

HIGH SPEED DESIGN

An exploration of methods for ideation and documentation as part of the rapid design process

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June, 2022

Abstract

Early in the design process, during the “ideation phase”, it is important to generate a lot of ideas in a short period of time.

This part of the creative process often leads to an overwhelming amount of ideas, usually resulting in a large pile of post-its or a whiteboard covered from top to bottom in words. After these sessions, what ideas were had, which were important, and how the ideas were formed is often hard to retrace. Part of this research is finding ways to structure these sessions to have more potent and documented ideation sessions as a result.

This is done by gathering and assessing different design-methods and testing them on small-scale design projects. The experiences of applying these design methods are mapped, visualised and reflected upon.

In the end, the insights gathered from the previous research steps are combined to create a “design guide” with steps and ingredients that guide designers on their way when generating ideas.

The judgements made during this study and the design guide that resulted from those judgements and experiences are very personal to the writer of the study. However, the steps taken could be applied by other designers to analyse and reflect on their own design process.

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1 Introduction

1.1. Context

For context, I should explain a little about myself and what my motivations were that drove me to take on this thesis project: I'm a multidisciplinary designer; someone with a wide range of skills originating in different design disciplines. Due to this, I am able to look at problems from a meta-view and am always searching for commonalities in the ways problems are approached by these different design disciplines, to find fundamental steps taken in as part of the design process. A phase that I found particularly omnipresent and fascinating in all these fields is the ideation phase: a phase where, using methods such as brainstorming and rapid prototyping, ideas are generated and evaluated in fast succession.

In my experience this part of the process often leads to an overwhelming amount of ideas, usually resulting in a large pile of post-its or a whiteboard covered from top to bottom in words. After these sessions, what ideas were had, which were important, and how the ideas were formed is often hard to retrace. Part of this research is finding ways to structure these sessions to have more potent and documented ideation sessions as a result.

I am a person who always has a large number of ideas and unfinished projects lying around, by getting more insight into the structures behind the ideation process I hope to get better at evaluating and pursuing these ideas in a quick way, and to make a dent in the ever-growing idea pile.

1.2. Goal

The goal of this research is to create a design-guide for the ideation phase of the design process. This guide will contain methods to aid the generation of ideas and the creation of "high-quality" design artefacts that can be presented, studied, or tested afterwards.

This study is set up in a practical and explorative way and can be applied to real world ideation sessions.

The study will be executed in two distinct research phases. Firstly a desk-research or "Critical Review" phase during which existing methods are investigated and ranked according to criteria relevant to the type of project this study is aimed at. Furthermore, a selection and assessment of various design-guides is made. In the second phase of the study, the selection of design-methods that results from the first phase is tested by applying each method to small-scale design projects.

Insights and experiences from these real-world tests will be reported and reflected on and a map is made of what method can be best applied when.

Finally, a design-guide is created to visualise the mapped methods gained in the second phase, this will be done in the way that was chosen during the last step of the Critical Review phase.

Since certain aspects of the design-method evaluation process are personal to each designer, the outcome of this study will be slightly different for everyone who executes it, in the Result sections of this paper you will find the results of me applying this study to my own projects; resulting in a design-guide that is personalised to how I work and what I value as a designer. However, this outcome might also apply to other designers.

This study is in effect a step-by-step guide on how to create your own design-guide and I encourage everyone who reads this to follow the steps and apply these to their own design process.

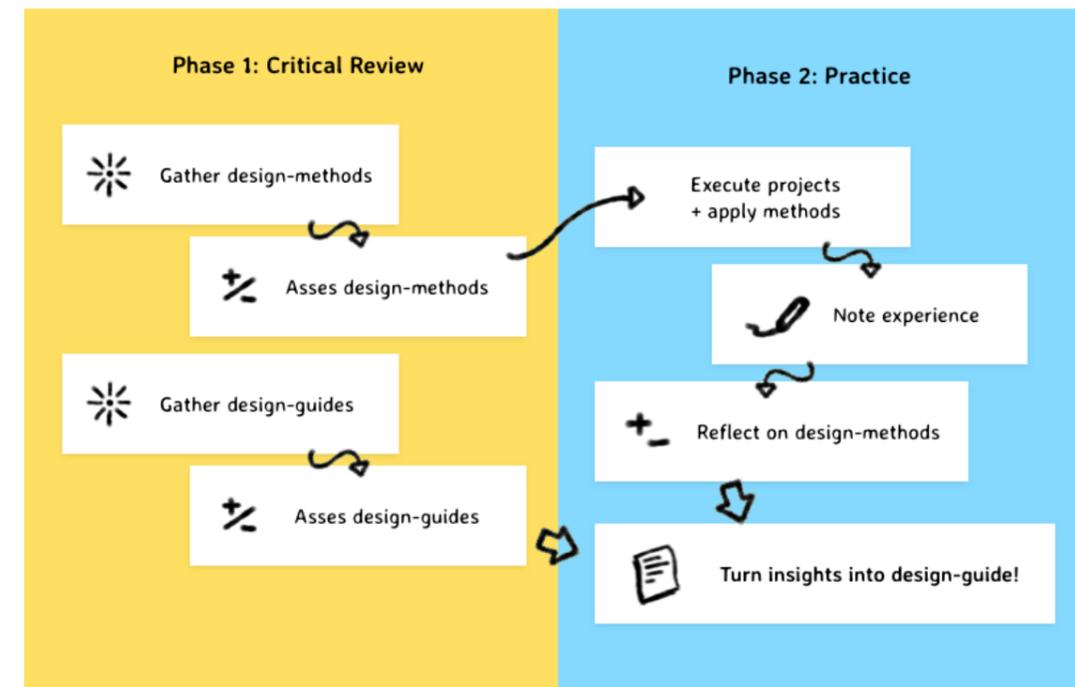


Fig 1. Research Phases

1.3. Expected Results

The first phase of this study will result in an assessed list of design methods and an assessed list of design-guides.

In the second phase these design methods will be tested and ultimately mapped in the form of a personalised design-guide, based on the guides resulting from the first phase.

By the end, the designer that executes this study will have a personalised design guide.

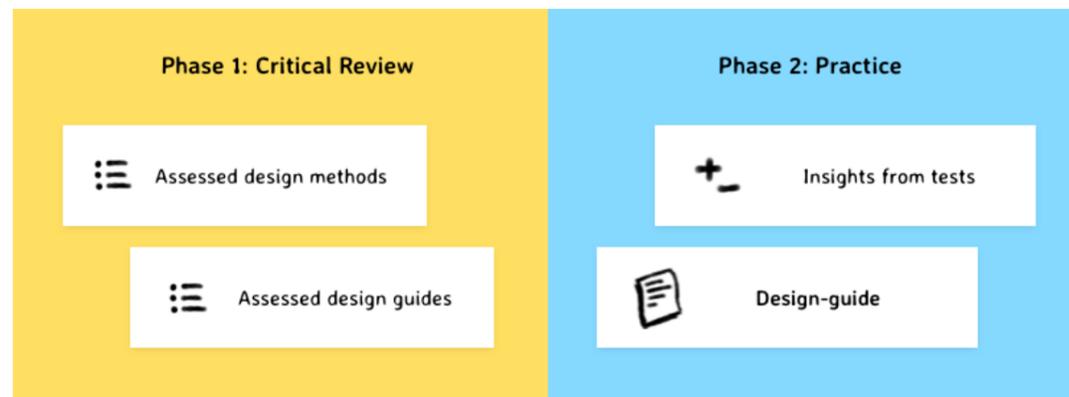


Fig 2. Expected results from each phase

1.4. Relevance

Due to the nature of the study and the wide range of design methods that are tested, this study can be of relevance to designers of any specialisation. The ideation practice is relevant to product design, visual design, interaction design, my personal field of audio design and potentially many others.

1.5. Limitations

Due to the timeframe for the study and decisions about the scope of the study some limitations will be present. Firstly, the second phase test will only be applied to personal projects, team-based methods could be a point of further study. Secondly, coding the data and artifacts gathered from the second phase could offer more insights. Lastly the amount of projects done as part of the second phase is limited so the study will be qualitative rather than quantitative.

1.6. Background

Design Thinking

Design Thinking is a broad term referring to a system of creative thinking based on models and processes used by designers. These models can be employed to come up with creative and innovative solutions. Although originating from the field of design, Design Thinking has since been used by businesses to further and accelerate innovation. [1]

Design Thinking in its current form is used less by designers and more in management circles but the models derived from the movement can still be useful for defining parts of the design process, as is the case with this study.

Ideation

When referring to ideation, I will be using the IDEO 3 I's model as a definition.

“ After identifying the context by observation and design research, the Ideation space of the Design Thinking process starts: an interdisciplinary team goes through a process of synthesis in which they distil what they have observed and learned, into insights that lead either to opportunities to change, or immediately to new solutions During this brainstorming process, visual representations of concepts are encouraged, to help others to understand complex ideas [1] ”

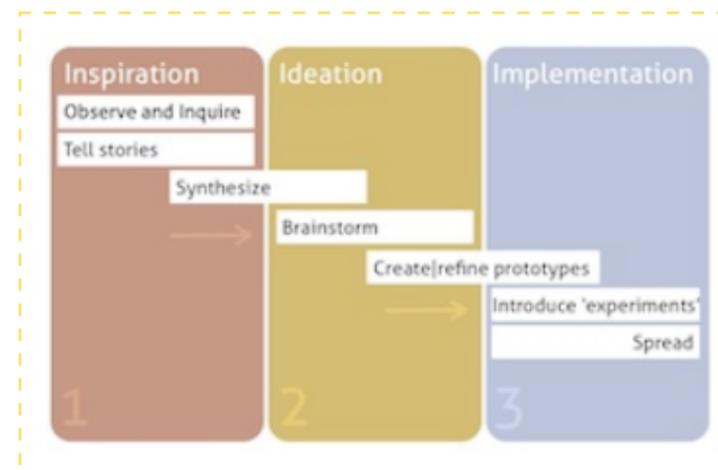


Fig 3. IDEO 3 I's Model

1. Design Thinking as an effective Toolkit for Innovation, Tschimmel K. (2012)

1. Design Thinking as an effective Toolkit for Innovation, Tschimmel K. (2012)

2. Sources of inspiration: a language of design, Eckert C. (2000)

3. Drawings and the design process, Purcell C. (2006)

Sketches

Sketches have long been used by designers during the design and ideation process to visualise and clarify their thoughts, to others as well as themselves. [1]

Sketches allow designers to extend their 'mental imagery'. By drawing what they see in their head they are better able to appreciate the form and use of the object they are sketching. Seeing the sketch in front of you can allow you to see certain aspects or problems in your design that wouldn't have been thought of without the visual aid. [2]

Goldschmidt defends that sketching is an extension of the "minds eye" and Schön goes as far as to characterise designs as an interactive conversation between mind and sketch. [2]

“ The authors consider these unintended consequences of a move as giving the designer access to other domains of their knowledge that are relevant to the design being worked on but which were not a part of the designer's thinking at the time the move was made [3] ”

Sketches, of course, are not limited to the visual "pen and paper" domain. Designers can use software to quickly compose and record audio sketches, make rough three-dimensional objects in modelling software and in general use the tools that are part of their specific design profession to create sketches.

Prototypes

Prototypes are a next step up in fidelity from sketches, prototypes come in many different forms but are distinct from sketches in that they allow a (rudimentary) degree of interactivity. They allow the designer, users or clients to get a view of not just the superficial aspects of the design but also *how* the design might operate.

Some definitions of prototype don't include a requirement for interactivity but emphasise the physical nature of the created artifact and an increased level of fidelity over a regular sketch [1]

Prototypes are usually created using materials and tools that allow for rapid creation and iteration. Physical prototypes can be made out of paper or cardboard, or digital tools can be used to add interactivity to already existing designs.

Prototypes don't require implementation using the same methods and tools as would be used for a final product. Methods like the "Wizard of Oz" method involve faking the interactive aspect of the design to quickly test an otherwise non-interactive prototype.

Artifacts

Artifact is a term used throughout this paper to refer to individual sketches, fragments, prototypes etc. generated during the design process.

An artifact can be created as a visualisation, materialisation or sonification of an idea or simply a collection of written down ideas.

Additionally to the materialisation of ideas, artifacts can also give insight into the order and thought processes that took place during the design process.

Documentation

To give insight into the inner workings behind the idea created during the design process or into the actions taken during the design process itself, documentation is created. Documentation usually comes in the form of a collection of artifacts that is presented as-is or elaborated upon.

In this study, the main focus will be on documentation that is created during or as part of the ideation process. In a way that limits friction and maximises insight into generated ideas and retrace-ability of thought processes.

2. Phase 1

Critical Review

Method
Result

2.1

Method

Each phase of the research is split into two chapters. Firstly, a method chapter that describes each step taken during this phase of the research. This first chapter is written in a way that it can be universally applied by any designer that wants to execute this research. Secondly, a chapter containing my personal practice and execution of the aforementioned method.

Moments of personal judgement and decision making will be marked clearly with examples personal to the writer of the paper.

1. Gather design-methods

Investigate a variety of sources and gather design methods relevant to the ideation process. Gather these methods from both academic sources as well as literature written for designers since both have different but relevant perspectives and information.

Make sure the methods you're gathering are relevant to the individual design process, either because the method is stated to be applicable to individual projects or because you think that (with minor adjustments) it could be used on individual projects.

2. Assess and rank design-methods

First, decide what your requirements are for the artifacts you want to generate as part of your ideation sessions. Make a list of at least five different criteria to weigh each design-method against.

Assemble a list of however many design methods you want to test and rank them based on the criteria you decided on.

Per example, see [Fig 4](#) for the the criteria I used.

3. Gather design-guides

In a similar fashion to the first step, gather relevant design-guides. Look at sources aimed at designers and make a collection of at least four design-guides. Make sure these guides have a variety of ways in which they present their information and methods.

4. Asses and rank design-guides

Assemble a list of design-guides that each offer a unique view of how to present the information in the guide.

For each design-guide reflect on how the information is presented by answering these questions:

- Elaborate on how each guide represents its individual methods
- Elaborate on how each guide categorises its methods or guides the viewer to a method that is relevant to them

Idea materialisation How well will this method facilitate in materialising the ideas in your head and does it make clear the ideas behind the artifact?	Presentability Does this method facilitate in making good looking, presentable artifacts?
Testability Does this method increase the viability of the artifact to be used in (user-)testing? Does it give a good impression of how a finished version would be used?	Insight in design process Does the method give insight into the order and thought processes of the design process itself?
Sparks more ideas Did the ideas created using this method spark other ideas, does it motivate the continuation of design?	

Fig 4. Criteria for design-methods

2.2

Result

In this chapter, the results of my personal execution of phase one can be found.

I will elaborate on the design methods I have chosen, secondly I will rank and explain the design-guides I will be taking inspiration from in the next phase.

2.2.1 Design Methods

According to the method described in section 2.1. I gathered design methods by looking at a variety of sources. I created a set of criteria that can be seen in [Fig 4](#) and chose design methods that aligned with those criteria.

These are the methods I settled on:

Mind Map

The first method I will be testing is probably familiar to the reader. The *Mind Map* is a way of spatially structuring ideas and information.

Mind Maps are very useful in the compilation of ideas and information since each keyword can be associated with other words and images. Starting from a central topic/theme, a *Mind Map* consists of labelled twigs and branches, which represent relationships. [\[1\]](#)

Mind Maps can contain both visual information in the form of sketches, images and symbols as well as textual information in the form of quickly written out phrases.

A *Mind Map* allows for the thought processes and connections that took place as part of the design process to be retraced after its creation, giving insight into the design process itself.

Concept Presentation

Often referred to or related to Powerpoint presentations or Pitch Decks, *Concept Presentations* present concepts in a sequential, screen-based way. Such presentations typically use text as well as visualisations to present or develop a concept. [\[4\]](#)

Making a *Concept presentation* requires the designer to consciously present their information in a coherent way. This can be done as part of the design process but is usually done afterwards.

Brain Writing

Brain Writing refers to the method by which thoughts and ideas are quickly written down in a structured or un-structured manner. Typically performed in front of a piece of paper or a computer, the designer is quickly able to put their ideas onto paper in the form of text.

The writings can be organised in a chronological way, by simply writing down the stream of consciousness and all the ideas that follow from that. Alternatively, writing can be categorised by the writer during the session, during my execution of this study I chose the latter.

Thumbnailing

In the background section, a case was made for the importance of sketches. *Thumbnailing* is a way of structuring the sketches created during the ideation session in a way that the range and order of ideas are visible. By starting at a point and chronologically laying out the sketches, the order of when the ideas were thought up will be immediately visible.

Thumbnailing as a method is mostly used by visual artists to quickly come up with a variety of layouts, ideas or character poses.

Visual Brain Dump

A *Visual Brain Dump* is a loose representation of ideas and iterations on those ideas.

Traditional brainstorming is a verbal activity that is often performed in groups. The technique shown here transforms brainstorming into a visual medium better suited for working individually. [\[4\]](#)

A *Visual Brain Dump* can be filled in from top to bottom, resulting in a chronological order that gives some insight into the order of the design process.

This method, like other visual ideation tools such as Mind Maps, also allows sources of inspiration to be integrated into the *Visual Brain Dump*, allowing it to function as a moodboard.

Timelapse

A *Timelapse* refers to a recording of the design process. These recordings are often done in regular increments or as a sped-up video of the event. Recordings can be made of physical ideation sessions using a camera as well as digitally using screen-recording software.

A *Timelapse* gives objective information about everything that took place during session, with all intermediate steps recorded that led to the final idea(s).

The recording of the *Timelapse* can be either done manually by regularly taking photos or screenshots, or it can be automated using software or by recording a timelapse video.



1. Design Thinking as an effective Toolkit for Innovation, Tschimmel K. (2012)



4. Graphic Design Thinking, Lupton E. (2011)



2.2.2 Design Guides

I chose to analyse the following 4 design-guides:

- CMD Methods Pack
- IDEO Design Kit Methods
- Graphic Design Methods (book by Ellen Lupton)
- 101 Design Methods (book by Vijay Kumar)

For each method I answered the following two questions:

- Elaborate on how this guide represents its individual methods
- Elaborate on how this guide categorises its methods or guides the viewer to a method that is relevant to them

CMD Methods Pack

Elaborate on how this guide represents its individual methods

All methods are represented as cards, all of equal size. Each card shows the name, an illustration and a short explanation of why to use this method. Clicking on each card shows a page that explains how to execute the method on the card.

Elaborate on how this guide categorises its methods

The cards are ordered in alphabetical order. They are categorised in 6 categories, each category represents a space where this method could be used. The cards are color-coded to their respective category

IDEO Design Kit Methods

Elaborate on how this guide represents its individual methods

Each method is represented by a square, some squares are bigger than others, whether this is done to highlight certain methods or if it's done for layout purposes isn't clear. Clicking on each card shows a step-by-step guide on how to execute the method.

Elaborate on how this guide categorises its methods

The cards are categorised in 2 ways: first they are color-coded and filterable according to 3 categories, each representing a phase in the design process. Secondly, the methods are filtered by questions, that can be answered by executing the methods.

Graphic Design Methods

Elaborate on how this guide represents its individual methods

Each method is given 3 to 4 pages in the book. The first page contains an explanation text; the second a step-by-step guide on how to execute the method; the third (and fourth) a case study with an example on how the method is used.

Elaborate on how this guide categorises its methods

The methods are divided into 3 categories, these categories represent phases of the design process.

101 Design Methods

Elaborate on how this guide represents its individual methods

Each method gets 2 pages: the first contains an example project; the next page explains the method, at the top of the page listed are the benefits, input, output and category of the method, the rest of the page explains what the method is and contains a step-by-step guide on how to execute it.

Elaborate on how this guide categorises its methods

The methods are divided into 4 categories, these categories represent phases of the design process.

3. Phase 2

Practice

Method
Result

3.1

Method

1. Execute ideation projects

In this step, we'll be testing the methods found in the previous step of the research. Execute several small ideation projects and apply the design-method during these sessions.

The focus of this research is on quick, iterative projects that take between hours to days to complete.

To execute an ideation session, start with an idea, maybe do some basic research on the topic (or pick a topic that you're already familiar with and then start ideating. Try coming up with as many ideas relating to the initial concept and use the design-method you selected to document these ideas. Make sure to start open during the sessions and try to postpone judgement on individual ideas until after idea generation [5].

2. Note your experiences

During or after each session, note your experiences relating to the applied design-method.

First, rate how much the design-method increased the quality of the artifacts created during the session based on your quality criteria from section 2.1 step 2. For this, use the rating scale shown in Fig 5.

Secondly, note the impact of the design-method on the momentum of the session; Did it take a lot of effort to apply the method or did it integrate seamlessly with the process of the session?



Fig 5. Rating scale

3. Reflect on design methods

Based on the insights gained from the previous steps, reflect on each design-method by answering the following questions for each:

- Based on previously ratings, how much does this method increase the quality of the artifacts created during the session?
- When can this method best be applied? (to what type of project)
- How much time does this method take away from the project?
- How much insight does this method give into the way of workings and order of the design process

4. Organise artifacts

Gather all the artifacts created during the sessions, organise the artifacts and find ways to categorise them. Finally, graph or visualise them according to these categorisations.

The categories will be largely subjective and based on individual judgement, as well as being inspired by the design-guides analysed in 2.1 step 4.

See Fig 6 for a categorisation example.

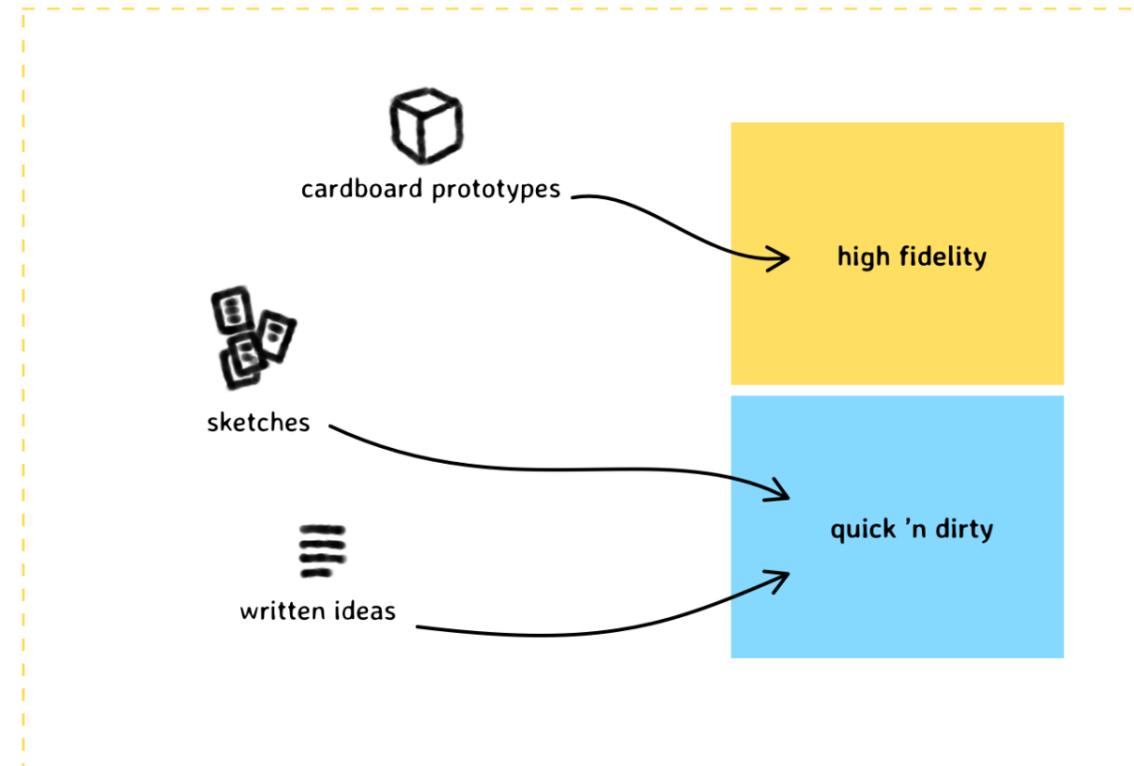


Fig 6. Categorisation example

3.2 Result

3.2.1 Projects

Over the course of several months, I applied the methods gathered as part of the previous phase of the research to 13 different projects. The ideation sessions were kept small in scope, lasting from hours to days, with the longest project taking a week to complete. Some of the projects combine several design-methods for the sake of efficiency, this did result in the two design-methods being judged as one as part of the project assessment.

The projects were intentionally varied in scale and in relevance to different design-disciplines and mediums, with some projects involving audio design and others involving physical, and visual design, for example.

In addition to the methods selected in the previous phase of the study, a method called “List of Artifacts” was added as a control test. A method where no rules were applied during the session other than the gathering of artifacts in the simplest way possible.



1. Knuts (Presentation)
A modular playset made out of cardboard



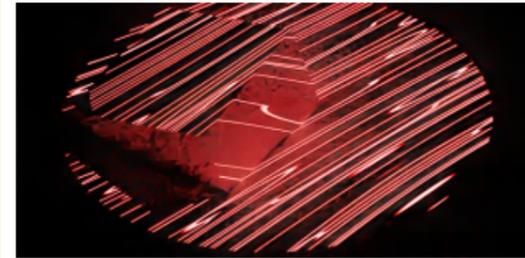
2. Magnote (Mindmap + Presentation)
Redesign of post-its with magnets



3. Screen reader (Mindmap + Presentation)
Semantic audio design for screenreaders



4. Light Switch (Thumbnailing)
Light switches with interesting interaction



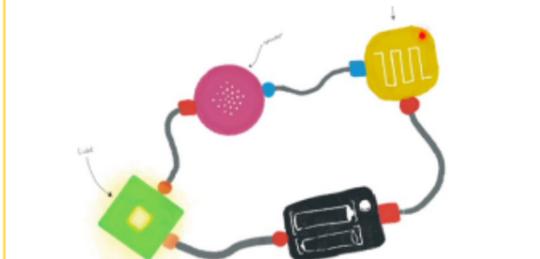
5. Spiderweb Visuals (List of Artifacts)
Spiderweb-inspired visuals made using Blender



6. App launcher (Visual Brain Dump)
A homescreen that reduces phone addiction



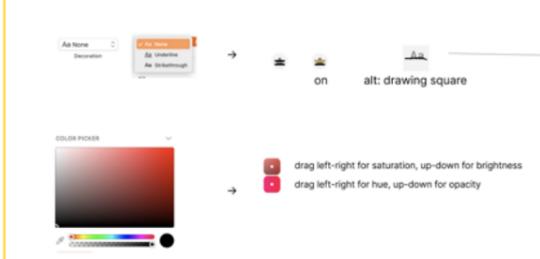
7. Playset (Visual Brain Dump)
A service that turns old cardboard into toys



8. Circ-IT (Mindmap)
A toy that teaches kids about electric circuits



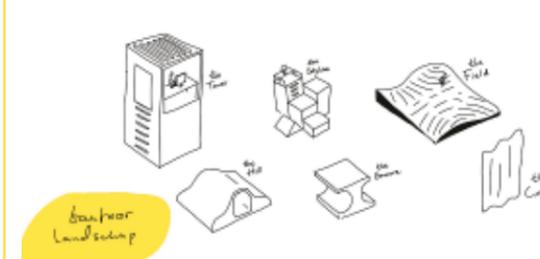
9. Station Light (Brainwriting)
Displaying information on trainplatforms



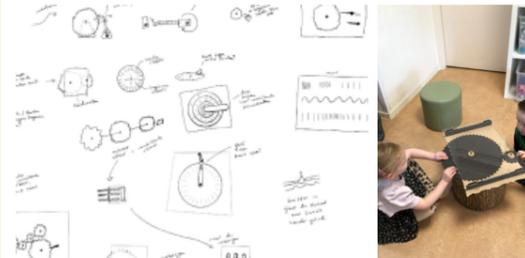
10. UI Patterns (Visual Brain Dump)
UI patterns that are as efficient as possible



11. Blind phone (Timelapse)
A phone for blind people without a screen



12. Playful furniture (Timelapse)
Sketches of playful (public or office) furniture



13. Gear module (Timelapse + Brain Dump)
An analog module for the “Muziekfabriek”

Fig 7. Projects grid

3.2.2 Project assessment

For each project, I ranked the impact of the method on the criteria created during the critical review stage. Each criteria was ranked on a scale from “active hindrance” to “large improvement”. These data points were then averaged for each method.

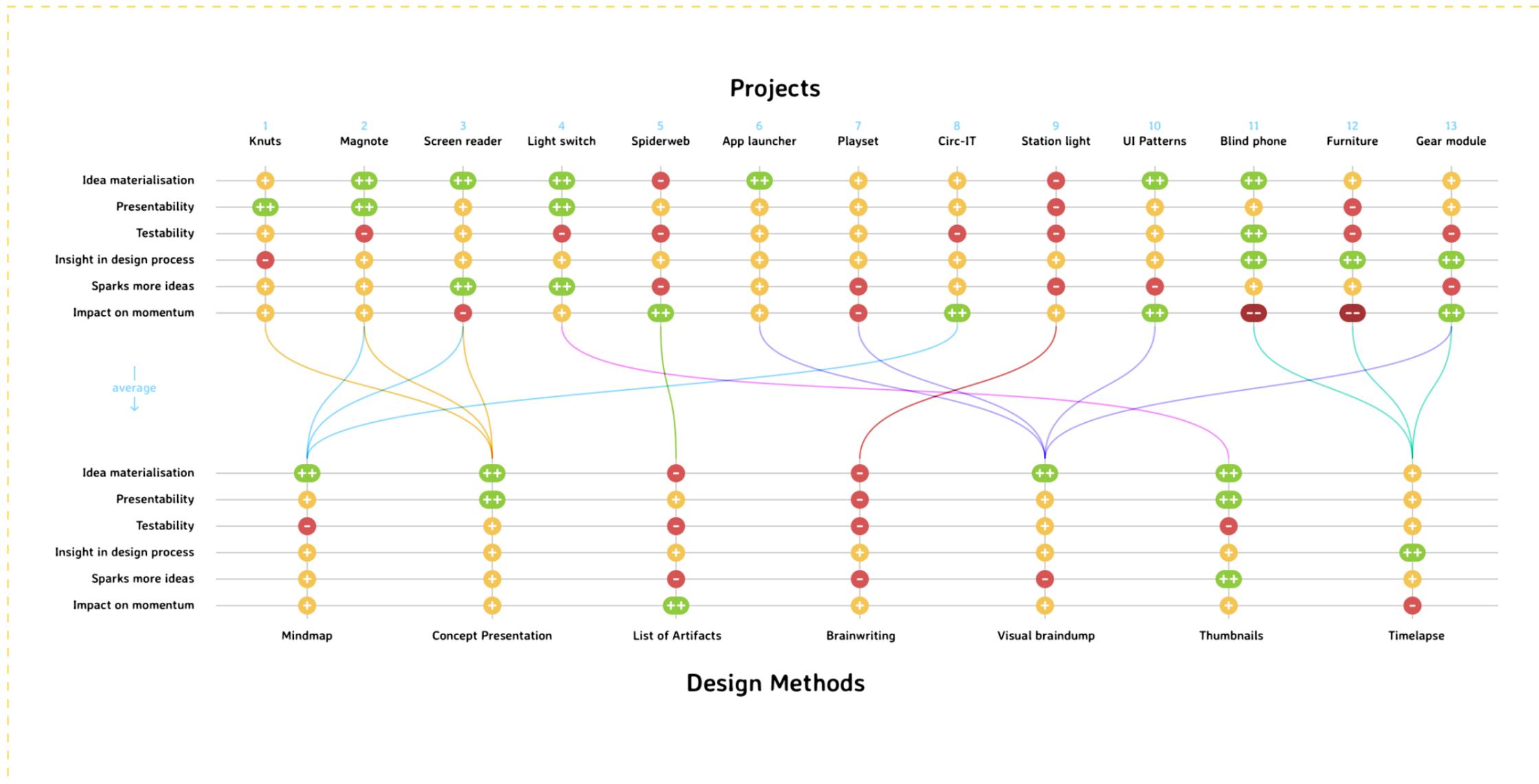


Fig 8. Project rating graph

3.2.3 Method assessment

Based on the data from the previous step and my experiences during the execution of the projects I answered these questions for each method:

Method	What kind of project can this method best be applied to?	How much time does this method take away from the project?	How much does this method increase the quality (and fidelity) of the artifacts created during the session?	How much insight does this method give into the way of workings and order of the design process?
Mindmap	Any ideation session that requires open exploration of ideas. Especially if ideas can be visually represented.	Can be incorporated into the process and even enhance it. Takes some time.	This method (based on the findings in this study) result in simple sketches that represent loose ideas. It increases artifact quality marginally.	To a large degree, it shows the idea pathways taken during the process. Showing which ideas are pursued and which are abandoned. It does however not give insights into the time spent on each idea.
Concept Presentation	Any project that needs to be shown to people that didn't participate in the ideation session.	A large amount, the concept presentation often needs to be made afterwards and although it might not take time away from the session itself, it does take considerable time.	Considerably, taking the time to present your ideas in a structured way is the best way for people outside of the project to gain insight into what was found or made.	Depending on how the presentation is structured, insight into the design process can be given but it does not necessarily increase the amount or quality of data on the process itself. All info given is subjective and often reflective.
Brainwriting	Any project that is predominantly abstract or text-based	Very little, thoughts are written down quickly. Writing down ideas can however be slower than sketching them visually in some cases	Not at all, because all information is mostly abstract and text-based it requires a lot of imagination from the viewer. Ideas can often come across as a abstract wall of text with little indication of priority.	If brainwriting is done chronologically, it can give insight into the order of the process but the method itself doesn't increase insight into the process itself.
Visual Brain Dump	Widely applicable to any project that allows its ideas to be visually represented	Can be incorporated into the process. Required time depends on fidelity of sketches. Relatively quick	Depending on the visual fidelity of the sketches it can help present all ideas and insights in a clear way.	Like brainwriting, a visual braindump can be done chronologically, lending insight into the order of the process but the result of a braindump also has the potential to come across as chaotic and unorganised
Thumbnailing	Any project that incorporated (visual) sketching, especially if a lot of different ideas need to be generated	Can be incorporated into the process, but also dictates and limits the process. If it fits the process, it doesn't take much time away at all.	This results in simple to more involved sketches. Increase varies from marginal to medium.	If thumbnailing is done purely chronological it gives objective insight into the order of the process, it does however not give insight into thought patterns and connections like a Mind Map does.
Timelapse	Any project that requires detailed information on the design-process itself	Depending on the automisation of the capturing of the timelapse, recording a timelapse can either be automatic or require a lot of effort on the side of the designer. Having to manually record your process can take you out of the flow.	This method has very little to no influence on the artifacts created during the process	This method generates a lot of objective data about the workings and timeline of the process, this can often be a lot to sort through but it is very detailed
List of Artifacts (control)	Art or design projects where the creation of tangible, visual or sonic artifacts is the main part. Where these artifacts "speak for themselves"	Close to none, this method is often already part of the process and can be quickly done intermediately.	Not much, the artifacts that would have been created regardless are presented in the most time efficient matter.	Although this method does give insight into the order of the design process it does not add to the understanding of how the artifacts were created.

Fig 9. Method rating table

3.2.4 Artifact categorisation

Based on the findings from the background research and critical review, as well as my own judgement, I categorised and ranked the types of artifacts that were created during all the different projects.

Categorisation

I divided the artifacts into two categories based on their purpose. Firstly, *inspiration sources*, which are previously created design artifacts and images that inspire the current design session. Secondly, *materialisation tools*, which are artifacts that visualise the image the designer sees in their head. Thirdly, there are *process analysis facilitators*, which show the inner workings and thought processes behind the design process itself.

Fidelity

The degree of fidelity of all the different artifacts created during these ideation sessions can vary wildly, from rough sketches to physical or digital prototypes that are closer in fidelity to a final product. What constitutes “fidelity” or “quality” is partially subjective, as made evident in step 2 of 2.1. That being said, I have created a scale of low to high fidelity based on the artifacts that were created during the projects.

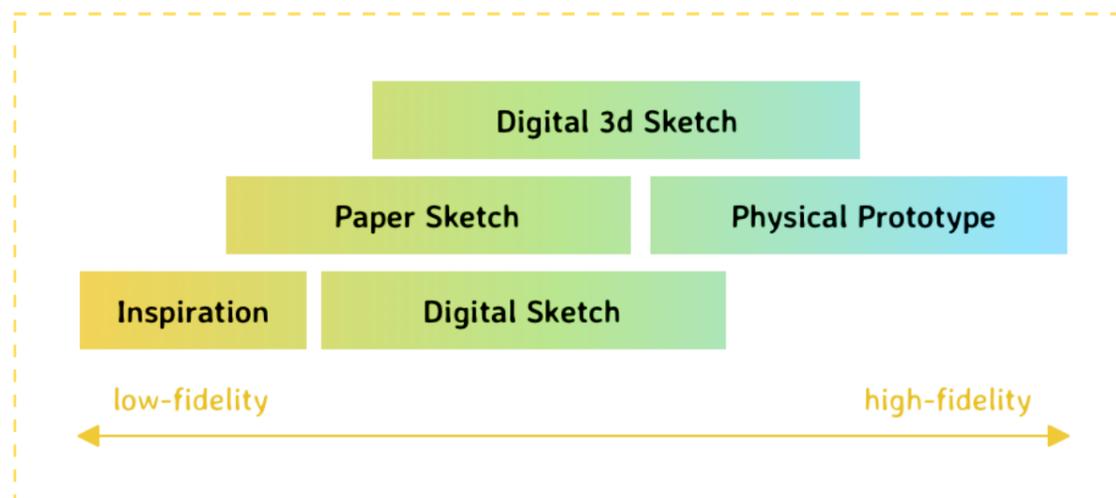


Fig 10. Artifact fidelity

Objective vs subjective information

Especially in the process analysis facilitators, I've noticed a varying degree of objectivity in how these artifacts represent the design process. A recording of the session for example, gives objective information about what happened at what time in the design process. While a presentation, created after the fact by the designer, can give insight into the design process but only based on the interpretation of the designer, therefore being more subjective.

Objective information isn't better or worse than subjective information but it's something to keep in mind when selecting the method you want to employ during your ideation sessions.



Fig 11. Artifact objectivity

3.2.5 Making of the design guide

Based on all the insights from the critical review stage and the experiences gained from executing all the projects, I've compiled all relevant information into an easy to understand guide.

Similar to the CMD and IDEO design guides, I've decided to go with cards to display and explain the individual methods. These cards are bound in a sleeve that contains the info on how to use the cards.

Each card contains a short explanation of the method, when to use the method, how to execute the method and a ranking based on the quality criteria as ranked in section 3.2.2.

I decided to go for a design that can be printed, the physical nature of the cards making it easier to use.



Fig 12. Initial sketch for design guide



Fig 13. Final design for outside sleeve



Fig 14. Final design for method cards

4 Conclusion

4.1 Conclusion and discussion

Given that the result of this research was to create a design-guide that assists in structuring ideation sessions, I'd consider this study a success. The result is extremely personalised to the person executing the study which was a point of internal struggle during the formation of the study, but I'm happy with the result as it allowed me to really reflect on the design processes I employ during these sessions.

When a designer exists in a multidisciplinary space, they have to draw from many different sources when it comes to developing a consistent creative process, these pieces of often contradictory information can sometimes be hard to make sense of. By executing this study and diving deeper into the fundamental thought processes of different kinds of designers, I have gained a further understanding and appreciation of the creative process of others and myself.

4.2 Future work

A study can never be all-encompassing and this one is no exception, several subjects were left out of the scope of the study.

The focus of this study was aimed at methods relevant to the individual design process. Looking into *collaborative projects*, processes and methods might be an interesting addition to this study, the study might even be adapted in the future to be more relevant to the collaborative design process.

Because the projects were done in a very short timeframe, there was no room for *testing with users* and iterating on these findings. Since iteration is a vital part of the design process and of ideation, a future study could look at rapid iteration with test data.

Another subject that was nearly included in the study but left out due to time limitations was *coding*. By adding tags and codes to the documentation created during the ideation session, more data can be extracted afterwards about the design process. This subject warrants further research.

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