



Design Thinking Strategies

All strategies developed and written by
André Nusselder
and edited by
María del Carmen Arau Ribeiro





Design thinking is a creative problem-solving approach dealing with complex societal challenges in many fields. In the DT.Uni project, eight European universities have combined forces to enhance the problem-solving skills of staff, management and students at higher education institutions. Here you can find the didactic materials for university students and teachers.

The didactic material is divided into 16 design thinking strategies that can be used in different combinations to implement design thinking in higher education. For each strategy the goal (WHY) and its application and practice (HOW) is provided. These descriptions can be used as educational material for both students and facilitators/teachers given the complete instructions, such as requirements (time, materials), suggestions, and teaching tips. An annotated list of relevant literature is included.





The Brief

What

A design brief is a written explanation, given to the design team, that outlines the aims, objectives and milestones of a design project.

Why

With the brief the challenge provider gives the designers the necessary insight and background for making their design. The brief is a powerful tool at the beginning of the design process, and warrants considered attention.

For the design team it is important to know the expectations and ambitions of the organisation it is working for. The challenge provider should try to describe all these aspects as detailed as possible, as well as the aims of the new design. It may turn out then that those aims are not yet fully clear, or that thoughts on what the design should deliver have not reached culmination.. This is not a problem since design challenges are often of a complex nature and thus not easily definable and, when this is the case, the brief serves to identify this clearly. The brief helps to consider important issues before work begins.

The brief is thus a tool of communication between the organisation and the design team. Not only does it provide as much detailed background information as possible but it also clarifies the constraints within which the team needs to work promotes mutual understanding and trust. A good brief can give the challenge provider a sense of involvement in the design process while showing the design team the strategy of the organisation. Communication between organisation and team is pivotal for successful design and the brief is a decisive first step. It is worth the effort to be detailed and to-the-point.

How

Cover the following topics in the brief, following up in writing when a representative of the organisation discusses these topics with colleagues, or gets feedback on the initial drafts of the brief.

Organisation profile

Start the brief with a short synopsis of what your organisation does, for how long it has been providing services or products, and in which segments these are being offered ...

Organisational aims

What does your organisation strive for, what value does it deliver, what does it seek to achieve...?

Target audience(s)

Who is the organisation trying to reach? For whom is it delivering products or services?

Challenge

What is the challenge that you want the design team to work on? Give a short description of this 'problem' and its context/background...

Aims of the design work

What does your organisation seek to achieve with the design work on this specific challenge? What goals, ambitions, values, and perspectives do you share?





Do not describe here what you want the design team to develop, but the added **value** that you hope to achieve

Archaeology

Give a brief description of the history of the challenge/'problem' and – if there have been any – previous attempts/'solutions' to deal with it

Social networks

Include information about your current use of social networks such as Facebook, Twitter, LinkedIn and Google+ if they are important for your organisation to reach your target audiences..

Contact person(s)

Provide name, function, phone number, and e-mail address of the contact persons so that the team can easily reach them.

Requirements

A Word document of 2-3 pages may be sufficient to provide the detail required. Use the template (on website)





A Day in the Life Recounted

What

A user recounts a typical (work)day: the design team listens and takes notes in order to get a first impression of the concerns and desires of the user.

Why

Design thinking is a form of user-centered design. Therefore a good designer will first find out what is going on in the life of the user to determine their activities, feelings, ideas, worries, and where these are taking place to get a clear picture of the environments involved, not just places but also people. The designer tries to put themselves in the position of the user, which is the crucial empathy phase in design.

Design thinking is not an easy activity as it requires design-researchers to take themselves outside of their normal and personal frameworks for interpreting the world. Since we have a natural tendency to consider our own point of view as the most relevant, changing this frame of reference may be quite difficult.

Friedrich Nietzsche is attributed with the quote, “Whenever I climb, I am followed by a dog called *Ego*.” Design thinking starts with a detachment from this normal attitude, a “narcissistic injury” as Freud could have named it. Not *me* but the *other* is the starting point. Not the designer but the user is considered the expert in their domain so the first step is to connect to this user’s “expertise”, which includes not just their expert-knowledge in the field, but certainly their hopes, fears, frustrations and ambitions.

What does the user think, feel, desire – those are the dimensions that a designer wants to connect to. Design thinking is therefore not just focused on collecting as much data and information as possible, but above all on grasping how the users contribute meaning to their (work) environment. The thoughts and feelings of a user take shape in a specific context. So if we want to understand how to improve the quality of work for a prison guard, we must visit the prison and actually sense what this person is experiencing every day. Developing empathy is a form of ethnographic research where you go out into the field and observe in order to get to real experiences in a unique context. Designers do this by observing individuals through a typical workday, recording their activities and taking notes about how they experience their environment. The exercise ‘A day in the life’ is such an observation of one day in the life of the user.

However, when it is not possible to conduct such deep field research, a variation on this activity combines storytelling with understanding the daily life of the user. As the users recount their typical workdays, the design-researcher takes notes to record and then think about how people spend their time and how they experience their activities. Although observations on location are preferable, this variation will help to gather a realistic picture of the daily life of the user.

The activity *A Day in the Life Recounted* can also be used to develop personas and user journeys and for empathy mapping. The notes that are taken are shared within the design team to then extract more detail, as well as to detect certain commonalities and patterns as part of the synthesis process where the team gathers all the information to develop deeper insights into what motivates the user.





How

One user, who may also be a representative of the client or stakeholder for whom you are designing, recounts a typical workday. All team members listen and take notes on a sheet with 4 different categories:

1. Activities: What is the person doing?
2. Places: What characterizes the physical environment?
3. Beliefs/Values: What is important to this person?
4. Concerns: What are the worries?

When the user has finished their story, the team members go back to their team working space and each team member gets 4 minutes to summarize their most relevant findings orally with the rest of the team, and writes (at least) 3 of them down on post-it notes to stick the wall. Ideally, the team has its own working space where all these notes on the wall become part of the team's space saturation.

Requirements

Time:

- Introduce the activity: 5 min.
- Recounting A day in the life: 20 min.
- Sharing in team: 20 min.

Material

- For each participant, one sheet of paper (A4) divided into 4 categories
- Sticky notes for each team to share
- Wall or flip chart in a designated team working space
- 1 pen per team member

Suggestions for facilitators

Listen carefully to determine whether the person recounting a day in the life is sketching a genuine and realistic picture, and not making things look better than they are. You can remind them that it is not a pitch; since this is ethnographic research, you really want to understand the user in all their aspects)

Findings may have a particular character, as users may operate differently in different days, but that is part of the game here. Since you are looking for details and unique contexts, findings should be expanded with other kinds of user research.

The focus should be on empathizing with the persona to help them go beyond their own biases.





Useful Links

The Institute of Healthcare Design Thinking: A day in the life

<https://healthcaredesignthinking.com/toolkit/chewables/chewable/a-day-in-the-life>

→ You can become a member of the IHDT and gain access to what they call “chewable protocols”, which offer guidelines on how to use an assortment of DT tools.

Siang, Teo Yu, & Dam, Rikke Friis (2020). 7 Simple Ways to Get Better Results from Ethnographic Research

<https://www.interaction-design.org/literature/article/7-simple-ways-to-get-better-results-from-ethnographic-research>

→ The Interaction Design Foundation has created the world’s biggest library of open-source UX Design literature

Think Design: Ethnography in user research.

<https://think.design/user-design-research/ethnography/>

→ Think Design offers a clear description of the advantages and disadvantages of ethnographic research.





Challenging Assumptions

What

The design team critically examines the existing assumptions about the problem at hand.

Why

When Mark Zuckerberg started his university network The Facebook in 2004, he may never have thought his fellow students would share all their personal information with him. He was wrong. He was lucky to find out his assumptions were wrong by just giving it a try and experimenting with a platform for students to connect and rate each other's photos.

In many other cases, just experimenting is not so easy. Since experimenting can be very costly, it is better to try to challenge your assumptions in advance as an important starting point for innovation strategies. It also is a great 'warm-up' exercise for a design thinking workshop. Here are some examples of questions to be asked:

- 'Is it true that people just want to read news stories based on their preferences?'
- 'Is the lack of innovation in our company really because we don't have time for it?'

Challenging assumptions is a critical thinking activity that also contributes to creative thinking by opening up more creative directions in problem solving. Assumptions are the hidden and often unconscious ideas, beliefs, and convictions about how things are or should be working. Assumptions are based on dominant practices and forces in society.

- 'Of course, we have to build an information profile of a person in order to understand what (s)he wants'. But are there no other options to get insight into the user without violating privacy?'
- 'Of course, you do not jot down notes on your phone but in a wallet size pocket diary' is what people thought until 2010, when Samsung challenged these assumptions and developed the Smart Case, which led to the well-known Note series.

Five years later, In 2015, Samsung Mobile's creative director Lee Min-Hyok reported that, "Although everyone is for innovation, no one wants to change when we start talking about details ... People told us, 'It won't sell.' 'You cannot hold it in your hand.' 'How can you put that thing next to your face?' 'The only reason to buy this is to make your face look small'" (Yoo & Kim, 2015).

Applying critical thinking teaches that all activities and all reasoning, even in design, is based on assumptions - ideas and convictions that you take for granted that constantly shape your point of view. If you want to get to new viewpoints and perspectives – and that is what innovation is aimed at because the older viewpoints are not good enough anymore – these convictions can hinder the positive change you are looking for.

If you decide NOT to challenge your assumptions, that is the easiest way to go, since there is a natural tendency to stay within your comfort zone and stick with the conditions that you are familiar with. This is also related to the tendency to tame wicked problems, which can mean one or more of the following:

- 1) You are not making the effort to expand the definition of the problem
- 2) You are casting the problem as 'just like' a previous problem that has been solved
- 3) You are declaring that there are just a few possible solutions
- 4) You are simply following orders.





When you choose to challenge assumptions, you invite the richness and complexity of the problem, which can be both liberating and creative. Challenging assumptions is meant to be both a critical and an enjoyable activity because exploring new ground requires that you face the unknown. Optimism

and joy, rather than fear, reflects the child in you who likes to challenge the ideas that you as an adult (have to) take for granted.

How

List some important assumptions that both you (personally and as a team) and the client (case provider) may have about the problem at hand. These include the important ideas and approaches that you and the client assume to be unavoidable for understanding and dealing with the problem.

Typical assumptions are:

- *People need (this particular) kind of product or service*
- *We must build an app in order to tackle the problem*
- *In our organisation we have no possibilities to...*
- *For (our idea) to be successful, it must meet these conditions...*

Then ask questions that challenge these assumptions, like:

- *How might this NOT be true?*
- *Might we do something that seems to be out of the question in the current situation?*
- *How might we be wrong in thinking that (this idea) is what people need?*
- *Are there other options to approach the problem than by means of (our idea)?*

Requirements

Time

Introduce the activity: 5 min.

Activity: 20 min.

Material

One large sheet of paper (A3 or flipchart with 2 columns:

- On the left: **Assumptions** (first **Ours** then, below this, **Stakeholder'**)
- On right: **Challenged**

1 pen per team member

Suggestions for facilitators

- Although this introductory exercise for the team is a critical thinking activity, it is also playful and a great 'warm-up' exercise for a design thinking workshop.
- Make sure ideas are written down and can flow freely, avoiding long discussions.
- Ensure that all team members give input.
- Watch the time: 10 min. for naming Assumptions; 10 min. for Challenging them





Further reading/links

Think Design. Critical Thinking and Design Thinking:

<https://think.design/user-design-research/critical-thinking/>

→ Think Design offers a clear description of the advantages and disadvantages of critical thinking.

Turnali, Kaan (2016). Innovation with Design Thinking Demands Critical Thinking. Forbes, 25 August.

<https://www.forbes.com/sites/sap/2016/08/25/innovation-with-design-thinking-demands-critical-thinking/>

→ DT.Uni particularly likes Turnali's reminder that "design thinking is the art of mindful restraint".

Ferguson, Douglas (2019). How Assumptions Stifle Innovation: A conversation with Paul Sloane, professional speaker and expert facilitator on innovation, lateral thinking, and creative leadership. Voltage Control: Innovation Series.

<https://voltagecontrol.co/how-assumptions-stifle-innovation-c2903492c8e7>

→ Paul Sloane, known as the King of Lateral Thinking Puzzles, also runs a website and writes books on thinking creatively, many co-authored with Des MacHale.

You can test your own lateral thinking with these puzzles <https://www.destination-innovation.com/the-top-ten-lateral-thinking-puzzles/>.

Check your responses here: <https://www.destination-innovation.com/top-ten-lateral-thinking-puzzles-the-answers/>

Yoo, Youngjin, & Kim, Kyungmook (2015). How Samsung Became a Design Powerhouse. Harvard Business Review. <https://hbr.org/2015/09/how-samsung-became-a-design-powerhouse>

→ The authors trace the process of innovation at this company.





Remembering the Future

What

The design team imagines a future situation about its challenge and pretends that this situation has already taken place in order to discover criteria for a successful design.

Why

Who could have imagined long ago what the present-day experience of listening to music would have looked like, with wireless earphones, via a device that connects to the Internet where all music is available through a service? Imagining that situation may not have been likely. Nevertheless, someone in the past might have imagined a dreamlike situation in which listening to music was not limited by the physical presence of albums or CDs so that hearing their favourite music was possible everywhere and anytime.

Or who could have imagined in the past what the present-day air fryer, by which we can cook by circulating hot air around the food, would have looked like? Still, someone might have thought of a future situation in which they could prepare their fries without frying fat (without actually having a clear idea of how this should be achieved). This person could have written a text message to friends saying, 'I now can prepare my favourite snacks without using fat!!' Similarly, the person describing the future of music listening could have written an article for the local student magazine with the headline, 'I can now listen to all of my favourite music while walking in the woods!!'

The examples show that it is very hard to imagine what a product or service will actually look like in the future. The range of future options or possibilities is so huge that it is nearly impossible to predict what will happen in product development. However, you can imagine a future product or service delivering something very valuable because, in that case, you do not have to imagine the future product itself, but what it will have done to make people very happy. When you focus on the needs or values that are important but have not yet been met, the specific development of the product need not be dealt with. Imagine really wanting to eat fat-free snacks but, like most people, you do not understand the technology; you can readily recognize the VALUE of a future fryer using hot air instead of oil.

Throughout the exercise *Remembering the Future*, you simulate that this future development has already taken place even though you do not actually know what it looks like), and that the resulting scenario has made the users very happy and pleased with the product or service. You then simulate the responses and reactions as users "look back" on their use of the product and express their satisfaction and appreciation in a tweet, in a discussion forum, or in the headline of a newspaper article. What would they have said?

By imagining that the future (development) has already taken place, you learn to avoid the strong tendency to presume that a future product or service will simply deliver more of what you already know. For example, a portable music device should be able to carry more tracks; a fryer should be able to make less greasy snacks by using less fat. When you think exclusively about the experience of success and the value it delivers, your thoughts open to exploring a wider range of possible solutions as you are stimulated toward more radical potential for innovation.





In this first stage in innovation and design thinking, two specific goals of *Remembering the Future* should be the focus:

1. Abstract your thought processes from the current approach and context by freeing your imagination, thus opening up the exploration of possibilities
2. Get a fresh understanding of what is important to users by developing greater empathy.

How

Imagine what your product or service will have done to make users happy (or successful or safe or secure or smart – choose the set of adjectives that work best for your product). Make sure you express how it has increased their quality of life, so that the meaning/value of the product or service becomes clear.

Individually, each of the team members will write this down in the form of a tweet sent by these users.

Why not simulate a celebrity response on her own twitter feed? Imagine Billie Eilish writing “With this product (X) I don’t have to use my car that often anymore to get to my studio and can contribute to more sustainable commuting.” Think about how a user would interact in a discussion forum after having found a solution to a specific problem. Also imagine how journalists - online and on paper - would report on this product or service and the catchy headlines their editors would create. On sticky notes, using two different colours, each team member should create 2 to 4 tweets and comments by users and another 2 to 4 headlines by journalists.

Move the sticky notes to a shared space where they are mixed with the creations by the other team members so that you can all discuss what you have written as you move the tweets, comments, and headlines around to reveal relevant clusters that determine any patterns or themes. An open and playful attitude will promote maximum exploration of the value and criteria for successful design especially since there is still no pressure to reach any conclusions.

Requirements

Time:

- Introduce the activity: 5 min.
- Writing tweets, comments, and headlines: 10 min.
- Discussing outcomes in team: 10 min.

Material:

- One large sheet of paper per team (or a flipchart)
- Large sticky notes in two colours
- 1 pen/marker per team member



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



Suggestions for facilitators

This should be a fun and playful exercise of thinking about scenarios in which users have written encouraging comments about your product

As an ideating technique, participants should not feel constrained by rationalizations, like “This is not realistic” or “No one would ever say such a thing”.

It is important for team members to focus on what is being said about the product or service in the future by users that are extremely happy with it, avoiding the distraction of what the design should look like.

The team discussion about the collection of simulated quotes should serve as inspiration for the rest of the design journey so there is no need to write down the discussion, which could immediately put the brakes on a potentially interesting direction. At times, such fixations can acquire the immutable characteristics that later on affect the design thinking process adversely.

You can also do this activity with real users, encouraging them to express what the product/service will have done to make them happy.

Further reading/links

Dorst, Kees (2011). The core of ‘design thinking’ and its application. *Design Studies* 32, 6, pp. 521-532
<https://www.sciencedirect.com/science/article/pii/S0142694X11000603>

→ About design as focused on achieving a certain Value, an activity to be carried out before the development of the working principle (“How”) or the thing itself (“What”).

Hohmann, Luke. Innovation games: Remember the future

<https://www.innovationgames.com/remember-the-future/>

→ We have added the aspect of comments on discussion forums in social media





Framing question

What

A framing question is a preliminary description that delimits and defines the problem sufficiently so that the team can begin to examine its broader system/field.

Why

Although design thinkers aim to come up with creative ideas and innovative solutions to a certain issue, the precise problem is not yet clear. The issue is often quite open; something is not satisfactory and should be going better. An example: although employees in an organization may have an urgent sense that their knowledge sharing is not good enough and should, therefore, be improved, they usually do not know the cause, let alone how to solve it.

How can you do (field) research when there is no specific problem yet? Where should you look and what should you investigate? The lack of time and resources requires focus on the design team's explorations and research. However, be careful to keep the focus broad enough to include domains and topics that are relevant for developing valuable solutions.

The framing question occupies this pivotal position by helping the design team first appropriately delimit the problem so that the research is viable and then get an idea of the broader field of the forces and factors at the root of the problem to be explored and investigated.

The design team working on the issue of *knowledge sharing* might question the important forces that cause the current situation to give focus to their research. This should help them to dig deeper into the system that causes inadequate sharing of knowledge. A good framing question should provide a direction for starting the (design) research that will lead to a deeper, systemic understanding of the issue at hand.

Note that this question is just a tool and not the final question that the team seeks to answer. Iterations are likely to change and improve the question during the research. When the design team on knowledge sharing discovers that it should reformulate its framing question into *What effects do workstations have on knowledge sharing?*, this happens because of the understanding reached about the role of workstations.

The framing question is a pragmatic tool for understanding the current situation within the existing conditions and context. This explains why a design team of 10 working on the issue for three weeks will frame the question differently than a team of three working for just a few days. In framing the question, the team should try to find a meaningful direction for doing research that helps it to understand why things are functioning as they currently do.

By combining systems thinking to understand *the causes of the current behaviour in the system* with user-centred thinking to understand *the user that experiences the current behaviour*, the framing question aims to develop designs focused on improving the system as a whole, not just the individual parts or units. As the framing question is not a scientific question, you will want to focus on a specific user group that is experiencing the issue. Compare the resulting focus when you ask *what causes the insufficient knowledge sharing in the management team* with asking *what causes it in the IT team*. With *design* research, you aim to focus on contexts of specific user groups.



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



How

The focus should be on understanding why things are going as they currently do.

You can ask yourself questions like:

- Why is that system the way that it is?
- What are the forces that cause the current condition?

If possible, focus these questions by zooming in on a specific user group. Try

- What causes the existing situation for this user group?' (the people your prototype will be designed for and whose situation you seek to improve)

Note that you should only include the user group when it is helpful. If a user group is not yet clear, there is no need to force it until your research in context brings clarity to defining your user group(s). If the above questions are not immediately applicable, try asking:

- What accounts for the current situation in [field] and what issues do [stakeholders] have here?"

Note that the question is not too narrow. You do not want to exclude topics that are relevant for exploring the field and understanding what is going on. The framing question should NOT already indicate or suggest solutions. It is not the *How might we...* question that will be used later for brainstorming in the design process, like, "How might we use ICT to improve knowledge sharing among managers". Also avoid embedding untested or contentious assumptions, like, *What accounts for the ways that older staff lacks knowledge sharing capabilities?*

Discuss in your team how you will formulate the framing question. When this is clear write it on 1 large sticky note at the centre of a large sheet of paper or a flipchart; then surround it with the relevant forces.

Requirements

Time

- Introduce the activity: 5 min.
- Discussing and formulating framing question: 20 min.

Material

- Large sticky notes
- Large sheet of paper or flipchart for the team work space
- 1 pen per team member

Suggestions for facilitators

- Focus should be on understanding, not on coming up with solutions
- Avoid questions that are too narrow or too broad
- Make sure the team's mindset is not rigid since this framing question is NOT the final question it needs to answer





References/Links

Pourdehnad, John, Wexler, Erica R., & Wilson, Dennis V. (2011). Integrating Systems Thinking and Design Thinking. *The Systems Thinker*, 22, 9, pp. 2-6. The Omidyar Group/Pegasus Communications
<https://thesystemsthinker.com/integrating-systems-thinking-and-design-thinking/>

→ Almost ten years ago, Pourdehnad et al. traced the course of systems thinking back to Egyptian and Mesopotamian bureaucracies. DT.Uni particularly supports the role of *wonder* with the corollary “Do not block the way of inquiry”, as proposed in the First Rule of Logic (F.R.L.) by Charles Sanders Peirce

(1899,
https://web.archive.org/web/20120106071421/http://www.princeton.edu/~batke/peirce/frl_99.htm
).

→ The original format of the article is also available here <https://thesystemsthinker.com/wp-content/uploads/pdfs/220901pk.pdf> but the first link gives you the opportunity to also examine the collected works of *The Systems Thinker*.

Acaroglu, Leyla (2017). Tools for Systems Thinkers: The 6 Fundamental Concepts of Systems Thinking. *Medium: Disruptive Design*.
<https://medium.com/disruptive-design/tools-for-systems-thinkers-the-6-fundamental-concepts-of-systems-thinking-379cdac3dc6a>

→ The introductory sketch art titled *Tools for System Thinkers* is a helpful illustration pairing six sets of approaches toward thinking.

Vassallo, Steve (2017). Design Thinking Needs To Think Bigger: Design thinking, as it was conceived 15 years ago, has outlived its usefulness. Enter systems thinking. *Fast Company*, 01 May.
<https://www.fastcompany.com/90112320/design-thinking-needs-to-think-bigger>

→ This is part 2 of a series of excerpts from Vassallo’s *The Way to Design*, which you can read or listen to online at <https://thewaytodesign.com/> DT.Uni particularly appreciates Vassallo’s focus on asking better questions although, if you do not have time for the book itself, DT.Uni also recommends reading part 1 of the series about reinforcing empathy as *rigorous evidence-based compassion* rather than as a euphemism for market research at https://www.fastcompany.com/90111831/the-case-against-empathy?_ga=2.73468050.1805024744.1591967308-1773557912.1591967308.

Systems Innovation: Systems thinking

<https://www.youtube.com/watch?v=Miy9uQcwo3U&list=PLsJWgOB5mIMBinjH9ZAbiWiVxsizC5mU&index=2>

→ In this SI video, in less than 6 minutes, you can check that you actually understand the assumptions and methods that make up the paradigm that is *systems thinking*. You can review the three steps involved in not only analysis of components - with its reductionist approach for situations involving both low interconnectivity and low interdependence - but also in synthesis with its focus on a holistic understanding of relations characterized by high interconnectivity and interdependence, like ecological systems, computer networks, and social systems. This video is from SI - an online eLearning and collaborative platform for systems thinking and systems change that works on a freemium business model.



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



Exploring the Field

What

Field explorations include the research activities that a design team must execute to discover what motivates users and what forces cause the current situation.

Why

The design challenge/problem is not an isolated issue but situated in a specific context. In business-oriented design thinking, the emphasis is on investigating the needs of the inner stakeholders within this context to uncover their needs and shape the concept development to these needs so that the solutions then are really valuable to the user.

When you go beyond stakeholder analysis to investigate the larger field, you can develop solutions that are not only valuable but also sustainable and have a broader impact on the system. By exploring the field, the design team will consider the wider context of players involved (beyond inner stakeholders), embedded in the social, technological and cultural spaces of the problem.

For example, with a design challenge to improve social cohesion in a specific neighbourhood in Amsterdam, the team investigated the needs of the inner circle of stakeholders, notably, the local population(s), the housing association, and the social workers. But a more complete exploration of the field included the impact of at least the following:

- technologies, like the use of the mobile phone and of social network sites for communicating different cultural backgrounds and values
- municipal regulations
- national policies on, in this case, the finance of public and/or subsidized residences.

Although it can be difficult to get a grasp of all these forces that impact the challenge/problem, these technological and cultural spaces significantly influence the social space of the inner stakeholders and should be included in user research to develop a larger and more systemic picture of the problem. In the Amsterdam housing example, solutions beyond simply creating benches for people to meet were created because the problem was understood at this deeper level, where a need was revealed to stimulate mutual understanding between cultural groups. A website was created where local residents could share the stories of their origins, which led to greater affiliation, bonding, and curiosity amongst people who previously had seen neighbours as mere strangers. Local residents discovered that they had similar personal origins since everyone had their roots outside Amsterdam, either in the Dutch provinces or in Northern Africa - see Dorst (2015) for the complete case study. Because the broader field was taken into account, the perspective on the problem changed from an issue of (lack of) security to a central theme of shared origins.

To gain deep insights, interviews, observations, and/or participating in the activities of your user are needed. Such contextual research approaches take you beyond what you hear about the user, or what is written about them in literature to actually see and sense what is going on in their world. This is important as there can be a huge difference between what is said and what is actually done. Seeing the user in their natural environment is crucial for developing a good understanding and insight into the subjective needs of users and/or inner stakeholders. Also focus on broader issues that might be important for understanding the current situation.





Field research aims to create an understanding of the needs of users/inner stakeholders AND discovering forces that determine the current situation. You might end up with what is called a *paradox*: where what people want is contradictory to the (forces in the) current situation. Such a paradox is not to be disallowed but should help you to develop a relevant point of view.

Field research is also important for showing your case provider that you have explored the problem and, therefore, can be trusted in your results. Take as many notes as you can (using different tools/media) so that you can effectively present your work. Show that you captured nuances of the process that may not be easily articulated in mere text.

How

To focus both on understanding the needs of the users/stakeholders and understanding forces causing the current situation, start with your framing question, that was meant to provide sufficient focus to your research. For the framing question, try the following format:

- “What accounts for the current situation in [field] and what issues do [stakeholders] have here?”

Consider the following questions:

- What is the goal of this research?
- Who do you need to target?
- How accessible and manageable is it (audience/location)?

Make sure that you do not transform this into theoretical/desk research. You actually must go out and try to get in touch with users/stakeholders in order to find out what the important issues are from their point of view! Then consider what kind of contextual research suits this goal and audience:

1. **Direct observation**: observing the user/stakeholder in their natural environment to obtain contextual data on people, situations, interactions, and surroundings.
2. **Participant observation**: not only observing but also participating in the activities of the user/stakeholder to enrich your observations with personal experiences.
3. **Ethnography**: an expanded observation of users/stakeholders in which you aim to also get a good perspective on the cultural values of an entire social setting.
4. **Qualitative Interviews**: questions that are asked directly to the users/stakeholders. Prepare your questions in advance. Additional questions can be asked in an informal conversation.
5. **Case Study**: an in-depth analysis of a person, situation, or event that is representative of a user group so that it delivers information that is also relevant beyond this specific case.
6. **Observing social networking sites**: analysis of how users/stakeholders talk and reflect on topics in social media, although strictly as an additional source of data

The way you document your notes will make an impact in good field research. Do you prefer written notes in a notebook, taking pictures, and/or recording videos? Each team member should understand their role.

Remember that these notes are also very important for presenting your work to the case provider and for communicating the value of your design. Keep in mind that, in the end, your field exploration should help your team in answering questions such as:

- What is important to the stakeholders?
- What issues (power relations, values, mindsets, technologies ...) dominate the field?
- What trends, new findings, or bright spots have you seen that point to promising approaches?



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



Requirements

Time

- Introducing the activity: 10 min.
- Preparing field research: 20 min.
- Sufficient time to actually execute the research

Material

- a page of pivotal questions to consider (before doing the research; and some questions to answer afterwards): see this list [link]
- a small paper notebook
- smartphone or camera for taking photos and making video recordings

Suggestions for facilitators

Stimulate taking field notes

Be aware of the fact that there is a duplicity in this activity. The research is needed so that your team can gain insight into the needs of users (human-centred design) AND into broader issues in the field (systems thinking). The aim is to combine these approaches and insights in order to get to broader themes that motivate the user and to develop solutions with more impact.

References/Links

Bhat, Adi. What is Field Research: Definition, Methods, Examples and Advantages. QuestionPro: Consumer Insights, Market Research. <https://www.questionpro.com/blog/field-research/>

→ In addition to the advantages and disadvantages of field research, DT.Uni recommends the examples and reasons for conducting field research to validate data.

Blackstone, Amy (2012). Chapter 10.2 Pros and Cons of Field Research. *Principles of Sociological Inquiry: Qualitative and Quantitative Methods*. Saylor Academy. https://saylordotorg.github.io/text_principles-of-sociological-inquiry-qualitative-and-quantitative-methods/s13-02-pros-and-cons-of-field-researc.html

Brown, Carolyn M. How to Conduct Field Research. Inc.: Innovate <https://www.inc.com/guides/201101/how-to-conduct-field-research.html>

→ Brown shows you how to discover what customers think about your product or service based on actual behaviour and use patterns. DT.Uni appreciates the distinction between perception and reality that field research can reveal.

Dorst, Kees (2015). *Frame Innovation: Creating new thinking by design*. MIT Press. <https://mitpress.mit.edu/books/frame-innovation>

→ Dorst is the inspiration around the focus on empathy for the alternative online workshop created for DT.Uni during the novel Coronavirus confinement in 2020





Think Design. Contextual Inquiry. <https://think.design/user-design-research/contextual-inquiry/>

→ Think Design offers a clear description of the advantages and disadvantages of contextual inquiry.

Malpass, Catherine. (2018). Everything you need to know about contextual research. Medium. UXdesign. <https://uxdesign.cc/everything-you-need-to-know-about-contextual-research-8bb806464d0c>

→ Follow these interesting tips to gain more insight into how contextual research contributes to visualization and storytelling.





Space Saturation

What

Space saturation is the decoration of a design space with all the findings from the empathy phases of understanding and observation. Ideally your design team will have its own working space where the walls and/or work boards can be filled with all the data that is gathered.

Why

Since insights can only emerge when a lot of data on what is going on in the problem space has been gathered, the data will need to be very wide-ranging, including anything deemed relevant for getting clues on what is going on. It actually *should* be very broad as in the Understanding and Observation phase ('Empathy') we want to keep a wide scope in order not to exclude relevant aspects. For only in the next step we try to find patterns and themes in this unstructured data. Space saturation is meant to create an environment for this transition to take place: to discover insights in all the gathered data. These conditions for insight development are created by getting it all out and making it visually. Creating a design space for all the findings also inspires and informs the whole team. By sharing findings, telling stories about what you have seen and heard, nuances are added to help make sense of all the data. Space saturation thus also functions as a team share.

How

Display all your data: notes of field research; pictures; quotes or remarkable statements/sentences from interviews; thoughts or experiences; citations from the brief or from the exercise *Day in the life*; observations of people, spaces, and/or circumstances... You can also include relevant objects and artefacts that tell a significant story.

Do not feel limited, instead immerse your team in a space that envelopes and inspires. Write down your quotes, observations etc. on sticky notes, post drawings, tell your team about what you have seen and experienced... The space will look like a collage of findings and stories.

The team share can be guided by talking about a future aspirational state of the system: a 'guiding star'

Requirements

- walls available in a team working space (design space) for the duration of the project to view and (re)organize the data as it accumulates
- sticky notes; pens; markers
- access to a printer to print out selected images

Suggestions for facilitation

- Each team member should find something to share: artefacts, stories, quotes, pictures ...
- The discussions and team sharing should be exploratory as you all expose the data in this space. There is no need for final insights finding the right answer, or definite descriptions at this stage.
- When suitable, the team can discuss a future aspirational state of the system: a 'guiding star'





References/Links

Taylor, James. The Creative Process (five stages). The Creative Life podcast, Episode 2.
<https://www.youtube.com/watch?v=Zl0R1uJ62xo>

→ This video takes you through the five stages of the creative process - preparation, incubation, insight, evaluation, elaboration - in under ten minutes. Note that the a-ha! moment, the insight stage, is really the least time consuming that occurs during a low energy level activity, like going for a walk or taking a shower. The critical nature of the evaluation stage involves appreciating feedback. DT.Uni encourages you to think of it as feedforward since it should be valuable and contribute to new perspectives in the work you are doing.

Stanford d-school. Space Saturation and Group. https://dschool-old.stanford.edu/groups/k12/wiki/65da6/Space_Saturation_and_Group.html

→ Note that, although this is not a safe link, it may nevertheless be valuable because it refers to original work prepared for d-school.

Space Saturation: Extreme affordability. https://www.youtube.com/watch?v=yyN30VD_mtE

→ This one-minute video shows a fast-forward example of space saturation by a design team working on a challenge by a campus bike shop.





Mapping Concepts and Themes

What

Concept mapping is a team activity to organize and structure knowledge. Based on the gathered data, important concepts for understanding the problem are formulated and mapped so that important relations amongst them are revealed.

Why

In the Empathy phase of understanding and observing, the design team has gathered a lot of data and you will need to determine what it all means (sensemaking). Talking about all your findings helps to generate a shared understanding. The concept map is a formal tool to organize the data and to discover meaning.

The first crucial step in concept mapping is moving from data to concepts. A concept is how a class of objects or events is understood and the name/label used to express these perceived regularities or patterns.

- *Apple* is the label for all fruit that has this specific (round) shape, that specific taste and size, etc.
- *Chaotic* is the label for events that are disorderly, with no clear centre or control etc.

To understand this process, imagine a design team working on the challenge of how to improve the wellbeing of telemarketers. Several of the team members heard these marketers worrying about not getting a good rating from clients after the phone call. The team may find remarkable resemblances in these observations from interviews and label the condition as *nervousness*, which then is understood as the concept for understanding the mental situation of the telemarketers in the challenge.

Concept mapping is organizing such concepts into visual maps and describing how they are related. When a design team develops shared knowledge of how to understand the challenge/problem, a concept map can help to construct the mental map of the problem. A mental map consists of a set of selected concepts and the relations that represent the real system. The holy grail in effective teamwork is to have a shared understanding of the problem, and collective understanding. Concept mapping reinforces higher level thinking about the gathered data and synchronizes thinking with the other team members.

The ultimate goal of concept mapping is to get an idea of the bigger picture. To determine what all the data *mean*, you will need to describe the relationships amongst the different concepts. The nervousness description by the design team working on telemarketing could also discover concepts such as *haste* and 'competitiveness', which might then - overseeing the concepts in the map and describing their relations - relate to the central connecting theme of *anxiety*. An important result here is the reframing of the question to examine how to better deal with the anxiety of telemarketers. Deep and meaningful sensemaking is what drives innovation.

How

Phase 1

- Group the data to identify similarities that will help to reveal important concepts for understanding the challenge.
- Discuss and describe the central topic for your concept map, like "lack of wellbeing of telemarketers"





- As you discuss the most relevant concepts for understanding the topic, write them on sticky notes to generate a parking lot of 8 related concepts.

Phase 2

- Write the central topic at the centre of a large sheet of paper (draw circle around the topic, and do this with all the concepts you put in the map).
- Add the main concepts one by one, connecting the concepts to the main topic OR between concepts when their connection is more direct and obvious. Note that you can only draw one line for each new concept.
- Each new concept can be developed with more detail, connecting new lines to further related concepts.
- Go on until the important concepts of your parking lot are on the map.
- Label some of the most relevant connections you have drawn with appropriate and concise linking words that describe the relationships between the primary concepts. Make the descriptions concise. They typically include verbs, such as *causes*, *includes*, or *diminishes*, as in the telemarketing example, where the link between 'hastiness' and the topic of wellbeing could be labelled *hastiness decreases wellbeing*.

Phase 3

Take a step back from the map and try to see the big picture. In a different colour, identify and similarly describe cross-links with appropriate labels. These relationships between concepts in different domains of the concept map may also encompass more than two concepts.

Remarks:

The description of cross-links can help you discover **themes**: deeper layers of meaning that underlie the observed needs, motivations, and experiences in the field.

(n.b: themes chosen should not be too close to themes underlying the current situation)

Describing the relationships (links and cross-links) is pivotal to the process of making sense in this mapping activity. By linking concepts, as in *hastiness decreases wellbeing*, you are creating propositions, which are the basic units of meaning. These short phrases should help you grasp an even deeper, broader level of meaning.

The description of cross-links is the focus point of this version of concept mapping that is therefore called a 'concept and theme map'.

Concept maps can also be generated in electronic version. This makes it easier to share and to iterate on a version of the map.

Requirements

Time

- Introducing the activity: 5 min.
- Creating the map: 25 min.



UMCS



HÁSKÓLINN Á BIFRÖST
BIFRÖST UNIVERSITY



TECHNISCHE
UNIVERSITÄT
DRESDEN



UNIVERSITY OF ECONOMICS IN
BRATISLAVA



IPG
Politécnico
da Guarda
Polytechnic
of Guarda



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM



Material

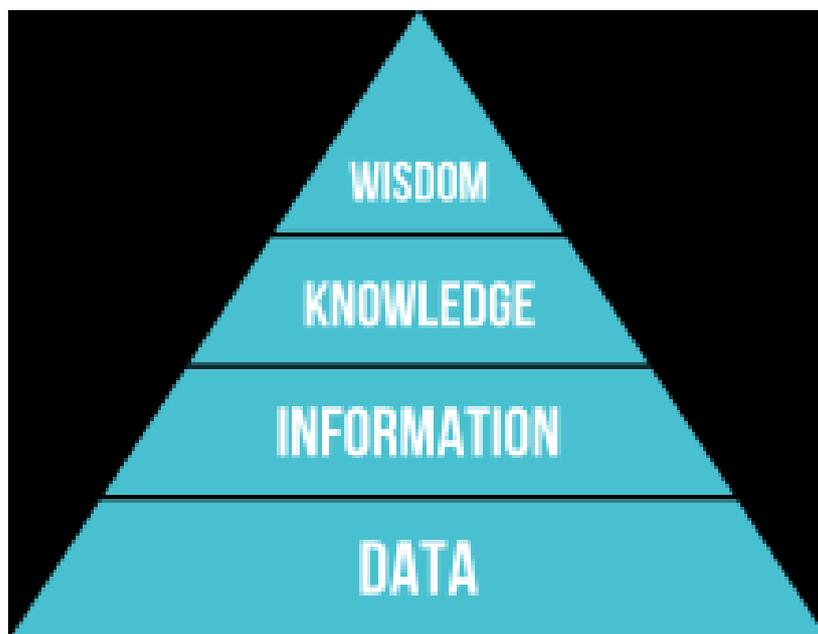
- sticky notes for writing down individual concepts (parking lot)
- Large sheet of paper or flipchart for mapping
- Pens and/or markers in different colours
- Note that free tools for creating digital concept maps are available. DT. Uni has used Miro for students and teachers.

Suggestions for facilitators

Concept maps are different from mind maps, which have a more 'associative' and spontaneous character. Concept maps seek to cover the whole system/field of a specific topic, and require a discussion of important concepts that are needed to understand this system. Concept maps are more complex than mindmaps since they primarily deal with establishing and defining relationships between different ideas and topics.

Note that there are four levels in the 'information processing' in this activity:

1. Data
2. Information: interpreted data
3. Knowledge: concepts and their connections
4. Wisdom: synthesis of knowledge: putting it in context; offering explanations about backgrounds (meaning)





References/Links

Cañas, Alberto J., & Novak, Joseph D. CMap Software: The Origin and Development of Concept Maps. IHMC: The Florida Institute for Human and Machine Cognition. <http://cmap.ihmc.us/docs/origins.php>

→ In the context of a site that pioneers technologies aimed at leveraging and extending human capabilities, you can learn more about how Novak came up with the idea of a concept map, working with the learning psychology of David Ausubel, where a learner's cognitive structure is the place for learning, assimilating new concepts and propositions into existing concept and propositional frameworks. For a meta-understanding of concept maps, see <http://cmap.ihmc.us/docs/img/CmapAboutCmapsLarge.png>

Knudtson, Eric. Concept Mapping for Designers of the Future. CPE: Cooper Professional Education. <https://www.cooper.com/journal/2016/08/concept-mapping-for-designers-of-the-future-2/>

→ This page goes over the creation and application of the Concept Mapping Together protocol, based on Novak's original work, adapting concept mapping specifically to the context of design thinking. See also <https://conceptmappingtogether.com/> and the Facebook Community at <https://www.facebook.com/SpeculativeFutures/>

LucidChart. What is a concept map? <https://www.lucidchart.com/pages/concept-map>

→ This LucidChart page offers the digital tool to make your own concept map. The presentation introduces the term *parking lot* for your collection of concepts before you have ranked them and includes a clear distinction between concept maps and mindmaps.

Softonic download of cmaptools for Windows:

<https://en.softonic.com/download/cmaptools/windows/post-download>





Persona

What

Personas - the term is based on the Latin *persona* - are fictional characters that represent a specific user group that you are designing for. Although personas may seem to be merely characters, it is actually a method of synthesizing all the data that you gathered during the empathy phase to learn about people and their needs.

Why

As a design team you cannot develop solutions for everyone who is suffering from the problem at hand. To focus your work, you will need to situate the development of your solution in a specific environment and for a specific user group. Creating personas helps you to understand who these users are and what worries and motivates them. Ironically, when you relate to these *broader characteristics* and features, also called *themes* of a user group, an effective tool is to work with a *typical user*; the persona. The persona is your tool for connecting general insights to individual circumstances.

The persona adds a human touch to raw data and general insights since you metaphorically walk in the shoes of a potential user. Using your imagination, you transfer your perspective: What would the world look like from the user's point of view?

Creating a persona is an activity that gives you the opportunity to use all of the data you have gathered about the world of your users. In this learning exercise, you combine the data with your imagination to create a persona (the user). The point of view of the user (the persona) that you come up with is not a matter of free-floating fantasy but is grounded in research and data. The persona is a sensemaking process of combining general data and insights to specific personal circumstances.

As an archetype, this specific, fictional person expresses more universal features. You will need to be aware that, without your carefully researched understandings and observations, your persona can easily become a stereotype based on assumptions and preconceived ideas about a representation of a group of people. The basis of the persona is research. You combine this with your imagination, not with your assumptions.

By trying to make sense of your data together, the team engages in a process that helps you to understand what and who you should focus on to create a meaningful design. When you share the research insights with your team, you develop a common language for understanding what is going on in the world of your users. This collective effort to connect with users and other stakeholders may also help to align all these involved parties. So, the persona guides communication about the problem and all your design decisions.

How

Discuss all your data from the Empathy phases of Understanding and Observation to determine common needs, patterns, similar interests, etc. You may find different persona groups. At Netflix, for example, you can categorize your users into groups interested in programs that are romantic or thrillers or even eclectic, progressive, or conservative.

You will need to discuss what to focus on because you cannot do everything for everyone. Select the most interesting and meaningful user group. Complete the Persona template with these details:

- Fictional name
- Job title and major responsibilities





Determine these psychographic aspects for your persona:

- Goals
- Values
- Motivation
- Worries
- Needs

Demographics such as age, gender can be added when helpful. Note, however, that this data is not part of the template to avoid creating stereotypes. Netflix, for example, does not use these demographics which the company does not find useful for predicting user needs)

Add a drawing or picture of your fictional persona and a quote that sums up what matters most to them.

If your first version of the Persona is on scratch paper, you may feel more inclined to revise and iterate. Remember that you do not need to discuss everything or even agree when you write out the characteristics so don't be afraid to start quickly. Everything you do can be revised in a fun design process that starts immediately and runs smoothly.

Develop more than one persona if it is relevant and interesting to keep your options open and prevent you from a narrow vision.

Requirements

Time

- Introduce the activity: 5 min.
- Discussing and filling in Persona template: 20 min.

Material

- Paper version of a Persona template (one per team)
- Scratch paper
- 1 pen/marker per team member

Suggestions for facilitators

- Maintain the perspective that the Persona is a fictional character, who incorporates the most significant findings from previous research. Teams should not invent this character but imagine it based on their research.
- The first version of the Persona can be done on as a draft to stimulate revision and iteration
- Start fast, iterate and have some fun.





Links

Innovation Training. How to Create Personas for Design Thinking: Four steps to building products or solutions with your users in mind. <https://www.innovationtraining.org/create-personas-design-thinking/>

→ This page from Innovation Training breaks the activity down into four steps that coincide with DT.Uni - Research and Analysis, Persona descriptions, Problem analysis, Collaboration and Revision.

Dam, Rikke Friis, & Siang, Teo Yu. Personas – A Simple Introduction. Interaction Design Foundation. <https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them>

→ This practical introduction covers a 10-step approach to personas and distinguishes between four different types of personas - goal-directed, role-based, engaging, and fictional.
Rose, Cicely. How To Create A User Persona (Video Guide). CareerFoundry. <https://www.youtube.com/watch?v=DvV7ZcRVQ4g>





Point of view

What

With the point of view tool, your team describes the situation of the challenge/problem with the most important insights and themes that were discovered during the Empathy phases of Understanding, Observing, and Researching. The point of view is subsequently narrowed down to one (or several) question(s) that can launch ideas for the next phase of Ideation.

Why

Defining what the problem actually is marks the pivotal moment in design thinking. It is visible in the centre of the double diamond diagram below as the axis of the design world.

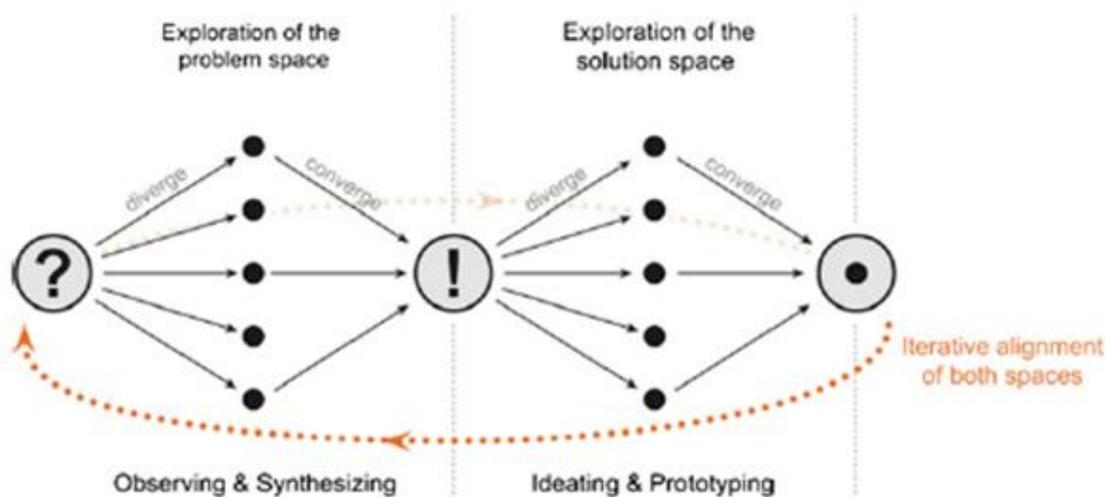


Fig. 1 Problem and solution space in design thinking

Source: Lindberg, C. Meinel, and R. Wagner (2011). Design Thinking: A Fruitful Concept for IT Development? In H. Plattner et al. (eds.), Design Thinking: Understand – Improve – Apply, Understanding Innovation (pp. 3-18). Berlin: Springer

Describing a point of view is the connection between the problem/challenge and the solution space. When you define the problem this subsequently creates a frame for thinking about possible solutions. For instance, the idea for the Walkman (portable cassette player) was “born” only after a Sony engineer was asked to think about listening to music *during trips*.

Language is used to define so to describe a problem, you write the situation. Your descriptions have to make sense so they can be meaningful. You will want to be coherent and set off a spark to create a sense of purpose and enthusiasm within your team. This creation of focus and inspiration occurs primarily when you are defining. The point of view you create is much more than a cold analytical observation of the problem; instead, it will be an informed and animated vision of how the team understands the problem.





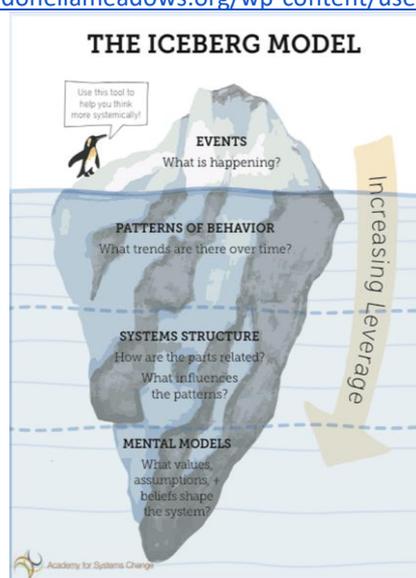
The point of view is your team's unique design vision. It is a meaningful focus to the situation, which serves as a frame for understanding what is going on and what is needed so that the design work can move forward. This narrow focus actually leads to a broader range of good solution possibilities, which reinforces the pivotal role of this focusing/framing activity in advancing more good ideas. The next step is to transform your point of view into an actual question that generates ideas. This can be done through the *How might we...* (HMW) question from design thinking and/or a type of frame creation from Dutch design thinker Kees Dorst. His recurring example is the unique vision that his design team developed on the crime problem in a late-night district in Sydney, where the problem was reframed from the point of view that saw the district as a metaphor for a music festival rather than as the law and order issue of crime. In this case, the underlying theme was defined instead as large crowds of young people wanting to have a good time. The frame posited that "If the problem [of late-night crime] is understood as [a music festival], then ..." This innovative approach to the problem generated many relevant ideas that might not have been apparent from a different point of view.

Design thinking as an innovation strategy aims to discover these new perspectives. Your point of view should combine your understanding and your creativity. The art of creating a good point of view is *narrowing* the problem down by framing it so that you have a *wide enough* scope to think about solutions which reach far beyond the status quo.

How

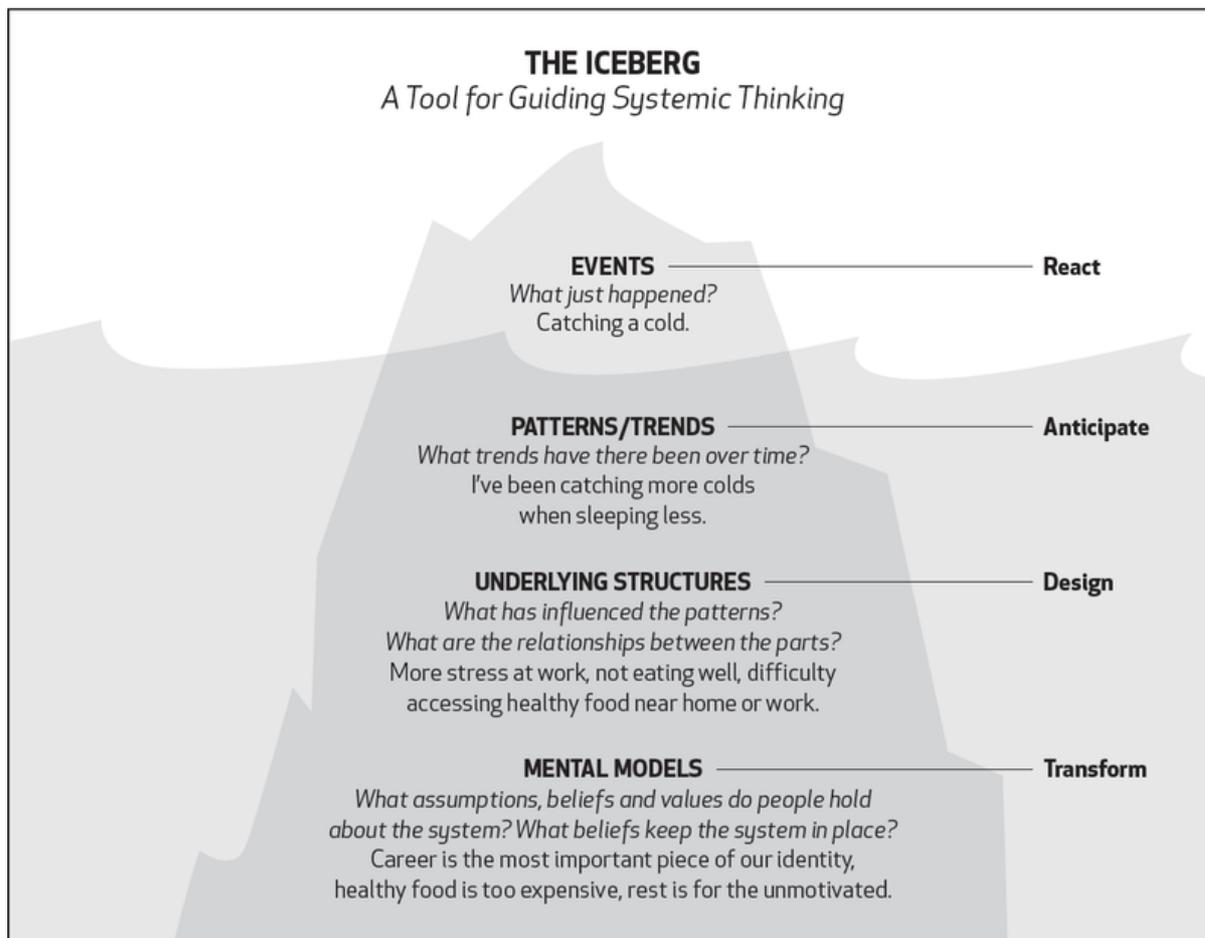
In contrast to systems thinking, the business-oriented versions of design thinking begin with users and their needs to reach an important Insight about the users' motivations or preferences. Defining a point of view then follows the logic, for example, that "a person who lives in the city... needs access to a shared car 1-4 times for 10-60 minutes per week ... he would rather share a car with more people as this is cheaper" (see <https://public-media.interaction-design.org/pdf/Point-Of-View.pdf> for the complete example).

The version of design thinking DT.Uni is proposing leans further into systems thinking, which reveals the deepest levels of the causes and/or motives for the behaviour of people or organizations. To understand this better, consider the visual metaphor of the iceberg model (for a printable version to keep as a reminder, see <http://donellameadows.org/wp-content/userfiles/Final-Iceberg-Model.pdf>):





Source: [Systems Thinking Resources, The Donella Meadows Project, The Academy for Systems Change, http://donellameadows.org/systems-thinking-resources/](http://donellameadows.org/systems-thinking-resources/)



Source: Ecochallenge.org (formerly Northwest Earth Institute), <https://ecochallenge.org/iceberg-model/>

In the approach to innovation that looks beyond Market (needs) or Technology (development), two of the queries for innovation include

1. Why are people using a certain product or service?
2. Why are they behaving as they are doing – and how could we intervene in this deeper level of motivations (caused by important values, beliefs, mental models) in order to make an improvement?

The third driver of innovation, then, is Meaning (see for instance the work of Roberto Verganti: verganti.com). A theme is this deeper level of meaning of a larger field, not just for one particular user group. For the challenge *How to improve the social support in a specific neighbourhood?*, the field research may reveal themes for the residents based on issues like security or loneliness. In *Frame Creation*, Kees Dorst shows that a theme will be simultaneously individual and universal. For example, people have similar concerns and desires related to the theme of loneliness, which are embodied by the specific people in the specific circumstances of that neighbourhood.

When design and systems thinking are combined, the point of view activity serves as a tool to describe themes your team has found during research and observation. For example, in the challenge





to improve the knowledge sharing in an organisation, field research revealed the themes *lack of time* and *stress*. This process could lead to the following point of view:

Employees in this organization need to share their knowledge more for the organization to be competitive and innovative. They do have strong personal and professional motivations to do

so. However, high time pressure puts a significant limit to their ability and willingness to share knowledge with colleagues.

Since you cannot design everything for everyone, the next step is to focus your point of view on a specific user group through Persona. Imagine that the Persona is a 40-year-old account manager that is eager to express their ideas and to advance their career. The specific *How might we...?* question could be as follows:

How might we provide an account manager in this organisation with more time to share their knowledge and insight?

You could also create the following frame, blending both theme and persona:

If the problem of insufficient knowledge sharing is approached as an issue of lack of time, then a 40-year-old account manager would ...

It is important to remember the following:

The *How might we...?* question or frame should not yet suggest a particular solution. At this point, it is just about creating a frame for innovative thinking.

The point of view should offer you the chance to answer your questions in a variety of ways
Your frame should be narrow enough to start your brainstorm, but also wide enough to give you room to explore ideas.

You may create several '*How might we...?*' questions or frames to give you the opportunity to pick the best one for ideation.

To summarize, to create your point of view, follow these steps:

1. Describe the problem/situation by using the theme(s) that you found during your research
2. Narrow this description down by making one or more '*How might we...?*' questions or *If ... then* frames.
3. Then use your Persona to focus these frames.

Requirements

Time

- Introduce the activity: 5 min.
- Describing POV and frames: 20 min.

Material

- Large sticky notes so that you can move your POV descriptions and frames to a wall or flipchart in your team's workspace)
- 1 pen per team member

Suggestions for facilitators

- Note that, because you have started with THEMES - a focus on Systems Thinking and Meaning - you will not be using the common (market-oriented) approach in describing a point of view using *user/need/insight*



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



desiguni.eu

- Divide this activity into two steps:
 1. Describe a more general point of view
 2. Narrow this general POV into a *How might we...)?* question or an *If ... then* frame
- Your objective is to create a frame for innovative thinking. You do not need to suggest a particular solution at this point. In the next phase, you will begin ideating.

References/Links

Dam, Rikke Friis & Siang, Teo Yu (2017). Define and Frame Your Design Challenge by Creating Your Point Of View and Ask “How Might We”. Interaction Design Foundation.

<https://www.interaction-design.org/literature/article/define-and-frame-your-design-challenge-by-creating-your-point-of-view-and-ask-how-might-we>

→ Dam and Siang prepare a market-oriented POV approach in describing the trifecta *user/need/insight* as well as your HMW question so that you are prepared for the Ideating phase.

Kees Dorst: How design can improve public spaces. Design Indaba

<https://www.youtube.com/watch?v=dPsmww461pI>

→ In this 5-minute video from the conference *What Design Can Do! 2012*, Dorst shares his design impact on Kings Cross in Sydney, Australia, and his design team’s reimagining of trash bins for public spaces.

Verganti, Roberto. ‘Meaning’: Verganti on Leadership, Innovation, and Design. www.verganti.com

Norman, D. A., & Verganti, R. (2014). Incremental and radical innovation: Design research vs. technology and meaning change. *Design Issues*, 30(1), 78-96

<http://www.verganti.com/wp-content/uploads/2017/01/NormanVerganti.pdf>

→ As Professor of Leadership and Innovation at the Stockholm School of Economics, Verganti co-directs [The Garden - Center for Design and Leadership](http://www.garden-center.com).

Nessler, Dan (2016). How to apply a design thinking, HCD, UX or any creative process from scratch.

Medium. <https://www.dannessler.com/portfolio/2016/8/6/mediumblog-publications>

→ Nessler introduces his revamped double diamond based on the [British Design Council’s Double Diamond](http://www.bdc.gov), [IDEO’s human centred design ideology](http://www.ideo.com) and [d.school’s Design Thinking process](http://www.d.school)

Peter Senge and the Learning Organization, <https://infed.org/mobi/peter-senge-and-the-learning-organization/>

→ At infed.org’s website for exploring “education, pedagogy, community-building and change”, especially “the theory and practice of informal education, social pedagogy, lifelong learning, social action, and community learning and development”, find out more about Senge’s five learning disciplines, including Personal Mastery, Mental Models, Shared Vision, Team Learning, and Systems Thinking.





Ideating

What

In the design thinking process, Ideating is the mode for generating a wide range of ideas. Rather than coming up with the *right idea*, ideating opens up many more solution possibilities. The mental mode of ideating is one of collective thinking, unhindered by all the usual limitations of hierarchy, egos, and accustomed expectations.

Why

After a broad exploration of the problem space, the design team needs to transition to exploring the solution space. This exploration is guided by their point of view, that unique design vision that the team has developed throughout this process. The point of view serves as the pivot between the problem- and solution space. Inventing solutions should be an exploration, and therefore ideating is about 'going wide' in the imagining of ideas. The trick in ideating is about creating environments and (mental) spaces in which the team can actually do this.

Ideating requires eliminating many of the limitations that usually hinder your free-floating thoughts and ideas. With no hierarchies allowed: it is not the superior in an organization that has by definition better ideas about how to solve a problem. Ideating is about making the idea generation process a truly collective effort of the team. This also means abandoning your personal fixations and convictions so that your subconscious and imaginative self can think freely about how things work. Ideating should challenge you to think beyond your preconceived ideas, job tasks, and specialization(s). The best and most innovative ideas can come from a team that is able to connect across many potential barriers, linking imaginative capacities to the input of others, even when this input comes from an unexpected direction. This mode of making (unforeseen) connections and associations requires that you also abandon the evaluative part of the mind for a little while so that you can effectively defer judgement. Ideas are not fabricated (rationally) but imagined.

After the team ideates in this divergent activity where quantity counts, the entire team will need to return to the convergent activity of evaluating and judging whether each idea is useful and/or viable to determine its value. Crucial is the creation of the circumstances for letting your imagination flow freely. You are letting go of the will to control and to comply so that you can open space for other processes. When asked what should be done to stimulate creativity, actor John Cleese said, "Nothing should be *done*. Exactly the opposite; it's about doing nothing." Research in Cognitive Psychology shows that low level activities – like walking – allow for the generating of ideas by doing nothing.

How

In design thinking many approaches have been developed in which this *doing nothing*, where you are free from the usual constraints, occurs. All the ideating techniques create the circumstances, both mentally and for the team, so that the individual and collective imaginations can speak out. The crucial lesson for facilitators, who might tend to overly instruct the team on their expected tasks, is to create and safeguard these conditions.

In design thinking, the ideating techniques *systematize* the act of *letting go*. Removing the usual conditions requires creation of a safe space for the team where they can feel free to express their ideas. Ideas can be wacky and wild when the team members can trust that their partners will refrain from any (self) criticism, discussion, or rejection that could stop the creative process. Be sure to encourage a positive and open mindset, in which people dare to build upon their own and others' fun and funny ideas.



UMCS



HÁSKÓLINN Á BIFRÖST
BIFRÖST UNIVERSITY



TECHNISCHE
UNIVERSITÄT
DRESDEN



UNIVERSITY OF ECONOMICS IN
BRATISLAVA



IPG
Politécnico
da Guarda
Polytechnic
of Guarda



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM



Design thinking also systematizes the approach by focusing on generating ideas about a specific question or statement based on the earlier definition of a point of view and corresponding *How might we...?* questions. By 'going wide' AND maintaining a specific scope during ideating, you are assured that the solutions you imagine are really connected to the target problem.

You will need to be thoroughly prepared for ideating. Not only a thorough exploration of the problem space but also to develop of a specific point of view on the problem and build an encouraging mindset for your team. Try this playful warm-up exercise, *An extremely bad idea*, to stimulate this mindset with a braindump that you may already know as *The worst possible idea*.

To prepare the team's mindset for ideation, ask them to stand up and, in groups of two or three, laugh and talk about an extremely bad idea that you and the other person have for solving the *How might we...?* question. This short warm-up clears your mind, in a brain dump, and prepares you all to move on to the good ideas in an adaptation of a *Crazy 8* exercise, which originally was used to write or sketch 8 ideas in just 8 minutes. Instead, the exercise Crazy 6 provides just a bit more time so that, in the same 8 minutes, you write down 6 ideas, two of which should be sketches rather than words. Your sketches provide a visual that effectively supports discussion and sharing of ideas by provoking still further ideas and widening yours lens for thinking. Here is a step by step guide to getting started: Each team member gets a piece of blank paper divided into six squares. Remember that at least two of the spaces will be for sketching or drawing your idea.

Set a timer for 90 seconds for each idea for solving the *How might we...?* question; move on to another idea when the timer goes off successively.

After the total 8 minutes of ideating with Crazy 6, each team member will present their top 2 ideas to the rest of the team

The next activity could be **brainwriting**, which differs from brainstorming by providing more opportunities for less vocal team members to contribute their own ideas. Peer pressure that might have limited the generating of ideas is eliminated since brainwriting occurs in silence — combining the group process of brainstorming with the individual process of a braindump.

Begin with 2 brainwriting sheets for each team member. Choose your 2 favourite ideas from the Crazy 6 activity and transfer one to the top left of each sheet. This is where you should transform any sketched ideas you might have chosen into words.

Pass both of your original sheets to your neighbour to your right and receive 2 sheets from your neighbour to the left.

In just three minutes, you will elaborate on the two separate ideas on each sheet. You can propose a variation or a different angle... Whatever seems to improve or develop the idea one step further. Then pass your brainwriting to your right and take the new brainwriting from your neighbour to your left.

Through brainwriting, you contribute to all of the top 2 picks from your team members and finally your original 2 picks with developments proposed by the rest of the team are returned to you. Examine the proposals and transfer your two favourite developments, which may or may not be your own original idea, to sticky notes to post on the wall. For example, on a team of 5, 10 ideas will be posted on the wall to be presented and explained to your team.





After all of the explanations, you **individually rate** the 10 ideas with dot voting, where each person has 2 stickers to “spend” on the idea they like best. You can also use a marker to indicate which ideas you intuitively like best with your 2 dots. In this part of the process, you are looking for transformations that make you enthusiastic: note that your critical evaluation based on strict criteria is done later in the process.

You will begin prototyping on **the 2 best rated ideas**, which implies again that these are not necessarily your definitive ideas since further transformation/improvement of the ideas during prototyping is still expected.

From these 2 prototypes, one will later be the chosen one.

Mindset Tips for the whole process of ideating:

- defer judgement
- be positive and build on the ideas of others
- step beyond obvious solutions
- dare to be associative

Requirements

Time

- Introducing activities: 7 min.
- Warm-up exercise *An extremely bad idea*: 10 min.
- Brainwriting: 3 min. per round
- Each person explaining 2 ideas: 10 min.
- Rating ideas: 10 min

Material

- Crazy 6 template for each team member available here:
- Brainwriting template for each team member
- Sticky notes
- Markers
- Flipchart or Team wall

Suggestions for facilitators

- Start with clear questions
- Stimulate visual presentations of the ideas
- Set time limits. For example, timeboxing helps to create clear and structured circumstances for brainstorming
- Encourage weird, wacky, and wild ideas
- Ban idea killers
- Prepare inexperienced teams for ideation
-



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM



IPG
Politécnico
da Guarda
Polytechnic
of Guarda



- Remember that brainwriting happens in silence and without any interference or spoken communication.

Links/References

Dam, Rikke Friis, & Siang, Teo Yu (2020). Learn How to Use the Best Ideation Methods: Brainstorming, Braindumping, Brainwriting, and Brainwalking. Interaction Design Foundation.

<https://www.interaction-design.org/literature/article/learn-how-to-use-the-best-ideation-methods-brainstorming-braindumping-brainwriting-and-brainwalking>

→ Dam and Siang give specific examples for how to work with these four techniques to make ideating an art form in your skill set.

Dam, Rikke Friis, & Siang, Teo Yu (2019). Introduction to the Essential Ideation Techniques which are the Heart of Design Thinking. Interaction Design Foundation.

<https://www.interaction-design.org/literature/article/introduction-to-the-essential-ideation-techniques-which-are-the-heart-of-design-thinking>

→ Dam and Siang give you a tour of their top picks from the hundreds of techniques that can help you ideate - the pivotal production of the design thinking process.

Dam, Rikke Friis, & Siang, Teo Yu (2020). 14 Barriers to Ideation – and How to Overcome Them.

Interaction Design Foundation. <https://www.interaction-design.org/literature/article/14-barriers-to-ideation-and-how-to-overcome-them>

→ Dam and Siang prepare you for the traps involved in ideation from the perspective of both the facilitator and the participant. DT.Uni recommends reading about these barriers and practicing how to avoid them so that you really are able to enter ideation mode.





Prototyping

What

When prototyping, you are producing an early, inexpensive, and scaled down version of the product in order to learn more about your team's idea/point of view or the user group – or even about the other ideas your team has ideated.

Why

Prototyping is concept development in different media. It reassembles the ideas from your notes, sketches, pictures, maps, and the pivotal written version of your point of view to concretize it all in a specific object or interaction. Rather than simply converting the fully developed idea into a product, prototyping continues the previous phases of concept development in a tangible form. When you think with your hands, your thoughts are different and potentially more dynamic than when you think with symbols and words.

Prototyping results in a specific object, scenario, or interaction that can actually be used and subsequently tested. The goal of prototyping is to carefully consider what aspect of the idea you want to get feedback on. Do not aim to build full versions of your idea, but focus ahead on specific aspects. In building the prototype, your team further develops these aspects **and** is able to get feedback from users. In essence, prototyping = learning.

On the path to improvement and learning, you may fail and this failure will help you discover that your prototype may not be the one. Consider these setbacks instead as important steps in the further development of your concept(s). Rather than develop an attachment to your prototype, try building a few in a rapid and low-fi mode to identify which of the ideas actually has the most potential. Prototyping can even help your team decide which of the ideas to pursue.

As yet another fun and playful activity, you can prototype in many different formats: sketches, paper interfaces, storyboards, with Lego, role-playing, or physical models. By trying things out and building things in a basic manner, children learn and adapt until they get it right. But with the rational mind of an adult, consciously put yourself in play mode so that you can learn even more about the problem facing your team.

How

Although prototyping for design thinking is a playful activity, you will need to structure your approach with some pertinent questions.

1. What is the goal of your prototyping activity? Is it:
 - *to understand the user group better?
 - *to decide within your team which of the ideas you will develop?
 - *to test your ideas or assumptions?
2. What exactly do you want to test?:
 - * whether people like it?
 - * whether people will use it?
 - * whether it fits in the workspace and/or in the organizational culture?
 - * whether people actually interact as you have assumed or imagined?.
3. After you have determined the key components of your idea, you will need to determine whether your prototype should be high- or low-fidelity. **High-fidelity** prototypes look and operate much like the finished product - consider an early version of a software system



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



desiguni.eu

developed using a design program such as Sketch or Adobe Illustrator. **Low-fidelity** prototyping which focuses on the basic features of initial models or examples of the product being tested, is the usual option during the early stages of a design thinking project. Later stages will opt for hi-fi prototyping, when the test questions are more refined. For now, aim for lo-fi to make the prototype rapidly so that you can learn from your mistakes and change quickly in fail fast mode

You can choose from a variety of lo-fi formats:

Storyboard: sketching the script or scenario of subsequent phases in the use of the product (it is an overview of the whole user journey, and therefore not suited for focusing on some details of use).

Sketches: it may seem basic but it is a very creative and effective form.

Paper: interfaces made of paper are particularly useful for early prototyping of digital products, while mock-ups made of paper may show just enough of the functionality of the product/service to make testing possible.

Lego-like prototypes: your inner child may enjoy working with these basic forms and colors to spark your imagination.

Wizard of Oz prototypes: borrowed from the area of software development, this approach that mimics specific functions helps when user testing is done with a human agent that acts out the role of these functions - for example the function of a virtual assistant software, by typing the digital responses. This can be very time-consuming so it can be reserved for a later stage of the design thinking process.

Role Playing: re-enacting a situation is a good way to experience what is going on, and is well-suited when you need an in-depth understanding of the human and interaction part of your design

Physical models: these are appropriate when you need feedback/feedforward on the material form of your design.

Video: this interesting tool for the early project phases can show scenarios, locations, and users in (inter)action..

To help you avoid the common pitfall - taking the first good idea and sticking to that - DT.Uni recommends developing 2-3 rapid prototypes.

Tips

- Get into the mode of thinking by building immediately. Do not begin by thinking first. Your ideas will develop as your prototype grows. The prototyping stage is NOT about explaining in words. Let the structures “speak” to you and be sure that you are listening.
- Don’t spend too much time on details; build it fast, and with the mindset that you can and will make changes and adaptations
- Your competencies in critical thinking will be allied to your ability to “listen” to your prototypes. Remember that your psychological mechanism that loves your own creation above other babies creates an affective resistance to change. Keep the model rough so you don’t step into the trap thinking that *This is it!*





desiguni.eu

- *Remember that*, when you discover that your prototype requires improvements, you will learn more about where to go and what to make next!
- If you are designing experiences, try – when possible – to engage the ultimate stakeholders, those who will be living that experience every day, as co-designers.
- It may help to think about different aspects of the prototype: people; objects; locations; interactions. Ask yourself what your prototype is about and which aspect you would like to learn more about.

Requirements

Time

- Introducing the activity: 5 min.
- Building 2 rapid, low-fi prototypes: 1 hour. Remember that one of these prototypes will be developed further in another iteration.

Material

- paper and cardboard in different colors
- scissors, glue sticks, and tape
- Lego
- large sheets of paper
- sticky notes

Further Suggestions for facilitators

- Teams should determine first what they hope to achieve with their prototype(s)
- Aim to develop more than one prototype
- Too much discussion about what the team plans to build distracts from getting started on the construction
- Active participation is key

Links

Dam, Rikke Friis, & Siang, Teo Yu (2020). Stage 4 in the Design Thinking Process: Prototype

On the difference between low- and high-fidelity prototypes. <https://www.interaction-design.org/literature/article/stage-4-in-the-design-thinking-process-prototype>

→ Dam and Siang prepare you for the pros and cons of both types of prototyping.

Creative Charlie (2016). Design Thinking - Paper Prototypes.

<https://www.youtube.com/watch?v=85muhAaySps>

→ This 2-minute video shows you the paper prototype for a dog food shipping package, enabling testing of content and size as well as the unpacking experience and clarity of instructions.



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



Critical Thinking

Critical thinking is a desire to seek,
patience to doubt,
fondness to meditate,
slowness to assert,
readiness to consider,
carefulness to dispose and set in order,
and hatred for every kind of imposture.
Francis Bacon (1605)

What

Critical thinking requires that you reflect on the information you use, the assumptions you have, and the values that guide you in the choices you make. This reflection is a self-directed way of learning that starts with an examination of your thoughts so that your decisions are well-informed and thoughtful.

Why

Your work, design vision, reasoning, and even self, according to philosophical tradition, will improve when you make time for critical reflection. In the Aristotelian pursuit of excellence, reaching your potential as a rational human being requires that you critically reflect to avoid the biases, incomplete information, distortion, and prejudices that affect your choices and ideas so that you can improve, learn, and grow.

In addition to this classical background of critical thinking, present-day contexts define the goals of critical reflection in a world of rapidly changing and dynamic environments predicated on an abundance of information that is highly connected and quickly outdated. The strong focus on ongoing learning, where you “learn to learn” includes critical reflection for improvement and renewal by identifying what may be lacking, outworn, biased, or distorted.

In the specific context of design (thinking), critical thinking incorporates reflection on the choices that are made, many of which are based on not only a scientific analysis of data but also the values of the design team. Software program developers, for example, have made a number of value-laden decisions in the case of the self-driving car. Whether the car, in case of an accident, should bump into two young people that cross the street, three elderly people on another lane, or even sacrifice the driver itself. It is not possible to objectively ascertain the best decisions; instead your decision depends on your values, what you deem important and good. To experience the difficulty of moral dilemmas, why not play MIT’s experiment “The moral machine” at <https://www.moralmachine.net/>?

Where objectivity is required for scientific work, this detachment is impossible in design, where the subjective level of values and worldviews are harnessed with a singular pragmatic purpose — to improve a specific challenge in a specific context. You cannot make a neutral and distanced analysis when you empathize within a problem space and get in touch with the deeper motivations of users. The “preferable future” which is the aim of design, refers to Herbert Simon, one of the founding fathers of the design disciplines, who determined “Design can broadly be defined as deliberate action aimed at turning existing living conditions into preferred ones” (Simon, p. 111).





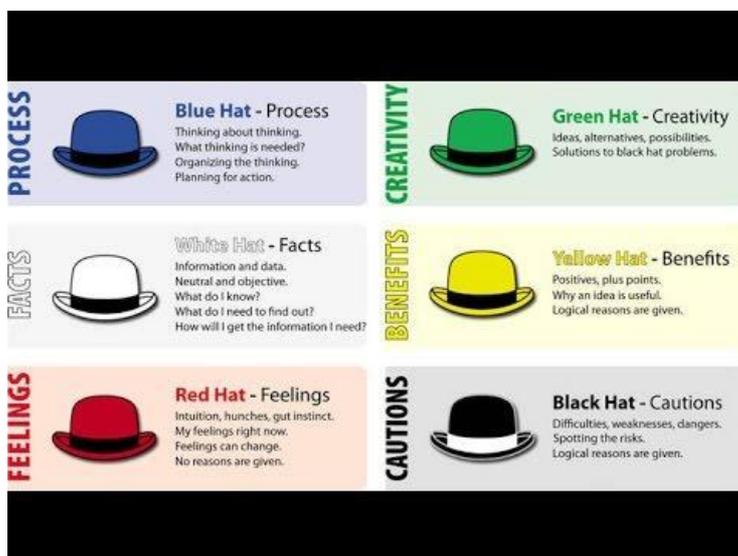
But the questions abound: What is preferable to the existing situation? And preferable to whom? And who decides? Design thinkers must think about the preferred situation that they are trying to create. And *think for themselves*, without allowing that their thinking be governed by stakeholders or senior managers, or the dominant beliefs in an organisation or society. When design really improves and innovates on a human basis, the designers apply critical thinking to determine the value of what they want to achieve with their work. Designers, as problem solvers and inventors of the future, have a *responsibility*. Designers must ward off distorted information, prejudices, and assumptions to fully integrate critical thinking into the design process.

How

In this stage, take a step back from your intense involvement in developing solutions to your challenge. Reach a meta-level by asking these pivotal critical questions to discuss the assumptions, possible biases and prejudices, and preferred situation in your design work:

- Were the methods to collect the information sufficient? Is the information that your design vision is built upon sufficiently reliable?
- What are your possible biases and assumptions in the design vision? point-of-view? prototype?
- What values inform the design? What values are pivotal in the decisions you have made?
- What is the preferred situation that your work aims at?

The next step further is to try a variation of Edward de Bono’s famous “Six thinking hats” by wearing these hats in representation of different points of view, where each of the perspectives will contribute to the decision-making process and help you avoid possible pitfalls. In de Bono’s version, the six perspectives aim to look at the problem to make a decision based on 1. available data (white hat); 2. intuition, emotion (red hat); 3. negative outcomes, difficulties (black hat); 4. benefits, optimism (yellow hat); 5. creativity, alternative possibilities (green hat); and 6. process control, planning (blue hat).



Source: DeBono, Edward (1985) Six Thinking Hats. Little, Brown, and Company.





In the version here adapted to five-person teams (teams need not be bigger than five persons; preferably four or five persons), the green hat of creativity is conflated into each of the remaining five perspectives:

- Critically assessing available facts from data and methods (white)
- Taking an intuitive, emotional approach to the design work (red)
- Seeing only negative outcomes and difficulties of the decisions and vision (black)
- Seeing only benefits of the decisions made and the design vision (red)
- Taking a rational, planning approach to the design work (blue)

Partner up if there are more than five on your team; if less than five, leave one perspective out. The discussion can begin when each team member puts on their hat.

This first reflection pause, which occurs during the design work, is mainly aimed at improving the point-of-view and prototype(s) that your team is working on. At the end of the design work, another important opportunity for learning occurs when you have finished the activities and can reflect on them to discover what can still be improved in your toolkit of skills for solving complex challenges by asking the following questions:

- What surprised you? What can you learn from these surprises?
- What would you do differently next time? Why?
- Which of your skills and personal qualities are well-suited for solving complex problems? Which would you like to develop more?
- What did you learn on problem solving strategies and methods for dealing with complex challenges? Why did these (not) work? How did they differ from other strategies that you were already familiar with?
- In which situations would you want to apply things you have learned here?

If you have time, ask the earlier questions for reflection again:

- Is design just a neutral problem-solving activity?
- Can you identify the value-laden decisions that imply your personal involvement?
- If you can find the reflections of your own worldview, your values, and your assumptions throughout the design thinking process, what have you learned about yourself as a person and as designer?

Fill out the questionnaire on paper or digitally and, with your team, share two of the most remarkable findings. You may find tendencies that you will want to discuss further.

Requirements

Exercise during the design work

Time

- Introducing the activity: 5 min.
- Introductory team discussion of the assumptions, possible biases, and prejudices, and preferred situation in your design work: 10 min.
- Playing “five thinking hats”: 15 min.
- Discussing the outcomes: 10 min.

Material

- Symbolic hats, represented by a simple strip of coloured paper or ribbons in white, red, yellow, black, and blue



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



Exercise at end of the design work

Time

- Introducing the activity: 5 min.
- Individually responding to the questions: 10 min.
- Discussing outcomes: 20 min.

Material

- Form “Post-Design questions”, digitally or on paper

Suggestions for facilitators

“Five thinking hats”

- Each team member should have an equal opportunity to communicate during the discussion
- The symbolic hats only work when everyone respects their roles

Reflection afterwards

- The reflection is not merely additional. Important learning takes place and articulating the takeaways requires this dedicated context.
- Respect the carefully planned time indications
- Consider keeping a personal portfolio of this and other design thinking processes

Links/further reading

DeBono, Edward (1985) Six Thinking Hats. Little, Brown, and Company.

→ This prolific Maltese author, professor of Thinking and Psychology at the University of Oxford, originated the term *lateral thinking* and created the Six Thinking Hats, among other essential activities for growing your thinking skills.

Elder, Linda, & Paul, Richard (2007). The Miniature Guide to Critical Thinking: Concepts and tools. Dillon Beach, CA: Foundation for the Art of Critical Thinking.

→ The authors provide a visual tour of tools associated with critical thinking.

MIT’s exercise Moral machine: <http://moralmachine.mit.edu/>

→ On this platform, you can simply browse complex moral dilemmas made by machine or judge and even create your own scenarios.

Lemans, Rafiq (2016). Guide for Critical Thinking for Designers. <https://www.designorate.com/guide-for-critical-thinking-for-designers/>

→ The author goes over Ohio University’s Larry Larson (1990), whose paper in the *Journal of Biological Education* covers guidelines for critical thinking, also available at <http://www.wright.edu/~elliott.gaines/criticalthinking.html>

Critical thinking modules and resources. <https://philosophy.hku.hk/think/critical/>

→ Tutorials on critical thinking

The Creative Pause Technique

<https://thoughtegg.com/the-creative-pause-creative-technique/>

Beyond Design Thinking

<http://www.cd-cf.org/articles/beyond-design-thinking/>





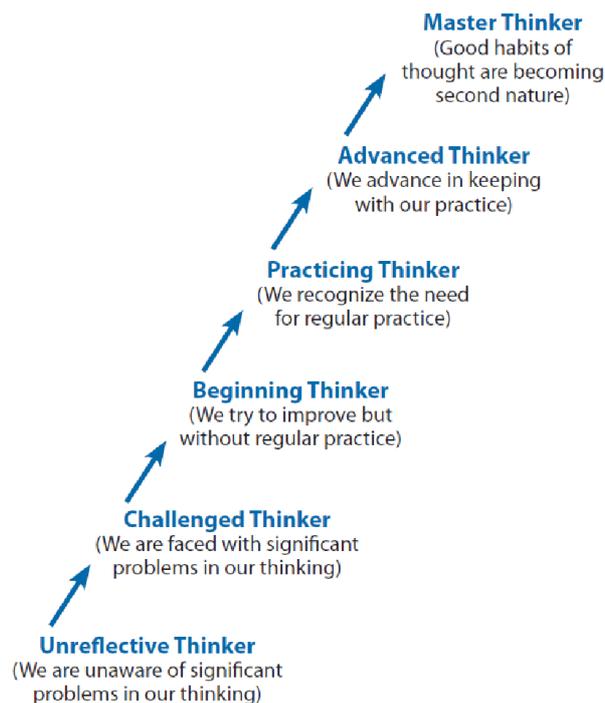
desiguni.eu

Simon, Herbert (1996). *The Sciences of the Artificial*, MIT Press.



Source: A Taxonomy of futures, redrawn by Stuart Candy, from Dunne, Anthony, & Raby, Fiona (2013). *Speculative Everything: Design, Fiction, and Social Dreaming*.

Stages of Critical Thinking Development



Source:

Elder, Linda, & Paul, Richard (2007). *The miniature guide to critical thinking: Concepts and tools*. Dillon Beach, CA: Foundation for the Art of Critical Thinking. p. 22 www.criticalthinking.org





Iteration

What

When you iterate, you repeat what you have already done in order to improve, which means that the stages in the design thinking process are not simply sequential.

Why

For some, iteration is a strange activity because they imagine that things they have already done are fixed and finished. In design using an iterative mindset means that you assume that the information you have gathered, ideas and prototypes you have developed are NOT yet finished despite your efforts to develop them; instead, they are just a first attempt that will require far more elaboration. Iteration obliges you to get involved in a continuous loop of learning, which puts it at the heart of a design thinking process.

The design thinking process is suited to deal with problems that are 'wicked', meaning that there is not one simple solution. In many cases there even isn't a steady problem definition because many interdependent factors can cause the problem. For example, what is exactly the cause of poverty, or of climate change? To fight climate change, for example, should we focus on CO₂ emissions, reconsider our traveling habits, cut back nitrogen emissions in agriculture, reflect on our consumption patterns, make our cities bike-friendly? In such wicked problems, the interconnection of all these factors means that the phenomenon is not only impossible to grasp in its entirety but also changes over time. We need a problem-solving process that can deal with multifaceted conditions, that invests sufficient time in developing a relevant point-of-view for the issue, and that provides opportunities to adapt and learn during the process.

To find a valuable solution to a wicked problem, you must gain a deep insight into the many elements involved, and learn how to (re)frame the problem, which will necessarily result in a new and creative approach. Because you never know whether your solution is final, you cannot simply test your solution to determine whether it is 'right'. The designers can neither hide behind assertions that they are 'right' nor excuse their actions and solutions by saying that they found out that they were 'wrong'. The solution that design thinkers develop goes beyond these (analytic) categories of right and wrong, which requires that they take full responsibility for their actions. They have to be able to continuously learn and adapt to come up with something that is valuable.

Continuous loops of testing, getting feedback and improving the prototype are of course also part of other strategies such as Agile and Lean, particularly in software development. Although these iterative approaches work well for product development, they imply a strong conviction of what the 'right' idea is. The subsequent processes of rapid prototyping and testing then aim to meet the stakeholders' changing requirements. Where iteration in Agile and Lean is part of developing the 'solution space', in design thinking, iteration is also part of discovering the 'problem space' involving the idea or frame that is used. For example, a team may find that its unique design vision is not working and that its point-of-view must be adapted or more information from field research is required, or that other elements of the system must be taken into consideration. In design thinking, iteration dominates the whole process, thus putting the design team in a continuous mode of learning to be able to deal with wicked problems.





How

Of course, you cannot continuously repeat the steps that have been taken. Iteration has a pragmatic side to it which means that teams should try to get feedback and learn within the time and resources available. The first lesson on how to implement iteration in design therefore is that it is primarily a mindset for continuous learning, where iteration guides the whole process. The second lesson is that, during a design thinking process, it is good to explicitly devote some (session) time to a 'repetition' of steps that might be considered done.

Practically this means that it is suggested to develop not one, but two or three rapid prototypes: this transmits the message that there is not just 'one right solution' and that learning must continue.

Then, if in a next step one prototype is chosen, try to get feedback from a wide range of stakeholders.

Make getting feedback a structured process (see Testing Grid)

Devote another session to a further (iterative) development of that one prototype in which the feedback is integrated.

Conditioning factors like the time and resources available will determine how many of these learning loops can be actively executed in these sessions. The main message is to stimulate these learning loops in the minds of the team members. Create a work environment that is playful, allows for curiosity and input from unexpected perspectives (invite an artist and the like), relieves the stress and notions of 'reaching targets', etc.

Requirements

Facilitators, stakeholders (predominantly the case provider) and workshop times that leave room for 'giving things another try'

Time

Introducing the importance of iteration: 10 min.

A second prototype development: 50 min.

Material

For prototyping

Suggestions

See iteration primarily as a mindset issue of continuous learning so that you recognize that it stimulates curiosity, wonderment, reflection pauses, discussions, etc.

Focus on developing habits in which teams integrate what they have learnt, such as taking another look at the frame, users, information from field research ...

Develop not one but several rapid prototypes

Make the one prototype that is eventually chosen not a 'one shot operation', but devote a second prototype development session to its iteration based on acquired feedback



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



Further reading/links

Wong, Euphemia (2020). What is a Wicked Problem and How Can You Solve It? Interaction Design Foundation.

<https://www.interaction-design.org/literature/article/wicked-problems-5-steps-to-help-you-tackle-wicked-problems-by-combining-systems-thinking-with-agile-methodology>

→ This article details the five steps for tackling wicked problems and offers an example from a big-box store.

Mueller, Roland & Thoring, Katja (2012). Design Thinking vs. Lean Startup: A comparison of two user-driven innovation strategies. Paper presented at the 2012 International Conference on Design Management Research: Leading Innovation through Design Process in Boston, MA, 8-9 August.

https://d1wqtxts1xzle7.cloudfront.net/43840251/Leading_Innovation_through_Design_Procee20160317-10435-1rg9nmt.pdf?1458268120=&response-content-disposition=inline%3B+filename%3DLeading_Innovation_through_Design_Procee.pdf&Expires=1600534684&Signature=JXD8hT2-KhmuhVMhGI52axqU~zmRIFZhouXil9mOC2yNzYzCYV2p5~IP7RFQ5-M12rB~toaz8BHGSIGhwYWram3dtb5WxfSraSsg2dlQrtcnH~7IbaijiG1Od29rw9UFI5f-8LrdFOiy5gvezKadkWe4LJ2iPwdsPz6IRcdOMXyBteElsYmzmptx-rXS0m35IT3I57hmanELTvyrSgvDVvJ51O4CQeYfUMb1JHMc2LOulnT9wXnb44D91gu21YgaVRrO1vO~7H0WQdm2pmfBfCFeeK7c3LXXQ0AoqJynP0u82Ecr4Y~TgR-a86oaxb-PHtk9pkVLhgRP0RcjYWe6w &Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA#page=181

→ This article by professors at the Berlin School of Economics and Law and at Anhalt University of Applied Sciences examines in detail the difference between Lean Startup and Design Thinking. In particular, the activity of iteration is explained more from the perspective of software development, providing opportunities for further discussion.





Testing

What

Through testing, you and your team are getting a prototype into the hands of your users. In the early phases, by using concept testing with low-fidelity prototypes, you can determine how users feel about your product.

Why

Design thinking is situated at the early stages of the innovation funnel, where new ideas about how to deal with complex challenges still have to be sorted out and developed. Testing in design thinking can be more accurately described as concept-testing, where you discover how users evaluate the approach your team adopted to the problem situation. Testing will reveal whether you are on the right track or whether you will need to alter the unique design vision (point of view) that has been developed.

In subsequent phases, when you have gathered sufficient evidence of the value of your approach and the corresponding prototype, testing can then focus on refining the prototypes. In any case, the results/feedback of testing are used to inform a next iteration of concept- or prototype development. Thus, testing is an advanced form of empathy where you get in touch with your users or stakeholders not by observing or studying them, but by observing them while they experience 'your solutions to their problem'. This may reveal unexpected insights.

How

At first glance, testing may appear to be a simple activity of simply putting your prototype in front of your users to see whether they like it or not. However, to enrich your testing, answer questions that will focus your testing. Before you show your prototype(s), answer the following questions in your team:

-Who will test your prototype? (team-mates or people close by for rough feedback; extreme users for incisive and detailed feedback). Note that this diverse range of 'test-audience' means that you and your team must make an active selection of appropriate testers according to your needs. **

-What exactly are you testing for? You will need to aim for clarity on the specific aspects or functionalities which are the most important to get feedback on.

-Where will you be testing? Will your team's working space suffice or should you transfer the experience to the user's environment? If your prototype is a physical object, you can ask users to actually take it with them to use in their normal routines. If it is an experience, you can try to create a scenario in a location that would simulate the potential situation.

** In the early development stages, feedback from **users** is important and sufficient since you aim to find out how users feel about your idea. In later stages of your project, you should also get feedback from **stakeholders/experts** so that you are simultaneously working towards implementation of the prototype, which enables you to determine whether it is an appropriate fit in the specific organisational context(s).

Questions to ask stakeholders/experts include:

- What resonates with you?
- What surprises you?
- What do you think is missing?





Guidelines

1. In the early stages of the project, let users compare several prototypes. Bringing multiple prototypes to the field to test will avoid tunnel vision since you are still in the phase of understanding whether your approach is valuable. Note that comparison can reveal the best feedback given that users may find it hard to be honest and critical towards only one prototype.

2. Track your feedback. Be systematic while observing and listening to the users experiencing the prototype. Use the feedback/testing grid where you will want to record, verbally or visually, the following information in each of the four quadrants:

- what users like
- their (constructive) criticism
- new ideas you got, suggestions from users
- questions that the testing experience raises (either by you/your team or the users)

During the testing, take advantage of the opportunity to easily organize your notes on the points raised by the users or things that you and your team come up with.

3. Capture the rationale of the feedback. After the feedback session, get together with your team and use sticky notes that you will post on your team wall to discuss/share what pivotal aspects of the feedback can be used for next iteration.

4. Don't explain everything. Carefully watch and listen as your tester interprets the prototype then ask why and other follow-up questions. This approach will capture your user's reactions to your prototype more accurately while avoiding testing to become an explanation that your user is evaluating. You can opt to only tell the users what problem your prototypes are meant to address and then step back and observe before asking your follow-up questions. Be sure to refrain from 'selling' or defending your idea.

5. When you let users voice their thoughts while experiencing the prototypes, you must also remain open to eventual negative feedback.

Tips

1. Consider distributing roles for you and your teammates during the test:

The host can give users the basic context they need to understand the scenario

Players can role-play parts in the scenario your team creates

Observers can do just that: watch and take notes while the users experience the prototype.

2. You can frame a more realistic situation by giving the users a specific role to play or a task to carry out with the prototype. Conduct the test in the user's natural environment in the best-case scenario but, if it isn't possible, encourage role play to demonstrate how the prototype would actually be used in a real-life setting.

3. Stimulate users to contribute ideas that build on your prototypes. Ask your users for suggestions as to how the product or service could be improved.





Requirements

Time

Introducing the activity: 10 min.

Preparing the team's questions for testing: 5 min.

Testing and collecting feedback: 15 min.

Discussing feedback results with your team: 10 min.

Material

One test-grid on a full sheet per team member

Sticky notes for writing main results to be posted on the team space wall

Pens

Suggestions

Prepare the questions with your team to focus testing first

Pay attention to the guidelines and tips for testing

Feel free to simulate and role-play so that testing can occur in (nearly) natural user-environments

Remember the importance of discussing and understanding the test results with your team

Links

Dam, Rikke Friis, & Siang, Teo Yu (2020). Test Your Prototypes: How to Gather Feedback and Maximise Learning. Interaction Design Foundation.

<https://www.interaction-design.org/literature/article/test-your-prototypes-how-to-gather-feedback-and-maximise-learning>

→ This IDF article offers six tips and practical examples for gathering feedback.





Storytelling

What

Storytelling is used to relate a series of events that happened to a specific character. In design thinking, storytelling helps to articulate your design vision by communicating the value of your team's work to an audience (of stakeholders).

Why

Given that design thinking is all about the processing of information, from collecting data to making sense of it, the value of which must be communicated to your audience, preferably in the deeply human way that is storytelling. We all love stories – and for a reason. They transform information to be engaging for others who can then participate in your vision. Stories go beyond the intellect's rational capture of the message to address the affective side, creating emotional connections. Storytelling is a powerful means of communicating the value of your prototype.

In design thinking, storytelling's role throughout the process is not limited to the implementation phase where you share your ideas with stakeholders and seek to implement the ideas in their organizational settings. It also plays a role in the Empathy phase where you aim to understand the emotional experiences of your users. Through stories, users can transfer their subjective knowledge to you. Remember that the activity 'A Day in the Life', involves users (or representatives) who tell the design team about their personal experiences in an ordinary working day.

When sharing all the information gathered during field research amongst the design team members, the convergence of this data will develop a unique design vision, point-of-view or frame – the pivot of the design process. This convergence is not only about scientific analysis to find the right conclusions from all the data or mining it for patterns. *Interpreting* the data is essential to understand the meaning in the specific context of the design challenge. Storytelling, where you exchange information with your teammates to get a clear idea of what they mean, is an important aspect of this sense-making process.

Coherence is the organizational principle of this 'humanistic' way of making sense of the data. To begin with, your story should be coherent, with a plot and a clear narrative structure. In storytelling, your claim relates to meaning, 'how it really is' *for humans*. Note that the truth-value of your story will be determined by the quality of this coherence, which differs from the exact sciences where the organizational principle is the *correspondence* of your assertions to facts that relate 'how it really is' in the physical world.

How

The essence of your story must be clear. What specific idea do you want to convey? You will want to select and prioritize the essential aspects you intend to share.

Create a clear structure so that your story has a sequence with a beginning, a middle and an end as well as a plot and/or a dramatic turn, which could be the problem itself and how it can be overcome. When you focus on this conflict or core paradox, you will include information about what made the problem so difficult to solve and how your frame/approach is essential to overcome these difficulties.

By including a character in your story, you can express human truths to generate empathy and interest from your audience. Tell your story around the Persona your team created using a fictional or real-life scenario. Be sure to explain the transformation of your persona



UMCS



TECHNISCHE
UNIVERSITÄT
DRESDEN



SAPIENZA
UNIVERSITÀ DI ROMA



BIRMINGHAM CITY
University



UNIVERSITY OF AMSTERDAM

IPG
Politécnico
da Guarda
Polytechnic
of Guarda



Steps

1. Identify an initial problem and your ideal, which you can think of as your guiding star.
- 2a. Identify pivotal insights from your field research and your discovery of a crucial theme
- 2b. How do your design vision and prototype enable your team to overcome the initial problem?
3. What does your vision imply for the organisational context?

Tips

Incorporate some detail, like interesting quotes or a particularly significant situation

Use what you have learned during the design process

When you include a bit of yourself and your personal experiences, your story is more convincing

Video is a powerful medium for communicating ideas, insights and stories

Your visual aids should be selected and used carefully. Converse with your audience instead of reading your slides. Avoid the temptation by using just a few words on each slide

Prepare for interaction and questions

Practice makes you better. Ask someone to let you rehearse on them and see if they grasp the message of the value of your team's work

Suggestions

Prepare your team's story carefully. It is not a mere addition after 'the real work' of creating a prototype

Verify clarity of meaning and structure

Instead of a designated storyteller, get all your team members involved in the preparation and presentation of the story

References/links

SkillsYouNeed (2017). Top Tips for Effective Presentations. Skills You Need: Helping you develop life skills. <https://www.skillsyouneed.com/present/presentation-tips.html>

→ This page offers ten helpful suggestions to boost your confidence.

Nuts & Bolts for PowerPoint. 15 Storytelling Tips and How to Apply Them. <https://nutsandboltsspeedtraining.com/storytelling-tips/>

→ If you decide to use PowerPoint, check out these tips. We particularly appreciate the suggestions to include twists and metaphors as well as the need to make your data memorable. Note, however, that, if you decide to tell your story without a digital source, be sure to check out the following link...





Bajaj, Geetesh (2014). Analog Storyboards. Indezine: Make better presentations fast!
<https://www.indezine.com/articles/analog-storyboards.html>

→ The author considers why we prefer a paper storyboard over an electronic storyboard.

Brosseau, Denise (2020). Resources. Thought Leadership Lab.
<https://www.thoughtleadershiplab.com/Resources>

→ In her list of resources, the CEO of Thought Leadership Lab recommends diverse activities that can help you develop your ability to tell stories.

Friis Dam, Rikke (2017). Everyone Loves a Story, and We are All Natural Storytellers. Interaction Design Foundation. <https://www.interaction-design.org/literature/article/everyone-loves-a-story-and-we-are-all-natural-storytellers>

→ Stories are the antidote to information overload! If you are still not convinced that storytelling is not just for children, this reading will help you sort it out.

Elmansy, Rafiq (2018). The Role of Storytelling in the Design Process. Designorate.
<https://www.designorate.com/the-role-of-storytelling-in-the-design-process/>

→ This reading includes more details about the correlation of storytelling in the design thinking process.

