elements before it matures into a final prototype. This phase is usually followed by implementation and market launch. However, many products and services today also require a well-thought-out business ecosystem design, which should be created on the basis of an MVP or after the completion of the final prototype.

The Groan Zone is the most challenging area for most teams, as they have to select the features, experiences, and solutions that will later make it into the high-resolution and final prototype. Tools like the Exploration Map (see page 72) help to document the respective experiments. In addition, the exploration map measures the expectations of an experiment and its effect on the target group. It also expresses and visualizes the radicality of the potential solutions. If the documentation of all outcomes in each phase of the micro and macro process is required, the *Design Thinking Canvas* is the perfect tool to capture the most important activities (see page 129).



The Exploration Map



The exploration map is documenting the novelty and the degree of change in every experiment performed over the entire macro design cycle. After each iteration in the solution space, outcomes of the experiment with a summary of test results can be documented on the exploration map. It provides guidance to the team about an experiment performed and at the same time the basis for the next planned one. The exploration map supports the critical discussion about experiments performed. Another great advantage of using an exploration map is that it shows, at the end of the entire design cycle, the path the team took to reach the ultimate solution. Metrics and measurements, in conjunction with exploration maps and how to estimate the probability of innovation success, are described on page 124.

Innovation Success



In the run-through of the micro and macro design cycles, the team repeatedly asks itself the central questions of desirability, feasibility, and viability. These three dimensions help to reduce the risks associated with the launch of new solutions, and the company and teams learning faster based on the “fail fast, fail early” approach. In addition, design thinking leads (if applied appropriately) to solutions that are innovative, and not only incremental.

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

–Tim Brown

What Is Desirability, Feasibility, and Viability?

Desirability by the potential customer must be understood and acknowledged by the design thinking team in order for customer-centric innovation to be possible at all. Even if it is tedious and takes effort to approach potential customers and users, the exploration of the problem space and the associated needs of the customer must be clearly understood and accepted to ensure a good basis for the subsequent work in the solution space. **Feasibility** means that a solution is technically possible, for example. It is the simple reality of the possibility that a design challenge can be realized with reasonable effort and cost. For many digital solutions today, feasibility is not a major challenge. **Viability** is the long-term understanding that the project is worth the time and cost, taking into account all the effort and potential returns or benefits. At best, the solution is not only of great value for the customer, but also for society or the environment by supporting a more sustainable way of life. Subsequent considerations or doubts are usually very costly and should therefore be taken into account in the design thinking activities (see costs of change on page 66). Other elements to consider might relate to environment, social, and governance (ESG) initiatives (see page 126).

The Design Thinking Lens

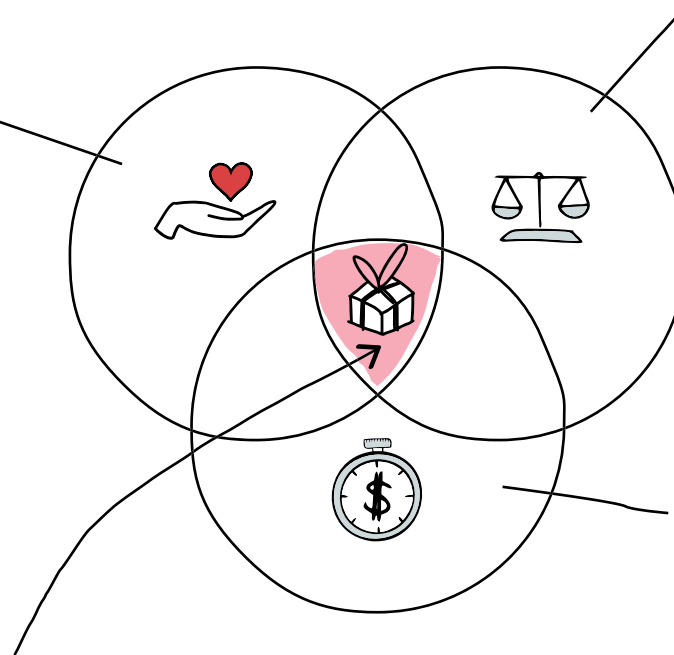
[Innovation success evolves from a combination of the following: the needs of the customer user (desirability), a solution that is profitable (viability), and technical implementability (feasibility).]

DESIRABILITY

- Who has the problem?
- How is it solved today?
- Which tasks of the customer/user (job to be done) are to be solved?
- Which customer/user pains and gains are known?
- Which customer needs and emotions are relevant?
- What critical functions and experiences for the customer/user should the solution include?
- How does the solution approach differ from known solutions?
- To what extent do customer/user benefits match the values of the service/product delivery?



INNOVATION SUCCESS



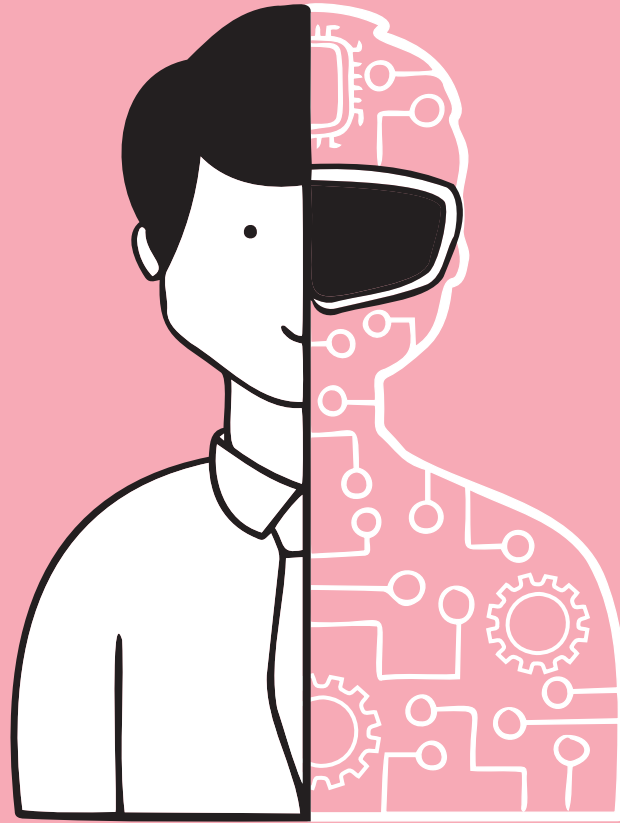
FEASIBILITY

- What are important components for implementation?
- What kind of technology is needed for this?
- What skills are needed for design, construction, and operation?
- Which systems are affected?
- What workflows are needed?
- How can “fail fast, fail often” be lived without destroying market opportunity?
- How is success defined, measured, and communicated to stakeholders?

VIABILITY

- How are revenues generated with the solution?
- How can costs be saved with it?
- Where does added value arise from for the organization, company, or a potential business ecosystem?
- How can the investments be justified?

FACILITATING WORKSHOPS



Performing Design Thinking in Physical, Hybrid, and Virtual Settings

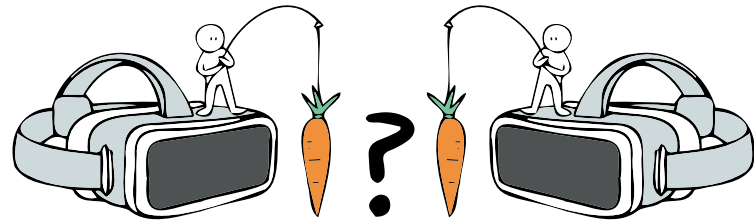
Design thinking exists in the interaction both within the team and with the potential customers/users. The interactive space and its respective environment are and remain an important component in design thinking (see tips and tricks for setting up creative space and environment in *The Design Thinking Playbook*, pages 132–143). New technologies and virtual environments, such as online whiteboards, virtual realities, conferences, or meeting rooms, have gained popularity in recent years.

Each format of interaction, from physical, to hybrid, to virtual, has its advantages and disadvantages. Reflecting on the neuroscience research during design thinking workshops in these different settings, it quickly becomes apparent that the interaction of a team in front of a physical whiteboard triggers more activity in different areas of the brain than the interaction using an online whiteboard. Likewise, there are only limited possibilities to build and experience prototypes in front of virtual space. Even quick sketches of ideas on a sheet of paper are currently faster in physical space than in hybrid or virtual spaces.

However, interaction with virtual reality has evolved dramatically over the last 10 years, and powerful VR goggles and modern applications can now provide excellent eye-tracking and full-body tracking. In many of the new virtual rooms, documents and 3D models can be loaded, and the room can be configured with meeting tables, whiteboards, or lecture hall seating.

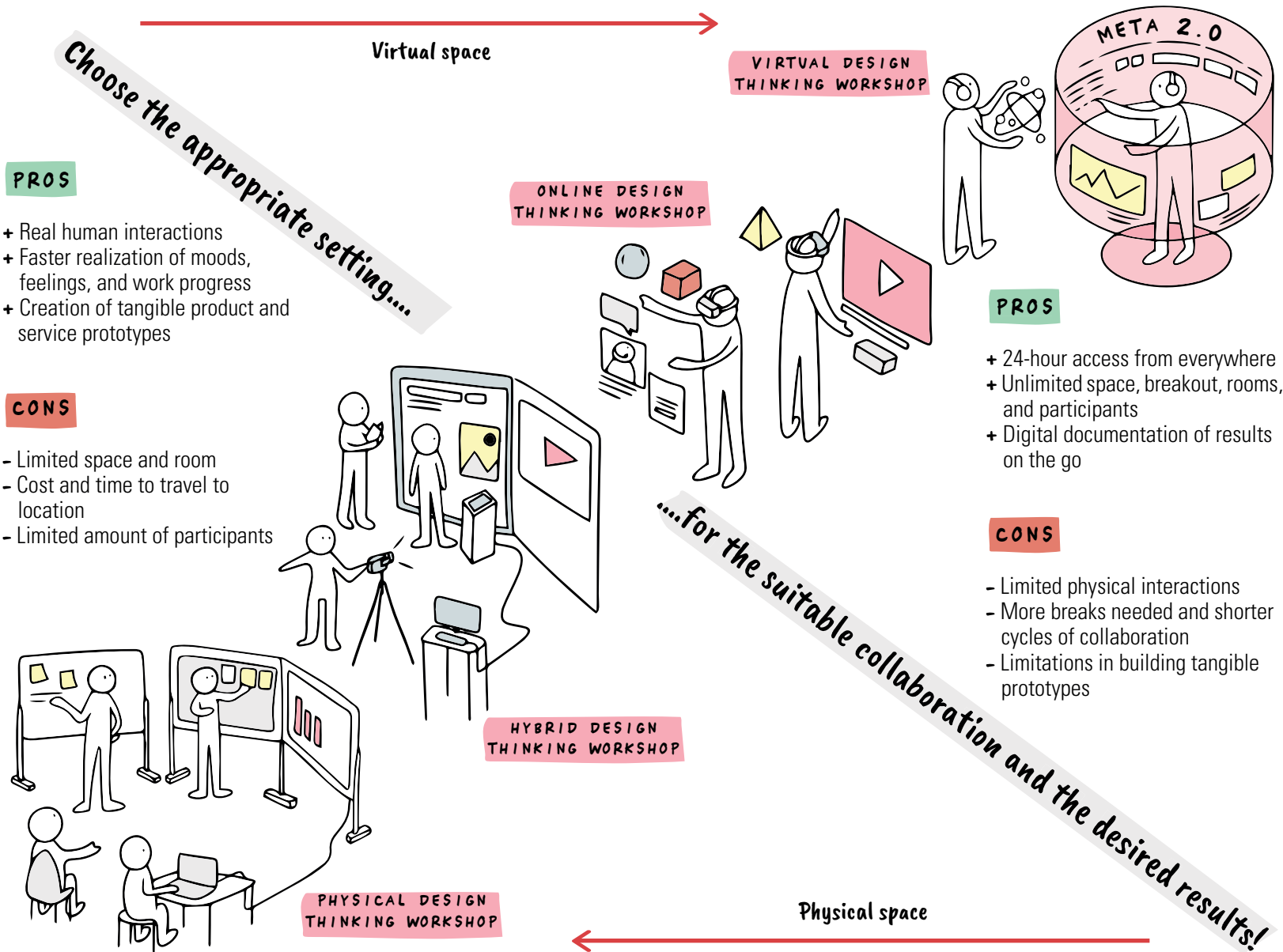
Regardless of setting, some rules for a well-performed design thinking workshop still remain.

Golden Rules of Performing Design Thinking Workshops



- Professional preparation and planning
- Information about the design brief/topic of the problem
- Invitation with agenda, directions, and access code
- Positive atmosphere for participants and sufficient space for collaboration
- An experienced workshop facilitator with the ability to apply the tools and methods as needed
- Use of appropriate warm-ups that bring out the desired mood state of the participants
- Material or tools to build physical/virtual prototypes
- Time and access to customers/users for testing initial features, experiences, and solutions
- Transparent communication about the intended mindset, the (virtual) etiquette of collaboration, and design principles
- Assembling teams based on individuals' T-shapes and thinking preferences
- Documentation of results, customer feedback, and experiments
- Measurement via a set of exploration metrics
- Embedding of objectives and key results (OKRs) from problem identification to implementation and scaling of solutions

A design thinking workshop is a hands-on, activity-based session that is based on the design thinking mindset. Facilitating workshops in physical, hybrid, and virtual spaces is an important skill that helps the team to navigate through divergent and convergent thinking.



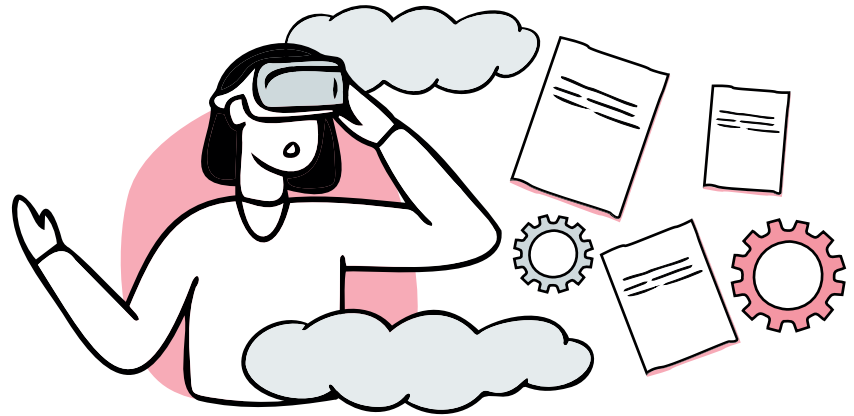
Maximizing the Human Design Thinking Workshop Experience in the Metaverse

New forms of collaboration have brought more efficiency to some of the innovation work, but at the same time let important elements, such as building physical prototypes, take a back seat. Digital and hybrid interaction have become the basis of daily collaboration. The interaction and execution of design thinking workshops in the metaverse is the next level of immersion. However, this requires a radical realignment of the approach and design of the workshops. The good news is that the design thinking mindset and tools help for designing such an experience, as one of the basic principles in the metaverse is to create a human-centered experience. From this perspective, the needs and urges of the workshop participants, in the virtual setting to explore new experiences, are the focus.

In many ways, workshop participants become a new dimension of design thinking players who are challenged to solve a wicked problem. Unlike digital whiteboards, which only had the function of supporting communication, the metaverse provides the possibility to build a closer relationship with the other design thinking players, the space, and experiences. At the same time, a balance between reality and the virtual world has to be kept, as well as between the existing 2D and the new 3D worlds, so that everyone can participate in the most human way.

This means that, in the best case, the design thinking players should have the possibility to participate from any place and with all their senses.

Next-generation virtual ecosystems are a reality to consider, not just as a conceptual futuristic vista. The design thinking community should consider a metaverse world and remain curious for the possibilities.



Simply copying existing experiences, procedures, and known workshop elements into the virtual environment has proven to be unpromising. The metaverse offers more. It gives the design thinking teams and each individual player the opportunity to see things that were previously impossible to grasp, to have access to knowledge that was previously unknown, and to experience things that the real world cannot offer.

There is also the possibility to create new communities, to express belonging, and to get involved in new ways. This applies to the work on the design challenge and, of course, beyond. The metaverse provides the opportunity to think beyond the existing boundaries of the company and to work together on the big challenges of tomorrow.

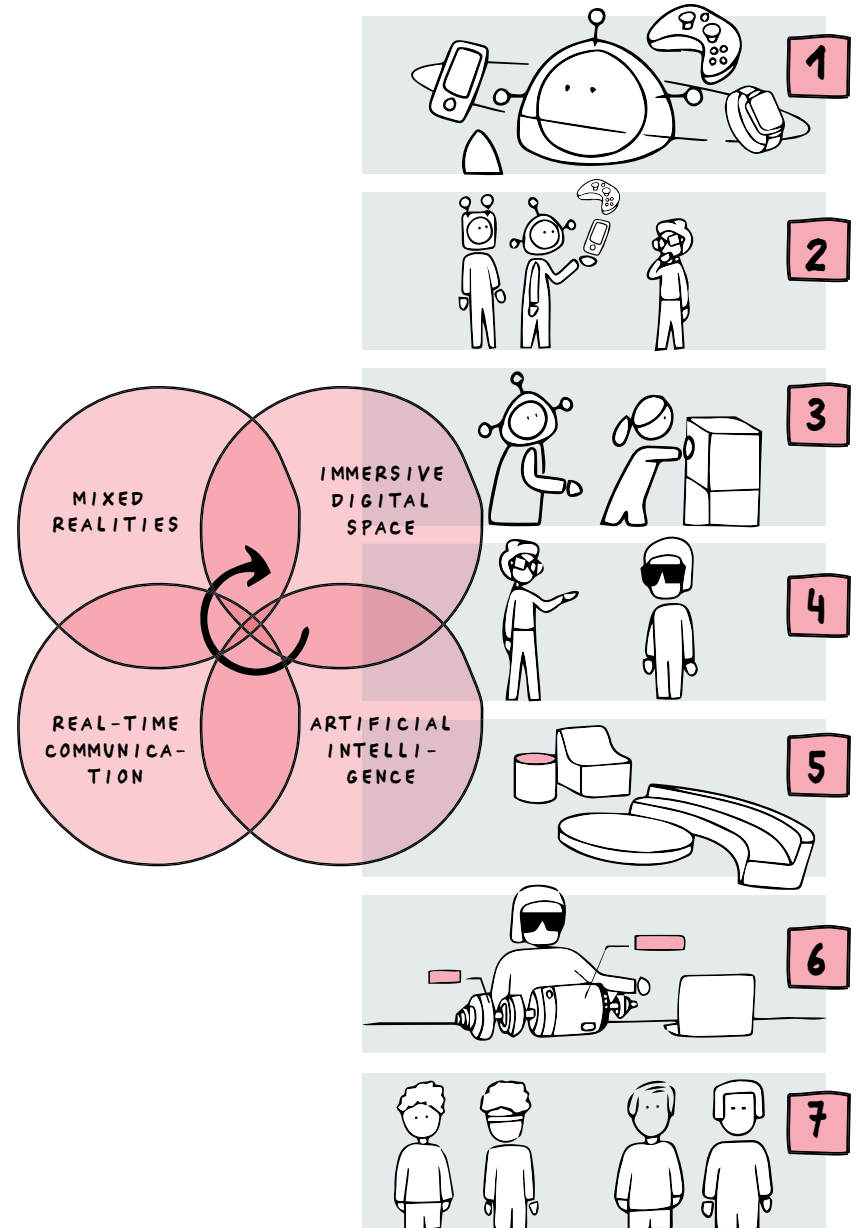
The teams have the opportunity to work together virtually, to playfully shape the design cycle, to treat intellectual property (IP) and ideas as digital assets, and not only to design new products and services for the real world, but also to design, test, and ultimately implement things, buildings, and experiences for environments in the metaverse.

The possibilities of interaction among teams, stakeholders, and communities are enormous and are on the journey to perfecting the experience. The use of design thinking tools and interaction will once again require an iterative approach and experimentation to inspire the design thinking players and to open up the appropriate worlds that allow for divergence and convergence. To what extent and how quickly the metaverse will make all assets available as a digital mirror, and how the augmented realities blend for each use case, depend on the speed of adaptation and the quality of the experience, functionality, and, ultimately, a compelling value proposition that speaks to the new interactions.

However, design thinking and innovation teams now have a unique opportunity to co-create their new environment of work and, ultimately, to create environments that are not limiting, but rather extend existing realities.

Procedure for Creating Workshop Experiences in the Metaverse:

1. Define the main objectives of the interaction with the design thinking players (e.g., team and community building, exploring the problem space, working with analogies and benchmarks)
2. Determine the roles of the design thinking players and other stakeholders (e.g., active participant, providing briefing, engaging for testing)
3. Launch the activities and tap into intuitive immersive experiences with the design thinking players. Do not overwhelm the participants with information and options to apply tools and to navigate along the design process
4. Measure results and analyze the behavior of participants in different thinking modes and activities (e.g., eye tracking and facial attributes data collection via XR technologies)
5. Constantly adapt and improve the experience for design thinking players
6. Embed the metaverse activities in physical interactions or extended realities
7. Share best practices with the wider design thinking and innovation community



Leading and Facilitating Design Thinking Workshops

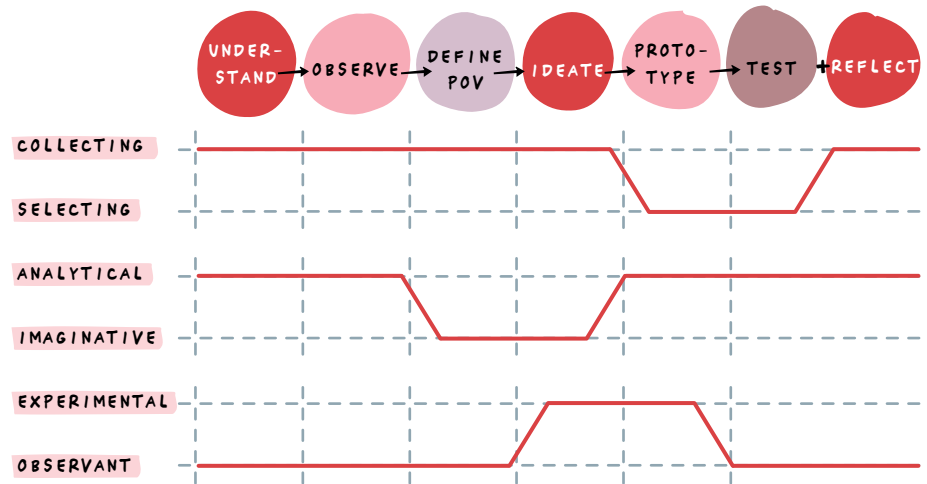
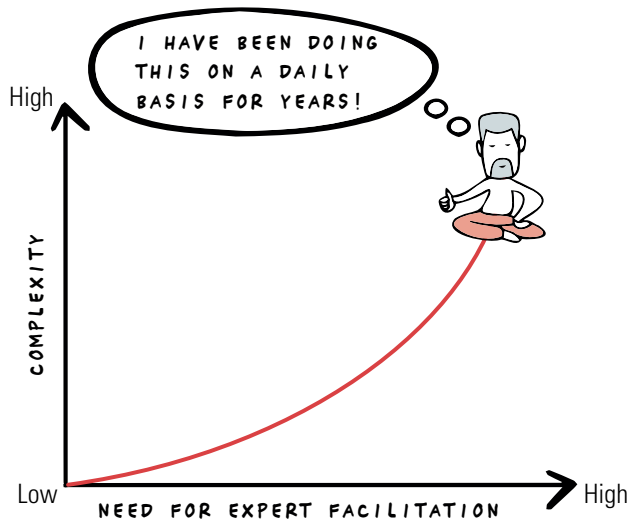
Leading and facilitating design thinking workshops, regardless of the setting, require experience in facilitation and, at the same time, knowledge of design thinking tools, methods, and processes. The cognitive process in design thinking is based on design abduction, which means that, in many cases, two unknowns lead to a process of creative exploration. The dance with ambiguity is challenging for both the facilitator and the team because, in a more traditional setting, the cognitive process is based on reasoning, deduction, and induction. Dorst (2017) provided a simple equation of the cognitive process in design thinking to illustrate the differences.

REASONING			
WHAT (elements)	+	HOW (pattern of relationship)	> OUTCOME (observed phenomenon)
DEDUCTION - SOLID REASONING FROM CAUSE TO EFFECT			
WHAT	+	HOW	> ???
INDUCTION - DISCOVERING PATTERNS			
WHAT	+	???	> OUTCOME
NORMAL ABDUCTION - SOLID PROBLEM SOLVING			
???	+	HOW	> OUTCOME
DESIGN ABDUCTION - TWO UNKNOWNS LEAD TO A PROCESS OF CREATIVE EXPLORATION			
???	+	???	> OUTCOME 



Micro and Macro Process Objectives

As was clear with the introduction of the design thinking mindset on page 62, it is important to know where one stands in the design thinking process and which tools and methods should be applied. Especially in the role of a facilitator, it is important to understand what the respective objectives are in the design thinking micro and macro processes. Experienced facilitators have a very good sense of which activities, tools, and thinking states are needed both in the moment and in the next step in guiding the team to ultimately achieve the best results. When going through the design thinking micro process several times, different tasks, thinking states, and activities are performed, depending on the situation. In early phases these elements can be described mainly as collecting, analytical, and observant. In later phases, the elements relate more to selecting (e.g., the appropriate functions and experiences) as well as experimental and observant (i.e., the activity that experiments are built and tested).



Key Expert Facilitator Behaviors:

- Manages complicated engagements that span multiple customer needs, places, times, technologies, and actors
- Works successfully with all levels of the organization, including executives and high-impact stakeholders
- Iterates complex design challenges in real time to adapt to emergent group and project needs
- Innovates designs thinking tools, methods, frameworks, as well as facilitation activities

Highly experienced facilitators are adept at solving all possible problems. They have the ability to explore, understand, and predict the complicated needs of teams and guide them to outcomes that meet those needs. Such facilitators create a coherent web of interactions on an ad hoc basis, combining warm-ups, tools, thinking states, dialogue, and fluidity in such a way that teams achieve outstanding results, even for complex problems and situations.

The Role of the Facilitator

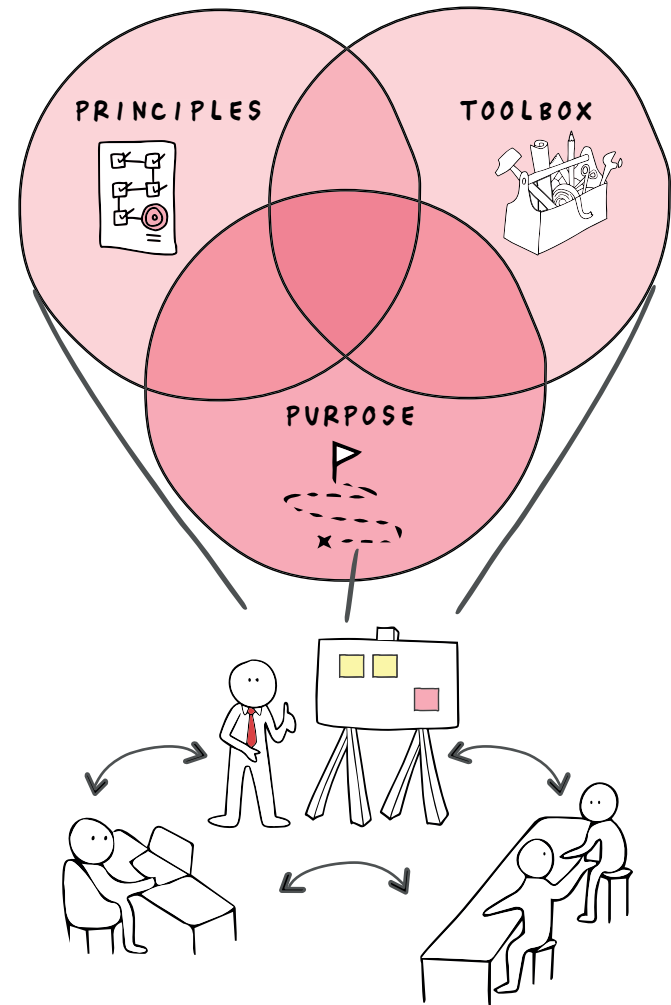
The role of the design thinking facilitator should be clear to everyone. It is to plan and guide activities and instructions throughout the design thinking micro and macro cycles to help the respective teams develop a common understanding with varying states of thinking. The task of a facilitator is not to develop an outstanding creative idea or to make the right decisions.

It is important that a facilitator not take command or dictate the outcome. The key is to allow each team member to contribute fully and equally, and to facilitate a collaborative team outcome. Here, objectivity is key. In addition to a degree of neutrality, their own contributions should be kept to a minimum whenever possible. The focus is on supporting the respective behavior (e.g., hunt or transport) as best as possible (see page 88). More specifically, the role of the facilitator is to help the teams in the beginning to identify the appropriate problem, to formulate a problem statement, to build empathy with the potential customer/user, and to get the teams to develop and test the best possible ideas. Different tools and methods can be offered by the facilitator to help create a dialogue among the teams and make the best decisions.

Purpose: Design thinking facilitation is the means to an end. It allows for inclusive and collaborative decision making, mutual understanding, shared responsibility, and equal participation of all team members.

Principles: Design thinking facilitation is more art than science. The setup and style might vary, but some core principles, like being authentic, embracing constructive conflicts, active listening, and the creation of an inviting physical, hybrid, or virtual space and environment, always stay true.

Toolbox: Design thinking facilitation applies the appropriate tools and methods to start activities, trigger dialog, or to achieve certain results. In addition, the materials for building first prototypes, templates to work with, and workshop supplies are the responsibility of the facilitator.



Highly skilled facilitators have a very extensive toolbox of methods and techniques that they can use during the workshop in an improvisational or planned way.

WORKING IN TEAMS



How to Expand Toward a Circle of WE

How to Shift the Culture

- Upshift leadership from commanding to building a shared consciousness
- Expect and empower decision making by whoever is closest to the content
- Work directly together to build trust
- Know your purpose
- Be willing to learn

Lessons from Working with Team-of-Teams

- Teams outperform individuals in complex contexts.
- Any one individual cannot comprehend the whole or have all required skills.
- Most organizations as a whole have yet to even begin to understand how to gain the advantages of teams at scale.

Typical Metrics and Measurements

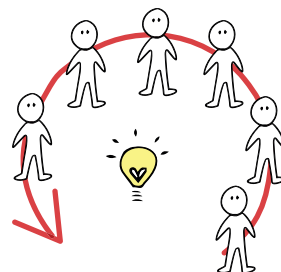
- Team member performance related to helpfulness
- Team member performance related to initiatives
- Overall team readiness based on feelings and maturity with regard to mindset, tools, and methods
- Overall team commitment for achieving joint objectives and key results
- Overall team collaboration and processes for decision making, communication, conflict resolution, problem handling



Radical Team Collaboration and Organizational Design

The collaboration of interdisciplinary teams is in many cases of high importance for the success of innovation and for the work in the solution and problem space. In many explanations of design thinking, the focus is on team formation, how teams should be composed, and what dynamics should be considered. These elements (thinking preferences, team composition according to growth phases, and T-shaped teams) are important, but the biggest challenge for companies today is to choose the appropriate organizational set-up so that they can work together in the best possible way in a global, diverse, and increasingly virtual and hybrid environment. The requirement for the organizational design and the environment is to realize a seamless collaboration of teams. This often transcends corporate boundaries, as products and services are increasingly delivered in ecosystems of business rather than vertically integrated through one company, with traditional supplier relationships.

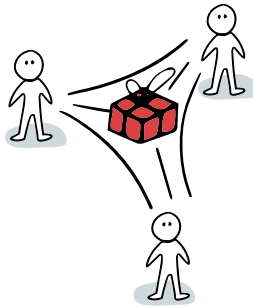
Many companies are also leveraging the external talent ecosystem to quickly realize capabilities for realizing projects with new skills and technologies. Thus, multiple teams are configured ad hoc to collaborate on a common core value proposition and set ambition. Measuring the collaboration of teams and the holistic team-of-teams design of an organization is possible on different levels. For example, it is possible to perceive the extent to which teams align their activities with a defined North Star, their respective actions are autonomous, and communication is open and transparent (e.g., via objectives and key results). The central element in such approaches is to establish a bowl of trust as a foundation. A supportive team community is the be-all and end-all for a culture in which the WE stands above disparate team interests, and conflicts are solved profitably, as the lessons learned help to move all teams forward. The relationship of the teams with each other and with individuals is important. It is about understanding what the others do, where their strengths are, and in which environment and under which conditions they work. Central to this is understanding how the other teams can help as one moves forward together and vice versa.



Team-of-teams is based on the fact that teams outperform individuals in complex contexts because individuals cannot comprehend the whole or possess all the required skills.

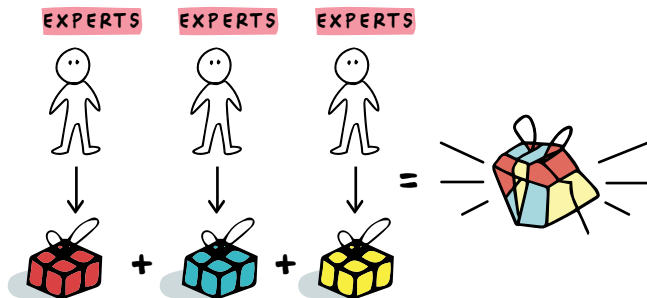
What Characterizes an Interdisciplinary Team?

In very general terms, interdisciplinary means comprising several disciplines. In interdisciplinary teams, ideas are produced on a collective basis. In the end, everybody feels responsible for the overall solution. A methodological and conceptual exchange of ideas takes place on the way to the overall solution.



What Characterizes a Multidisciplinary Team?

A multidisciplinary team has the advantage in that, at the end, everybody stands behind the commonly created product or service. This is a factor of success that interdisciplinary teams, for example, cannot afford. On a multidisciplinary team, every member is an expert who advocates his or her specialization. The solution is often a compromise.

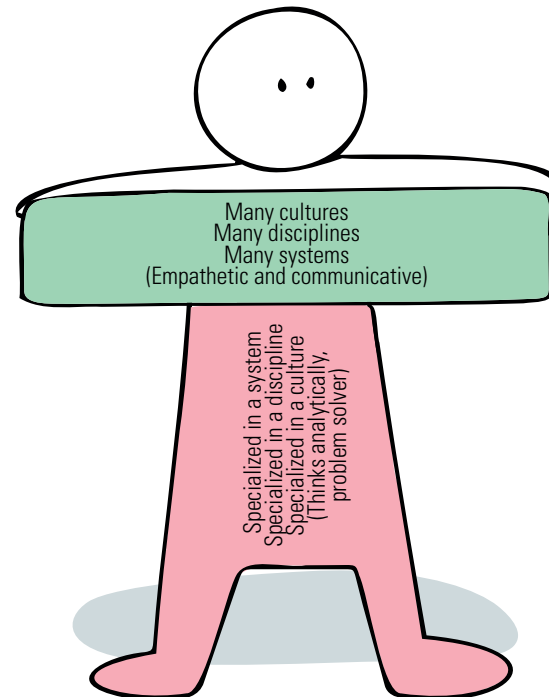


What Characterizes T-shaped Profiles?

The vertical bar of the T profile stands for the respective specialist skills that a team member has acquired, usually through vocational training or specialized academic studies. Most of the time, this is mirrored by the job descriptions for specific functions of experts in organizations to analyze and solve a specific problem.

The horizontal bar of a T-shaped team member is defined by many cultures, disciplines, and systems. These skills and capabilities are related to experiences and learnings, which are usually not apparent from the job descriptions. These include, for example, experience of living in and understanding different cultures, to skills and achievements that help to analyze problems from a different perspective, or to re-frame the problem.

T-shaped team members (with their unique skills and capabilities) are open, interested in other perspectives and topics, and curious about other people, environments, and disciplines. The better the understanding is for the way others think and work in a team, the faster and greater the common progress and success of the design thinking work is.



Team-of-Teams Evolution

In an ideal world of team-of-teams, employees have a constant exchange and dialog. They review their previous actions to learn from mistakes. They compare new methods with proven ones to find the most effective practices. They proactively acquire new information and skills and coach each other across boundaries so that teams succeed together. However, such a transformation does not happen overnight. It takes time, skills, and the right leadership to respond fluidly to complex environments before an organization becomes adaptable and resilient. This in turn requires that all team members adopt core elements of the design thinking mindset (see page 62):

Dance with Ambiguity: Learn to expect the unexpected

Radical Collaboration: Connect in a way that allows rapid self-configuration to respond to new threats or opportunities

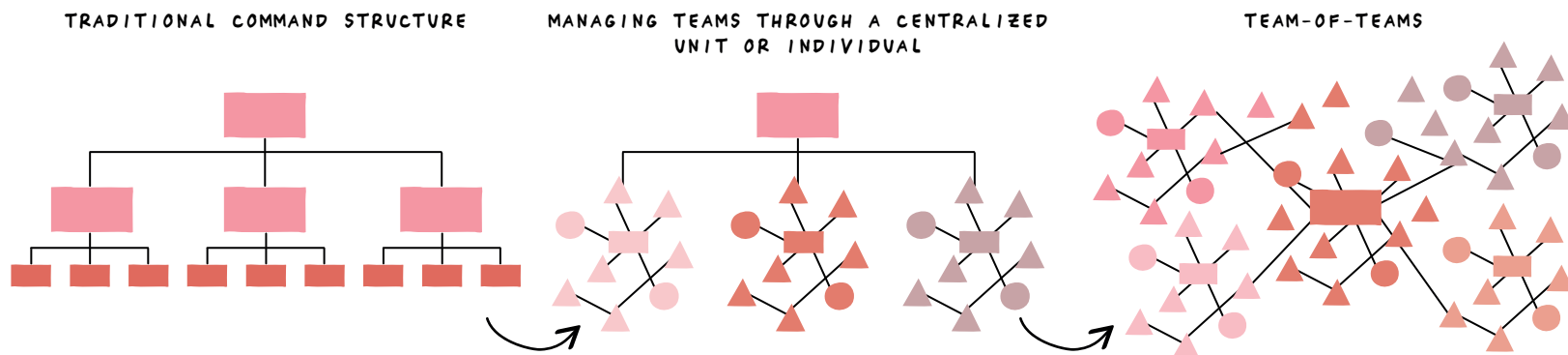
Leaders must be able to link organizational elements both vertically (up and down the command chain) and horizontally (across units and divisions within the organization, as well as across external partner organizations).

How to Achieve it

Working with different companies has shown that a good starting point is to make sure each team member has a systemic understanding of the big picture and knows how their work is interdependent.

It is also paramount for the teams to understand the strategy and to learn how to link the North Star to the team objectives and key results. As mentioned earlier, the strong lateral connectivity between teams through personal relationships between individual team members is essential. Everyone benefits if T-shapes and thinking preferences of each team member are made transparent. Knowing each other better and tapping into vertical AND horizontal skills helps in this process. Equally important, however, is that for a team-of-teams to be born, the leadership team must be willing to let go and to share power. A popular approach is to empower teams with new techniques and ways of thinking (e.g., design thinking, systems thinking, critical thinking).

The non-structured mesh of individual connections is what makes team-of-teams successful.



Design Thinking & Organizational Network Analysis (ONA) for Organizational (Re)design

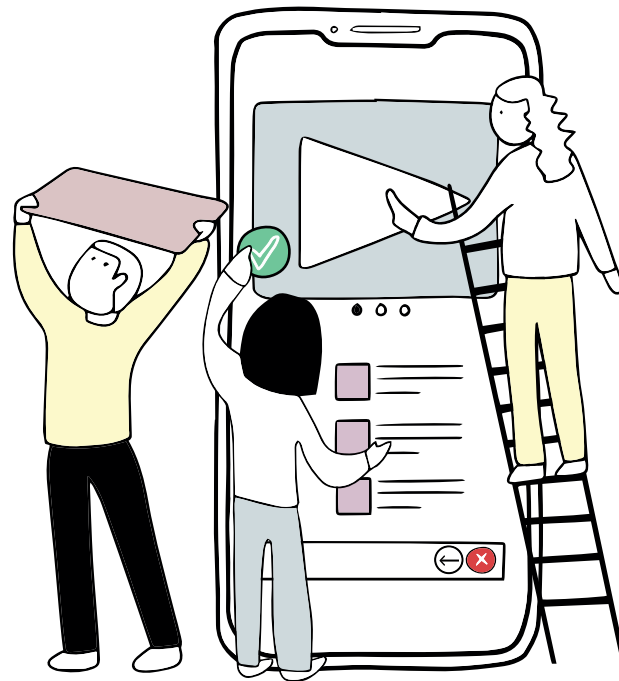
By applying design thinking to redesign organizations, organizational network analysis (ONA) helps provide insights that go beyond shifting through job titles, sweeping organizational charts, and unclear role descriptions. As presented in the team-of-teams approach, the best team constellations emerge based on thinking preferences and different T-Shape profiles (see page 84). This is how natural networks form when teams come together that make their work better, easier, or even just more satisfying.

Supporting ONA can create further insights into how, for example, information and knowledge are actually retained and shared through employee and team networks. Visualizing and analyzing the formal and informal relationships in the respective organizations helps to develop forms of collaboration that promote cooperation and improve the effectiveness of tasks from EXPLORE to EXPLOIT. However, ONA is a structured method for visualizing the flow of communication, information, and decisions in an organization. Organizational networks consist of nodes and links that form the basis for understanding how information is flowing between individuals and teams.

Utilizing ONA as the Basis for the Organization's Design Helps:

- to transform organizations in savvier ways by identifying formal and informal organizational leaders who facilitate change and help realize the benefits of transformation more expeditiously.
- to develop more effectively and focused talent by minimizing role confusion and redundancy, as well as identifying interests in specific projects, initiatives, and skill development programs of talents within the teams and organizations.
- to increase operational efficiency and effectiveness by building a structure that is organized dynamically in a way that fosters collaboration and information sharing among the appropriate employees and teams, which contributes to the achievement of the defined objectives.

More advanced application of ONA can be found in the 301 section, which provides enhanced metrics including, for example, culture based on an AI-enabled network analysis (see pages 355–356).



Visualizing and analyzing the formal and informal relationships of teams help to design organizational structures that make the organization more sustainable and effective.

In every organization and in every team, there are employees ("nodes") who serve as important channels for the exchange of ideas, prototypes, and information. A connection is beneficial when the needed information is exchanged and knowledge is shared.

- **Central connectors** are the team members who seem to know everyone. These central nodes share a lot of information and have a quick influence on all teams. Central nodes can be located in any team, and are often popular and highly involved in company news and developments.
- **Knowledge brokers** are team members who build bridges between teams. Without knowledge brokers, the exchange of information and ideas stalls.
- **Shadow players** are easily overlooked and are not connected to the rest of the teams, so they can pose a risk to companies. For example, outstanding data scientists who don't collaborate with design thinking teams not only stagnate in innovation development, but are also easily convinced to take their talents elsewhere.
- **Ties** are the formal and informal relationships between nodes. Creating optimal relationships between central connectors and knowledge brokers helps ensure that useful information is easily shared between and within teams.

WHO HOLDS THE NETWORK OF
TEAMS TOGETHER?

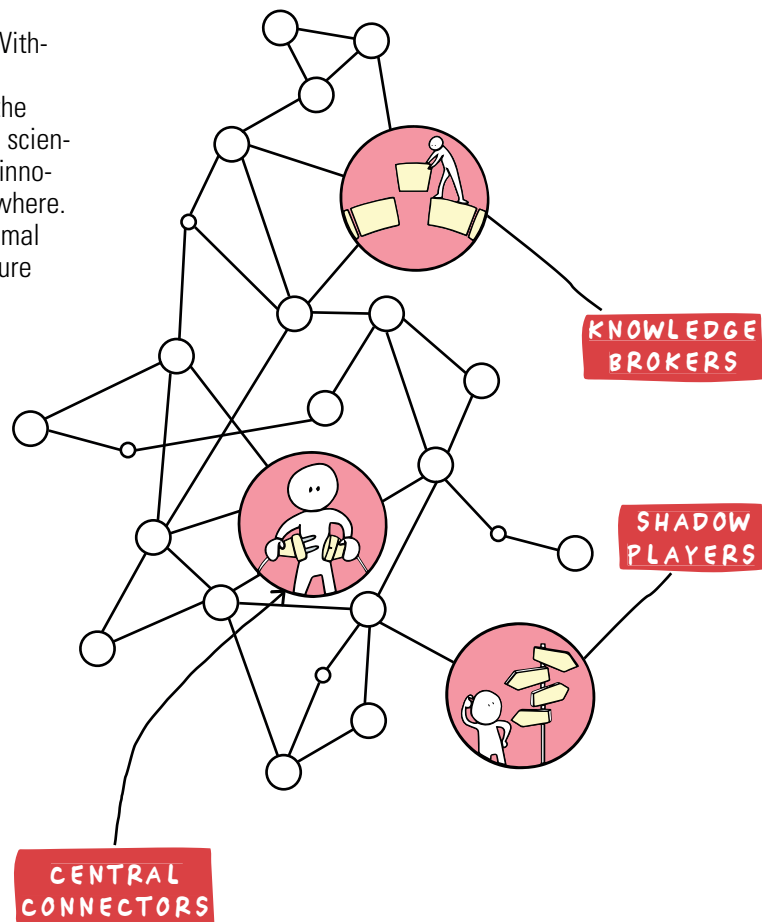
WHO HAS THE POTENTIAL TO BECOME A
BOTTLENECK IN EXECUTION?

WHO IS A CRITICAL CONNECTION TO
EXTERNAL KNOWLEDGE?

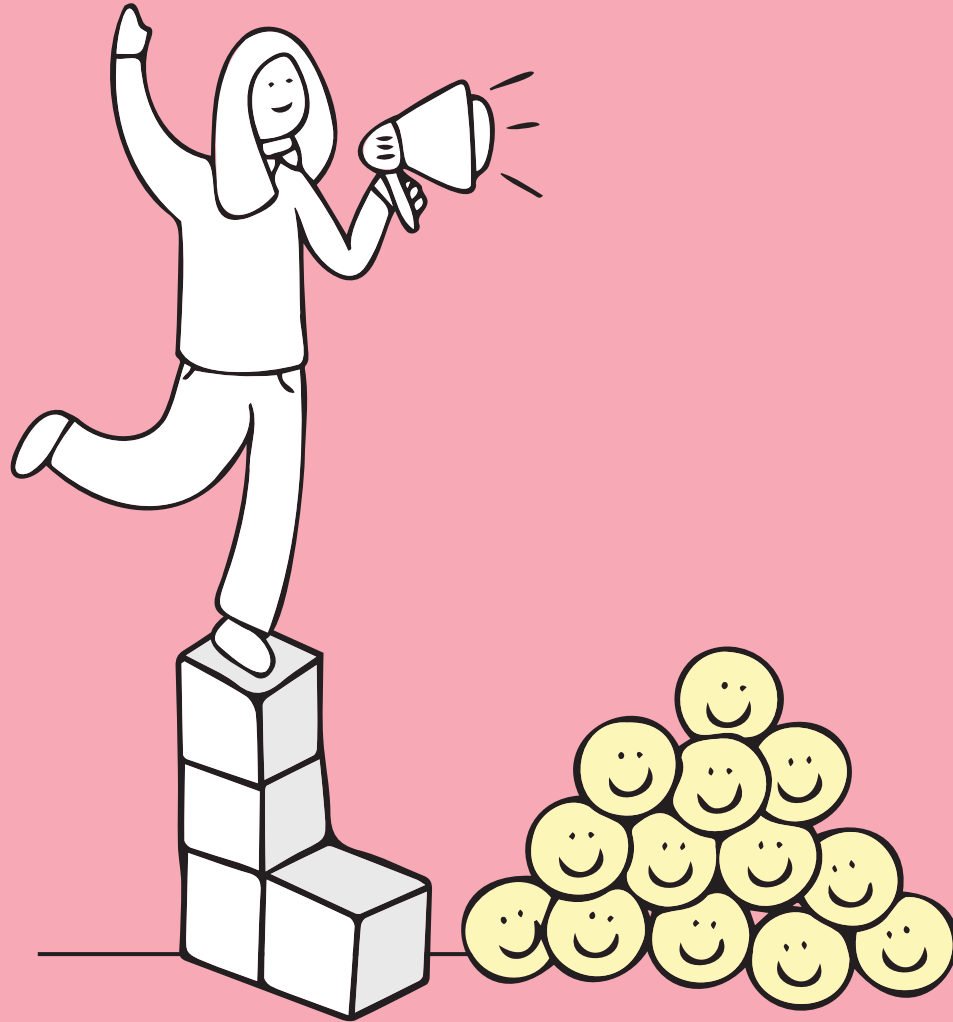
WHO NEEDS TO BE CONNECTED INTERNALLY
TO BE EFFECTIVE?

WHO IS TOTALLY DISCONNECTED AND
AT RISK OF EXIT?

WHO IS TALENTED, BUT NOT CONNECTED
TO RELEVANT FUTURE PROGRAMS
AND PROJECTS?



BUILDING CAPABILITIES



Building Design Thinking Capabilities and Measuring Maturity

If a company really wants change and aims to strengthen innovation, it cannot expect it to just happen. Rather, an environment must be created in which new market opportunities can thrive. That takes a culture of embracing creative confidence and the appropriate skills to allow teams to collaborate radically.

Building design thinking capabilities is an investment to future-proof the company. Corporate practice shows that there are two paths that work best when done in parallel: capability-building programs and hiring talent. The targeted search for and hiring of talents and high performers who already have the desired mindset and future skills is the quickest way but is usually only feasible to a limited extent. The new joiners are employees who have the power and the will to commit to positive change, who are able to think from the customer's point of view and at the same time connect all the dots (design thinking and systems thinking), and who are able to absorb information at lightning speed and turn it into action with the teams.

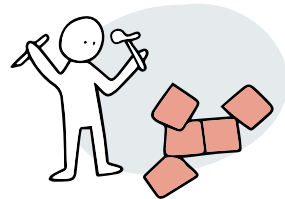
In addition to talent, a new system agility (see page 90) is needed at all levels from the work environment to support the measurement of objectives and key results to organizational design, work processes, and structures that allow for design thinking and new thinking. The biggest challenge here is for management teams to break away from traditional command-and-control hierarchies and, for example, through the team-of-teams approach, to focus on more autonomy and accountability of employees, while at the same time strengthening the self-efficacy of each individual.

Empowered employees who have been gradually introduced to the design thinking mindset through project-based learning, for example, are better able to initiate change. Rather than endlessly seeking approval and encountering resistance, they can make decisions and act quickly.

By changing the structures and the organization, the decision makers in the company can also reconnect with each other, which in many cases helps to create better alignment and flexibility, and ultimately a better vision for the future.

By infusing design thinking as a mindset into every aspect of a team, organization, or company, a new culture is created. This influences the strategic thinking about growth initiatives, the attitudes of the workforce, the organizational structure, and the approach to the problems to be solved.

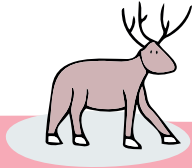
Teams that work close to EXPLORE or that support these activities will feel increasingly confident in exploring new customer problems, developing ideas, and implementing them. Especially in a time where the world is changing faster than ever before—which everyone has felt in the last few years—the companies that have built up the appropriate capabilities and skills will be able to deal with the future better.



Tweaks won't do it. Design teams need to get things off of the whiteboard and into the real world!

Design Thinking Behavior Can Be Trained to Deliver Value

Through project-based learning and tailored capability programs, design thinking behavior can also be trained to create business value and accelerate transformation. It supports teams not only in solving customer problems but also in defining business strategy and growth options to invest in the most promising opportunities, while reducing the risk of making inappropriate investments. In terms of culture, design thinking serves to establish a positive and affirming culture, while encouraging and empowering each team member to think creatively and collaborate without fear of failure or retribution across the well-known silos in the organization. In addition, it can be observed that the planning and execution of projects is significantly accelerated, and overhead can be reduced in the medium term. However, acceptance and transformation need time, constant reflection, and a capability-building program that fits the organization. In this way, the maturity of design thinking can be increased over time, and real business impact can be generated.



Accept, Learn, and Apply the Hunting and Transport Philosophy

- **Hunting is not wandering** (have a purpose)
- **Never go hunting alone** (multi-capability teams)
- **Don't give up too early** (patience with failure)
- **Don't confuse transport with hunting** (declare the behavior)
- **Bring it home** (deliver results)

The best way to describe the design thinking behavior is the hunting and transport model, which reflects the way true design thinking teams work and has become the core of activities. The model has been shaped by Larry Leifer at Stanford University in the context of ME 310. The hunt for the next big market opportunity starts after the exploration of the problem space, with divergent thinking and a first experimentation with known solution approaches. The goal is identified, first prototypes are built, and then they are tested against what is known to the potential customer/user. For the unknown, the feedback from the customer/user provides information. The respective insights, the feedback, and the discussion in the team contribute to learning and help in the planning and execution of the next experiment, which is usually focused on a target that is situated somewhere else. By frequently alternating inductive and deductive thinking, the unknown can be revealed over time (see page 88). To make this happen, it takes pragmatic abduction to produce a discovery. Transport is in many cases not straightforward. The way home also has ups and downs and road blocks to overcome. It is best to overcome these challenges by involving key stakeholders who are already in the hunt.

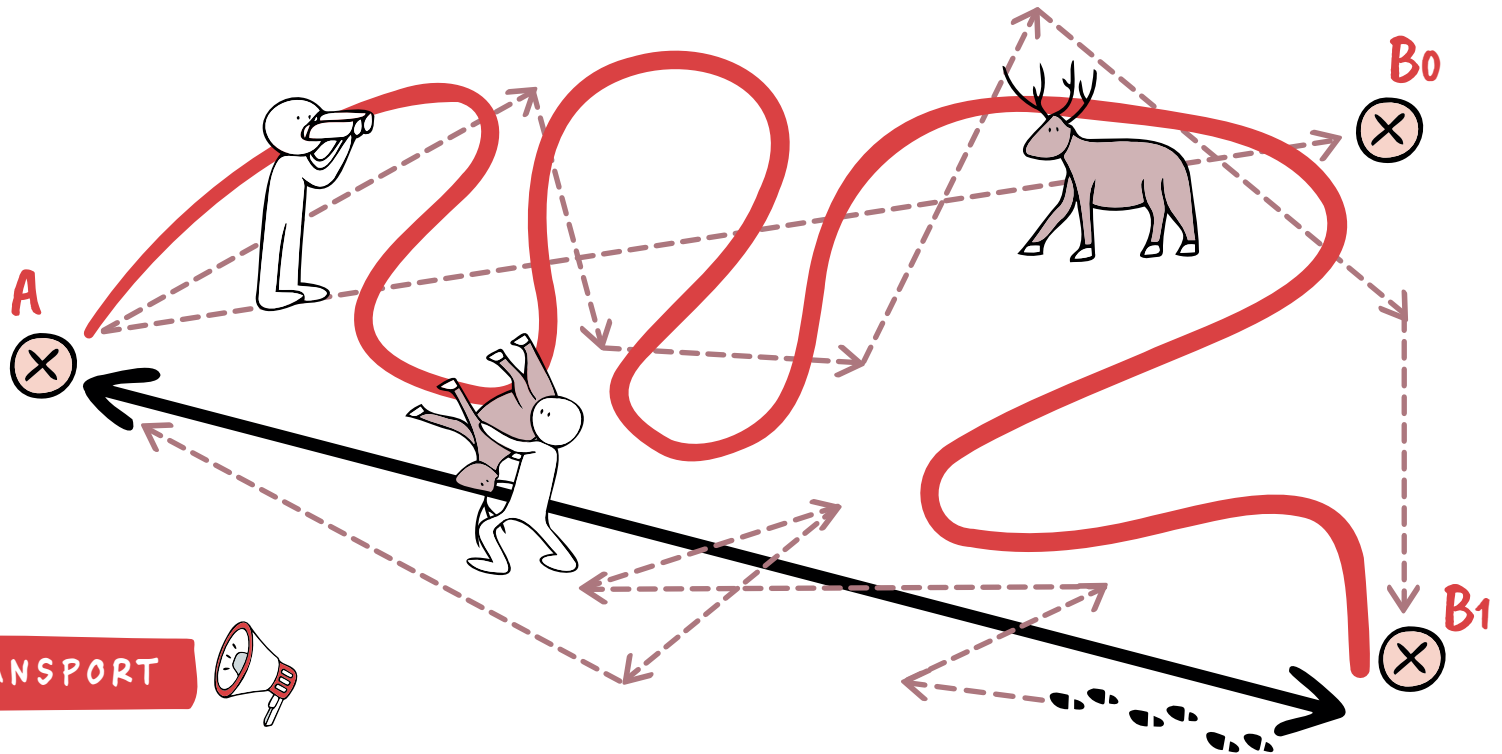
The biggest challenge in design thinking training is to teach both individual team members and the team as a whole how to hunt again.





HUNTING

It's best to go hunting as a small and agile interdisciplinary team with a maximum diversity of skills. This includes a good hunter; a gathering specialist; a realist who keeps track of time, equipment, and conditions; and someone who pays attention to team dynamics, emotions, and communication.



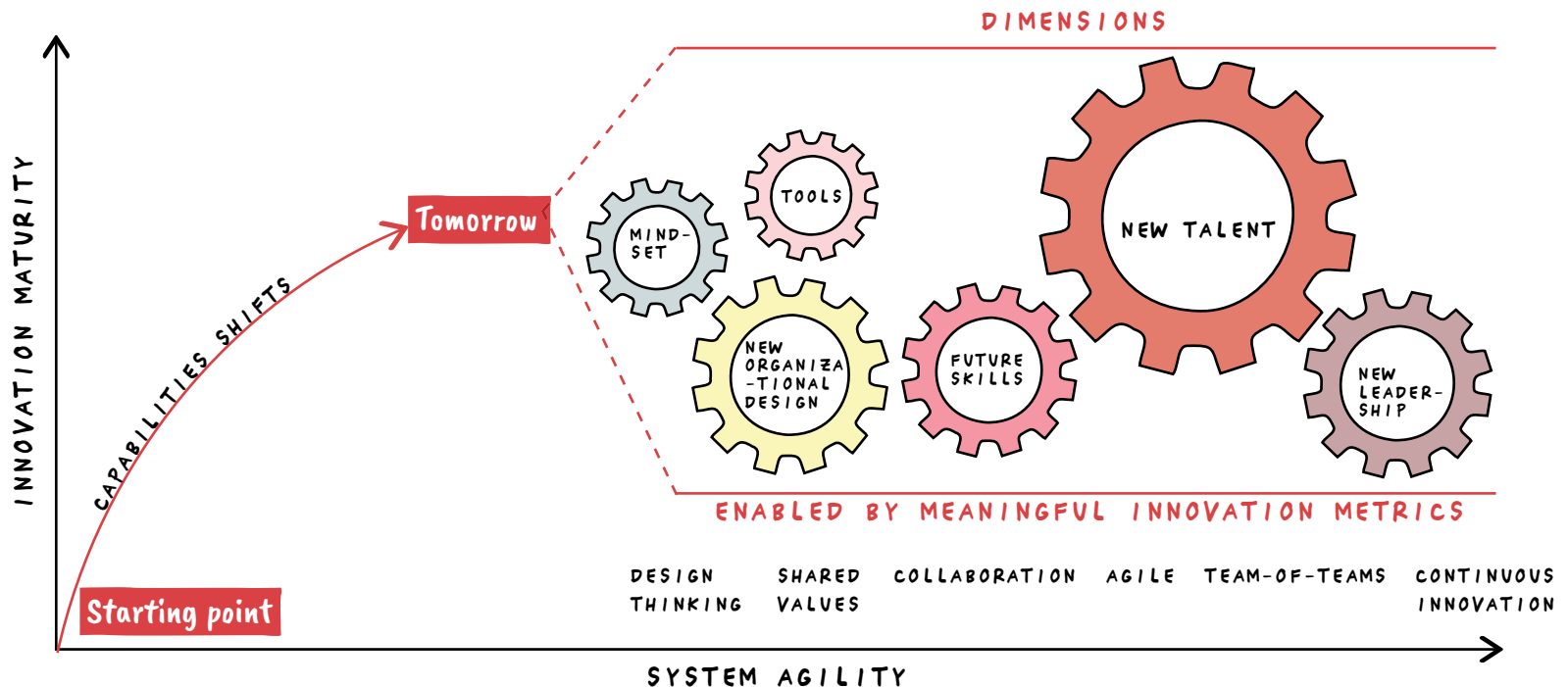
TRANSPORT



After the big idea is discovered, it has to be made tangible, and the question of how to bring it home is in focus. Now is the time for the team to fix the requirements, make plans for the implementation, and optimize the resources.

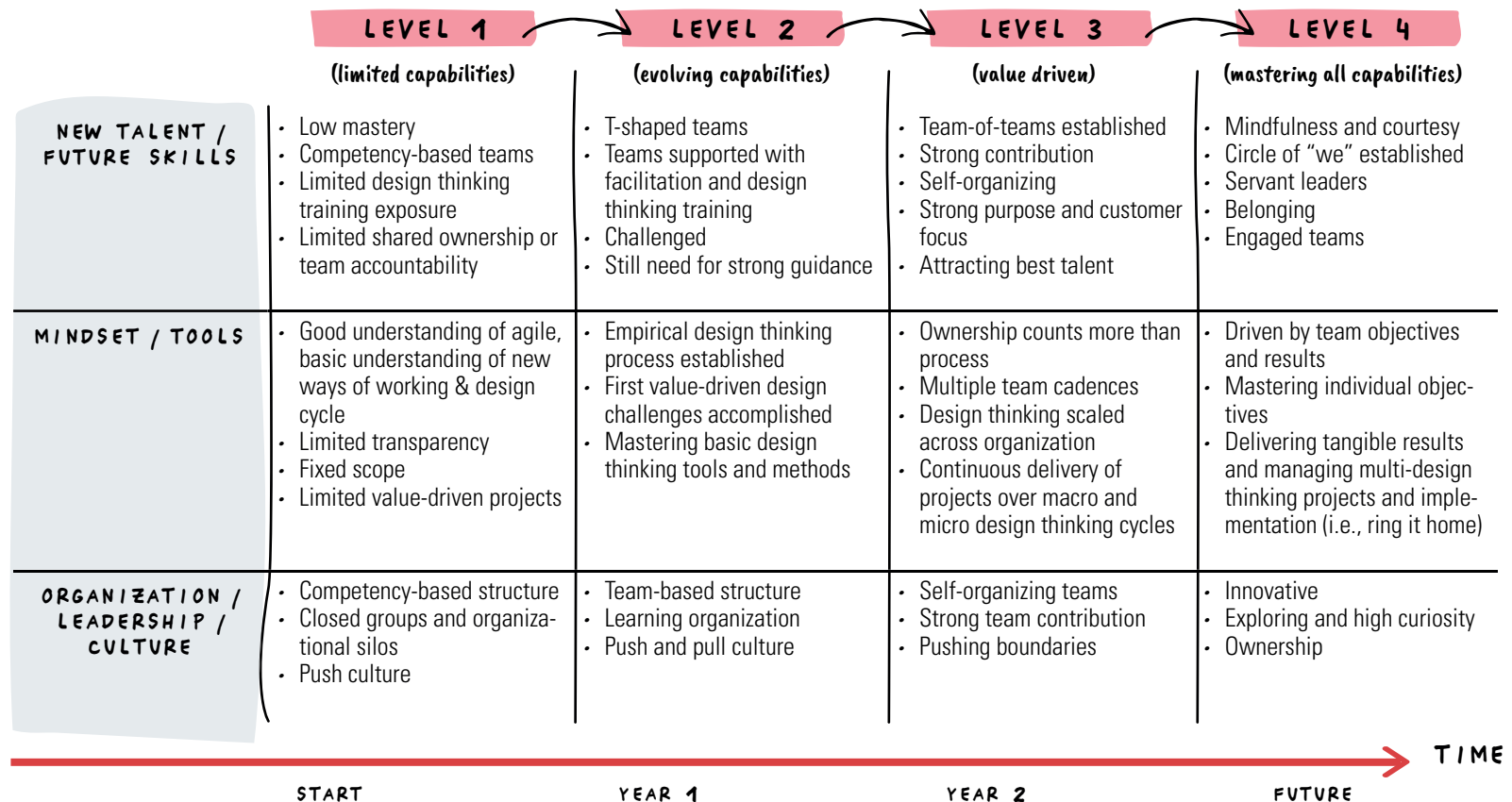
Measuring Design Thinking Maturity on Different Levels

The maturity model of applying the design thinking mindset for companies, organizations, and teams could be extended with countless dimensions to achieve more system agility and increase innovation maturity. In addition to the general future skills described on pages 40–41, there is usually a trigger reason why companies consider design thinking to be an important mindset and capability, and use it specifically to achieve progress on different levels. Often, in large organizations, the situation is that almost all teams have a good understanding of agile working, but the structures, processes, and mindset, as well as the overarching collaboration in the form of team-of-teams, are not yet very well developed. Likewise, the measurement of employees has so far been based on a classic management by objective approach. The step-by-step development of design thinking capabilities, within the framework of a project-based learning program, helps to realize new market opportunities, and at the same time to transform the organization from a push culture to one based on a new understanding of ownership and personal responsibility. The parallel introduction of OKRs supports this transformation (see page 269).



Applying the Design Thinking Maturity Model

An initial measurement of maturity in terms of the applied design thinking mindset very often shows that the organization and the teams in question have limited capabilities in terms of design thinking and the desired future system agility. Based on an initial assessment of the existing capabilities, targeted capability-building measures, experiments in organizational design, and new ways of designing and measuring innovation and performance, measurements can be initialized. Usually, it takes several capability shifts over a time horizon of 2 to 3 years until the teams master all capabilities. Design thinking and the underlying mindset help to build many areas of future skills, and in some areas these go beyond the toolbox of design thinking.



How to Start Project-Based Learning and Scale New Capabilities across the Organization

For many organizations, there is also the question of how design thinking experience and skills can be scaled to the entire organization. One possibility is to make design thinking an integral part of the company-wide academy and at the same time offer interested employees the opportunity to expand their design thinking toolbox and, in turn, expand their skills as a facilitator on a project basis. However, this is usually only successful if the framework conditions fit, the gradual build of the innovation and performance management systems are initiated, and the strategy is clear and understandable to the employees. If these conditions are met, far-reaching benefits for transformation and future business success can be realized.

SET A STRONG NORTH STAR

Create a customer-centric strategy and allow teams to create strong missions based on objectives and key results.

ALLOW PROJECT-BASED LEARNING IN EACH MISSION TO COMPLETE

Embed the missions to complete in a design thinking capability program and guide teams to begin at the beginning.

SET CLEAR PRIORITIES AND AMBITION FOR THE DESIGN CHALLENGES

Initially support creating the design principles and how much risk your organization will take driving it.

MANAGE EXPLORE AND EXPLOIT

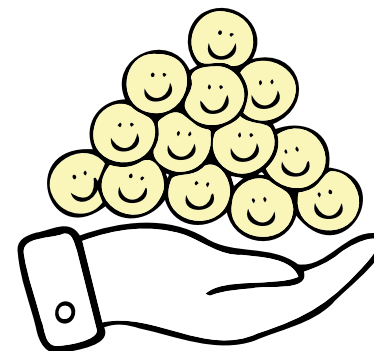
Actively review, measure, and manage the EXPLORE and EXPLOIT portfolio. Provide feedback and clear governance to teams.

DEVELOP THE BASIS FOR A DESIGN THINKING ACADEMY AND PROFESSIONALIZE FACILITATION

The academy provides structures, approaches, tools, and the development pathways to scale transformation to all relevant parts of the organization.

FUEL AND FUND INITIATIVES

Allow teams to on-board appropriate internal and external resources to accelerate and amplify initiatives—funding, talent, tools, sponsors, and more.



BENEFITS

- ✓ Attracting, developing, and deploying individuals to innovation and the mindset for radical collaboration and operating in a networked organization.
- ✓ Building connections to internal and external resources who can augment and amplify initiatives.
- ✓ Establishing a clear understanding in the organization about mindsets, methods, and approaches for understanding the problem and solution space.
- ✓ Sensing constantly organizational maturity for methodology, measurements, and organizational design and teamwork.

The applied metrics and measurements depend on the maturity and overall ambition to initiate change. The following simple example shows minimum viable exploration metrics that are predominantly measuring the adoption of the new mindset and team maturity through a three-part defined acceptance criteria.

Example



1 CAPABILITY DEVELOPMENT

Successful completion of the training modules and project-based learning sprints, with each of the teams reaching their learning goals

2 PROJECT DELIVERY

Positive feedback from project customer on project delivery (e.g., time, improved or new products and services, product/market fit)

3 BEHAVIORAL

Positive feedback from the project sponsor and select team members on future skills and mindset displayed on the job

Example of Validating the New Innovation Capabilities through Improved Project Delivery

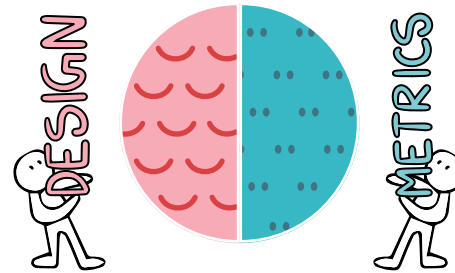
Success is:

- More projects successfully delivered
- Projects delivered faster
- Reduced change requests late into the process
- Failing earlier and learning from it
- New mindset with better ways of working (measured, for example, in team surveys)



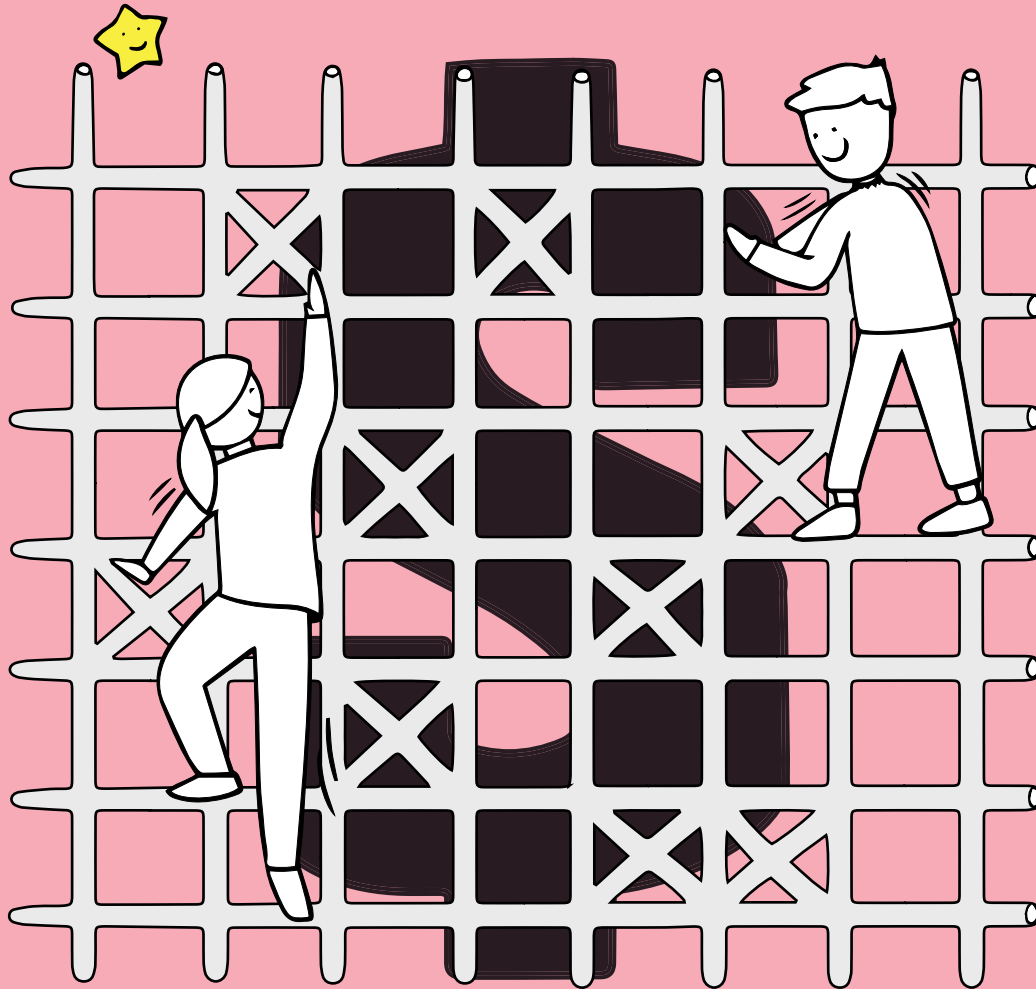
Every single member of a design thinking team in an organization plays a role in spreading design thinking mindsets by looking for opportunities to openly share and pass on their methods and tools. All of them should be guides to human-centered design, not its guardians.

The new capabilities also include the ability to apply the appropriate quantifications, measurements, and metrics. Starting from design thinking, the toolbox expands to innovation metrics. These new capabilities to work with data open up many new opportunities to not only measure innovation, but also to generally bring data-driven innovation together with design thinking to ultimately be faster to market with innovations while reducing uncertainty. The table below summarizes the characteristics of design thinking. The attributes of design thinking and innovation metrics are to be understood as additional elements to design thinking.



What	Design Thinking	Design Thinking & Innovation Metrics
OBJECTIVES	• Product, service, process innovation • Realizing new market opportunities • Transformation/new mindset	• Customer-led and data-led innovations • Reducing uncertainty in dynamic environments • Professionalizing/scaling transformation
FOCUS	• Providing insights rich in strategic information • Understanding the problem space • Building empathy with customers • Creating tangible prototypes	• Providing standardization in comparison • Improving evidence through measurement • Establishing the basis for AI-supported innovation • Creating a better understanding of effectiveness
QUALITATIVE METHODS	• Ethnographic research, synthesis, definition of point of view, brainstorming, idea selection, prototyping, solution tests	• Understanding the need for measurements and metrics and consequences of possible actions • Asking the right questions
QUANTITATIVE METHODS	• Applying mostly descriptive analytics • Application of criteria score, define success criteria, and digital enabled A/B testing	• Applying descriptive, predictive, and prescriptive analytics • Operationalization of measurements and metrics
TYPICAL METRICS	• Problem/customer fit, problem/solution fit, product/market fit • Testing assumptions (viability, desirability, feasibility)	• North Star metrics, minimum viable exploration metrics, kill metrics, OKRs for innovation teams • Transition toward exploitation metrics and health metrics
TEAMS	• Interdisciplinary teams, T-shaped participants, mix of diverse thinking preferences	• Expanded team with data scientist and AI (future)
TYPICAL APPLICATION SCENARIOS	• Solving wicked problems • Creating a team-of-teams culture • Changing behavior	• Anticipating before the next S-curve • Measuring organizational/cultural change • Prove effectiveness of teams and procedures

MEASURING IMPACT



Measuring the Impact of Design Thinking in Business Performance

The burning questions at the end of Design Thinking 101 are whether the impact of design thinking and the activities described can be measured. And the good answer is yes, the business impact from the combination of building design thinking capabilities and value creation can be measured, and evidence of this exists from various design thinking initiatives. In various projects, this approach has made it possible to place the customer at the center of considerations, to offer teams new opportunities for radical collaboration, and to significantly increase work efficiency. Especially when the design thinking mindset is applied across the company's portfolio of products and services, costs can be saved, the development speed increased, and better solutions for the customers can be created. Moreover, it is not a one-time effect, as, due to the increasing maturity of the capabilities in the teams and the accelerated transformation, the potentials for the financial impact for both innovation projects and a successful organizational transformation are enormous.

An evaluation of various design thinking capability programs over a decade shows the most significant outcomes. The improvements, activities, and anticipated change range from improved collaboration to a more sophisticated understanding of how to design value propositions. The fact that customer interaction becomes more intensive through design thinking is due to the nature of a human-centered design approach.

From the observations, however, also emerges a list of the most challenging issues that have been witnessed over the same period of time. In many cases what is needed is a strong-willed decision maker, who knows the potential of design thinking and is willing to lead the mindful transformation of teams, organizations, and organizational structures over a longer period of time. In addition, the aspect of time is a critical element, since working attitudes and routines cannot be changed from one day to the next. As already described on page 88, design thinking behavior can be trained to deliver value, but it needs space for reflection and a speed of change adapted to the pace of employees. It also needs to be accepted that not all employees will embrace the change. It is up to leaders to find appropriate roles and tasks for these employees that better fit their mindset, attitude, and personality. In a normal business cycle, there are also phases of focus, cost savings, and an over-weighing of EXPLOIT. In these phases, there is a danger that, in a very short time, the capabilities and talent that have been painstakingly built up will leave the company or be taken over by the new objectives. The best approach is to embrace design thinking as a mindset that can add value to all areas of an organization, starting with the exploration of customer needs and continuing up to strategy work, which is supported by the iterative approach.

Top Five Results from Building Design Thinking Capabilities

- Improved team collaboration
- Increased customer interaction
- More efficient processes and workflows
- Acceleration of time to market
- More clearly defined value propositions

Top Five Challenges in Disseminating the Design Thinking Mindset

- Perseverance and support from top management
- Time and space for change and transformation
- Appropriate tasks and roles in a changing culture
- Healthy balance between EXPLORE and EXPLOIT
- Perceive design thinking as a mindset

Quantifying the Financial Impact of Design Thinking Projects

Example



The challenge remains to quantify the previously listed benefits of design thinking and to establish the basis for measurement. On page 66, we have already described the impact on costs, customers, and employees that can be observed in typical innovation projects. As a first measure, the reduced costs from the initialization of the projects to successful implementation can be quantified for a defined period of time.*

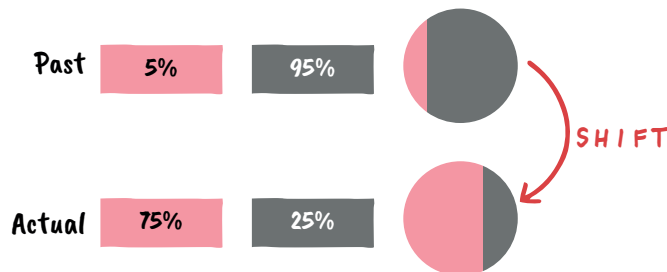
Metrics Based on Meta Level

- Overall reduced cost from project start to implementation in USD

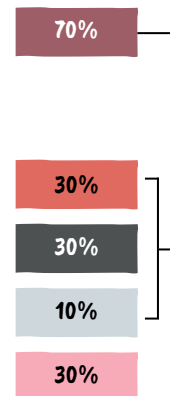
Metrics Based on Phases

- Reduced cost for project selection in USD
- Reduced cost of prototyping and testing in USD
- Savings for modification in late development state in USD
- Increased profit from better customer/solution fit in USD

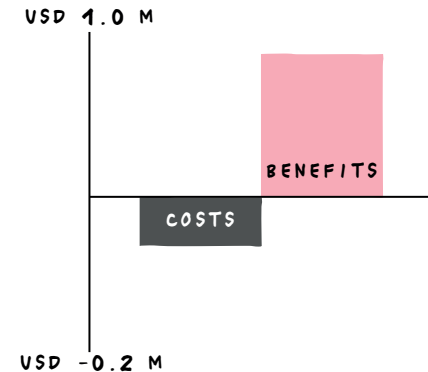
Ratio shift for time spent in problem definition to implementation refinements in % / USD



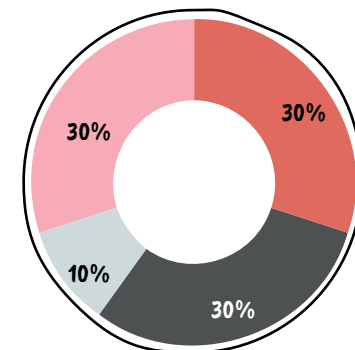
ILLUSTRATIVE



Innovation Project Portfolio Analysis



Benefit Breakdown



Many organizations realize significant gains because design thinking internally addresses the problem up front, whereas without design thinking capabilities, late changes, throwaway efforts, and rework are the norm.

* The defined period of time might vary for different industries (e.g., for pharma 5–10 years in comparison to digital services 1–2 years).

Calculating Costs / Benefits for Training and Capability-Building Programs

There are various options for building up design thinking capabilities. These range from the establishment of an internal academy, to the use of specialists, to the involvement of large consulting firms, which have purchased the corresponding skills over the last decade through the takeover of smaller design studios and agencies. The costs/benefits vary accordingly.

However, for rapid scaling of capabilities, it has proven to be good to have some of the workforce become design thinking coaches early in their respective training. This approach has a significant impact on the proliferation and number of projects and teams executing projects with the design thinking mindset. It is also important to not only focus on design thinking skills, but also to continuously expand the toolbox to include, for example, business ecosystem design skills in order to achieve a higher skill density.

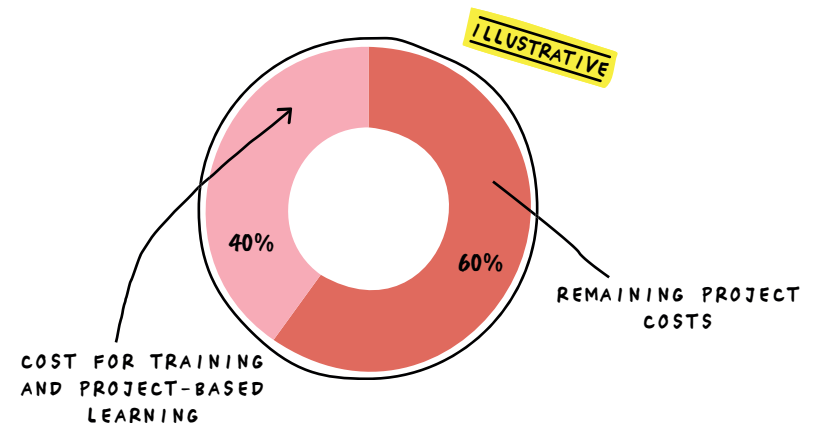
Furthermore, it is strongly recommended to build on known tools, methods, and design thinking approaches and not to waste budgets on activities such as re-branding and re-naming of methods, tools, and frameworks. Usually that results in more confusion than a positive effect. The best results and acceptance can be achieved by building on existing templates, literature, and process models that are known worldwide and beyond the organization's own boundaries.

Many organizations start capability-building programs with a smaller amount of pilot teams, usually no more than five teams, that gain experience through project-based learning. Mostly, the design challenges used have a manageable time frame of 4–12 months, depending on the complexity, the available time budgets and the desired integration with, for example, the defined objectives and key results.

Based on the first experiences and success stories, the programs can be quickly scaled to 20–30 teams. In parallel, programs for trainers can be initialized and the first teams can work autonomously on the respective design challenges without support. Accompanying measures and communication via town halls and leadership boards increase the spread of relevance.

Calculation of the costs depends on how much time employees spend for the training and how much for the actual application. Real costs are incurred for external support of the teams, surveying the intimate capabilities, conducting trainings, workshop facilitation conducted by design thinking experts, and supporting the measurement of impact from individual activities to overarching outcomes.

Usually, the cost for the training and project-based learning is not more than 40 percent of the total design thinking project costs



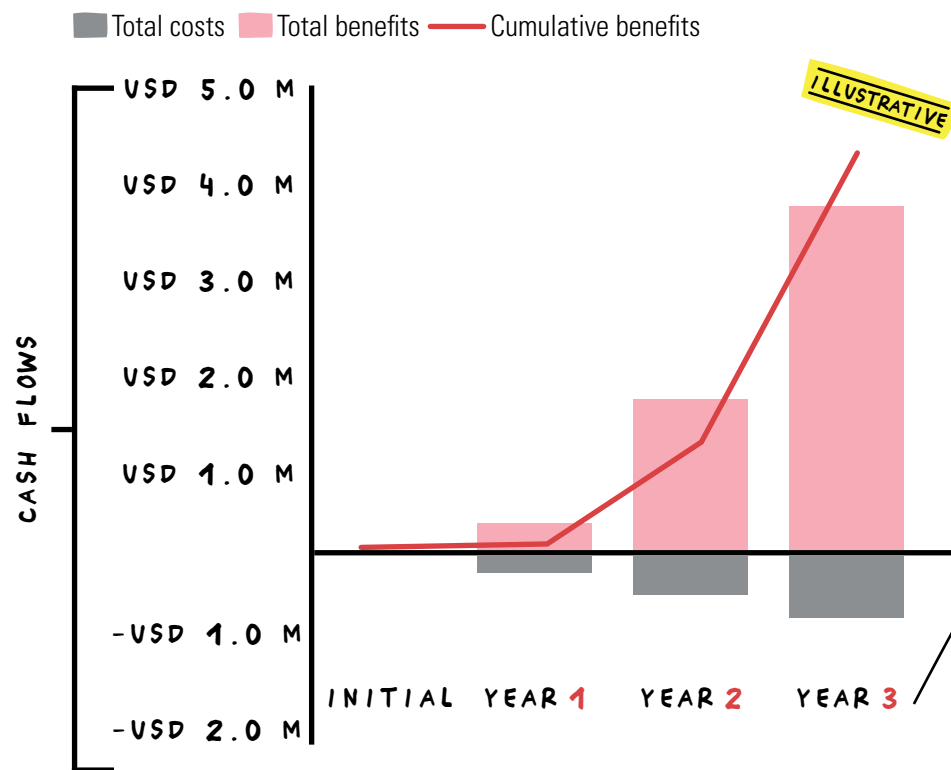
Financial Bravado Exists – Deeper Benefits Are Making the Difference

Example



Metrics / cash flow view on design thinking,
capability building, and project-based learning

Qualitative measures about capability
building and project-based learning



HARD FINANCIAL FACTS AND OUTCOMES

MEASURING BRAND VALUE AND MARKET PERCEPTION

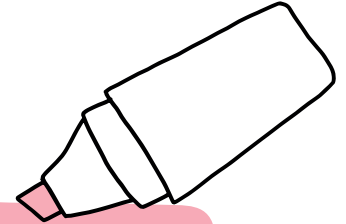
MEASURING CUSTOMER RETENTION, LOYALTY, AND CONVERSATION

MEASURING TEAM AND ORGANIZATIONAL TRANSFORMATION

MEASURING TALENT ACQUISITION AND DEGREE WORKFORCE UP-SKILLING

MEASURING FUTURE SUCCESS BASED ON MINDSHIFT CHANGES

To the Point !

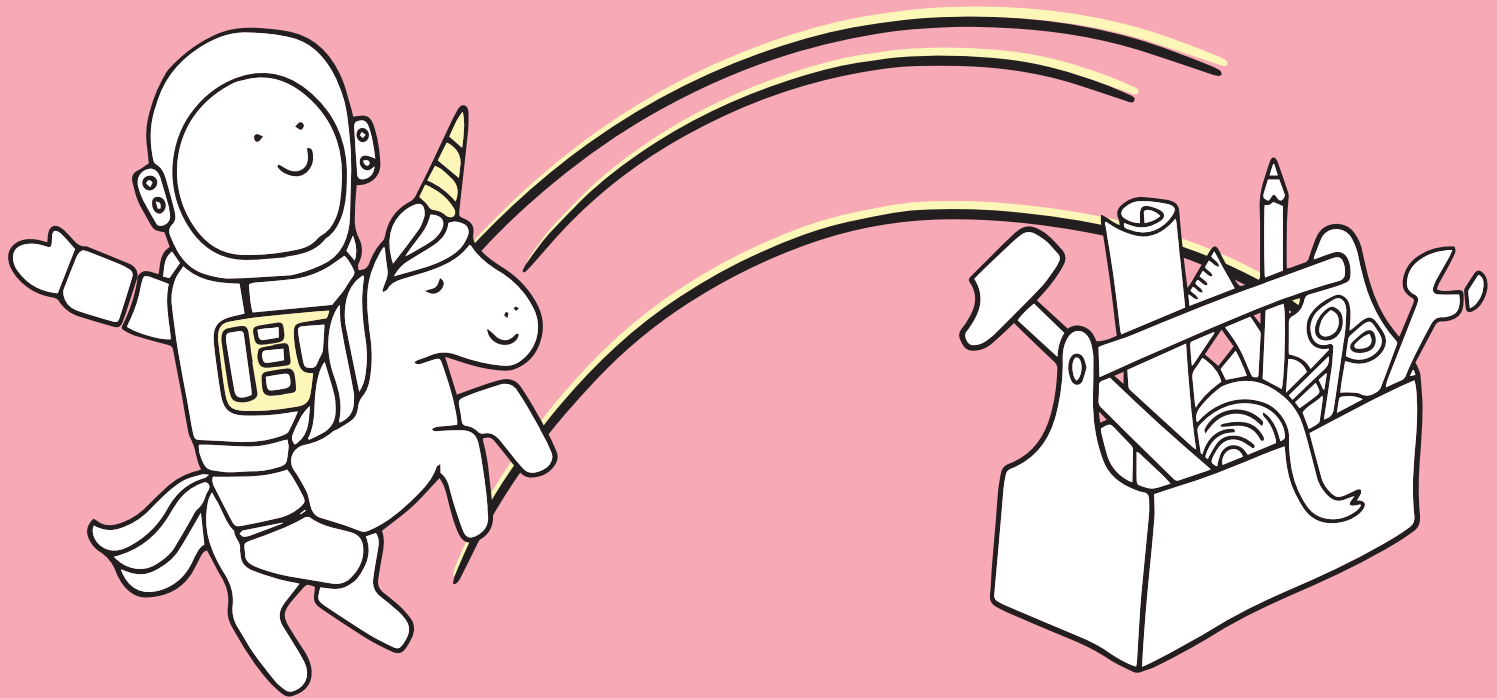


Design thinking is more than a creativity method. Today it is part of the skills of the future and a mindset for the realization of new market opportunities. At the same time, it has a transformative character in the way teams collaborate across the traditional organizational silos.

Design thinking starts the exploration for new market opportunities with a lot of uncertainty. The underlying mindset, tools, and iterative process allow teams to validate the needs of the customer/user, profitability, and technical implementability. As a result, design thinking provides teams a natural way to minimize the risks and to make predictions about market success.

Design thinking is the foundation for long-term value creation and forms the basis for the agile development of products and services, up to the design of complex business ecosystems.

DESIGN THINKING TOOLKIT

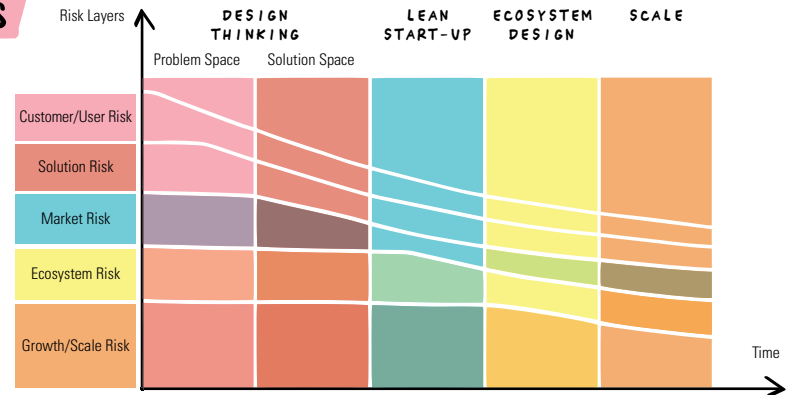


Extended Selection of Design Thinking Tools

The entire design thinking toolbox comprises more than 500 methods and tools, which are beyond the scope of this book. The most popular and valuable tools can be found in the book *The Design Thinking Toolbox*, which is highly recommended to everyone aiming to apply design thinking or take on the role of facilitating design thinking workshops. This introduction to design thinking includes a selection of prudent methods to reduce risk from the problem/customer fit all the way to the product/market fit, including the systems/actors fit (if a business ecosystem is required). Most of the presented tools focus on simple tips and tricks that can be used within EXPLORE to compare ideas, provide insights, or make better decisions through data collection and measurements over the entire design cycle. For a quick and easy mapping of the tools and metrics, the tools follow the problem to scale and growth framework. From the previous introduction of design thinking, it becomes already obvious that design thinking means consistently moving from a narrow technical and business perspective to a truly interdisciplinary and collaborative culture of thinking and doing. For many organizations, however, the expectation of design thinking is still mostly linked to the metrics of business success based on traditional financial indicators. This fulfilling viability is a key element, but it should not be viewed in isolation from the other benefits of applying the design thinking mindsets. It can already be guessed that design thinking cannot be measured as a single concept. The presented examples of measures on a tool level are therefore to be understood as supporting components for reducing risks. In addition, the applied metrics and measurements are very often the starting point for creating a larger innovation measurement system. It is highly recommended to adapt the quantifications, measurements, and metrics to the specific situation, objective, and available resources. A step-by-step guide for how to create an innovation measurement system and how causality of two more metrics help in providing evidence is outlined in the Measuring 101 section (see pages 145–255).



Examples and ideas for quantification and measurement at the tool level are included throughout the toolkit.



Preview of Suitable Methods and Tools for Design Thinking

1. Design Thinking (Problem Space): Problem/Customer Fit

• Define Success	107
• Problem Statement	108
• Empathy Map	110
• Jobs to Be Done	112
• Personas/User Profiles	114
• Critical Items Diagram	116
• Point of View	118

2. Design Thinking (Solution Space): Problem/Solution Fit

• Scoring Ideas	121
• Tracking Experiments/Prototypes Tracking Canvas	123
• Probability of Innovation Success	124
• Prototype Question Checklist	126
• Design Thinking Canvas	129

3. Lean Start-Up: Product/Market Fit

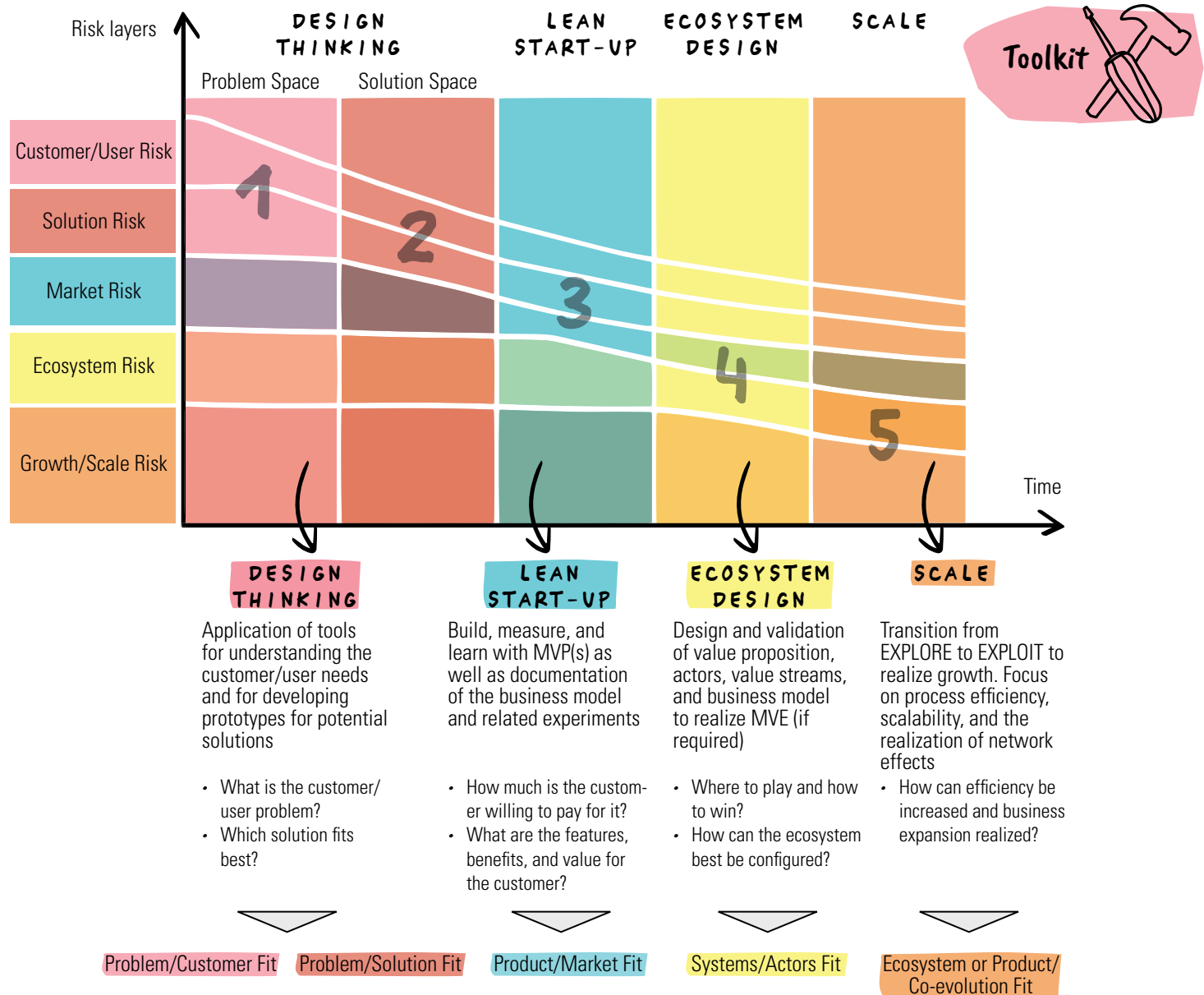
• Innovation Accounting	131
• Lean Canvas	136

4. Ecosystem Design: System/Actors Fit

• Ecosystem Capital	139
• Ecosystem Design Canvas	141

5. Scale: Ecosystem or Product/Co-Evolution Fit

• Scale & Growth Canvas	144
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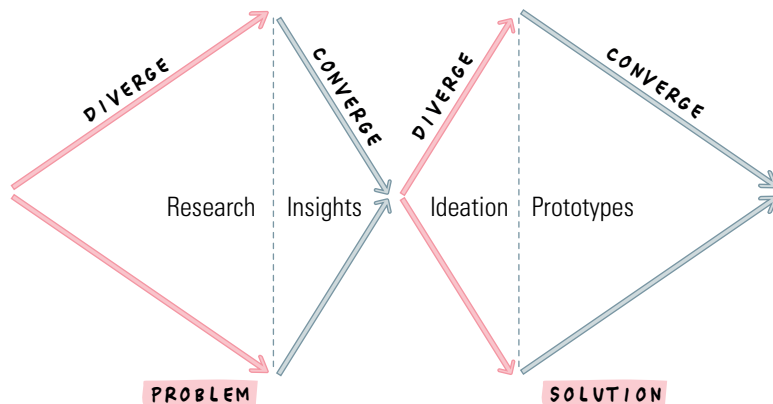


Design Thinking (Problem Space): Problem / Customer Fit

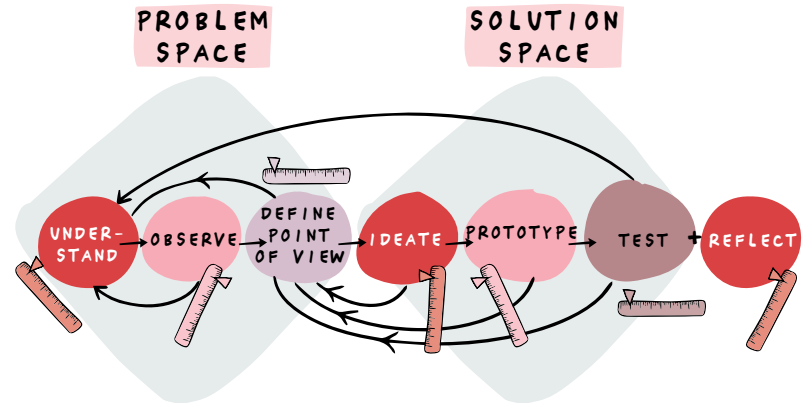
Design thinking primarily focuses on the customer/user and solution risk. Proficient design thinking and innovation teams ideally spend 80 percent of their time trying to better understand the customer problem (problem space). Without a deep understanding of the customer needs, the efforts in the solution space quickly fizzle out. However, observations and measurements in companies across all industries and sizes unfortunately show a different picture. Many teams spend the lion's share (up to 70 percent) of activities and time on ideation without having understood the customer's problem. Measurements also reveal that teams sometimes spend less than 5% of their available time on the first two quarters of the double diamond. It is not surprising that, on this basis, design thinking generates only output but no results and impact. For this reason, the double diamond should be presented and applied in an asymmetric form to provide the appropriate perspective on the design work that is expected and will be performed.

SOLVING THE RIGHT PROBLEM

SOLVING THE PROBLEM RIGHT



The *Design Thinking Canvas* (see page 129) supports the team in documenting the activities from the problem definition to the final prototype. A focused application of the design thinking mindset and tools helps to create long-lasting value based on the problem/customer fit and problem/solution fit.



De-risk development by continuously assessing the dimensions of desirability, feasibility, and viability to evaluate high-uncertainty, transformative innovation initiatives.

Examples of Indicators Related to Design Thinking:

- Confidence level of the team regarding problem worth solving
- Overlapping characteristics, needs, behaviors in a set of personas
- Number of new insights collected per deep interview of customers
- Scoring of ideas on desirability, feasibility, and viability
- Number of critical and unknown assumptions identified
- Percentage of change from unknown to known in each iteration of validating critical assumptions
- Number of interactions across the organization to collaborate
- Reduced cost from start to implementation
- Design thinking maturity level of team/organization
- Hard financial facts, outcomes, and impact on brand value and customer satisfaction

Define Success

For measurement purposes over the design thinking cycle, it is possible to initially define success at various levels and applications. What constitutes success on a very high level may already be roughly anchored in a design brief, derived from the design principles or, in many cases, initially defined by the design thinking team itself. However, defining success can be done in different phases of the design cycle. Most teams start before the project. Defining success can also be done based on the point of view, after the problem space has been observed for the first time, or much later in the process close to implementation. Mostly, the type of project determines the appropriate time for defining success.

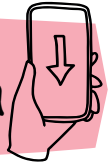
Defining Success Helps the Design Thinking Team:

- to get alignment from the team members on what success should be.
- to ensure the team understands the organization, management, users/customers, and other stakeholders' requirements (so it is easy to get buy-in later or prepare the transition from EXPLORE to EXPLOIT).
- to select and prioritize throughout the project.
- to create a concrete start for measuring with clear outcomes.

Procedure and Template:

1. The principle is to do an ideation, first considering all the elements that may be defining success, then narrow them down to the critical ones.
2. Typical questions are related to the team, organization, company, customers/users, financial impact, or other stakeholder relationships:
 - What does success mean for the potential customer?
 - What does success mean for the company?
 - What may be the value of the project for the organization?
3. Once all these elements have been shared, the team may need to go through a converging exercise that will help pick the key elements for success. For example, clustering the key areas for defining success, then voting on main areas.
4. As the project progresses it is useful to review the criteria for success several times, as internal or external requirements may change.

Template
download



EVALUATION AND SELECTION TEMPLATE FOR SUCCESS

Evaluate the answers to relevance. Define the values for the example.



+	+	+	+
IMPORTANCE	IMPORTANCE	HIGH	TO BE DEFINED
SUCCESS FOR CUSTOMERS	SUCCESS FOR COMPANY	VALUE OF THE PROJECT	TO BE DEFINED
IMPORTANCE	IMPORTANCE	LOW	TO BE DEFINED



DOWNLOAD TOOL
[www.design-metrics.com/
en/define-success](http://www.design-metrics.com/en/define-success)

Problem Statement

The problem statement is, in many cases, based on initial research about the current and future customer needs and number of customers (rough estimate of the size of the market). In some cases, trend reports or pictures of the future are supporting the reasoning. Besides early evidence that the problem matters, many of the customer pains, gains, or jobs to be done are based on assumptions. Without starting the design thinking process with *observing* and *understanding*, most of the assumptions will not be validated. The problem statement outlines which user/customer problem might be solved. In other words, what is the design challenge? The problem statement is part of the empathy phase. Different immersion and observation techniques support the empathy phase (see for example the empathy map on page 110).

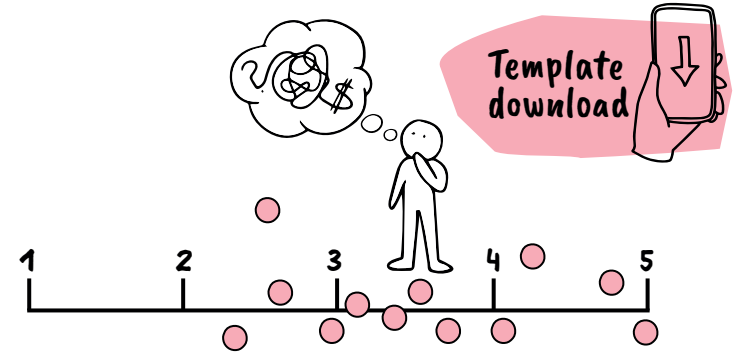
The Problem Statement Helps the Design Thinking Team:

- to develop a common understanding of the problem.
- to formulate the collective findings from initial research in a design challenge.
- to outline the direction and next activities (e.g., validating assumptions).
- to create and support a reference for measuring success (see page 107).

Procedure, Template, and Examples of Measurements:

1. Ask key questions to formulate the problem statement: What is the problem? Why is it a problem? Who has the problem? Who has a need? When and where does the problem occur? How is it solved today?
2. Based on the analysis, formulate a problem statement. Use, for example, the following form:

How might we (re)design.....(WHAT)
for.....(WHOM),
so that..... (THEIR NEED) is satisfied?



WH QUESTIONS					
WHO	WHAT	WHEN	WHERE	WHY	HOW
Who is involved?	What do we know already about the problem?	When did the problem start?	Where does the problem occur?	Why is the problem important?	How could the problem be an opportunity?
WHO...	WHAT...	WHEN...	WHERE...	WHY...	HOW...



PROBLEM STATEMENT



BASELINE FOR MEASURING, FOR EXAMPLE, CONFIDENCE LEVEL AND OUTLINING CRITICAL ASSUMPTIONS (SEE PAGE 109)
--



DOWNLOAD TOOL
www.design-metrics.com/en/problem-statement

Measuring Confidence Level and Critical Assumptions

Example



For measuring the relevance of a **problem statement**, two methods are helpful to create indicators in two perspectives:

- Assessing the confidence level of the team with periodic check-ins
- Discussion and evaluation of the critical and unknown assumptions

Examples of questions to assess the confidence level of the team with regard to a problem worth solving

How confident is the team in working on the problem? 

1. How confident are we with the targeted user profile (persona)?

☐ ☐ ☐ ☐ ☐

Low Not sure High

2. How confident are we about the deeper needs of the user/customer addressed in the problem statement?

☐ ☐ ☐ ☐ ☐

Low Not sure High

3. How confident are we about the estimated size of the market (total and addressable)?

☐ ☐ ☐ ☐ ☐

Low Not sure High

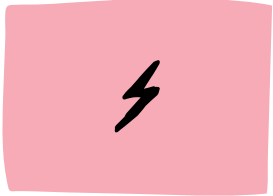
4. How confident are we with any limiting factors from the design principles?

☐ ☐ ☐ ☐ ☐

Low Not sure High

Categorization of critical assumptions related to initial design phases (e.g., desirability, feasibility, and viability)

What is the team assuming with regard to customer behavior (desirability), monetization (viability), and technology (feasibility)? 

CRITICAL	
KNOWN	UNKNOWN
NOT CRITICAL	

Initial confidence level of team versus confidence level in every micro design thinking cycle:

The measurement indicates the ambiguity at the start and compares the confidence level with prototypes and experiments performed until the final solution is performed. The metrics also help the team to overcome the "groan zone," switching from diverging to converging.

of critical and unknown assumptions identified:

The measurement indicates how much uncertainty is related at the start of project and helps to estimate the time and resources needed to validate assumptions.

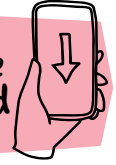
% of change from unknown to known in each iteration of the design thinking micro cycle of validating critical assumptions:

The metric indicates the continued process of knowledge gain along the activities.

Empathy Map

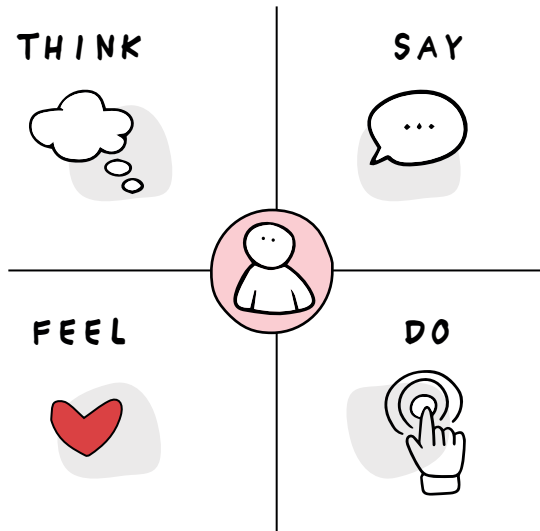
The empathy map is great tool for capturing and synthesizing the conversation informed by the design thinking team's observations. The visualizing of customers/user attitudes and behaviors helps to create a deep understanding of customers/users. The mapping process and discussion with the design team also reveal any discrepancies about the real and assumed behaviors of customers/users. Any of unexpected insights are especially of value for the further development of personas and the creation of jobs to be done (JTBD).

Template
download



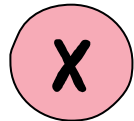
The Empathy Map Helps the Design Thinking Team to Answer the Following Questions:

- WHAT are some quotes and defining words the customer/user said? (**SAY**)
- WHAT actions and behaviors are performed by the customer/user? (**DO**)
- WHAT might the customer/user be thinking? What does this tell you about their beliefs? (**THINK**)
- WHAT emotions might the customer/user be feeling? (**FEEL**)



Problem Scenario

- What fundamental jobs need doing?
- What needs have to be fulfilled?



Alternatives

- How does the customer/user deal with it today?
- How is that working?



Your Value Propositions

- What might be created that is better?
- Why does it matter now and in the future?
- How does it work?



DOWNLOAD TOOL

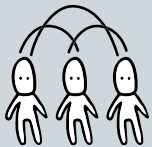
www.design-metrics.com/en/empathy-map

Measuring Activities Related to Customer/User Interactions

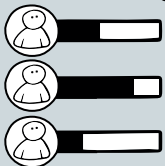
Building empathy with the customer/user is an important part of the design thinking mindset. At the same time, it is also an integral design thinking process step that should be given special attention by the design thinking team. That is why, especially for those situations where the empathy of a design thinking team with the customer/user is central or frequent, appropriate measurements should be applied to evaluate these activities.



- 1. Time between respective observations and deep interviews of customers/users:** This measurement can be initially collected for typical innovation projects, and activities can be taken to reduce the time between interactions.

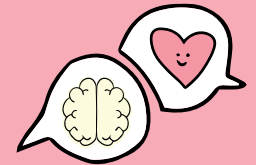


- 2. Number of customer/user interactions over the entire design thinking macro or micro cycle:** The ultimate goal is to keep the number of interactions constant throughout the entire design cycle (i.e., from need-finding to solution testing).



- 3. Application of a lagging indicator on the variety of interactions with customers/users:** This measurement compares with the persona used to solve the customer problem with the actual customers/users. The metric allows you to analyze in retrospect to which kinds of customers and needs an interaction has taken place over the whole design cycle.

How to Measure Empathy



Experienced design thinking teams know that measuring empathy is more difficult than other activities. The future possibilities of neurodesign are discussed in 301, which can fundamentally help to better explore the *why* in the context of the problem space (see page 364), and thus reduce some challenges in the application of the currently used empathy tools. In general, measuring empathy is problematic because meaningful comparisons about how to define and measure empathy are lacking. Hopefully, the ambiguity of the term *empathy* will soon be overcome, and consistent measures will be developed. Research in social cognitive neuroscience suggests that four different neural networks should be activated for a human to have a complete experience of empathy. These neural networks should be the basis for future measurement and are important components of the application of the empathy map for design thinking and innovation teams:

1. Effective sharing: Subjective reflection by the design thinking team on another person's observable experience.

2. Self-awareness: Differentiation between the experiences of the design thinking team and those of the customer/user being observed.

3. Mental flexibility: The ability of the design thinking team to effectively imagine what it would be like to experience the world from the customer's/user's position.

4. Emotion regulation: The design thinking team's ability to regulate the volume of their own feelings as they arise from mirroring the customer/user experience.

Jobs to Be Done

Jobs to be done (JTBDs) is a conceptual tool that is often used in connection with the development of a persona and the reflection on gains and pains in order to convert observational findings into strong statements that the customer/user implicitly or explicitly tries to achieve. Often there are countless JTBDs that a customer/user has to complete, and these JTBDs can contain both emotional and functional aspects, depending on the problem to solve. Thus, the selection of the appropriate JTBD is not an easy task for design thinking teams. Finally, the best possible scenario is to focus on the JTBD that has the greatest potential to realize a market opportunity or is the starting point for radical new business ecosystem considerations. For the formulation of a JTBD, a simple pattern based on an outline of the situation, motivation, and expected result can be applied.

When _____, I want to _____ so I can _____.

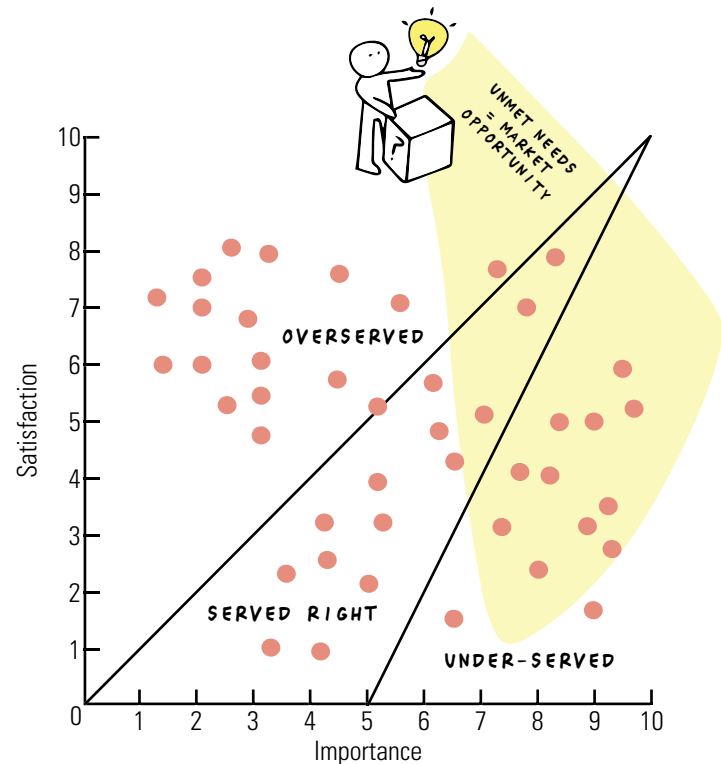
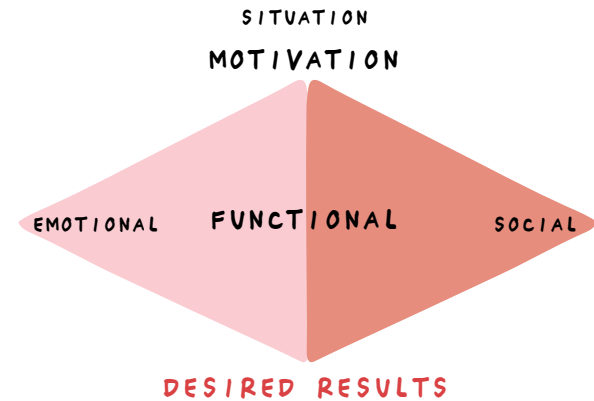
(Situation) (Motivation) (Expected result)

Example of Measuring JTBD with the Application of Two Dimensions:



- How important is the task to be accomplished for the customer/user?
- How satisfied is the customer/user with the solutions that already exist?

For the measurement of JTBDs, the described dimensions can be used to map the customer's viewpoint on the one hand and on the other hand to carry out a valuation of the opportunity. It has proven useful to survey the importance for the customer/user on a Likert scale (degree of importance). Satisfaction with existing solutions can also be surveyed in this way.



The Power of Game-changing JTBDs

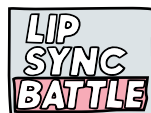
The specific JTBDs are the basis for many design thinking teams in determining the metrics that customers use to measure success in completing each step of the job to be done. These metrics, based on desired outcomes, give predictability to a potential market opportunity. A desired outcome is a specifically constructed statement that has a set of unique characteristics related to the outcome. Characteristics range from solution-free, stable over time, measurable, controllable, and/or tied to a process (or the task) that the customer/user is trying to complete.

Many of the JTBD statements are created within the first two design thinking activities (understand and observe customers/users) of the design thinking micro cycle. A great example of applying the combination of design thinking and data analytics (see the hybrid model on page 320) for detecting powerful JTBD is the transformation of TikTok (formerly musical.ly) into an engaging consumer platform. TikTok has become the number-one downloaded app by understanding new customers' needs, motivations, and behavior.

Example 



Musical.ly is an app that focuses on adding background musics and videos.



The TV show **Lip Sync Battle** becomes famous on Thursday nights.

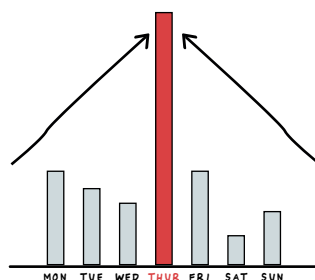


TikTok realizes customer/user needs for lip sync and the JTBD for cool video features.



Downloads of the Musical.ly app increase after the TV show

EVIDENCE BASED

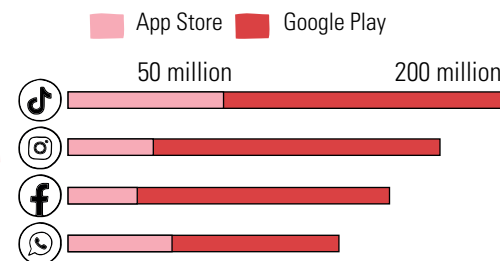


WHY MORE DOWNLOADS?

Fans search in App Stores for "lip sync app" after the show. Musical.ly shows up in the top search result, which generates massive downloads.

NEW CUSTOMER NEEDS

A new value proposition based on user motivation, advanced features, and JTBD leads to better ad hoc videos.



2015

2018

2022

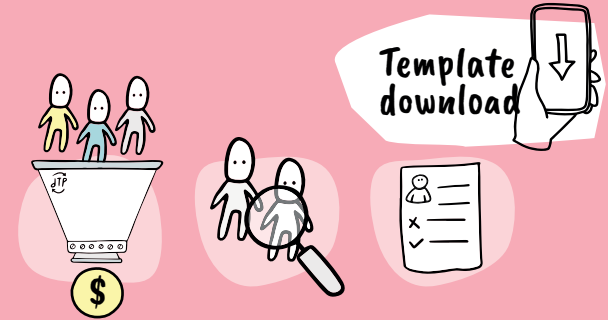
TIME

Personas/User Profiles

Personas/user profiles are a great way either to define initial assumptions about user behavior and needs (which are later validated) or to document the collected insights from observations and in-depth interviews. For the representation of personas, there are different possibilities, and for the comparison of different personas, it is recommended to choose criteria that can be derived from the design brief. For example, if the final solution has to be provided digitally, it makes sense to compare the personas in terms of their maturity in the use of digital media or to express it in a temporal dimension in terms of hours per day that the persona has active screen time.

Typical Elements to Describe a Persona:

Location:	Where is my persona from?
Gender:	What is the gender of my persona?
Age:	How old is my persona?
Education level:	What education level does my persona have?
Hobbies/Interests:	How does my persona spend leisure time?
Income:	What is the income of my persona?
Marital status:	Does my persona have a family?
Occupation:	What is the professional sphere my persona works in? What are the responsibilities of my persona?
Channels:	What websites or social media does my persona use?
Motivation:	Why does persona buy my products? What is my persona's goal?
Pains:	What are the concerns of my persona? What problems exist?
Gains:	What possibilities does the persona have? What benefits is the persona already experiencing?
JTBD:	What are the jobs to be done (see page 112)?



Typical Criteria for Comparing Personas:

Motivational Criteria:

Achievements, personal growth, efficiency, convenience

Personality Criteria:

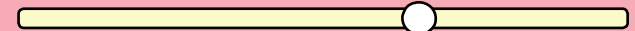
Introvert versus extrovert; thinking versus feeling; sensing versus intuition; judging versus perceiving; loyal versus fickle; passive versus active

Customized Criteria Based on Problem Statement:

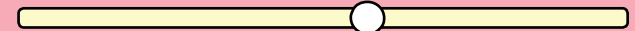
For example, confidence in digital, level of independence, planning horizon, buying behavior, preferred channels (e.g., multi-, opti-, omnichannel)

MOTIVATIONS

ACHIEVEMENTS



PERSONAL GROWTH



EFFICIENCY



CONVENIENCE



DOWNLOAD TOOL

[www.design-metrics.com/
en/persona-comparison](http://www.design-metrics.com/en/persona-comparison)

Quantitative Specifications of Personas

Example of the personas comparison of 65+ segments based on three customized criteria with regard to confidence in digital, level of independence, and (financial) planning horizon

Example 

Personas of 65+ Segments

Independent Rosemarie



- Leads a financially comfortable life and is confident in managing money
- Proactive planner who thinks about the future



Rational Needs



Objective and expert knowledge

Emotional Needs



An empathetic sounding board

In-the-Moment Bill



- Lives day-to-day and makes the most of life with the money he has
- Deals with problems when they occur



Structured plan and methods to stick to it



Consistent support through highs and lows

Dependent Anna



- Has physical and cognitive disability
- Relies on support in managing finances day-to-day



Practical, trustworthy help



Guidance from someone who understands



Examples of Measuring the Perceived Value of Potential Solutions

Real customers/users corresponding to the persona can be used in measuring later in the design thinking process in measuring the perceived value of specific features, potential products and services, or the defined value proposition. Key questions to ask and to collect data points might refer to the following three questions and validations:

- **Feature Value:** What features and aspects of the product do potential customers/users care most about? What do they care least about?
- **Quantified Value Propositions:** What value messaging drives them to sticking to a specific proposition?
- **Price Sensitivity and Willingness to Pay:** How much are the customers/users willing to pay to solve their problem?

Critical Items Diagram

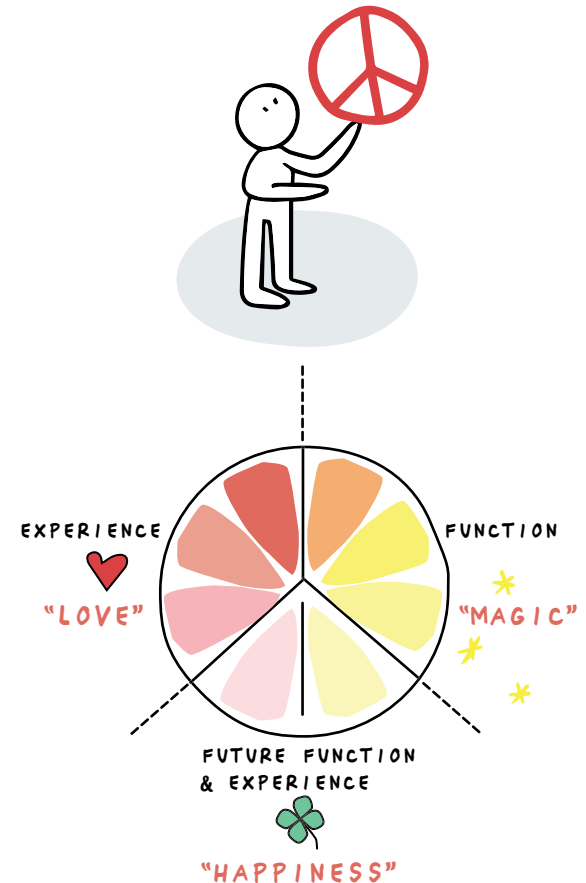
The critical items diagram is a frequently applied tool for designing physical, digital, and hybrid experiences, services, and products. It helps the design thinking and innovation team to agree on the critical success elements for the target group based on initial findings, the definition of a point of view (see page 118), or validating a persona. Many of the elements elaborated in the critical items diagram are the ones that are most likely included later at the stage of creating the final prototype to fulfill customer/user needs. The described elements in the critical items diagram can either describe the expected experience or present expected functions. It is recommended to challenge the elements of the diagram with each iteration. However, some of the critical items will necessarily have relevance to a critical experience or critical function up to the final prototype.

The Critical Items Diagram Helps the Design Thinking Team:

- to appraise the results from the understand and observe phases and filter out the crucial elements.
- to prepare the ideate and prototype phases, later the realize-MVP phase, to establish a good starting position.
- to figure out the things that are essential to the project and agree on what might be important to success.

Procedure, Template, and Examples of Measurements:

1. At the beginning of this step, ponder the question: "What is crucial for a successful solution for the customer/user in the context of the problem?" This is based on the findings from the understand and observe phases.
2. Sketch a critical items diagram on the whiteboard or a large sheet of paper and discuss in the team which experiences the user must have/which functions are critical for the user/customer.
3. The team brainstorm and writes elements that are critical for the user on Post-its.
4. The team selects and names four experiences and four functions, one of which focuses on completely new or future expectations.
5. Discuss the results and agree in the team about the final eight critical items. The critical items diagram supports the definition of the "How might we..." questions that are thought provoking enough to launch the ideate phase successfully.



The items (functions and experiences) are best placed by applying the concept of the daisy flower. Each petal has the same importance as the others.

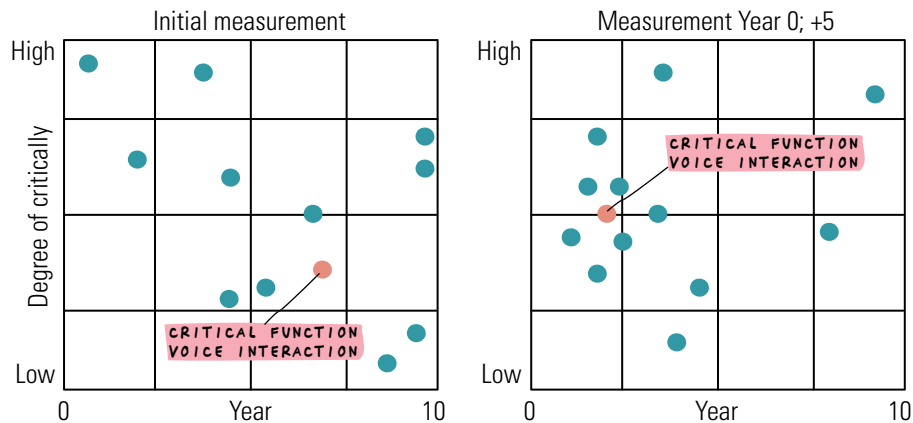
Metrics for Measuring Critical Items

One way of measuring critical items is the extent to which individual critical items develop over time in terms of their relevance and time-related importance. Such measurements have led to insights into how quickly individual functions, such as voice interaction in vehicles, become highly relevant for customers over different design challenges.

Example



CLUSTER OF CRITICAL FUNCTIONS AND EXPERIENCES RELEVANT IN THE FUTURE [YEAR 0-10]

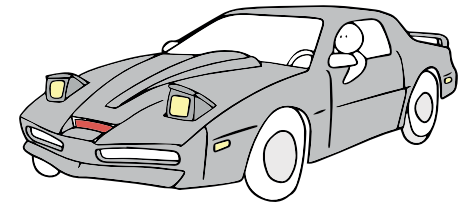


Importance of Future Functions and Experiences for User:

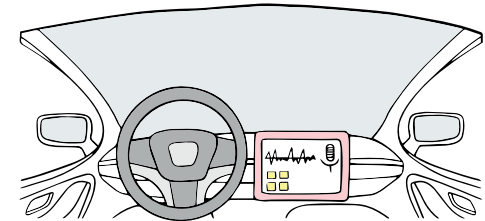
Measurement of the extent to which individual critical items develop over time in terms of their relevance and time-related importance.

In many cases the functions are related to the experiences, future use cases, and JTBD of the user/customer. Some mega and technology trends accelerate the user/customer adaption and experiences from the living environment (e.g., Alexa or other conversational AI technology) becoming a necessity in the application of mobility.

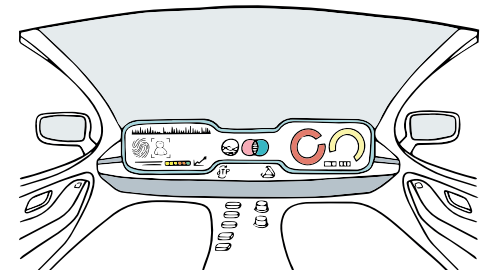
Science fiction and foresight in the 1980s



Customer awareness in the 2000s



Integration with Siri, Alexa, and Google for all driver and passenger functions +AR experience to be connected to the external world.



Point of View

The point of view (PoV) is the reframing of the design challenge into an actionable problem statement. The PoV is based on the first two phases of the design thinking process (understand and observe). The analysis of the customer/user behavior and deeper needs is the first step of breaking down complex concepts and problems into constituents which are better and easier to understand. For the creation of the PoV, the design thinking team focus is on organizing, interpreting, and making sense of the collected data and insight. The next step of the design thinking process, ideate, is based on the previously mentioned actionable problem statement based on HMW questions.

- 1. Insights:** Collect and organize information. Identify what every team member sees.
- 2. Clustering:** Sort gathered information and manipulate or reframe the collected information, as necessary.
- 3. Drill down into the design challenge/problem:** Build HMW questions on different PoVs.
- 4. Prioritization:** Decide which PoVs and related HMW questions might have the biggest impact and highest urgency.

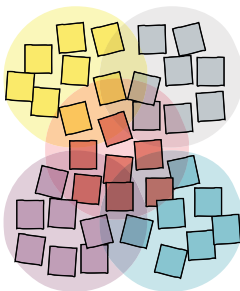
Applying an analysis and synthesis approach provides design thinking and innovation teams with a path to identify true, core insights on which to build the HMW questions.

**How might we redesign(WHAT) for(WHOM),
so that..... (HIS NEED) is satisfied, by considering
..... (INSIGHT/REQUIREMENT/LIMITATION)?**

1. INSIGHTS



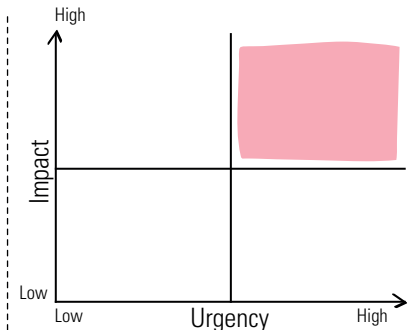
2. CLUSTERING



3. DRILL DOWN OF DESIGN CHALLENGE

DESIGN CHALLENGE/PROBLEM STATEMENT		
POV #1	POV #2	POV #3
HMW...	HMW...	HMW...
HMW...	HMW...	HMW...
HMW...	HMW...	HMW...

4. PRIORITIZATION



HOW TO CREATE POWERFUL HMW QUESTIONS

- Adjust the original problem statement with focused HMW questions.
- Present the identified challenge as a problem statement.
- Use the HMW question to evaluate competing ideas.
- Phrase the question in a way that makes it actionable and tangible.
- Remember always that the HMW questions guide the innovation effort and serve as inspiration to the team.
- For different ways of exploring, expand the HMW questions into "What would happen if ..." or "What is stopping us from ..." once the team feels comfortable.

Understanding the Relationship between Analysis and Synthesis

The analysis of findings from the observe and understand phases involves disintegrating the fragments. Synthesis creates the bigger picture and forms the basis for experimenting and applying. Analysis and synthesis often occur at the same time. By structuring the analysis, the problem is framed, while synthesis is emergently helping to create connections that identify breakthrough ideas and opportunities. Insights derived from the smart use of data and collected information are hugely powerful. Design thinking teams who are able to develop big insights from any level of data or collected information are usually more successful in creating breakthrough innovation.

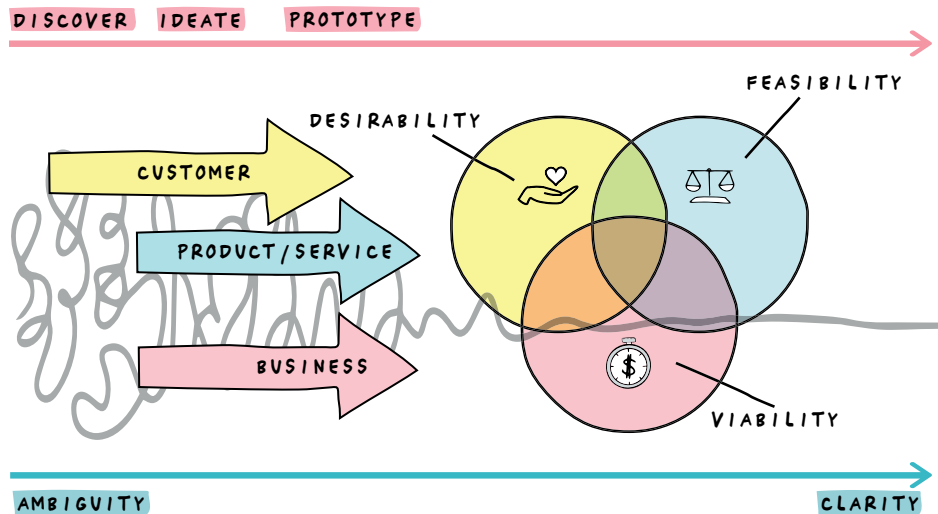


The hybrid model (see pages 320–334), which combines design thinking and data analytics, is ideal for gathering valuable insights at all levels and synthesizing the appropriate conclusions.

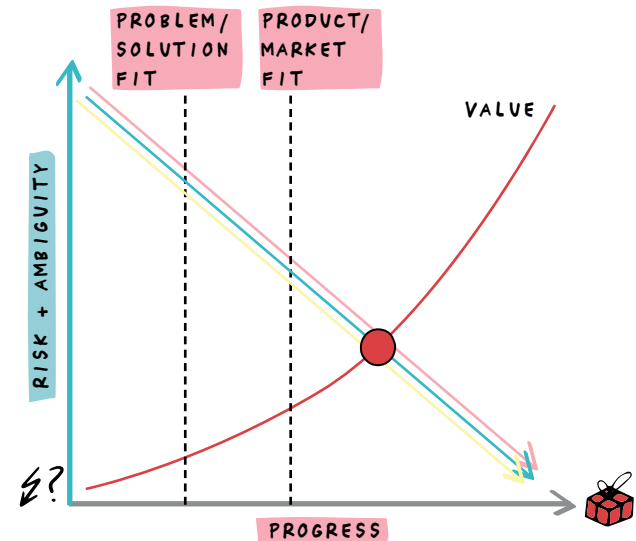
	Analysis	Synthesis
DEFINITION	The analysis aims to fragment a complex customer problem into micro sections to acquire more comprehension from it.	Synthesis aims to collect the micro sections and connect them together, in conjunction, to acquire a broader view of the problem.
CORRELATION	Without synthesis, analysis will not get justified.	Without analysis, synthesis will not take place.
KEY FEATURE	It involves research, observation, and theories of customer behavior and needs.	It involves practical experiments and outcomes that are new and are freshly available.
IMPACT	It is easy to understand and execute.	It is complex to understand and execute.
DEPENDENCY	Analysis is an independent process.	The synthesis process is dependent on analysis.
PROCESS STEPS	It is the process of thinking, observing, and then trying.	It is the process that includes applying, experimenting, and then studying and reflecting on the outcomes.
BENEFITS	It provides a detailed investigation of specific topics.	It provides an abstract overview of the whole topic.
TYPES	Qualitative, quantitative, predictive, descriptive, prescriptive, and diagnostic are the different types of analysis.	Sample-based, vector, frequency modulation, granular, wave table, additive, subtractive, physical modeling, spectral, and West Coast are the different types of synthesis.

Design Thinking (Solution Space): Problem / Solution Fit

The point of view (PoV) is the starting point for ideation (solution space). The confidence level of the team is usually much higher than the starting point, since the team has more information about the potential customer/user and his/her needs, and many of the critical assumptions have been verified. At this point confidence indicates how sure the team is about impact, and to some degree also about ease of implementation. The initial chaos is cleared and there is more clarity about the framework of a potential solution. Through different brainstorming variants and the construction of different prototypes, different solutions are made tangible and then tested with the customer/user. However, it is not advisable to measure the number of ideas in this context, as it is not a useful measure. It seems more important to check and evaluate the potential prototypes and solutions for their desirability, feasibility, and viability (see the introduction on page 73). A detailed guide to different creativity techniques, brainstorming variants, and prototype building (e.g., Dark Horse Prototype, Funky Prototype, Functional, X is Finished Prototype, and Final Prototype) can be found in the complementary tools and methods book *The Design Thinking Toolbox*.



Every prototype created helps in the validation of desirability and feasibility. In addition, the question of viability is becoming increasingly important in the solution space.



Scoring Ideas

One possibility for measuring ideas is based on the dimensions of the previously mentioned design thinking lens. This approach is the foundation for many decisions the design thinking team makes over the entire design thinking cycle. This means that an idea can be reviewed in different phases of the design thinking macro cycle with regard to the central questions of how the idea scores against **desirability, feasibility, and viability**. Whereas in the early design phases the team usually concentrates mainly on desirability, the question of feasibility and viability becomes more important as the solution matures. Finally, all ideas, experiments, and solutions can be evaluated with respect to the three dimensions of the design thinking lens.

Scoring Ideas Helps the Design Thinking Team:

- to find out how much the idea, experiment, or solution is wanted by customers/users.
- to evaluate the possibility that the idea will become a reality.
- to understand if the necessary capabilities, technologies, and resources exist to bring it home.
- to evaluate the economical and sustainable model for creating, building, and maintaining the solution.

Procedure and Template:

1. Create a three-dimensional diagram for the ideas, experiments, or solutions based on the three dimensions (desirability, feasibility, and viability).

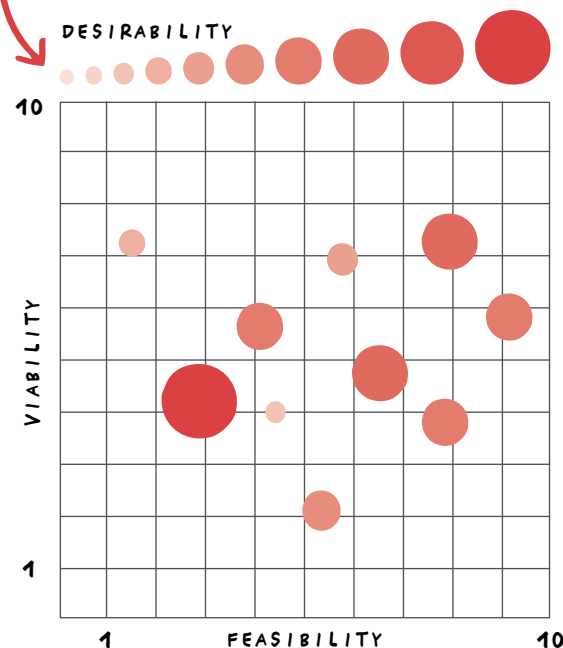
Tip: If you operate in only two dimensions, it is recommended to use the size of the idea as the indicator for desirability.

2. Find appropriate parameters to compare ideas on each dimension.

Tip: A good starting point is to compare new approaches with already existing solutions.

3. Discuss with the team the dimensions and constraints and find innovative solutions to overcome limitations' feasibility and viability.

ITEMS	DESIRABILITY	FEASIBILITY	VIABILITY	TOTAL
01	4			
02	10	2		
03	7	3	7	13
04	3	4	4	17
05	6	4	6	17
06	5	5	4	11
07	8	6	2	13
08	7	6	7	18
09	8	8	5	19
10	7	9	4	19
		9	7	24
			6	22



Tracking Experiments / Prototypes

Similar to the previous tool, the individual experiments can be broken down even further. The *Experiments/Prototypes Tracking Canvas* helps to systematically question the assumptions in the dimensions of desirability, feasibility, and viability. On this basis, the confidence level of the teams can also be validated. The actions taken are related to the well-known design thinking phrase: **love it, leave it, or change it!**

The Experiment/Prototypes Tracking Canvas Helps the Design Thinking Team:

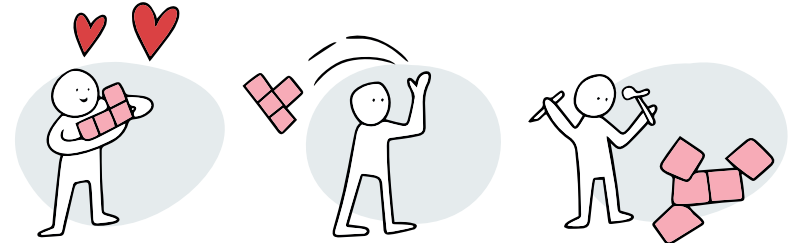
- to document all the assumptions for one experiment based on desirability, feasibility, and viability.
- to document what has been learned from the evidence to support or refute a specific assumption.
- to calculate the confidence level based on how strong the insights (I) are and the strength of the evidence (E), Likert: 1 = weak | 3 = strong, with the confidence level calculated as $I \times E = C$ (max. 9) (min. 1).
- to decide on action to take based on love it, leave it, or change it.

Procedure and Template:

1. The *Experiments/Prototypes Tracking Canvas* helps before starting an experiment, planning an experiment, capturing the outcomes of an experiment, and creating actions
2. Define the experiment/prototype testing in three phases:
 - Before the experiment: Reflect on critical assumptions.
 - Planning the experiment: Decide what to test and how.
 - After the experiment: Validate insights, check the strength of evidence, and calculate the confidence level.

Compare the confidence level with the general feeling of the team about prototypes tested/experiments conducted.

3. Define actions based on outcomes of testing the *Experiments/Prototypes Tracking Canvas*.



What Actions Derive from Experiment/Prototype Measurements?

- **Love it:** This is typically when the hypothesis is confirmed, and the design thinking team is very confident about the strength of the evidence.
- **Change it:** This is a typical pivot when the design thinking team has gathered enough evidence to change parts of a prototype and to test it again afterwards.
- **Leave it:** This radical move is not an easy decision for design thinking teams. However, if there are multiple pieces of supporting evidence that disprove the hypothesis, the prototype will not make sense in most cases.

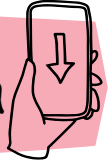


Examples of Measuring Activities Related to Experiments:

- # of experiments/prototypes which contribute to significant learning outcomes related to "love it, change it, or leave it"
- # of experiments/prototypes that were independently initialized, planned, and executed by the design thinking team

THE EXPERIMENTS / PROTOTYPES TRACKING CANVAS

Template
download



NAME OF EXPERIMENT/PROTOTYPE TESTED:				MAIN OBJECTIVE OF THE EXPERIMENT/PROTOTYPE TESTING:			
CRITICAL ASSUMPTIONS Confirmed or rejected?			LEARNINGS Insights are true? (1-3) Strength of the evidence? (1-3) = Calculated Confidence Level $I \times E = C$			ACTIONS Love it, leave it, or change it?	
DESIRABILITY							
FEASIBILITY							
VIABILITY							
SCORE							

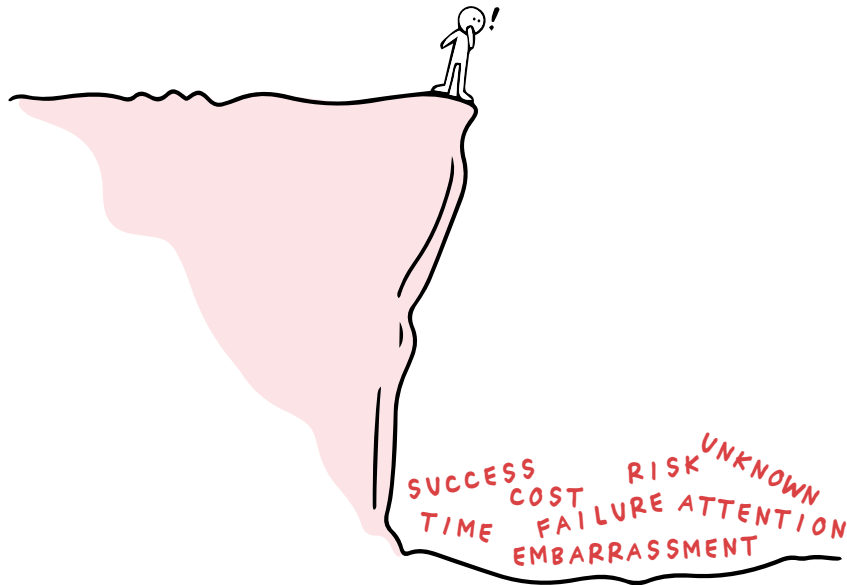


DOWNLOAD TOOL
www.design-metrics.com/en/tracking

Probability of Innovation Success

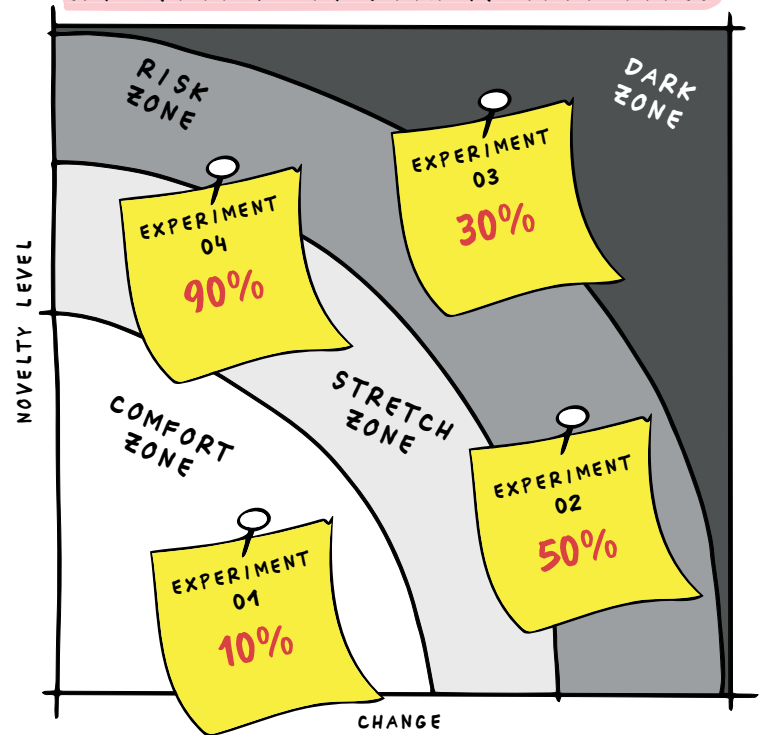
Different statistical models (see more in Measuring 101, starting on page 146) can be applied by the design thinking team throughout the entire design cycle to establish measurements and metrics step by step. For example, the application of Bayes' theorem for determining the probability of success for innovations is helpful in determining a potential solution's likely success based on the data from the design thinking team's previously conducted experiments based on the exploration map (see page 70). An experiment is a success if the actual results at least correspond to the expected results. The expected results could, for example, be formulated in the form of the so-called XYZ hypothesis: "At least X% of target market Y will Z," where Z describes how this percentage of the target market will react to the solution idea.

Bayes' theorem - a classic of probability theory - is a calculation rule, which is used to calculate the (conditional) probability of an event.



Especially in the execution of different experiments within the comfort, stretch, risk, and dark zones, the advantage of Bayes' theorem is that, after each performed experiment, the learning progress can be evaluated by an updated calculation of the probability of success. The objective is to achieve a predefined minimum value for the probability of success by conducting experiments, from which point there is sufficient certainty that a potential solution can become a success. This threshold must be reached before investments for the realization of the final prototypes, MVPs, or any other relevant investments can be released to the design thinking and innovation team.

EXPLORATION MAP WITH PROBABILITIES

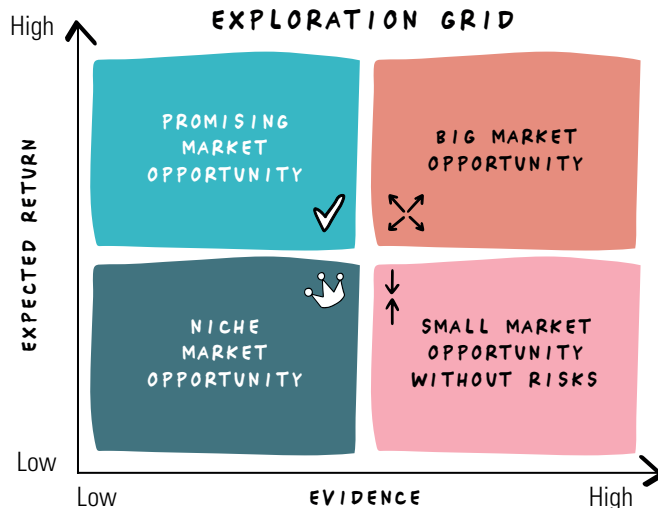


Which Prototypes Have the Potential for Breakthrough Innovation

Example



The input variables of the probability of success with respect to different competing solutions or a portfolio of potential innovations can also be visualized on an exploration grid for market opportunities. Typical axes reflect the expected return and the degree of evidence. It is recommended not to include any potential solution with no evidence, because such visualizations of potential market opportunities are usually the basis for applying portfolios for EXPLORE and EXPLOIT, which have the goal of pursuing a balanced strategy of exploiting existing business and exploring new market opportunities.



PROMISING MARKET OPPORTUNITY

- High financial potential
- Weak evidence of success

NICHE MARKET OPPORTUNITY

- Low financial potential
- Weak evidence of success

SMALL MARKET OPPORTUNITY WITHOUT RISKS

- Low financial potential
- Strong evidence for success

BIG MARKET OPPORTUNITY

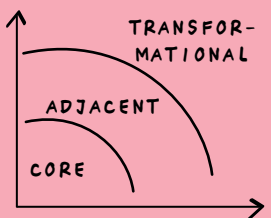
- High financial potential
- Strong evidence of success



Examples of Indicators Related to the Exploration Grid:

- **Ratio of big, promising, niche, and small market opportunities in the exploration portfolio:** The metrics indicate the innovation risk on the exploration portfolio.
- **Budgets for teams gathering evidence over the entire design thinking cycle for potential market opportunities:** The quantification is an input for the expected return of investments in teams to provide evidence on the desirability, feasibility, and viability of potential market opportunities.

Alternatively potential market opportunities refer to core, adjacent, and transformational. Mostly used and applied in combination with the “where to play” and “how to win” framework.



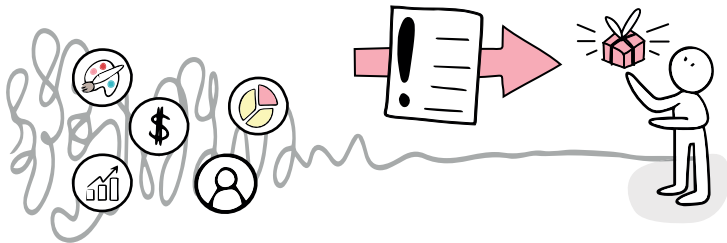
Prototype Question Checklist

Another simple way of dealing with near-final prototypes, implementation, and defining measurements and metrics is to use appropriate question checklists to help teams determine all contingencies in the run-up to the key question: **how to bring it home**. The design thinking team creates a set of questions that need to be answered in order to proceed with a prototype/final prototype. Several questions and checklists can be considered, but it is most important to focus on what questions need to be answered to take something from a final prototype to a true market opportunity with the potential to thrive.

The Questions and Checklist Help the Design Thinking Team:

- to check important aspects beyond the desirability, feasibility, and viability.
- to actively prepare for potential roadblocks that could jeopardize realization during implementation.
- to estimate how long the implementation will take and what dependencies there are on other initiatives or the operational teams.
- to prepare good planning and moderation of EXPLORE to EXPLOIT.
- to consider new requirements that have gained importance, for example, regarding the environmental, social, and governance (ESG) criteria framework as shown in the example on page 127.

Design thinking includes exploring the problem space, prototyping an idea, and implementing the solution to achieve innovation success. But without impact, there is no innovation.



The questions vary from design challenge to design challenge, but examples help to formulate customized checklists:

- What immediate or short-range gains or results can be anticipated?
- How simple or complex will the idea's execution or implementation be?
- What might be potential roadblocks from key stakeholders in the organization?
- How soon could the solution be put into operation?

Additional questions around the market, legal environment, competition, or impact on ESG might be relevant as well, depending on the prototype and degree of innovation:

- Is the solution legal?
- What is its environmental impact?
- Will it have any negative effect?
- Who might be a current or potential competitor?
- Who will buy it first (early adopters)?
- How much will it cost to get the solution to market?
- How can ESG and impact be balanced in the best possible way?

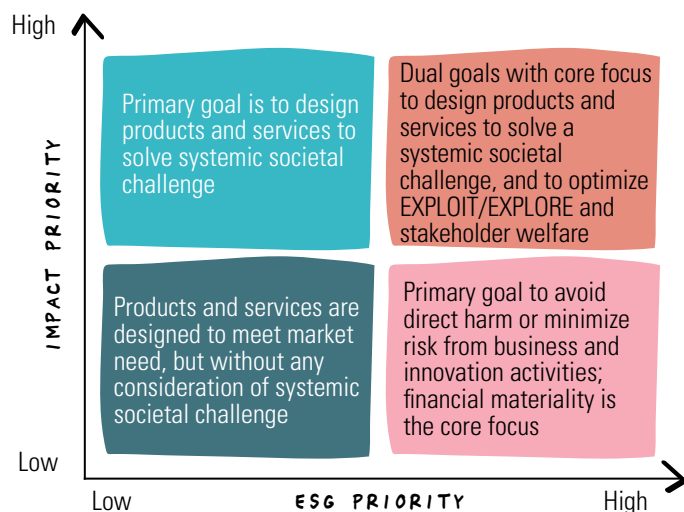
How Can ESG and Impact Be Balanced in the Best Possible Way

Example

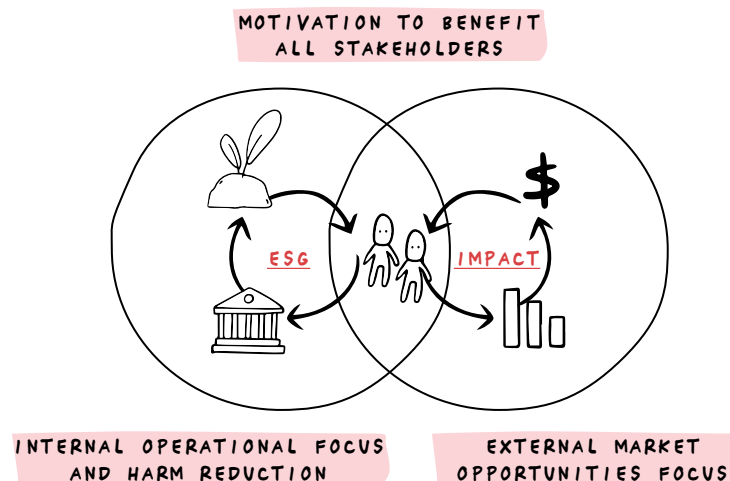


One of the evolving key questions in the realization of new market opportunities for design thinking and innovation teams is how organizations that prioritize both ESG and impact are best positioned to create sustainable value. Organizations that focus on both ESG and impact typically strive for the outcomes listed in the top-right quadrant of the matrix depicted below. However, even with the best intentions, this is not always possible due to a general lack of resources and time to conduct and build comprehensive ESG and impact assessments and reporting. For this reason, as part of the Prototype Questions Checklist, it is important for design thinking and innovation teams to have already focused and prioritized their efforts by not only considering the metrics recommended by leading frameworks (ESG and impact), but further narrowing down this list through a double materiality assessment. This includes soliciting feedback on the issues and metrics that have both the greatest business value and the greatest relevance to stakeholders, and then taking action.

ESG PRIORITIZATION RISK & OPPORTUNITY MATRIX



Combine the business and innovation metrics with the ESG measurement frameworks to generate benefits for all stakeholders.



Measuring at the Tool Level and Beyond

Examples Input Variables:

- Actual collaborating culture
- Design thinking activities
- Reflecting on activities on various levels
- Effectiveness of experiments
- Reaching defined success

Main Purposes of Measurements:

- Improving collaboration
- Building new capabilities
- Transformation
- Change of culture and mindset
- Impact of design thinking process steps and applied tools/activities

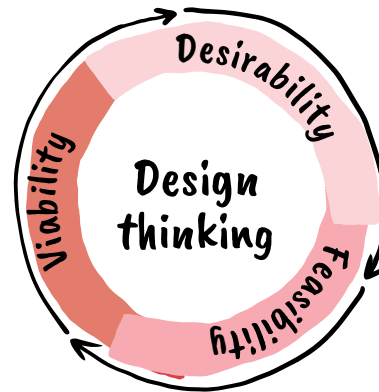
Examples of Measurements / Metrics:

- Confidence level of teams
- Design thinking maturity levels
- Future success based on mindshift changes
- Hard financial facts and outcomes and impact on brand value, customer satisfaction
- Reduced cost from start to implementation
- Final prototype quality (right level of functionality and experience; provides solutions to pain points, repeatable applicable; initiates excitement at the user to spread the word about solution; intuitive way of using the service, product, or experience)

Documentation of Design Thinking Activities

Within the EXPLORE phase the design thinking mindset and its associated methods and tools have the potential to impact on many different dimensions (collaboration, capabilities, transformation, culture, and innovation success). The applied tools in design thinking have the objective of reducing the customer and solution risk. Additional quantification, measurements, and metrics help to generate additional evidence and build the basis for minimum viable exploration metrics and the development of an innovation measurement system (IMS). Common metrics are related to how to collaborate, how ideas are implemented, and what is driving the business forward. Ultimately, all metrics help balance purpose with profit maximization, and more importantly, hold the key to a culture where a balanced portfolio of EXPLORE and EXPLOIT can exist.

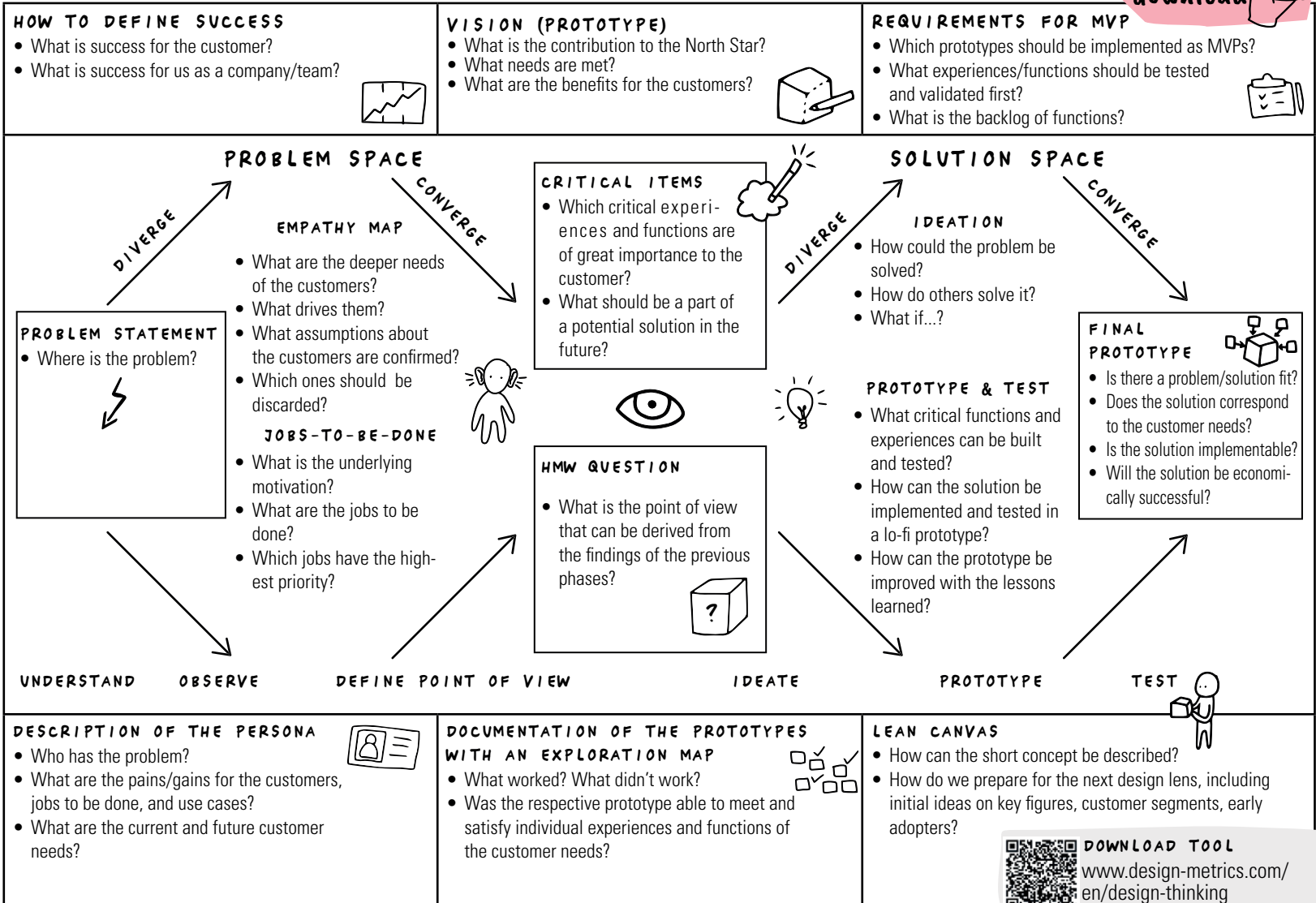
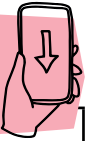
The Design Thinking Canvas helps to document the respective findings over the entire design cycle and to create a good basis for the later validation of the product/market fit. Especially when new team members join or a handover to another team takes place, the most important elements, including the requirements for an MVP, are well documented.



Design thinking has the aim of minimizing the risks of market flops by engaging the customer/user through an iterative approach of collecting insights and building different prototypes to learn, test, and refine the potential solution.

DESIGN THINKING CANVAS

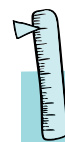
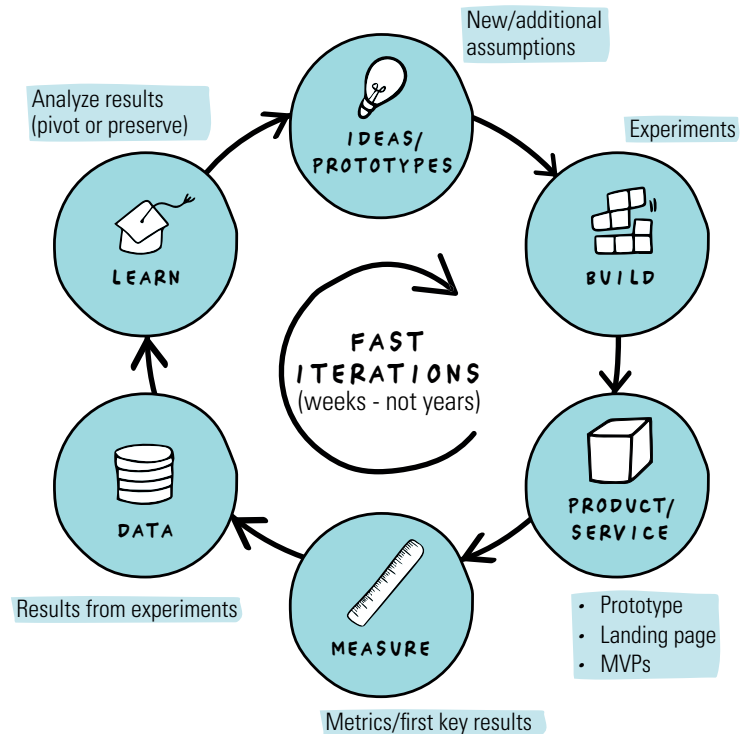
Template
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Lean Start-Up: Product/Market Fit

After the comprehensive development of the problem/solution fit, the development of the product/market fit is a potential next step in reducing risks. The transition from design thinking toward lean start-up is overlapping and part of the extended design thinking toolbox. The main objective is to iterate the minimum viable product (MVP) through the build-measure-learn loop. The core elements of lean start-up are customer development and business model design based on some principles derived from the lean manufacturing paradigm. With regard to measuring, it can be observed that innovation teams apply and integrate very often the principles of innovation accounting for business model validation based on MVPs. However, in day-to-day practice, it is often the observed case that teams try to take a shortcut and omit the important design thinking activities before the lean start-up phase. In addition, attempts are often made in the lean start-up phase to deal with potential revenue results in absolute numbers, which are based on predictions that cannot be verified at the start of the product/market fit. Consequently, innovation teams should apply first the design thinking tools and second the validation of the product/market fit, indicating a range of possible revenues. The initial critical and unknown assumptions (see page 109) might need some updates based on the final prototypes and first validations in design thinking. Based on the distribution curve, kill metrics (see pages 182–183) based on Monte Carlo simulation might be applied to stop innovation initiatives with confidence, if the desired objectives are not reachable.

The Lean Canvas (see page 137) helps to document the comprehensive market validation. The measurement extends to customer value, retention pricing, and elements associated with recurring, repeat, up-sell, adaptation, or consumption rates. The Lean Canvas thus gives a more comprehensive picture of the business and monetization model. Further, it is recommended to define variables which can be tested with well-known statistical and research methods from the measuring toolkit (see page 237). The proper application of the lean start-up philosophy helps to reduce the risks further from the problem definition to the desired product/market fit.



Examples of Indicators Related to Lean Start-Up:

- Determining if new product, service, or experience is creating value for the customer/user
- Measuring if customers/users are returning
- Quantifying how much a customer/user is willing to pay for a new product, service, or experience
- Potential range of revenues of a new offering
- Total investment from problem identification to product/market fit

Innovation Accounting

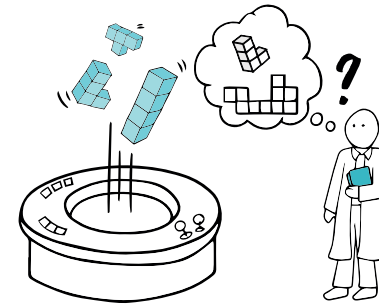
Measuring innovation success is an essential part of the lean start-up methodology. It enables design thinking and innovation teams to objectively demonstrate that the right conclusions are drawn from extended experimentation with MVPs, which are then used to improve the MVP and a potential business model. A particular MVP or multiple MVPs can be the subsequent basis for designing a business ecosystem in which multiple actors generate a shared value proposition. Early simulations of revenue figures can be performed and measured with so-called driver trees (see page 132).

Innovation Accounting Helps the Innovation Team:

- to determine the starting point as to which MVP with its associated functions and experience should run through the build-measure-learn cycle.
- to carry out fine-tuning by testing the relevant hypotheses (e.g., with regard to viability).
- to create scenarios based on different hypotheses (e.g., with testing different acquisition and retention rates).
- to decide whether something should be discarded (pivot) or retained (preserve).

Sample Questions:

- 1. Acquisition:** How do customers/users find us?
- 2. Activation:** Do the customers have a first positive experience?
- 3. Retention:** Are the customers/users coming back?
- 4. Revenue:** How does the offer or function make money?
- 5. Referral:** Do the customers/users recommend the offer to other people?



For many design thinking and innovation teams the lean start-up methodology is applied to verify the most risky business model assumptions by way of empirical testing with customers/users.



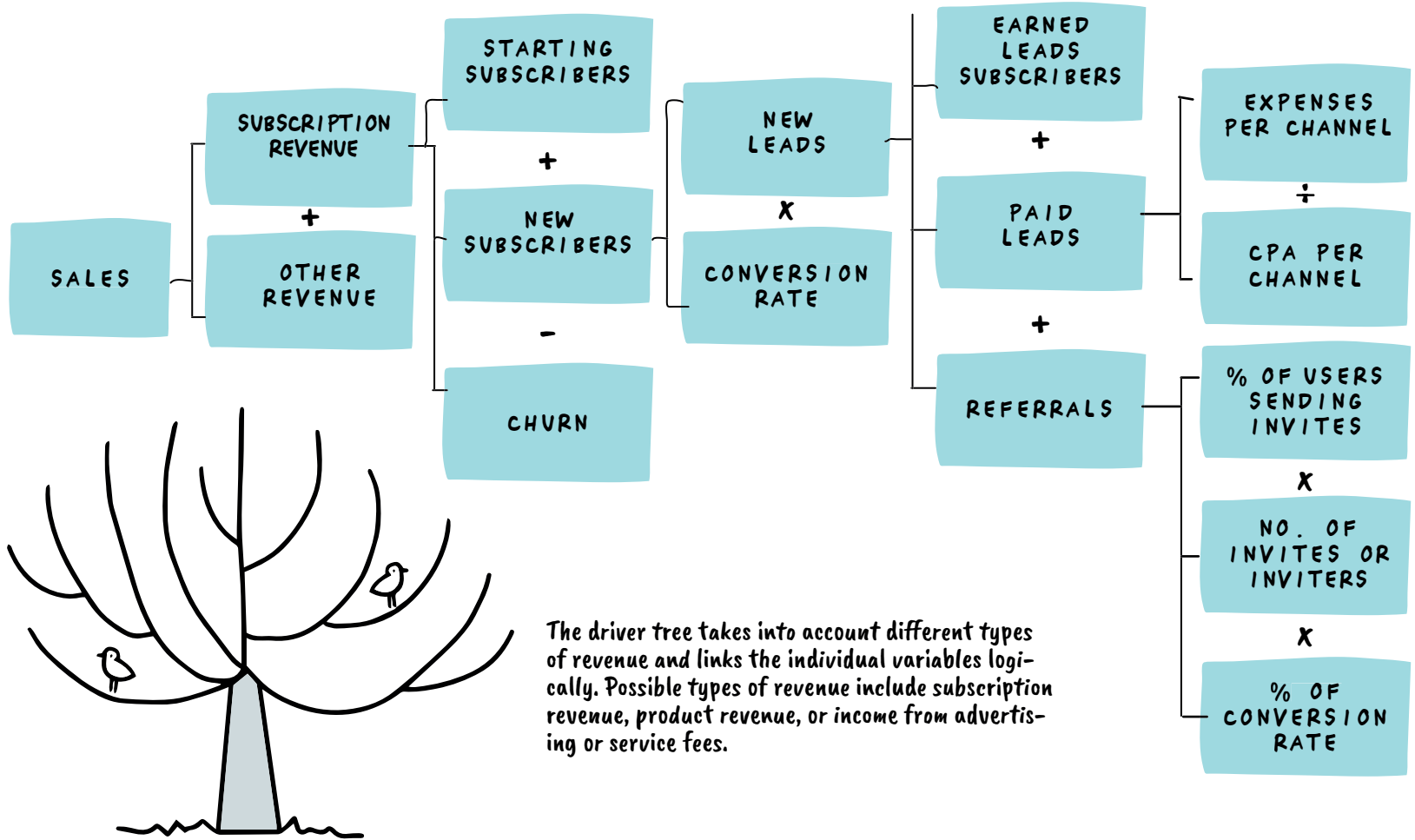
Examples of Typical AARRR* Measurements:

- Number of unique visitors per channel
- Time to value; customer aha moments; conversion rates
- Retention versus churn rate; customer churn; retention length
- Referred customers; viral coefficient; viral cycle time
- Revenue churn, lifetime value; acquisition costs; average order value; conversion from free to paying customers

* AARRR metrics depend on business model, industry, and business ecosystem configuration

DRIVER TREE

Example



Willingness-to-Pay (WTP) Analysis

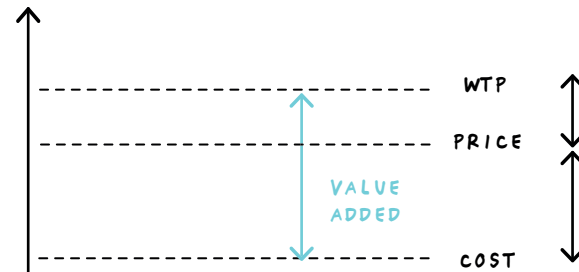
For certain offers, pricing can be tested in an early phase and be validated as part of an MVP. Well-known models for pricing are cost-plus pricing, comparison pricing, or the willingness-to-pay analysis described here. There are different ways to determine the willingness to pay. One option is the “discreet choice analysis,” either based on actual purchase data or on asking the customers for their preference among alternatives with different sets of attributes. In most cases, the potential customers are not able to articulate the value they place on a feature directly; what they can do is compare two alternatives in an A/B test and express their preference. Given a sufficiently large number of votes, this method (conjoint analysis) can be an implicit evaluation of each feature by the customers.

The Willingness-to-Pay Analysis Helps Innovation Teams:

- to obtain an initial idea about the willingness to pay for products and services on the part of certain customers and segments.
- to establish an estimate of demand that can serve as a basis for predicting the overall size of the market or segment for the nascent ecosystem.
- generally develop an assessment on whether the costs are in a healthy relationship with the validation from the willingness-to-pay analysis.
- to begin with tactical thoughts on pricing, business model, and ecosystem design and evaluate individual functions and experiences.

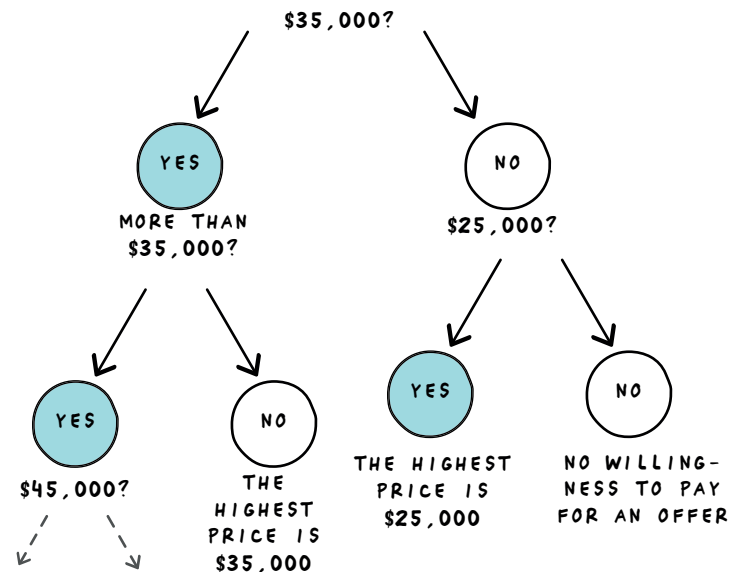
Procedure and Template:

1. An open question in the interaction with the potential customer and the MVP may mark the starting point: What is the attribute/feature worth to you?
2. Is there already an indication of what it may cost, or what the initial situation for the willingness-to-pay analysis is?
3. As part of A/B tests, questions about various pricing aspects can be asked.
4. The analysis may relate to the overall offer, individual features, or specific services (e.g., neutral advice).



It is unlikely that each customer has the same willingness to pay for a particular product or service, and it is recommended to create a market demand curve that shows how many customers will buy at a given price; from this, the market price elasticity can be calculated.

**WHAT IS THE OFFER WORTH TO YOU?
OR WHAT IS THE FEATURE WORTH TO YOU?**



MVP Portfolio and MVP Portfolio Planning

Successful design thinking and innovation teams think in opportunities and understand that, beyond the initial MVP, they need to reach new target customers continually with their offers. Target portfolios, defined and implemented incrementally, are good for this. At the beginning, an Ansoff matrix can be used. The original matrix shows four portfolio fields and contains the dimensions of market penetration, product development, market development, and diversification. This matrix can be adjusted to the development of MVPs, where it helps to evaluate the projects. Products in the form of existing offers and existing markets normally don't require lean start-up considerations. The focus in design thinking and lean start-up is on innovative customer development (new markets/new offers).



Corporate practice shows that MVP is one of the most referenced and least understood concepts in modern product development. A deep dive into the work of Steve Blank and Ash Maurya's methodology is highly recommended to understand the concepts.

ANSOFF MATRIX

	EXISTING OFFERS	NEW OFFERS
EXISTING MARKETS	USUALLY NO MVP NEEDED FOR THE REALIZATION OF A UNIQUE VALUE PROPOSITION	INNOVATIVE OFFER DEVELOPMENT (DIVERSIFICATION)
NEW MARKETS	NEW CUSTOMER DEVELOPMENT (FIRST-MOVER ADVANTAGE)	INNOVATIVE CUSTOMER DEVELOPMENT

In the mindset of integrated and rather traditionally managed companies, innovative customer development is seen as risky because there is often little room for the exploitation of existing know-how or for achieving economies of scale.

MVP Portfolio Planning

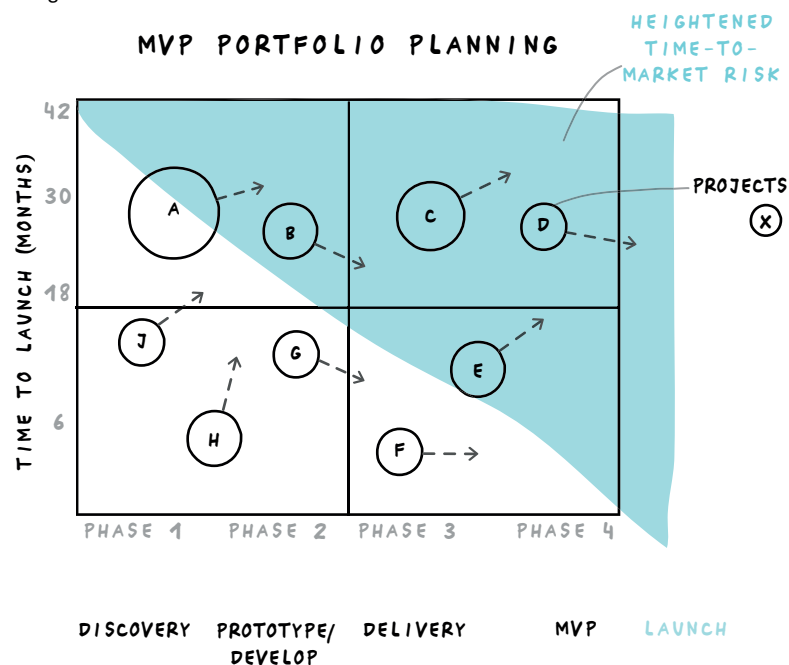
Business growth initiatives need a comprehensive combination of functions, experiences, and features that are explored, developed, and provided by the actors. There are various options for portfolio planning and portfolio presentation. The individual MVPs alternate between discovery and delivery. Individual functions should be validated and introduced to the market as quickly as possible, for instance. Projects with a high risk in terms of time to market usually require additional resources, implementation know-how, or dependency on new technologies.

Portfolio Planning Helps the Design Thinking for Business Growth Team:

- to prioritize individual MVPs and align them with the strategic goals.
- to align future functions and experiences with the business goals, e.g., “run, grow or change the business.”
- to get an overview of the status of the individual portfolio elements.
- to coordinate the respective project phases, e.g., planning, implementation, project management.
- to carry out adequate resource planning and allocate the respective roles and resources accordingly.

Procedure and Template:

- The individual projects are entered on the portfolio grid; their progress is reflected upon every four weeks or at shorter intervals.
- The size of the bubble per initiative indicates the value added. Depending on the project, you can work with NPV, IRR, revenue, or other figures.
- The four phases show where the initiatives are in terms of implementation; a rough classification: discovery and delivery.
- The arrows indicate whether there are any shifts regarding the next phase or whether some initiatives go back to the discovery phase since the first usability test yielded new insights, for instance.



Evaluating the data of an MVP is just as important as building the product part. Designing and testing metrics is part of value creation.

Innovation Accounting and Beyond

Examples of Input Variables:

- Acquisition channels
- From signing-up to happy customer/user
- Retention of customer/user
- Retention management activities
- Degree of virality (type, cycle time, coefficient)

Main Purposes of Measurements:

- Risk reduction
- Understanding cause and effect
- Defining next steps
- Tracking of individual customers/users
- Predicting success of new business

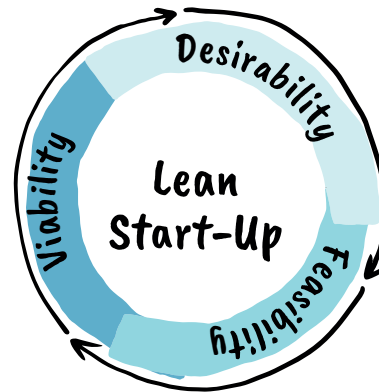
Examples of Measurements / Metrics:

- Confidence in the go-to-market concept
- Customer success
- Probability of scalability
- Market demand
- Probability of traction
- MVP - product and service quality (performance, features, reliability, conformance, durability, serviceability, aesthetics, perceived quality)

Documentation of Lean Start-Up Activities

Innovation accounting and the Lean Canvas supports the innovation team with structuring and visualizing the innovation project. In the practical use it is very common to apply the completed Lean Canvas to review the problem/solution fit and adjust if necessary. In this case, the collected data is compared to the best solution that fits the behavior and challenges of customers. The activities related to the Lean Canvas documents the first efforts of implementing the solution or business model. The main objective is to identify potential market risks entailed in the implementation. It should be noted that the respective metrics applied are different depending on the industry and type of business and should be used in different degrees of complexity. The AARRR framework by Dave McClure (see page 131) and similar frameworks like the RARRA or ATAR framework are applying a very simplified set of possible metrics that should be extended with minimum viable exploration metrics depending on the business environment and the business model.

The Lean Canvas helps to include and document the respective findings from design thinking and lean start-up. It is recommended to add with the documentation the customer/user profiles and experiment reports from earlier activities over the entire design cycle.

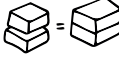


Activities related to lean start-up are about developing products, services, and experiences that have already proven to be highly desirable for customers/users, so that a market already exists once the market launch is complete.

LEAN CANVAS

Template
download



WHO (Customers)		WANTS (Product, service,...what)		FOR (Satisfaction of needs)		BECAUSE (Motivation)	
PROBLEM What are the main problems that the business idea has to solve? Describe the biggest 1 to 3 problems of your customers. 	SOLUTION Describe a solution for each problems. 	UNIQUE VALUE PROPOSITION What value should be provided to the customers? A simple, clear message that explains why the solution is different and noteworthy. 	UNFAIR ADVANTAGE Something that makes it difficult for others to copy the solution. 	CUSTOMER SEGMENT List the target and user groups.  - For whom does the product or service add value? - Who are the most important customers? - Whose needs still have to be considered (e.g., partners, suppliers, external influencers, decision makers?) - Who are the most important stakeholders and interest groups? Draw a stakeholder map or business ecosystem.			
	KEY METRICS Which measurable figures show whether the solutions work? 	-Gain creators and problem solvers. -How does the solution support customers in fulfilling their job in specific use cases that are important to them? 	CHANNELS Through which channels do your customer segments want to be reached? 				
EXISTING ALTERNATIVES  How have these problems been solved so far?	HIGH-LEVEL CONCEPT X for Y analogy: Is there a simple analogy? (e.g., YouTube as Flickr for video) 		EARLY ADAPTERS Describe the characteristics of the early adopters (those customers who will use the product first). The ideal customers may not necessarily be the first customers. 				
COST STRUCTURE List the main fixed and variable costs. 				REVENUE STREAM List the sources of income. 			



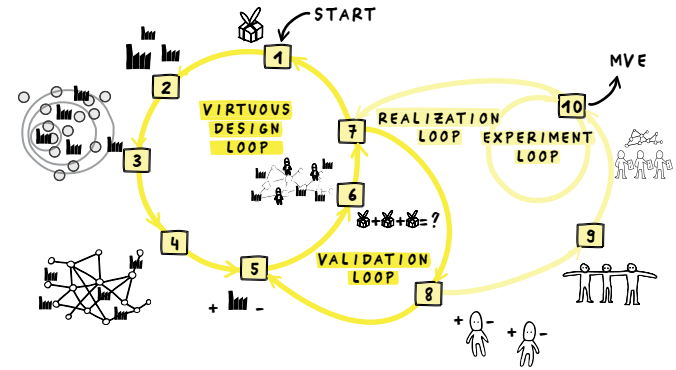
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www.design-metrics.com/en/lean-canvas

Business Ecosystem Design: Systems / Actors Fit

The design and implementation of business ecosystems play an increasingly important role in the context of new products, services, and experiences. This section briefly discusses the systems/actors fit. The entire framework and discipline of business ecosystem design can be found in the book *Design Thinking for Business Growth*.

Design thinking and innovation teams that act as initiators of business ecosystems usually have few reference points from the past for defining how to measure such initiatives. Moreover, business ecosystems are dynamic entities in which actors can be added over time, for example to extend the core value proposition. However, capabilities of individual actors can also become obsolete, so they are replaced by other actors. In addition, most ecosystem initiatives have an exploratory nature, based on new and unique value propositions for which there is no data and evidence, for example from benchmarks or market studies. In an early phase of business ecosystem initiatives, many of the methods, tools, and measurement instruments from design thinking and the lean start-up phase take hold. For the design of the actual business ecosystem, the measurement points mainly relate to the configuration of the business ecosystem that is critical for success. Traditional metrics such as return on investment, profitability, cash burn rate, and revenue are of little help in terms of initialization, as these metrics are all lagging indicators. Other quantifications and measurements, in most cases, only measure the current trend and thus at most provide information about the number of users, subscribers, time spent from customers/users on the offer, retention, clicks, or social media exposure. The decisive factor, however, will be whether the business ecosystem is successful in the long term at the levels of value capture and value delivery, and whether the initiative creates ecosystem capital. Here, measurement should take place on several levels and the measurement criteria should fit the respective design, test, and implementation phase of the business ecosystem. In addition, the governance model often changes in the early phase and the operating model changes later as part of scaling. Consequently, metrics are needed that indicate performance and potential at the system level and at the level of the individual companies or actors participating in the ecosystem, as well as the ecosystem initiator or orchestrator. They need to be able to measure growth not only in terms of ecosystem participation, but also in terms of the supporting governance and underlying operating model. And most importantly, ecosystem initiatives need metrics that reflect the success factors unique to the development of the MVE and scaling as well as activities of enhancing the core value proposition over time.



The appropriate metrics help initiators/orchestrators to avoid the most common pitfalls in the design, implementation, and scale of business ecosystems.

Examples of Indicators Related to Business Ecosystem Design:

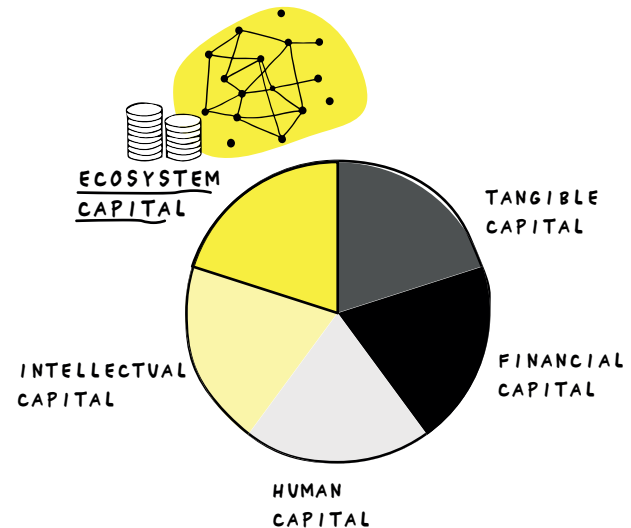
- Volume of real options in market opportunities versus relevant opportunities
- Number and engagement level of marquee business ecosystem actors contributing to the core value proposition
- Actual number realization of ecosystem capital in X-time
- Satisfaction of ecosystem partners/actors with expansion of the core value proposition over time
- Customer satisfaction with the value proposition delivered jointly by the actors in the system

Ecosystem Capital

An important metric for business ecosystem initiators and orchestrators is ecosystem capital, which is used to quantify the value of network connections, configuration, and value streams. On the one hand, traditional companies often lack this component because their business models and strategies have not allowed room for business ecosystem development. They have a high proportion of physical and human capital, which is sufficient for linear growth but limits the achievement of greater margins and the exploitation of new growth opportunities. Design thinking and innovation teams, on the other hand, that have understood the importance of ecosystem capital for their organizations, which consists of the interaction of all actors in the system and create win-win situations through a multidimensional view of business models, are well equipped to realize corresponding opportunities to leverage exponential growth.

To date, various elements have been included in the measurement of ecosystem capital. Mostly it includes a combination of knowledge, value streams, and number of connections that different organizations have to each other to deliver a core value proposition to the customer. On the one hand, the measurement is challenging because business ecosystems are dynamic, and it is a measurement that mainly consists in the external relationship of several actors in the system. Moreover, well-configured business ecosystems allow additional innovation at the edge of the business ecosystem as well as access to the customer, which is helpful for realizing exponential growth but does not make quantification and measurement easier.

In an early phase (MVE), however, the calculation is still manageable, since the value of the fomented and consolidated relationships is based on the initial considerations of the business ecosystem and the number of actors is typically limited to the minimum. The origin of ecosystem capital can therefore refer to the business relationship of each company in the system to the other companies and to the orchestrator, and be constituted, for example, in the context of an ecosystem/community experience in the metaverse, by the totality of the mostly intangible goods that are made available to the customer/user collectively.



Typical Elements to Consider in Measuring Ecosystem Capital:

- Formal established and orchestrated relationships between actors in the system
- Established value streams and benefits for all actors in the system
- Exploitation of network effects and scale effects of actors in the system
- Adaptability of actors in the system to cope with the dynamic environment
- Alignment of the frequency of customer interaction, share of wallet, and retention to the system
- Configuration of the ecosystem with regard to openness, transparency, and market roles in the system
- Application of new and game-changing technology and the use of big data analytics for agile customer development and innovations

Business Ecosystem Design

Examples of Input Variables:

- Effectiveness of minimum viable ecosystem (MVE)
- Access to customers/users via ecosystem actors
- High-value data points generated by the ecosystem itself and ecosystem actors
- Customer feedback about the core value proposition delivered

Main Purposes of Measurements:

- Prove viability of ecosystem to initiator/orchestrator, customers, and actors
- Impact of ecosystem configuration on customers/users, actors, value streams, and growth
- Engagement level of actors and customers/users
- Market acceptance of the core value proposition

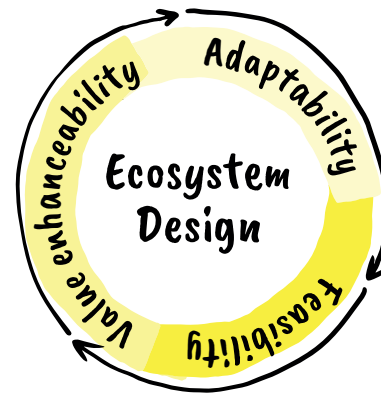
Examples of Measurements/Metrics:

- Activities in conjunction with the ecosystem (e.g., active users, customers, actors)
- Successful transactions, unit/product/service cost
- Satisfaction of actors participating and customer engaging with the ecosystem offerings
- Share of revenues and distribution of value streams across the ecosystem
- MVE – configuration quality (use of channels, data quality, alignment of actors, quality of value delivery, speed of adaption to new market dynamics, and changing customer needs)

Documentation of Ecosystem Design Activities

Business ecosystem design focuses on adaptability (the needs of the actors and their ability to jointly carry a value proposition), value enhanceability (design of sustainable value streams and benefits for all actors in the system), as well as feasibility (concretization of technology components and interfaces for the realization of an ecosystem approach). Through the respective design loops, the minimum viable ecosystem (MVE) is developed, which, in turn, is the basis for scaling the system. Depending on the market and configuration, the ecosystem is limited in upward growth (i.e., growth slows down). Usually, similar ecosystems are initialized by different ecosystem initiators, which compete with their own initiative. Thus, focusing on increasing the frequency of existing customers as well as strengthening the bond with ecosystem partners becomes a key element for strengthening the market position. In addition to the already ongoing customer development for the value proposition, the ecosystem will again explore the new and changing customer needs in order to expand the value proposition step by step.

The Business Ecosystem Design Canvas documents the activities over the virtuous, validation, realization, and experiment loop.



Activities related to ecosystem design aim to reduce the ecosystem risk by designing and testing MVEs with a selected (minimum) number of actors to test the value streams, collaboration, and provision of the core value proposition.

ECOSYSTEM DESIGN CANVAS

Template
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DETERMINE THE NEEDS OF THE USERS OR CUSTOMERS - Who is the customer or user? - Describe the customer/user profile (pains, gains, jobs to be done, and use case). - What problem is to be solved?	CORE VALUE PROPOSITION What is the core value proposition for the user/customer?	DEFINITION OF THE VALUE STREAMS - What are the current and future (positive and negative) value streams? - What are the product/service streams, money/credit streams, data, and information flow? - What are the digital and digitizing value streams/assets?
DESCRIBE THE ACTORS - Who are the actors in the business ecosystem? - What is their function and role in the system? - How high is their motivation to participate in the business ecosystem?	DESIGN / REDESIGN - Which actors are pivotal for the provision of the core value proposition in the business ecosystem? (For the placement, go from the inside to the outside.) - Place the actors with advanced and complementary offerings and enabling functions, and who are directly or indirectly part of the system. - Do various scenarios exist with different actors? - Which actors can be eliminated? - Are there actors who scale multidimensional value streams or better value streams? - Is the business ecosystem robust and able to survive in the new scenario?	PROTOTYPE, TEST, AND IMPROVE THE BUSINESS ECOSYSTEM - What are the MMFs/MVPs the ecosystem starts with? - How can the first MVE be tested? - What interactions/testing and measurement methods help us to improve the value streams, business models, and the role of actors in the ecosystem iteratively? - What is the minimum version of the first MVE?
ANALYSIS OF THE ADVANTAGES AND DISADVANTAGES OF EACH ACTOR - What are the advantages and disadvantages for each actor? - What are his strengths/weaknesses and opportunities/risks in the system?	MULTIDIMENSIONAL VIEW OF THE BUSINESS MODELS - What does the resultant business model and value proposition for each actor look like? - How does the respective business model contribute to the core value proposition? - Is the defined core value proposition the result of the sum of the value propositions of all actors?	



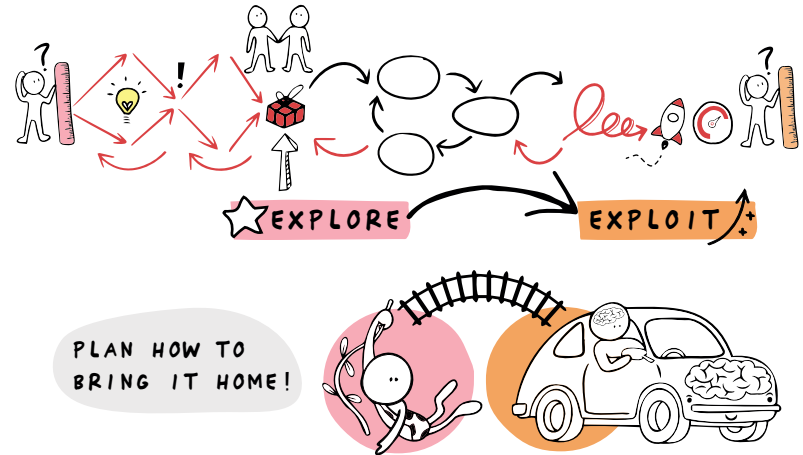
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Scale: Manage Transition

Depending on the focus, scaling/exploiting comes after the product/market fit or the MVE (systems/actors fit). Scaling focuses mainly on realizing growth and, as a result, maturity and evolution, and the metrics change. These range from metrics that capture information about the initial scaling, to maturity and evolution, and should be chosen to allow the right conclusions to be drawn. In addition to the chosen business model, the possibility of scaling depends very much on the respective product, service, and experience. In the case of highly specialized services and products with a very small addressable market, other levers are relevant than in the case of solutions for the mass market and rapid adaptation by customers due to new or changed customer needs. In both cases, however, there is a need for different measurements and the application of the appropriate mix of relevant exploitation metrics. To scale successfully, decision makers and growth teams must have the courage to think exponentially (i.e., to deal with levers greater than 5, 8, and 10 of the current value). The term *10x* is often used for exponential growth. In EXPLOIT many of the traditional metrics for gaining efficiency and IT scalability are applied. The focus shifts gradually from EXPLORE toward launching robust value-creating products or services, with compelling value propositions. Growth teams focus on designing virality, scalability, and customer loyalty; building brands with purpose, while gathering customer feedback for core value enhancement activities.

In addition to feasibility (expansion, professionalization, and leverage of the technology components), scaling has two focal points: rhythmicability (network effects, repetitions) and captivateability (number, intensity) of interactions in the business ecosystem. These both must increase and at the same time reduce the unit cost of each interaction/transaction in the system.

Since the focus of this book is on design thinking and innovation metrics, this toolkit will conclude with a brief discussion of the transition from EXPLORE to EXPLOIT, leaving the space open for applying tools and methods beyond the scope of this book. As in EXPLORE, there are different layers to consider in the growth and EXPLOIT phases (see layers on page 36) and guidance for creating an appropriate set of exploitation metrics (see page 187).



In transition, two mindset worlds collide, and good planning, facilitation, and an understanding of both mindsets and associated management stylers are key for bringing it home.

Examples of Indicators Related to Growth, Scale, and EXPLOIT:

- Number of customer adoption in X-time versus market size
- Customer stickiness to an offering versus all customers in X-time
- Solutions sold to new customer segments versus all segments
- Unit cost per transaction versus IT investments to scale

Growth/Scale/Exploit

Examples of Input Variables:

- Cost per transaction
- Usage of resources
- Throughput (e.g., transactions or interactions processed)
- Time per interaction engagement

Main Purposes of Measurements:

- Understand business/innovation performance, business health (health metrics), and prospects
- Retrain product, service, and experience quality throughout expansion and exploitation
- Maintain positive relationship with customers/users

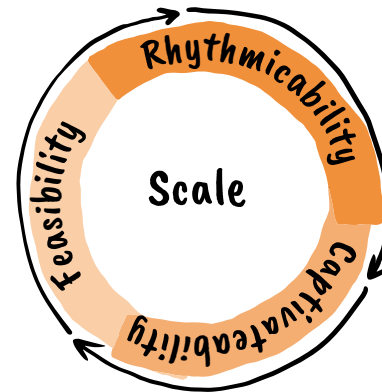
Examples of Measurements/Metrics:

- Sales revenue with new services/products
- Customer loyalty and retention
- Market share
- Process efficiency
- Time between visits and/or contribution
- Quality of product and service scalability (social referral rate, engagement metrics, customer open-ended comments, degree of mass-customization, and pleasure of usage)

More portfolio measurements beyond EXPLOIT are listed on pages 190–191.

Documentation of Scale Activities

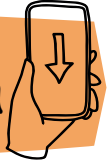
Most initiatives have the ultimate objective of scaling, which means that the responsible teams and decision makers are looking for ways to grow more efficiently, so that the gains exceed the previous and current investments. Growth is often used synonymously but is not always the result of innovation work. Companies also grow, for example, through mergers and acquisitions, or the simple hiring of more employees, and growth often leads to losses and gains. Scale tools and methods are varied and some tools for scaling can be found in the book *Design Thinking for Business Growth*. In terms of measuring scaling activities, it is necessary to distinguish between the type of business to be scaled. For appropriate measurement, the processes and interactions that drive scaling must be well understood. Metrics are often chosen that are critical to how these processes and interactions can be made repeatable and frequency can be raised. Many initiatives today are about determinants of engagement and repeat usage. Traditional scaling efforts tend to focus on per-unit efficiencies.



The Scale & Growth Canvas (see page 144) helps to document the scaling activities, which deal with the definition of the appropriate channels, network effects, and culture. The canvas is based on the considerations of a potential business ecosystem and should be adapted accordingly if the focus is, for example, on a single product and without the participation of partners/stakeholders in the system.

SCALE & GROWTH CANVAS

Template
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LEVERAGE CAPABILITIES OF PARTNERS OR ECOSYSTEM ACTORS  Which partners help to drive efficiency, innovate, provide relevant data, or accelerate the market opportunity?	SCALABLE PROCESSES, IT, DATA ANALYTICS  What activities are necessary to align the processes, the IT, and analytics with the requirements and growth? Which algorithms help in customer interaction?	EXPANSION OF THE VALUE PROPOSITION  What other needs and customer problems can be addressed/solved? How is the value proposition expanded? What is the experience, and which functions are offered? Which new offers can be derived from data points and algorithms?	BUILDING THE CUSTOMER BASE AND COMMUNITY  Which mechanisms and methods are used to increase the number of customers, interactions, and ties to the system?	SOLVING PROBLEMS OF MANY  Who are the customers? Have the segment considerations changed? How are new needs and target groups dealt with?
OPTIMIZED COST STRUCTURE How can the cost of user acquisition be kept lower than that of the lifetime value generated, for example? 	EXPANDED VALUE STREAMS What new value streams are rewarded by the customer? Where does willingness to pay exist? Where are there options for bundles, cross-selling, or up-selling? 			



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