Measuring Strategic Design Performance;

a KPI for the fuzzy front end

Maser thesis by
Adam Helbing

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Feel free to contact me for any questions, or comments!

Summary

This thesis describes my Master graduation project in which I attempt to design a Key Performance Indicator (KPI) for Strategic Designers, to enable us to justify and explain our efforts in a quantitatively oriented context, such as a corporate setting.

In the end, this project provides multiple novel perspectives to knowledge about Strategic Design, and a concept for a Strategic Design KPI for the fuzzy front end.

This project was based on the premiss that Strategic Design has proven to be valuable and relevant for innovation – for which there is no shortage of demand, but that Strategic Designers often struggle to justify/explain their added value.

Research suggests that more emphasis on applying KPIs or metrics is a way to address this issue, but there are currently no suitable metrics for Strategic Design.

The lack of a suitable Strategic Design KPI is explained by the core characteristics of Strategic Design, and those of their typical work. The most predominant of these characteristics is the high uncertainty that Strategic Designers deal with; no clear goals, or means of achieving them.

This is most applicable to the fuzzy front end; the earliest stage of an innovation project, where nothing is clear or known, questions are open ended, and results are not predetermined.

In order to measure performance in highly uncertain projects, process-based metrics were identified as the most suitable option; metrics based on the process, but not limited to only productivity.

A concept was designed for a KPI for Strategic Design performance, based on the findings of a qualitative study. The KPI can be mostly integrated into a normal Strategic Design process. The KPI consists of the following elements:

1. Fuzzy Front End Commitment Score; summarising overall Strategic Design performance in the fuzzy front end.
2. Content Quality Score; indicating the quality of content development.
   This is based on 2 sub-scores;
   - Information Comprehensiveness Score; indicating the quality of diverging activities.
   - Logical Coherence Ratio; indicating the quality of converging activities.
3. Total Support Level; indicating the quality of stakeholder management.
   This is based on 2 sub-scores;
   - Managerial Support Level; indicating the level of support from managerial stakeholders, and their perception of the strategic fit of the result.
   - Internal Support Level; indicating the level of support from internal stakeholders, and their perception of the continuity of the result.
4. Level of Discrepancy; a benchmark to indicate potential problems for interpreting the KPI. If there is a large difference between the Content Quality Score and the Total Support Level, it is recommendable to evaluate the following:
   - Understandability; indicating the extent to which the Strategic Designer is able to sufficiently convey the content.
   - Innovation culture; indicating the organisation's ability to change/innovate, which determines the potential scope of the result.

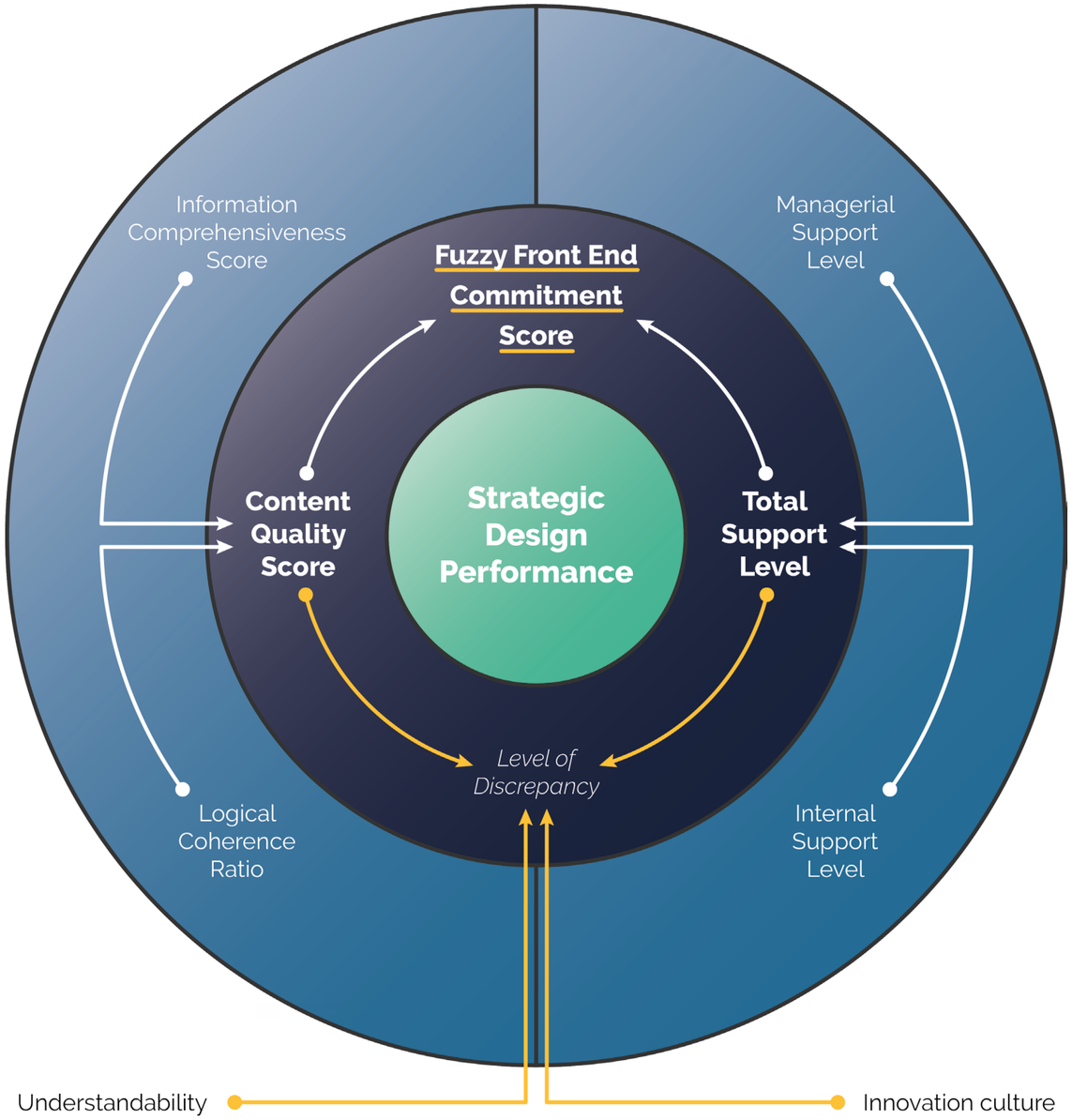


Figure s.1 Strategic Design KPI

In the end, the KPI is at a conceptual stage, so more development before implementation is recommended. The novel perspective to Strategic Design performance does open new academic, and practical possibilities for testing, and evaluating the impact of Strategic Design.

Words of appreciation

Before we dive into the content of my graduation, I would like to take the opportunity to express my gratitude and appreciation for everybody who has contributed to this project. 2020 has been a strange year for everyone, and I have been very fortunate to find so many people who have been willing and able to help me through it. I am not exaggerating when I say that I could not have done it without you.

Special thanks go out to my research participants, who gave me their time, and insight into their experiences as Strategic Designers. You have all been very open and helpful, and it is safe to say that you have been the foundation of my results.

Furthermore, I would like to thank my supervisors: Marina and Erik Jan. You have contributed to the quality of my project tremendously through your input. I realise that you made a lot of your time available to me, and for that I am grateful.

Marina, your patience, willingness to help, and extreme thoroughness have been incredibly valuable in many ways, and I think you will recognise a lot of your input in the final result.

Erik Jan, your critical, 'no-nonsense' approach has been a great way to get me going, but also to keep me grounded in reality, and I hope that you will see a reflection of that throughout this report.

Thank you to my parents; Beatrijs and Wim, for all the opportunities that you have provided to me, and for your contributions to this project specifically. Although Strategic Design is not a subject that you are familiar with, your help has proven to be surprisingly valuable.

Thank you Gittan, for all your help throughout the entire project. I think you have given me a lot more input than you realise, and it has helped my greatly.

Thank you, Manon, for your last-minute efforts,

Special thanks to Gaab, for helping me out with my project, but more importantly for keeping me sane. It was not my choice to spend my entire graduation at home, but I could not have asked for better company.

Lastly, my thanks to you, the reader. I hope you will enjoy my work, and I am grateful for your time and attention!

Table of contents

1. Introduction

What to expect going into this project?

This chapter explains the starting point, and topic of this graduation project. It also addresses some contextual information, and provides an overview of the project's process.

1.1 Subject & motivation

The starting point of this project was a personal observation about Strategic Design, based on impressions from multiple Master courses, and conversations with other Strategic Designers. This observation is that the perception of the potential impact of Strategic Design, seems to alternate between extremely positive, and totally unclear. One major contributor to these different perceptions, is the fact that the impact and quality of Strategic Design can be difficult to quantify. Traditionally, performance measurement can be a way to address this, however this does not happen in practice. This observation resulted from the following phenomena:

On one hand, Strategic Design is being recognised for its potential added value. This is demonstrated by the increasing popularity of design methodologies, such as Design Thinking, for strategic purposes. A typical example of this popularity is the creation of the 'Design Master of Business Administration'.

On the other hand, however, Strategic Designers can struggle to make themselves heard, or properly understood in contexts where strategic decisions are predominately based on numbers and data, which is still common practice in most organisations.
Strategic Designers are also not helped by the fact that design is established as something accessible. Resources about design tools and methods are readily available to most people, and often portrayed as something that everyone can apply. How can a Strategic Designer, who studied for 5 years (e.g. at the Delft University of Technology), then explain what they can bring to the table, compared to somebody who watched a video about Design Thinking once?

Obviously, this scenario is exaggerated, but the struggle to formulate exactly what a Strategic Designer has to offer, seems to be quite common. This is demonstrated by the fact that the Strategic Product Design Master even dedicates a course to addressing this problem.

A traditional approach to address this problem would be to measure performance using metrics, or Key Performance Indicators, but this is not something that Strategic Designers are generally enthusiastic about. Instead they might question whether everything that matters can be measured, and vice versa.

This response to performance measurement is admittedly logical, but it does not help to better explain Strategic Design. Instead accepting the challenge of applying a KPI, and creating something that does work, seems like a more appropriate response for a Strategic Designer, and proved to be an engaging challenge.

1.2 Approach

The main body of the project's content can be divided into three different phases, followed by validation and a discussion, which are explained below. Figure 1.1 shows an overview of the project's structure.

Problem framing

The first phase of the process consisted of literature research. Firstly, literature was researched to establish to what extent the problem described in the introduction is in line with research. This led to the design brief. Secondly, literature was researched to explore the problem, gain a thorough understanding of the topic, and to define a relevant scope for the project.

Solution framing

The second phase of the process consisted of a qualitative study. This study served to generate knowledge that was necessary to create a Strategic Design KPI, but did not yet exist.

Design phase

The third phase was a design phase. Firstly, more existing knowledge from various sources was gathered in order to gain the necessary means to translate the qualitative study results into a practical result. Subsequently, all previously gathered knowledge was synthesised in order to create the Strategic Design KPI.

Validation and discussion

The final result was validated using two example projects as cases. Lastly, a discussion of the limitations and contribution of the results rounds off the project.

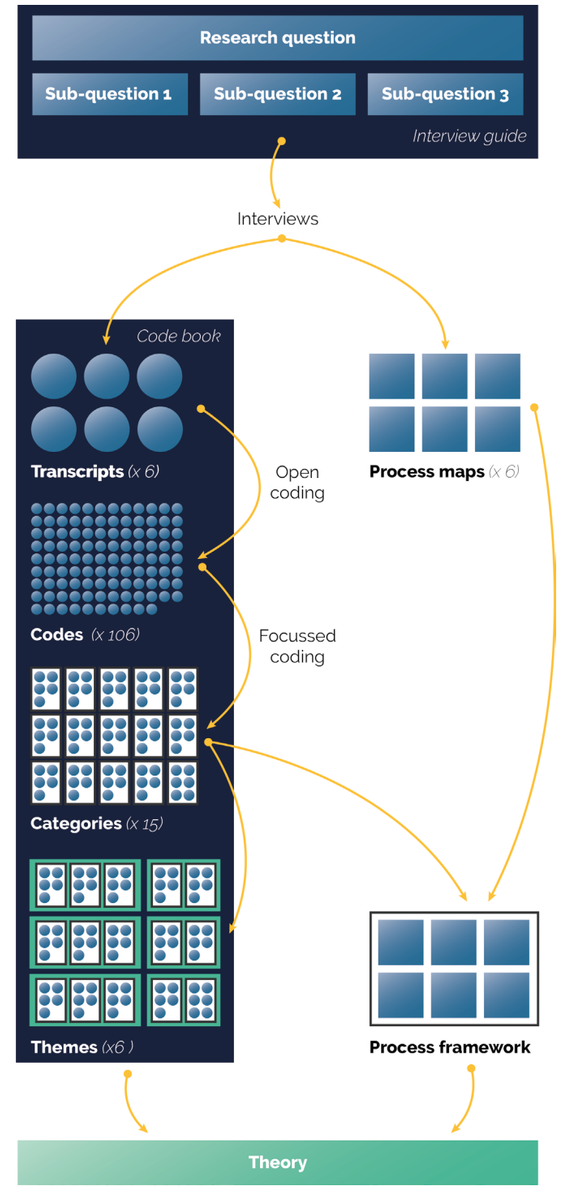


Figure 1.1: Project approach

2. Problem framing:

Why and when is measuring Strategic Design performance difficult, and why is this a problem?

This chapter provides an overview of the literature study that was conducted in order to explore the essence of the problem that is addressed in this project.

Given the fact that the starting point of this project was a personal observation, the first step is to validate to what extent this can be supported by research, and to determine the most relevant goals for this project. This resulted in the design brief.

Subsequently, Strategic Design literature, and performance measurement literature was explored to develop a theoretical background on which to base the rest of the project.

2.1 Problem statement

Despite the field of design being relatively young it has already seen a significant evolution since its origin (Cooper, 2019). It has moved beyond styling and the creation of products, into the domain of services, systems, and everything in between, as described by Buchanan's 4 orders of design (2001), and portrayed in figure 2.1. Through this evolution, design has become an increasingly popular, and suitable field for innovation, and addressing ill-defined, or even wicked problems - problems that are seemingly impossible to solve due to a lack of available information, and the involvement of many, often contradictory stakeholder perspectives (Cooper, 2019; Sanders & Stappers, 2012).

The scope and influence of design continues to expand rapidly, and has been moving into the domain of organisational/business strategy as well. This has resulted in the emergence of a form of design which can be described as Strategic Design (Calabretta, Gemser & Karpen, 2016). Strategic Design is characterised by its long-term focus, and emphasis on Product Service Systems - the holistic combination of solutions throughout all 4 orders of design (Meroni, 2008).

While the field of design has been evolving, the world is increasingly facing challenges that require us to fundamentally adapt the world around us, and innovate differently from before (Cooper, 2019). These are challenges such as achieving social and environmental sustainability, creating solutions for the 'new normal' society following the corona crisis, or a myriad of other challenges. The necessity to address these challenges, is an opportunity for Strategic Designers to make an impact through their unique focus and approach to innovation.

The potential impact of Strategic Design is not limited to only charitable solutions to global challenges, however. Multiple studies have found a strong correlation between the design capability of companies and their monetary success relative to less design capable companies. The Design Management Institute (2015) measured a 211% return on investments over a 10-year period in design-centric companies, compared to the S&P 500 - a stock market index that measures the stock performance of 500 large companies listed on stock exchanges in the United States. This was not a one-time occurrence, as 2015 marked the third consecutive year that the relative return of these design-centric companies was over 200%, as seen in figure 2.2.

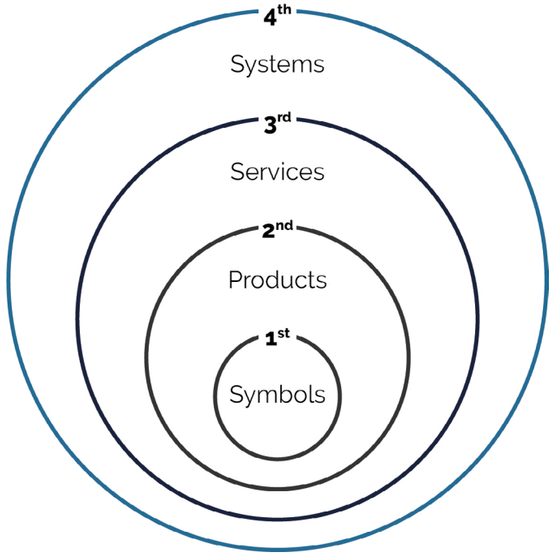


Figure 2.1: 4 orders of design (Buchanan, 2001).

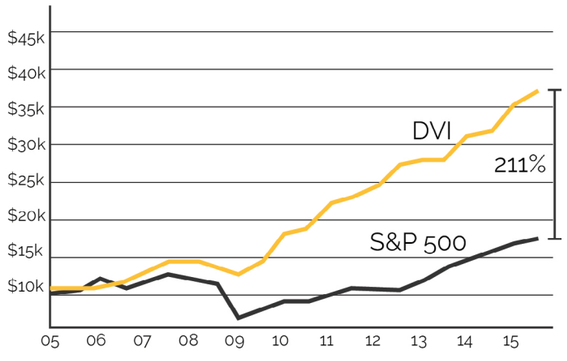


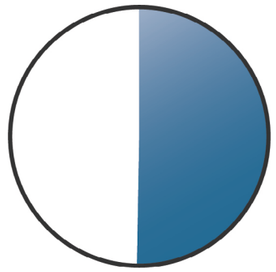
Figure 2.2: Design Value Index 2005-2015 (Design Management Institute, 2015).

Similar results were found by McKinsey (2018), as they found that: "Companies with top-quartile McKinsey Design Index scores outperformed industry-benchmark growth by as much as two to one". These findings are about the application of design in general, however both also emphasise that design is especially valuable, when it is implemented throughout the entire organisation - including at management and strategic levels (McKinsey, 2018; Design Management Institute, 2015).

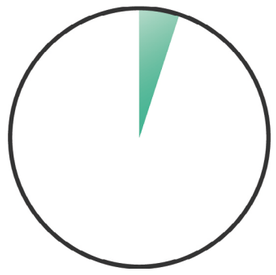
Based on these findings, one could think that organisations and companies will be lining up to hire Strategic Designers for influential functions, yet this is not always the case. In practice, the relatively new Strategic Design field does not have a lot of influence in most organisations (Calabretta, Gemser & Karpen, 2016).

One major obstacle for the successful application of any type of design, is that few companies truly understand how to apply/ embed design, and that designers often lack the means to justify their efforts (McKinsey, 2018; Frog Design, 2017). This is troublesome for all designers, but especially problematic for newer design disciplines, such as Strategic Designers. Newer design disciplines have a shorter, and often less tangible legacy, which can be used to explain/justify their work, than for example product designers.

McKinsey (2018) also points out that the ability to objectively measure design performance is one of the key factors that determine a company's design potential, but that more than half of the companies they surveyed admit that they are not able to do so. Less than 5 percent of the surveyed companies reported that their leaders could make objective design decisions (see figure 2.3), which results in insufficient support by decision makers for proposed design solutions. As a result, design/innovation projects receive insufficient investment for them to be properly developed further, and are consequently not reaching their full potential impact.



"Just *over 50%* [of the companies surveyed] admitted that they have no objective way to assess or set targets for the output of their design teams."



"*Less than 5%* of the companies surveyed reported that their leaders could make objective design decisions."

Figure 2.3: Findings from McKinsey (2018) about the challenges of applying design.

These findings are in line with Frog Design's (2017) research about the value of design, and both McKinsey, and Frog Design stress the importance of applying metrics/KPIs in order to make design efforts measurable, and more importantly: understandable. Applying metrics/KPIs should enable designers to explain their work more effectively to their leaders/managers, and involved decision-makers, which should allow them to gain more influence and apply design more effectively.

Unfortunately, McKinsey does not provide any suggestion for metrics or KPIs in their research. Frog Design (2017) provides a list of KPIs that could be used to measure the value of design, such as revenue, market share and customer acquisition. The problem with these KPIs is that they are mostly retrospective, and do not provide actionable insights for designers and their leadership.

This leaves Strategic Designers at a disadvantage, when it comes to explaining, or justifying their efforts, and unable to deal with the aforementioned issues caused by a lack of understanding for their work.

To summarise; design has the potential to be a suitable field for dealing with global issues, and its value has been proven in practice, especially when it is also applied at a strategic level. However, the lack of suitable metrics leaves Strategic Designers unable to justify and explain their efforts, and to receive the responsibility and influence required to apply the full extent of their capabilities.

For these reasons, the goal of this graduation project is:

to design a Key Performance Indicator or metric for Strategic Designers, with the goal to be able to justify and explain their efforts.

2.2 Theoretical background

In order to understand how to design a Strategic Design KPI, it is important to understand exactly why it is so difficult to do so. This means that a clear image of what distinguishes Strategic Design from other design fields, as well as from other strategy-oriented fields, is necessary. Furthermore, it is necessary to understand what performance is, what performance measurement traditionally means, and how it relates to Strategic Design.

The following section goes into these details, and serves as an overview of what knowledge currently exists, where blind spots are, and consequently what the scope of this project is.

Defining Strategic Design

Strategic Design can be described as "the professional field in which designers use their principles, tools, and methods to influence strategic decision making" (Calabretta, Gemser & Karpen, 2016). It is commonly characterised by:

- Creative problem solving; like the rest of the design field, but unlike traditional strategic fields, Strategic Design applies creativity and creative techniques to predominantly deal with problems (or opportunities) that are ill-defined (Cross, 2006; Sanders & Stappers, 2012), meaning that the exact problem (and therefore solution space) are not clear from the start.
- Involving multiple stakeholders; designers are often tasked with projects that involve multiple stakeholders, with their own perspectives, and are responsible for finding a way to satisfy possibly conflicting needs (Calabretta, Gemser & Karpen, 2016; Sanders & Stappers, 2012).
- Long-term orientation; unlike other design fields, Strategic Design focusses on projects with a long-term orientation, and usually on intangible outcomes relative to other design fields. This can be at a service, or systems level - the 3rd and 4th order of design as described by Buchanan (2001), or on the combination - Product Service Systems, as described by Meroni (2008).

These characteristics are reflected in the work of Strategic Designers which can typically involve:

- Intermediate results; meaning that the results are not an end-point or final product, but lead to more activities down the line. Examples of such results are future visions, roadmaps, and brand strategies (Calabretta, Gemser & Karpen, 2016).
- Divergent values; meaning that the type of results and added value that can be delivered can vary per stakeholder, and for each project (Bos-de Vos, 2020). This means that Strategic Design does not follow a clear cut, or fixed approach.
- High uncertainty; meaning that Strategic Design is not focussed on day-to-day innovations, such as product and service development, but rather on higher level and more radical innovations, such as new ways of working, and innovation strategies. Note that this does not mean 'radical innovation' as described by Verganti, (2009), but rather describes the scope and uncertainty in which Strategic Designers work.

Figure 2.4 shows a visual overview of these elements.

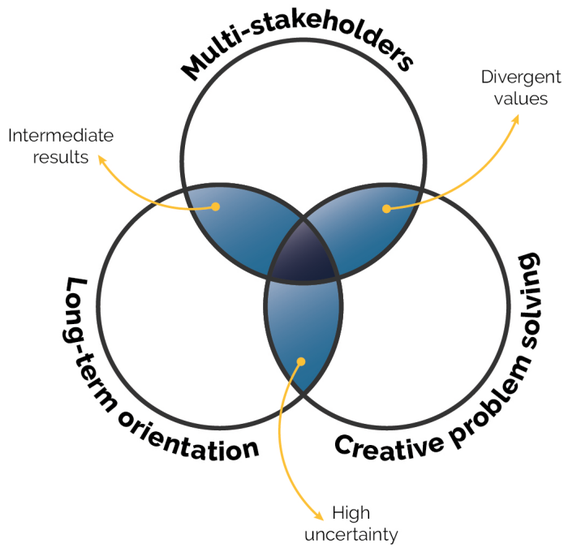


Figure 2.4: Characteristics of Strategic.

Despite Strategic Designers' focus on innovation, they can still work in various contexts. However, in order to narrow the scope of the project, a choice has been made to focus on Strategic Designers in a commercially oriented innovation context, or in other words: a business context. A business context was chosen, because that is the most common context in which performance measurement is applied. More specifically, performance measurement is usually associated with large scale, for-profit organisations; more colloquially referred to as corporates.

Simply put, Strategic Designers can work in one of two business contexts; internal - as an embedded part of an organisation, or external - as an independent party hired by an organisation. Although external Strategic Designers may also be subject to performance measurement, they are not included in this project, because it further complicates the subject, and can be researched separately at a later stage.

Understanding performance measurement

In business terms, performance is "the accomplishment of a given task measured against pre-set known standards of accuracy, completeness, cost, and speed (Business Dictionary, N.A.)." What this means, is that performance describes the progress towards an intended result, relative to what was expected, and relative to the resources that are used to reach the result.

It is important to note that 'performance' does not describe the intended results itself, such as quality or value, but it specifically addresses the progress towards such goals. These goals can vary from financial goals, such as revenue, returns, or profits, to other goals, such as customer satisfaction. The 'resources' used can be many different things, but are typically financial means (money), and/or time spent.

Performance measurement refers to the act of quantitatively assessing and expressing performance (Peterson, 2006). Quantitative expressions of performance are known as performance indicators. The performance indicators that are most important to an organisation, describing what is considered to be crucial to the organisation's success, are what is known as Key Performance Indicators (KPIs). Most organisations use a set of multiple KPIs, which vary between organisations.

In short, A KPI is a number which conveys essential information about the progress towards an objective, in relation to the needs/expectations of stakeholders (Peterson, 2006; Rodriguez, Saiz & Bas, 2009; Sinclair & Zairi, 1995).

Although there can be slight variations in the exact definitions, 'metrics' and 'KPIs' will be used interchangeably throughout this project, as they refer to roughly the same concept.

Despite a wide availability of very different KPIs, there are three characteristics that they share. The key characteristics that make up a KPI/metric are (Peterson, 2006):

- Quantitative; KPIs can take many different quantitative forms, such as rates, ratios, and scores, and are expressed in numbers, however, never in raw data.
- Time based; KPIs should be comparable, and should therefore have a clear relationship with time. This can mean that time is accounted for within the KPI as a resource, or that the KPI is measured over a standard period.
- Actionable; KPIs should provide insights which can be used in order to make grounded decisions about how to act in order to reach the intended goals.

An easy example of a KPI (which is also relatively common), is return on investment (ROI). In this case, spending on an investment is compared to earnings from that investment, with the goal to maximise profits (Investopedia, N.A.). In this case, cost/money spent is the resource, and money earned determines the progress towards the goal of profitability. It tells an organisation how effective an investment is in relation to their goals.

$$ROI = \frac{\text{Net Return on Investment}}{\text{Cost of Investment}} \times 100\%$$

The reason organisations measure performance, is because performance measurement (if done correctly) is believed to ensure alignment of efforts and goals (Lynch & Cross, 1991), thus giving grounded direction to a company, and leading to better overall (financial) results (Gates, 1999). What this means, is that measuring performance allows organisations to gain insight into how well they are achieving their goals, and how to act accordingly.

Measuring design performance

As pointed out by Mckinsey's (2018), measuring design performance is a significant challenge for many companies. There are multiple reasons for this. Firstly, designers have been known to be reluctant to embrace metrics in their work (Calabretta, Gemser & Karpen, 2018). This is not surprising, given the challenges associated with performance measurement, and how they negatively affect design in general, as well as Strategic Design. The problems with performance measurement are that it;

- has traditionally been predominantly financially oriented (Bruns, 1998),
- is usually only retrospective, and provides insufficient information about future performance (Dixon et al., 1990; Hayes and Abernathy, 1980),
- favours acting upon short term gains, rather than long-term, sustainable gains (Kaplan, 1986),
- focuses internally, with little regard for competitors or customers (Kaplan & Norton, 1992; Neely et al.,1995),
- lacks insight on a strategic level (Skinner, 1974),
- and most importantly, often inhibits innovation (Richardson & Gordon, 1980, Calabretta, Gemser & Karpen, 2018).

At the heart of the issues associated with measuring design performance lies a mismatch between the worldview on which design, and performance measurement are based. Performance measurement is based on the notion that everything can be quantitatively explained. Design on the other hand is far more qualitatively focussed.

These fundamentally different worldviews have also been found and described in the world of academics. Denscombe (2008) describes these worldviews as the following: on one hand, there is positivism, which in short assumes that there is an objective truth/reality, which can be seen free of interpretation. Positivism is characterised by quantitative research, and deductive reasoning. Interpretivism, on the other hand, sees truth/reality as subjective, and something that cannot be separated from its context and interpretation. This is characterised by qualitative research, and inductive reasoning.

In practice, businesses are often managed from a positivist perspective, and the quantitative focus of performance measurement is a manifestation of this. Design on the other hand, is characterised by its qualitative approach, and focus on people's experiences.

Seeing how fundamentally different these worldviews are, it is no surprise that design and performance measurement have traditionally not gone hand-in-hand. However, a lot of research has gone into the downsides of traditional performance measurement (Sanchez & Robert, 2010), and companies have been known to try to evolve their performance measurement systems accordingly in order to reflect their changing business environments (Eccles, 1991; Neely, 1999). In other words, the mismatch between performance measurement and design is not definitive.

In order to bridge the gap between the two, a third worldview is required that allows for the two worldviews to be understood from the perspective of the other. Denscombe (2008) also describes what this worldview is; pragmatism. Pragmatism (see figure 2.5) is a worldview that accepts the possibilities and limitations of the other two, and combines approaches from both as necessary. It is therefore neither exclusively quantitative or qualitative, but instead focuses on what is necessary and possible to the desired outcome. In practice, this is not an easy worldview for decision making, as it can be difficult to achieve the clarity of positivism - which is a relatively 'black and white' worldview, and the nuance of interpretivism - which would be a collection of greys.

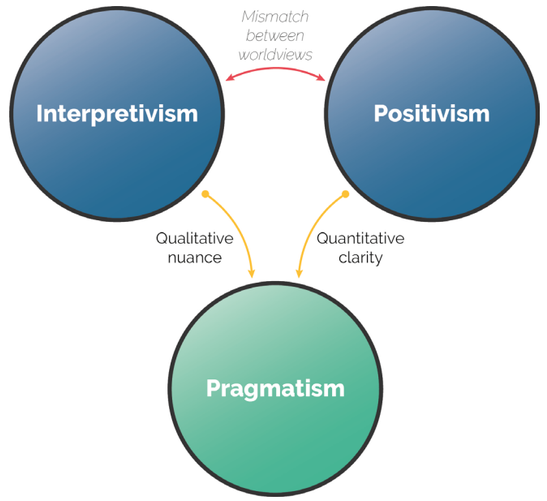


Figure 2.5: The pragmatic worldview.

A practical example of a pragmatic metric is Formula 1 driver ratings. Every team has performance goals with regard to a season, which is measured through points, which are won through races. Performance during a race comes down to average lap times. These lap times are influenced by a tremendous number of factors, however. This means that knowing how to improve them can be difficult. Examples of relevant factors are: the car and its various different set-ups, tire degradation pitstop times, track characteristics, etcetera. Formula 1 teams measure as much as possible to be able to predict and influence them, to get the best chance of success.

One essential part of the success of Formula 1 teams is their drivers. In the end, the drivers win or lose the races, and being human, they are relatively unpredictable. Measuring a driver's abilities just by race results would be inaccurate, as there are many aspects that influence the outcome, that cannot be influenced, such as the weather, accidents, and other teams' strategies. To overcome this blind spot in performance measurement in Formula 1, data driven as it is, driver ratings were developed.

Driver ratings are the result of an extremely complex collection of both qualitative and quantitative data, which give a nice and simple indication of one driver's abilities, relative to that of others. This means that an aspect which used to be uncertain and unpredictable, has become more or less measurable. Obviously, the driver score is not perfect, and cannot explain everything, but it is a simple, quantitative indication of a complex, uncertain factor that is extremely important for overall success.

Measuring Strategic Design performance

Performance measurement has evolved beyond the traditional, purely financial perspective, and there are multiple metrics available to capture other perspectives, including multiple user-centric metrics, such as customer retention and Net Promoter Scores (NPS), as well as other non-financial metrics, such as brand equity and speed to market (Frog Design, 2017). These can be relevant for (strategic) designers, however there are shortcomings.

Despite being useful at certain stages, any singular metric is insufficient for measuring performance of anything involving multiple stakeholders, as it will be too one-sided (Doyle, 1994). Furthermore, the long-term orientation of Strategic Design complicates the application of result-oriented metrics, as they do not provide actionable insights during a project, but rather retrospective judgement (Parmenter, 2015). As a result, any single KPI will not provide actionable insights for Strategic Designers, as it cannot be representative of variation in results per project, or how the work of Strategic Designers influenced performance in later stages of the project.

There are ways to deal with these blind spots however, but not without other shortcomings for Strategic Designers. Measurement systems such as the Balanced Scorecard (Kaplan & Norton, 1992) and strategy maps (Kaplan et al., 2004) can help to provide insight into how different stakeholder perspectives relate, but they provide little insight for innovation with high uncertainty, and have been criticised to be an oversimplified representation of reality (Parmenter, 2015).

Similarly, Strategic Performance Measurement Systems (SPMS) can shed light on how performance of different groups at different stages influence each other, but have not proven to be a consistently effective tool to base decisions for innovation on. When Strategic Performance Measurement Systems have been applied for innovation successfully, the effect was limited to incremental innovations only, as the SPMS had helped to build capabilities that were suitable for improving existing processes, but not for creating new ones (Micheli, & Manzoni, 2010).

Regardless of the irrelevance to strategic designers of such systems as a whole, there are elements which are useful. For example, the ability to balance multiple aspects of performance, and to justify intermediate results. This includes metrics such as innovation culture (Dobni, 2008), and intangible assets such as organisation capital (Kaplan & Norton, 2004), which both indicate how able an organisation is to innovate.

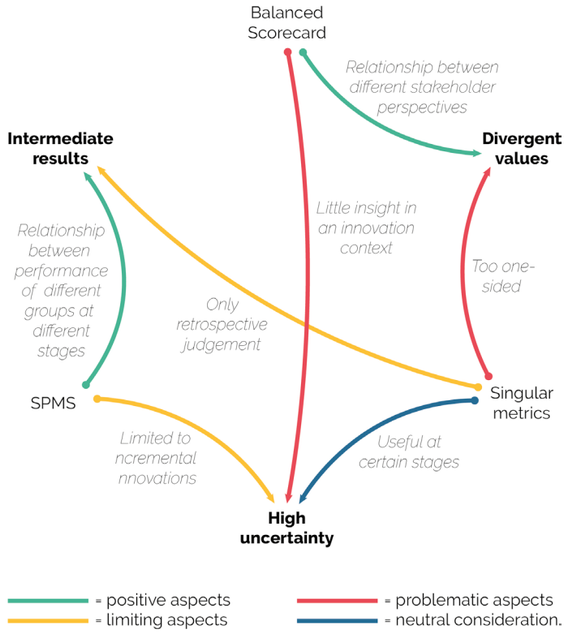


Figure 2.6: Mismatch between Strategic Design and types of performance measurement.

Figure 2.6 shows a visual overview of the previously described characteristics of Strategic Designer's work relative to the types of performance measurement discussed in this section. The green arrows represent positive aspects of performance measurement types relative to Strategic Designer's work characteristics.

For a more uncertainty-oriented approach to applying metrics, Calabretta, Gemser & Karpen (2018) suggest that designers try to apply assumption-based planning techniques, such as Discovery Driven Planning (DDP). Discovery Driven Planning can help to deal with ill-defined goals, and uncertainty (McGrath & MacMillan, 1995), by breaking up vague business goals, and setting increasingly specific sub-goals, as the subject matter becomes clearer. What this does from a performance measurement perspective, is to postpone the application of metrics, until a point is reached where the most suitable metric for the subject matter can be chosen, and addressed.

There is a problem with this approach, however; it does not fully cover the work of a Strategic Designer. Methods, such as Discovery Driven Planning, require a vague business goal to begin with, as well as commitment from the involved stakeholders to invest in the development of the innovation, before reaching a state at which they can realistically apply existing metrics. This means that Strategic Designers are not required to justify their work with metrics until the point that other metrics become applicable. This leaves a blind spot for Strategic Design performance in the early stages of an innovation project, and can only work if Strategic Designers are given the freedom and faith to develop a project until it reaches the point that metrics can be applied. In other words, methods such as Discovery Driven Planning are insufficient, from a performance measurement perspective, during the early stages of an innovation project.

To summarise, there are metrics that are usable for different elements of Strategic Design throughout different stages of a design process, but nothing fully covers all characteristics, especially in early stages of an innovation process, where the uncertainty is the highest and organisations are not yet committed to a specific direction (typically described as the fuzzy front end).

The fuzzy front end

The fuzzy front end is the name commonly given to the early stages of an innovation project (commonly visualised as in figure 2.7). Sanders & Stappers (2012) point out that the fuzzy front end has been growing and gaining importance over the last ten years (at their time of writing).

In short, the fuzzy front end can be described as the first stage of an innovation process, where nothing is clear or known, questions are open ended, and results are not predetermined. As a result, the activities are messy and chaotic in nature.

What is striking, is that what makes the fuzzy front end chaotic (or fuzzy), shares fundamental characteristics with what makes Strategic Design so hard to understand and measure from a business perspective. Namely the ill-defined problems, and resulting high uncertainty.

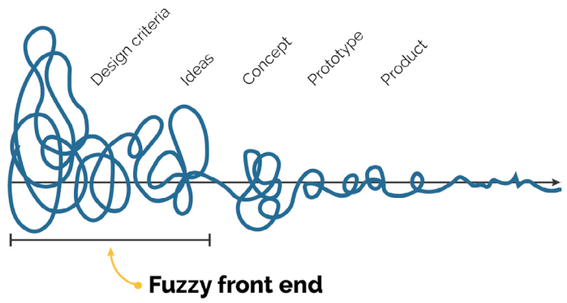


Figure 2.7: The fuzzy front end of innovation (Sanders & Stappers, 2012).

In a (competitive) business environment the timing of innovations relative to competitors can make tremendous differences, adding another layer of complexity, as not only is nothing clear, time may be limited too. Furthermore, as things become clearer, they can also be clearer for competitors.

In a way, in a business context, the fuzzy front end can be seen as if a person goes into a maze at night, and is tasked with finding a treasure before somebody else does. The exact location and nature of the treasure, and whether or not there are others in the maze are unknown. All the person can do in this case is to start moving, and try to gain the information they need as they go. Being in the dark, however, this is not an easy task.

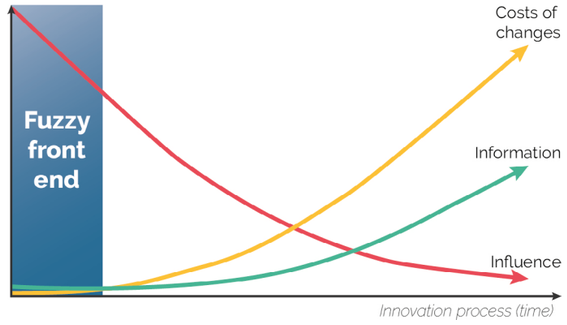


Figure 2.8: Influence throughout the fuzzy front end (von Hippel, 1993).

Despite the fact that the fuzzy front end is characterised by a lack of information compared to the rest of an innovation process, it is where Strategic Designers - or any innovators - have the biggest influence on the end result. As innovations become more concrete, and more becomes known, the room for changes also decreases, while the cost of changes increases (as presented in figure 2.8). This means that innovators that can deal with uncertainty in a meaningful way - such as Strategic Designers - can be of significant importance. As previously established, however, their ability to do so in a business context is limited by the lack of suitable metrics. Overall, this means that Strategic Design performance is not only most relevant during the fuzzy front end, the biggest improvement on the influence of Strategic Design can be gained from a suitable Strategic Design KPI for the fuzzy front end as well.

Measuring performance in the fuzzy front end

The lack of metrics for Strategic Designers in the fuzzy front end, comes down to the inability to evaluate the development of content at a stage when it can still serve to improve that development. This is because of the uncertainty that characterises the Strategic Designers' work in that phase. This can be described as the inability to measure what 'doing the right thing' is in the eyes of decision-making stakeholders.

Alternatively, process metrics can be a solution for dealing with long term processes, where content related metrics are not sufficiently insightful (Eddy, 1998). This can be seen as applying measurement to evaluate when Strategic Designers are 'doing things right'.

For innovation within a business context, traditionally, stage gate models are used to apply process measurements (Sommer et al., 2015). The problem for Strategic Designers, however, is that stage gates have been found to lack the flexibility that modern problem solving requires (Sommer et al., 2015). Agile process metrics provide an alternative which provides more flexibility than stage gates, but have been found to lack long-term insight (Chan & Thong, 2009), which also makes it unsuitable for Strategic Design.

A hybrid system could be a way to combine the long-term compatibility of stage gates, with the flexibility of agile metrics, however so far there has been little evidence that such hybrids are in fact effective (Bianchi, Marzi, & Guerini, 2018). Furthermore, both approaches rely primarily on productivity measurements, which reduces the notion of measuring 'doing things right' to only 'doing', as the uncertain nature of Strategic Designer's work and the fuzzy front end inhibit the ability to evaluate what is right, at a time that it is still actionable.

Ultimately, this means that in order to measure Strategic Design performance in the fuzzy front end, the method that is most likely suitable, is to measure based on process, but not limit it to productivity only. This type of metrics will be referred to as process-based metrics. Figure 2.9 shows how these different layers of metrics can be seen relatively to each other on a scale from content oriented to process oriented.

Figure 2.9: Process-based metrics relative to other types of metrics.

To summarise, no existing metrics and measurement systems are suitable for the combination of the key characteristics of Strategic Design and the work of Strategic Designers. This is especially relevant during the fuzzy front end. In theory, process metrics can be applied in order to measure Strategic Design performance in the fuzzy front end, however due to the uncertain nature of the fuzzy front end and the work of Strategic Designers, productivity-oriented process metrics are insufficient.

Metrics based on the process, but not limited to productivity only - now referred to as process-based metrics - should be the most likely way to create a suitable KPI for Strategic Design performance during the fuzzy front end of an innovation process.

3. Solution framing:

How can Strategic Design performance in the fuzzy front end be measured?

As pointed out in the previous chapter, process-based metrics should be the most likely way to create a KPI for Strategic Design performance during the fuzzy front end of an innovation process. However, the knowledge required in order to create this process-based metric, does not currently exist.

This chapter elaborates on the qualitative study that was conducted in order to find the exact process-based elements that can be translated into a Strategic Design KPI.

3.1 Method

The following section explains how the qualitative study was conducted. The second section is an overview of the findings, and the final section is a short summary of the conclusions that were drawn from the findings.

Approach

Given the fact that the research is about creating new knowledge on a subject about which little theory is currently available, a qualitative approach is most suitable (Patton, 1990).

More specifically, the Grounded Theory Method (Glaser & Strauss, 1968; 2017), was used to inductively build up theory which is grounded in the data itself.

Data was collected through a series of semi-structured interviews with Strategic Designers working in practice. The following sections go into more detail about the way the study was conducted. Figure 3.1 shows an overview of the different steps and elements of the research, as also further explained throughout this section.

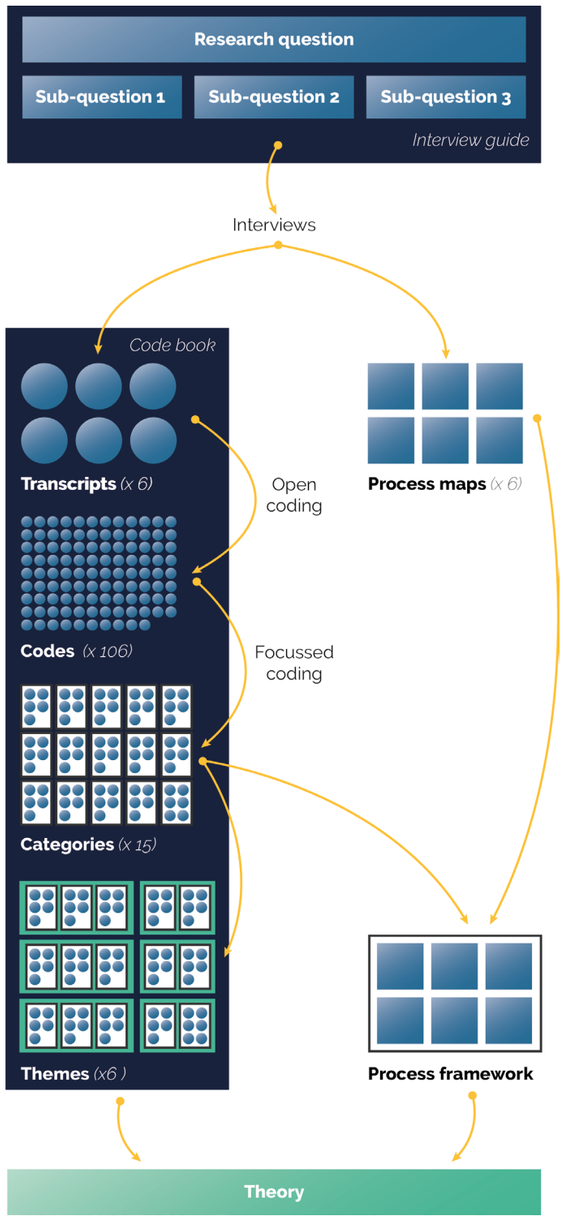


Figure 3.1: Qualitative study research approach.

Research questions

The qualitative study was conducted based on the following research question:

How can process-based metrics be used to measure the performance of Strategic Designers, during the fuzzy front end of an innovation process?

In order to answer the research question, the following sub-questions were explored:

1. What makes a Strategic design process in the fuzzy front end successful?

2. How do different elements of a Strategic Design process, such as activities, and deliverables, influence the quality of the outcome?

3. Which attributes of a Strategic Design process can be measured?

Data collection

Data was gathered through 6 semi-structured interviews, as described by Patton (2002), with Strategic Designers (see participant selection). Each interview was 1-1,5 hours, during which the participants made a process map of a project (see case/project selection). The interviews were structured according to the process map, starting at high level information, for example the different phases of a project, and going into more detail as the interview progressed. Furthermore, as the interview progressed, the questions went from a more empirical focus on events, to a more experience oriented and reflective focus in order to gain rich insights into the nuances of Strategic Design performance. The interview guide that was used can be found in appendix A.

All interviews were recorded, and subsequently transcribed excluding any content, person, or company details, that can be considered sensitive.

The process map each participant made was a timeline of a past fuzzy front end project, in which they made a visual overview of all phases, steps, activities, milestones etcetera, and reflected on how different elements of the timeline influenced the success of the outcome.

It was made in order to gain deeper insights by grounding the participants' answers in past experiences, and to avoid hypothetical answers, following a context mapping approach (Sanders, & Stappers, 2012). The process maps were all made digitally using 'Miro', which is a digital whiteboard.

What context mapping comes down to, is using tactile/visual mediums to let research participants create overviews of their past experiences. Customer journeys are a famous example of context mapping. In this case, a process map served to gain more insight into Strategic Design processes practice.

Participant selection

As explained in chapter 2.2, Strategic Designers can work in multiple contexts, but the scope for this project was limited to those that work internally for corporates. Participants were found through personal connections and LinkedIn. Figure 3.2 shows an overview of the sample.

Participants were selected based on the following criteria:

- Strategic Designers; by function/title, or education.
    - Meaning they work on innovation projects, with a long-term orientation, and multiple involved stakeholders.
    - Using design (related) tools, methods, and/or approaches.
- Working internally for a corporate.
- Involved in the fuzzy front end of innovation projects.

Participant	Function	Experience	Company industry	Design team structure
P1	Innovation lead	~10 years	Publishing	Independant
P2	Innovation coordinator	~1 year	Mobility	Internal incubator
P3	Innovation lead	~25 years	Finance	Internal incubator
P4	Innovation manager	~15 years	Legal council	Innovation department
P5	Design strategist	~6 years	Healthcare	Innovation department
P6	Innovation manager	~3 years	Insurance	Innovation department

Figure 3.2: Research sample.

Case/project selection

As previously mentioned, the process maps were made, based on a Strategic Design process, which the participant completed in the past, and which was selected by them. In order to ensure comparability between participants, the participants were asked to choose a project based on the following criteria.

The project should have:

- (in part) been the direct responsibility of the participant; for both the process, and the outcomes.
- recently resulted in intermediate results for further development by others, marking the end of the fuzzy front end.
- been an (early stage) innovation project, with:
    - High uncertainty; an ill-defined problem, and no predefined solution space
    - Long-term orientation
    - Multiple involved stakeholders

Analysis

Following the GTM data analysis steps as described by Glaser & Strauss (1967; 2017), each interview transcript was firstly coded; separating, and organising the content while remaining as close to what was said as possible. This resulted in 106 codes, describing what participants were discussing, such as:

- Measuring success based on stakeholder enthusiasm
- Importance of expertise for idea generation
- Indirect added value
- Reliability of knowledge
- Estimating quality on the basis of intuition (logic and experience)

Subsequently, the codes were clustered based on common themes, which were used in order to start forming theory based on the data. This resulted in 15 categories, such as:

- Impossibility of measurement
- Quantifying arguments
- Predicting the future
- Structure & creativity

Finally, the process maps were analysed in order to gain insight into how the different categories relate within a fuzzy front end process, using the themes as a guide. The following 6 themes emerged from the research, and were used in order to formulate the final theory;

- Commitment
- Content quality
- Justifying progress
- Measurement
- Motivation
- Trade-offs

Figure 3.3 shows a simplified example of one of the process maps.

Memos were used in order to keep track of emerging categories and themes during the coding process. Examples of such topics are:

- The role of the validity and understandability of logic embedded in results
- The effect of a predetermined direction.
- The importance of presenting

Based on the themes, the codes were compared again to find differences between participants, in order to develop a more nuanced theory. In the end, the results mostly describe what was common between participants, in order to avoid drawing conclusions based on a participants' personal beliefs, that are not common, or shared by other Strategic Designers. This was done to make the final results more widely applicable, and reliable for a broader potential user group. Examples of aspects where participants had widely different stances are:

- Whether or not potential user insights are a good foundation for fuzzy front end development
- The importance of a systematic approach to idea generation
- The value of indirect benefits of proposed results

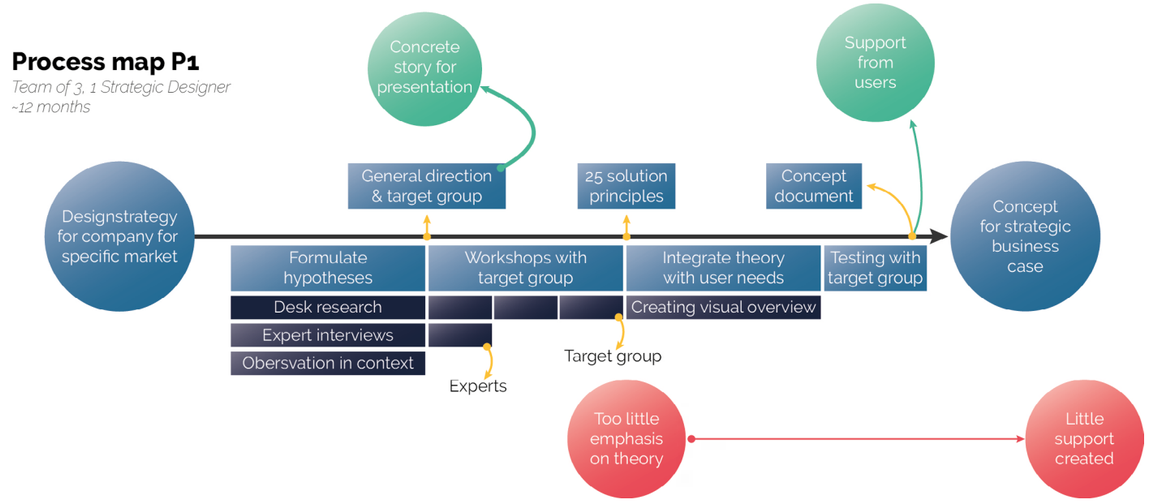


Figure 3.3: Simplified overview of a process map

3.2 Findings

The findings of the qualitative study are explained in this section. Where possible, findings are supported by quotes - all translated from Dutch to English. A big portion of the findings emerged from a large number of explanations, however, so not everything can be easily summed up in a comprehensible quote.

The process in short

The following paragraph is primarily based on the process maps. The findings described in this section serve to sketch a general image of a fuzzy front end process, help to understand the structure of a Strategic Design approach, and give context to the rest of the interview findings.

As the name 'fuzzy front end' implies, the process, starting point and outcomes are not clear cut, and vary significantly between and within organisations. However, from a bird's eye view, there are commonalities that characterise the process, and give insight into how the process can be more predictable.

In short, the fuzzy front end starts with the choice to explore an opportunity - in the broad sense of the word; including problems, a lack of opportunities, or search areas - and finishes when the organisation commits to further development of a more concrete version of the opportunity. This means that the opportunity is developed into a specific direction, but not a final outcome, for example, a value proposition, a concept, a future vision etcetera.

The origin of the initial opportunity also widely differs, but can be summed up by three categories:

- Internal; starting from an (internal) question, or request to explore an internal topic. In these cases, it can be challenging to convey the necessity to act upon a direction.
- External; starting from an external opportunity, or changing external factors. The 'burning platform' as research participants called it, can be more present, making the necessity of a direction more obvious. The challenge then lies in conveying why a particular direction is suitable.
- Mutual; Ideally (as innovation literature also tells us), both internal and external factors align, making both the necessity, and the choice for a particular direction easier to grasp.

Although the origin of the opportunity affects the process, and even the potential success, it is unpredictable, or even random to the process. Therefore, it cannot fairly reflect the performance of a Strategic Designer. As a Strategic Designer, it is advisable to keep the origin of a process in mind, and understand how it can affect success, but it is not a good attribute to base a KPI, or metric on.

As can be expected from a design perspective, the process typically follows a 'double diamond' structure, as popularised by the British Design Council (2005). This means that it is not a linear process, but involves iterations of diverging activities (gathering research insights, and ideating) and converging activities (synthesising insight, and developing ideas) in two main phases. The first phase (Discover & Define) being about defining a problem-solution fit - again in the broad definition of the words - based on the initial opportunity. The second phase (Develop & Deliver) is about creating a more concrete direction based on this problem-solution fit. With some slight variations to the original model, this double diamond structure of multiple phases of diverging and converging could be found in the process of all 6 participants,

The process varies in length (3-12 months, most commonly 6 within the research sample), but the time is not equally divided between the phases. The first diamond is often (for 5 of 6 participants) much shorter, because the organisation/Strategic Design team chooses to focus their efforts more on the activities of the second diamond (ideation and development), than on the activities of the first diamond (research and scoping). In most cases (5 out of 6), the diverging steps are also more time consuming due to the involvement of stakeholders in the activities, which simply adds calendars to conform to, and slows down the process.

Figure 3.4 is a visual framework of the process in which Strategic Designers operate.

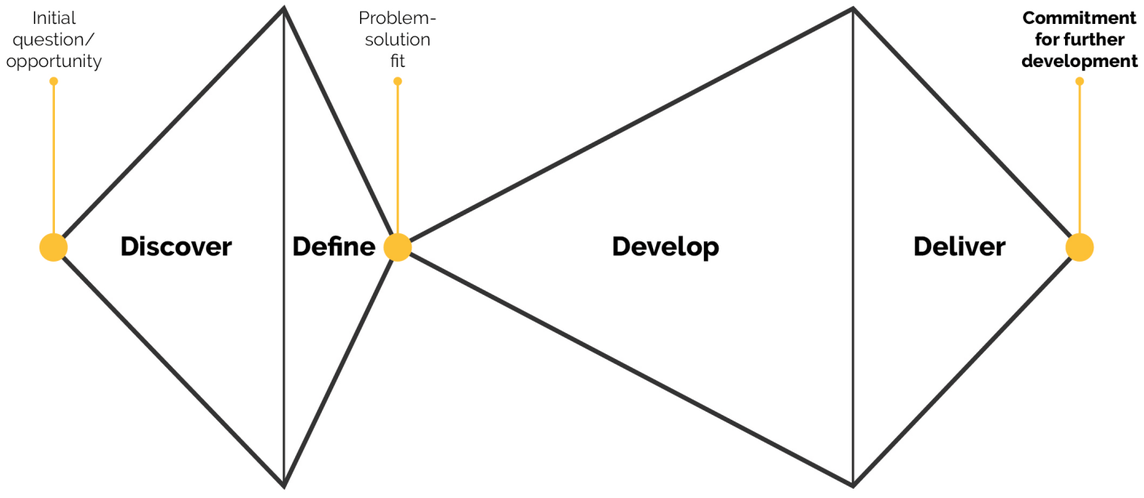


Figure 3.4: Strategic Design process phases overview.

Commitment

As previously mentioned, the fuzzy front end can be considered to be finished when the organisation commits to further development of a proposed direction. This commitment is achieved when the quality of the content and the level of support from the organisation (both will be further explained in the following sections) reach an implicit required level.

It is important to note that content quality and support levels are not neatly separated in practice, and often not separately addressable. However, they are distinctly different dimensions of success, which are influenced differently, and reflect different aspects of the Strategic Designer's performance.

The levels of quality and support required for commitment can be seen as implicit, as they are not explicitly defined, measured, or even discussed. All participants pointed out that they did not have a standard, or formal way to judge the quality of their work, but instead, approval/justification of the quality happens through qualitative conversations, without explicit targets that must be met. For the level of support, this implicit nature goes even further, as it is often not explicitly addressed at all, but rather something that the Strategic Designers try to influence throughout the process by their actions.

To summarise in terms of the process, the responsibilities of a Strategic Designer come down to a combination of creating sufficient quality of the content (content development), and achieving a sufficient level of support from stakeholders (stakeholder management). Although these aspects of the Strategic Designer's work are separate dimensions of success, they can mutually influence each other, as will be further explained below.

Content development

As previously stated, content development happens through diverging, and converging activities, which is a rather high level, neutral way of describing what happens, and not an informative basis for better understanding performance during the fuzzy front end.

There are many different ways to describe these activities in a more specific way, and all participants had different wording to describe what they did, but when comparing all of them, an underlying logic became apparent.

Below, two ways of explaining the activities of a Strategic Design process are described, which emerged during the coding process. The first is a more content related way of describing a Strategic Design process, which sheds more light on why measuring quality and performance is so complicated, and how it can be addressed. The second way of describing the activities of a Strategic Design process goes deeper into the working principles, and serves as a basis for the measurable attributes of the process on which a KPI/metric can be based.

Figure 3.5 shows how these two ways of looking at the process relate to the content-process metric scale which was described in chapter 2.2.

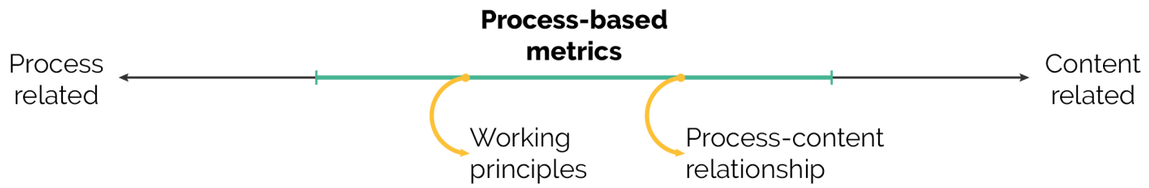


Figure 3.5: Perspectives of content development relative to process-based metrics.

Process-content relationship

Looking closer at the content, in essence, the job of the Strategic Designer is to predict the future. Whether it is a matter of an ideal future, the most likely future, or most commonly a combination of the two, the main goal of the fuzzy front end is to go from what is currently available, and create a meaningful prediction/goal for the future. Gathering the required information to base these predictions on, can be seen as an attempt to gain certainty in the fuzziness of the fuzzy front end, and to create a believable foundation for these predictions.

So in the terms of the process, developing the content of the fuzzy front end can be seen as the constantly going back and forth (iterations) of predicting the future, and gaining certainty (see figure 3.6). All participants used different words to describe this process, for example 'formulating hypotheses' (P1), or 'framing the potential of a direction' (P4), but what they all have in common, is that they apply current knowledge in order to make claims about the future.

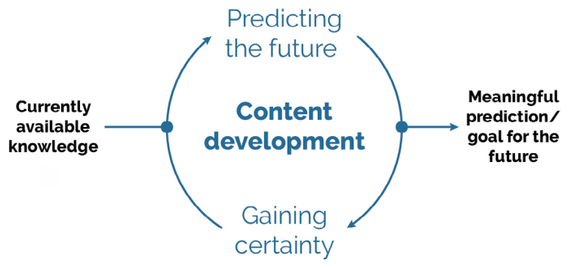


Figure 3.6: Strategic Design content development.

In this tension between current knowledge, and claims about the future lies the crux of why measuring content quality in the fuzzy front end is so challenging; it is impossible (be it unfeasible, unviable, or both) to accurately measure any representative aspect of quality of something that does not currently exist, especially if that something can still change. As a research participant explained it:

"As soon as you can measure it quantitatively, you know what you are working on. Then you have actually already passed the fuzzy front end. [...] Metrics always exist by the grace of the past." (P1)

Furthermore, quantitatively judging quality requires an image of what a successful outcome is, which is also something that is usually not present in the fuzzy front end, as was also pointed out in chapter 2.2. A participant explained it as such:

"All projects guide the goals and the goals guide the projects. So, it is a mishmash an d an interplay." (P2)

This means that by the time a clear image of success (and thus quality, and consequently performance) can be formed and measured, the Strategic Designer has already put in a tremendous amount of work which cannot be realistically addressed from a measurement perspective, given this way of looking at the content and process.

So instead of judging quality quantitatively, judging the quality of the work of the Strategic Designer happens qualitatively. All participants pointed out that they have qualitative conversations about their content, within their team, with management, and/or with stakeholders, in order to develop, test, and justify what they were creating. This happens in various forms, such as:

- informal weekly meetings with direct managers to discuss the content in detail (P1)
- organised sessions before presentation to management, with the whole team where they 'roast' or nit-pick on their own presentations to find and address potential problems (P2)
- interview-like 'validation' sessions with involved stakeholders (P5)
- opportunistic/ad hoc 'chats' when the Strategic Designer runs into involved stakeholders in the building (P6)

These conversations can, strictly speaking, be seen as subjective. Quality in this case is a matter of perspective and interpretation, and thus subject to the influence of personal opinion. However, two thirds of the research participants explicitly pointed them out as being one of the most crucially beneficial aspects of their process, in terms of achieving quality and success. The reason for this, as one participant explained:

"You come up with something, and your intuition gives you a hunch. And actually, still before you have the idea, you already rationalised it. [...] When the right idea is there, we rationalise why it is a good idea... Maybe it is actually a lot more intuitive than that." (P3)

So, in other words, in practice, people intuitively estimate the quality/value of a direction quite well, before being able to fully rationalise it. From a positivist perspective (see chapter 1.2), this can seem unreliable and risky, however from a design perspective it makes sense, as it allows people to work from their experiences, and to make creative decisions. From a strategy perspective, being able to make these creative decisions is what makes design valuable, as these creative leaps allow an organisation to create truly novel ideas, and to avoid 'low hanging fruit', as one of the participants (P1) described it.

All of this does not mean that there is no place for performance measurement in the fuzzy front end. As two participants (P3 & P5) pointed out, the difficulty of qualitative conversations is that people easily fall into an exchange of opinions, rather than a constructive conversation meant to develop, test, and justify what they are creating. In this context, performance measurement can help to structure these qualitative, intuitive steps, and make them more insightful, and actionable.

A side note: when available, quantitative data can allow Strategic Designers to increase the credibility - not the objectivity of their claims, or address specific topics that can be explored quantitatively such as market size estimations. However, in practice, this does not seem to be necessary for a successful fuzzy front end as not all participants do it fully, if even at all. One participant explained how they often address measurability of certain standard aspects such as market size, but that they never finalise the numbers:

"In practice, you often see that we do address measurability. For convenience, we fill in an x and tell each other we will fill it in later. We'll get to that. The project proceeds to version 2, version 3, version 4... The x always remains." (P3)

To conclude, judging the quality of content created by Strategic Designers happens qualitatively in practice, which works due to people's intuitive understanding of quality and value. From a measurement perspective, the challenge lies in being able to surface these intuitive judgements, and make them tangible and concrete, in order to estimate the Strategic Designers performance.

Working principles

In order to surface the previously explained intuitive judgements, the second way of looking at the Strategic Design process comes into the picture. In order to make future predictions, Strategic Designers gather information (diverging in terms of the double diamond), and create logic, explaining what this information can mean (converging).

The quality of the future predictions and the achieved level of certainty thus depend on two aspects:

1. the quality of gathering information
2. the quality of the applied logic.

The first aspect; the quality of gathering information, comes down to how comprehensive the information is. Comprehensiveness is not a clear-cut objective, considering that at the time of gathering information, it is not yet clear what is required. However, gathering comprehensive information is a goal that is easier to comprehend than creating good quality content, due to the availability of tried and tested methods, and it being ground in the past and present, rather than the future. In practice, it is a matter of just getting started, gathering some information, and filling gaps where they emerge.

Comprehensiveness can be further broken down into scope (how broad is the information), and depth (how detailed is the information). Based on the data available for this research, it is impossible to say exactly how to balance these two aspects, but it comes down to a good mix of both within the available time. A broad scope prevents blind spots, more depth is more useful in applying the information.

Information in this context refers to both research insights in the first diamond, and ideas in the second. Although none of the participants identified their information gathering activities as the most important for the eventual quality, there was recognition for its importance. As a participant charmingly described it:

“Shit in, shit out.” (P5)

What this participant meant, was that the end result can only be as good as the information that was used to achieve it. What was common in the answers of all participants, however, is that they relied heavily on other stakeholders for gathering information, other parties within their company networks most commonly (5/6). A big consideration for this is speed; network-based research is quick. Another consideration pointed out by two participants, is that Strategic Designers lack the expertise on most subjects to generate sufficiently deep insights, and consequently have to rely on the expertise of others. In the words of one of the participants:

“I think that it is very important [during ideation] to make sure you have a multidisciplinary group of people with real expertise. [...] Because if you [ideate] with only designers, I often think, it results in a bit of a fluffy fantasy story. I think that the diversity of the group is essential [during ideation]. And their experience.” (P5)

The second aspect; the quality of the applied logic, is where Strategic Design content is really created, and what people tend to look at, when making the previously described intuitive judgements. It is also the activities that 4 of 6 participants pointed out as being an essential part to their eventual success. It describes the efforts of the Strategic Designer to take information, and synthesise it, taking a step towards something more concrete - and valuable if done correctly - than the separate elements. The creative synthesis of information into something valuable, is what makes design valuable, but also what is so hard to understand, or quantify. In the words of one of the participants:

“In [the Discovery phase] we try to make concrete combinations of ideas. So, we go over all of our findings [...] and then the process emerges, which everyone is trying to understand, but still remains a bit magical. The aspect of design where you suddenly [understand how things connect]” (P3)

Intuitively judging the quality of logic, in essence comes down to the coherence of the logic, and underlying information. Three participants explained how the qualitative conversations they have, which are so critical to the success of the phase, are to test and/or develop their argumentation/story, which is a way of testing and developing the coherence. One participant explained it using the following example:

“So, if I tell you: well, for vegetarians, we will make a huge steak, which has lots of protein. Then you will say, hang on, I don’t get it. A steak for vegetarians... That does not make sense.” (P3)

What this example shows is how people are able to estimate the validity of an idea based on how logically coherent the underlying information is. In this case, the idea that somebody would buy a steak is not coherent with their vegetarian diet, so developing a type of high protein steak for them would not make sense.

In conclusion, in order to estimate content quality, and to structure intuitive judgment of the quality of Strategic Design content into actionable, and potentially measurable aspects, a distinction needs to be made between the comprehensiveness of gathered information, and the coherence of the created logic (see figure 3.7). These are both attributes that people can intuitively estimate, and are indicators of good Strategic Design content in the fuzzy front end. Together, these attributes can give a grounded (partial) indication of Strategic Design performance.

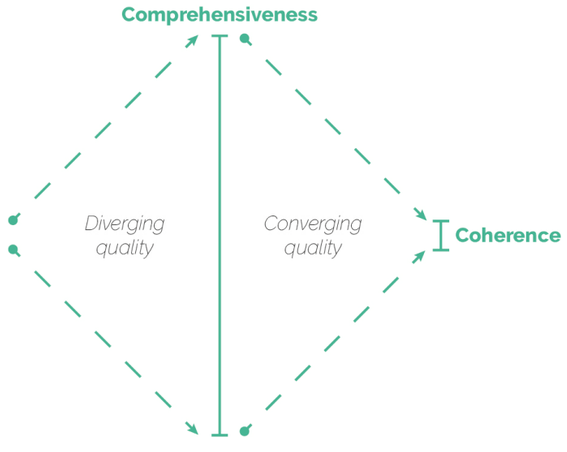


Figure 3.7: Working principles behind quality of Strategic Design content.

Stakeholder management

As previously mentioned, the quality of the content is not the only aspect of the work of a Strategic Designer that influences their success in the fuzzy front end. Stakeholder management - achieving the required level of support from the necessary stakeholders - is the other aspect which is influenced throughout the entire process. Support in this case is the translation of the Dutch word 'draagvlak', however it does not fully cover its meaning. 'Draagvlak' in a Strategic Design context is used to describe a sense of approval, and willingness to accept responsibility for a design from stakeholders.

This level of support can again be divided into two dimensions;

1. managerial support
2. internal support.

Both levels of support are an indication of how much the stakeholder 'likes' the content. Liking the content seems subjective, which it partially is, however it is also the result of the intuitive judgement of underlying requirements for successful fuzzy front end outcomes; the strategic fit, and continuity of the idea, which are further explained below.

Obviously, the level of support is related to the quality of the content, but there are aspects of it that can be seen separately. It is also important to do so, since addressing it can require different actions than 'just making better content'. In other words, it is possible to create amazing content, yet fail the fuzzy front end. In order to avoid this, or understand why it is happening, the level of support should be addressed separately.

Managerial support

Managerial support describes how much support management - or the decision-making unit, has for the proposed problem-solution fit/idea. Other than the quality of the content itself, this support is the result of the estimated strategic fit. Multiple (4) participants explained how their fuzzy front end was successful, or not, due to the way management supported further development of the outcomes, which was based on how well the estimated benefits matched the organisation's goals.

For three participants this meant that funding was allocated to the projects, and that people were made responsible for further development. For the fourth participant, a lack of managerial support meant that the proposed solution remained in a conceptual stage, where it was reworked without the involvement of the original team. In the eyes of the participant, this has led to a loss of quality and the essence of what made the concept valuable. One participant explained how a change in management determined the continuation of development of a proposed concept, that was not accepted by previous management:

"For a year, we tried to find a [way] to try such things, with the marketing department, and they just did not work out. The formal manager, and the person responsible for the website just did not agree. [...] The manager left, and someone else replaced him. [...] And when he came, and I proposed my [prototype]... Things were just suddenly possible. [...] That was a major turning point for how well we could work, and how fast we could proceed." (P4)

Internal support

Internal support describes how much support stakeholders within the organisation have for the proposed solution. Stakeholders within the organisation can range from stakeholders who are owner of the subject/solution within the organisation, to teams responsible for further development, and to people affected by the proposed solution. The presence of internal stakeholders is the result of the size of corporates, as well as the intermediate nature of Strategic Design/fuzzy front end results.

It is determined by what can be described as continuity. The stakeholders that will be responsible for further development after the fuzzy front end need to be able to do so, as well as feel ownership, or the innovation will not succeed later on. As two participants explained it:

"What I know is that in such a deep dive, all stakeholders need to be involved. The people that will have to [continue the project later on], the people who are owners of the subject within [the company] ... Everybody needs to join, because otherwise you do not get support and then [the project] dies." (P3)

"Everybody always says, if it's a good idea, everybody will be able to work with it. It's just not true!" (P1)

Significance

Similarly to statistical significance in quantitative research, there are aspects to keep in mind before drawing conclusions based on the previously described aspects of a Strategic Design process. These aspects are:

1. Understandability
2. Innovation culture

Firstly, understandability determines if judgements of the content quality are a valid indication of the actual quality. One participant pointed out how any form of qualitative judgement is only representative if the judging party understands the content sufficiently. In other words, understandability does not directly relate to the quality of the content, however any intuitive, or qualitative estimation is useless if the subject matter is not understood. For that reason, the understanding about the content should be checked in order to draw conclusions based on the qualitative judgement.

Secondly, the level of support can also be influenced by an organisation's innovation culture. Innovation culture determines how well an organisation can change (as mentioned in chapter 2.2), which determines the available solution space for an innovation project. Less innovative organisations might not be supportive of radical changes, and more innovative organisations might not be interested in incremental changes. In essence, this determines the scope of successful directions, and consequently influences the level of support independently from the actual level of quality of the content.

This difference emerged from how participants from more innovative companies - based on reputation, and industry stereotypes - described stakeholder responses, compared to participants from less innovative companies. For example, looking at participants 1 and 2, who both worked on conceptual projects, which are a departure from what the company normally does, with an emphasis on company image rather than business value, both described completely different responses to their work. Participant 1 described how the team was hindered by the company's way of working, and that internal stakeholders struggled to see the benefit, despite elaborate explanations. Participant 2 on the other hand, was given resources and freedom to develop a concept, and received positive responses, despite the concrete added value of the concept still being unclear.

3.3 Conclusion

Looking back at the research questions, the following conclusions can be drawn:

1. What makes a Strategic design process in the fuzzy front end successful?

The process is successful, if the Strategic Designers are able to reach the - usually implicit - required levels of content quality, and support for a proposed 'idea' for further development.

2. How do different elements of a Strategic Design process, such as activities, and deliverables, influence the quality of the outcome?

The quality of the outcome is not directly influenced by particular activities, or deliverables, but instead by the quality of the working principles embedded in their process of diverging and converging steps. This means that the quality of the outcome is primarily influenced by the comprehensiveness of gathered information, and the coherence of the created logic, of the problem-solution fit, and proposed 'idea' for further development.

3. Which attributes of a Strategic Design process can be measured?

Firstly, the quality of the working principles behind the quality of content development, through comprehensiveness and coherence. Secondly, stakeholders' intuitive estimations of quality, the strategic fit, and continuity, through managerial, and internal support.

Main: How can process-based metrics be used to measure the performance of Strategic Designers, during the fuzzy front end of an innovation process?

In short, by surfacing and structuring intuitive judgements in order to make essential aspects of success (content quality and support), as well as the underlying attributes (comprehensiveness and coherence, strategic fit and continuity) measurable. Keeping in mind their limitations (understandability and innovation culture) in order to correctly interpret appropriate conclusions from these measurements.

Figure 3.8 shows a framework for Strategic Design performance measurement in the fuzzy front end, combining the previously discussed aspects of content development, in the overview of the process phases, through which support runs as a parallel process.

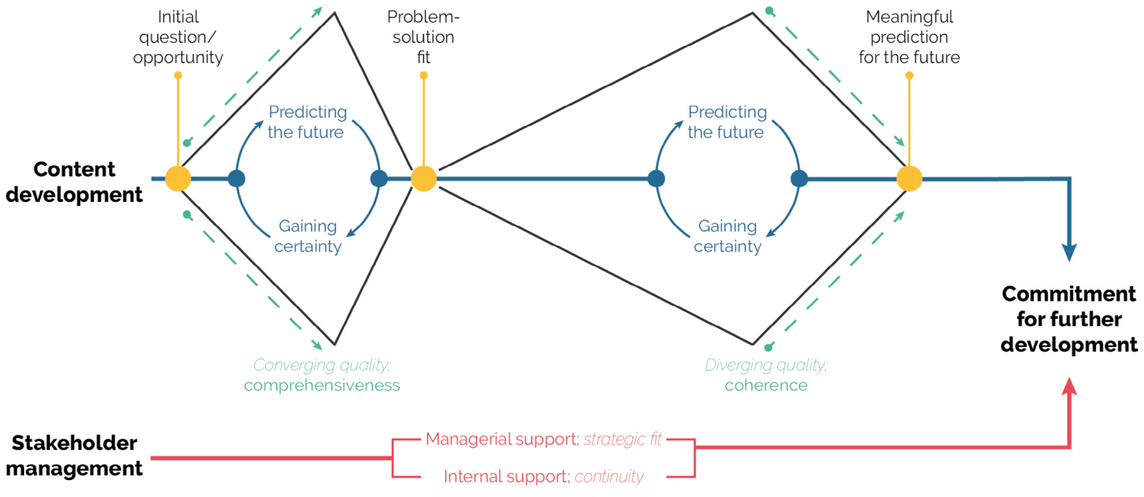


Figure 3.8: Theoretical framework for understanding Strategic Design performance.

4. Strategic Design KPI concept:

What it all comes down to.

After the theoretical foundation for a Strategic Design KPI was found, as described throughout the previous chapter, the next step was to design the KPI itself.

The following chapter describes the Strategic Design KPI concept in its final design state, as developed in this project. It is derived from the qualitative study, as well as additional theories, but it is a completely new concept. All scores are new creations, and although some scores' structures were derived from existing methods, non were previously used in the context of measuring Strategic Design performance.

The design process of gathering additional information, and developing the KPI can be found in Appendix B.

4.1 KPI overview

Measuring Strategic Design performance, using process-based metrics, needs to happen over multiple elements, to gain sufficient understanding of the performance.

These elements can be divided into main scores, sub-scores, and a control score.

Main scores

In short, the main scores indicating Strategic Design performance are:

- the Fuzzy Front End Commitment Score; summarising overall performance
- the Content Quality Score; indicating the quality of content development
- the Total Support Level; indicating the quality of stakeholder management

Sub-Scores

The Content Quality Score consists of the following sub-scores:

- the Information Comprehensiveness Score; indicating the quality of diverging activities
- the Logical Coherence Ratio; indicating the quality of converging activities

The Total Support Level consists of the following sub-scores:

- the Managerial Support Level; indicating the level of support from managerial stakeholders, and their perception of the strategic fit of the result.
- the Internal Support Level; indicating the level of support from internal stakeholders, and their perception of the continuity of the result.

Control score

The control score of the KPI and its sub-scores are:

- the Level of Discrepancy; a benchmark to indicate potential problems for interpreting the KPI.
    - Understandability; indicating the extent to which the Strategic Designer is able to sufficiently convey the content.
    - Innovation culture; indicating the organisation's ability to change/innovate, which determines the potential scope of the result.

Figure 4.1 shows an overview of these elements, and their links. Each element in explained in detail in chapter 4.4.

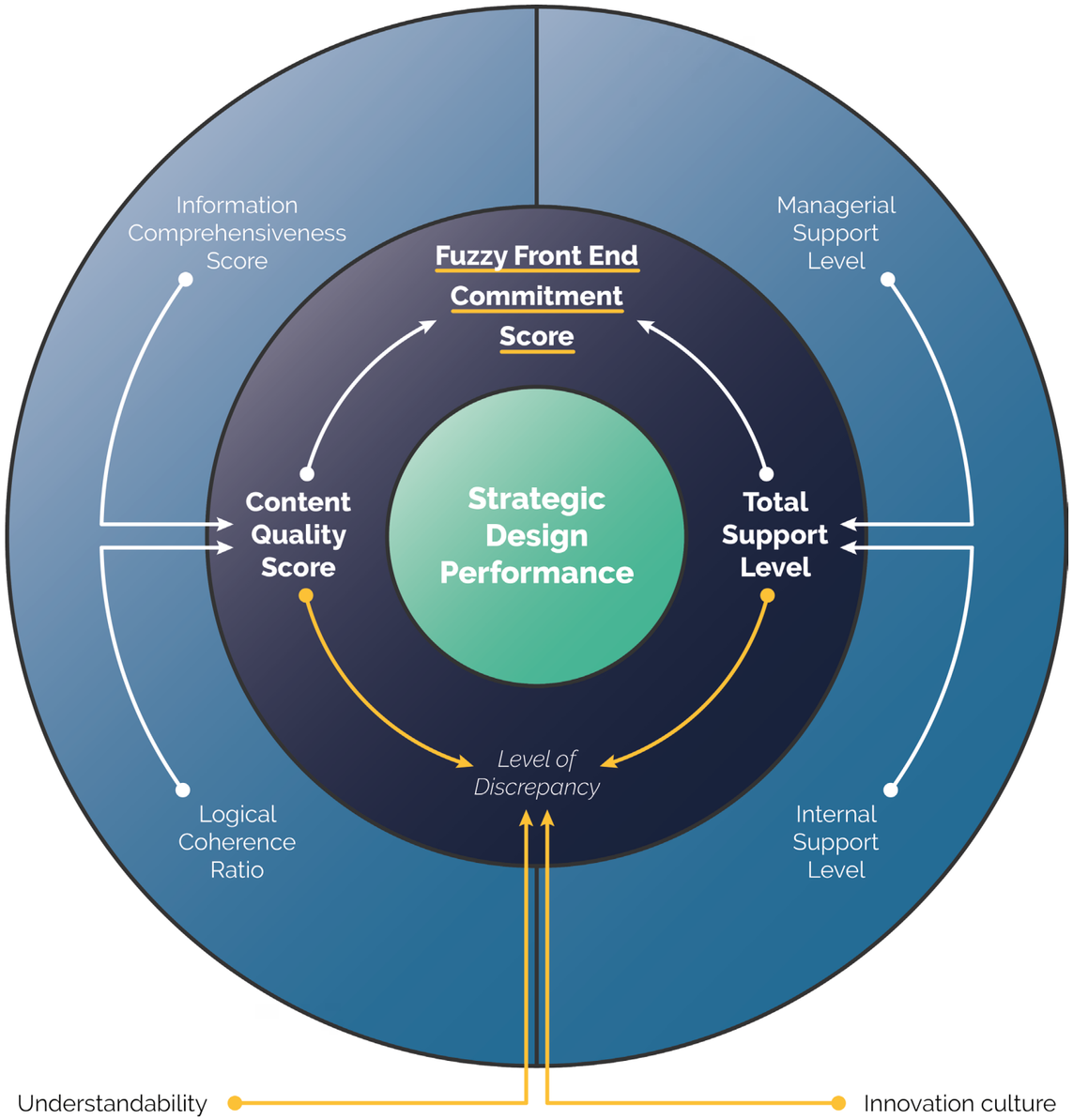


Figure 4.1: Overview of elements of Strategic Design Performance.

4.2 Workflow

Figure 4.2 shows an overview of how measuring Strategic Design performance ties into a Strategic Design process. The workflow can be integrated into an individual phase/diamond, assuming that the process as a whole follows a double diamond structure, as was found to be common in practice in the qualitative study (see chapter 3.3).

This means that the Strategic Design KPI can be used to evaluate every phase individually, and/or to evaluate the process as a whole, by going through the workflow twice.

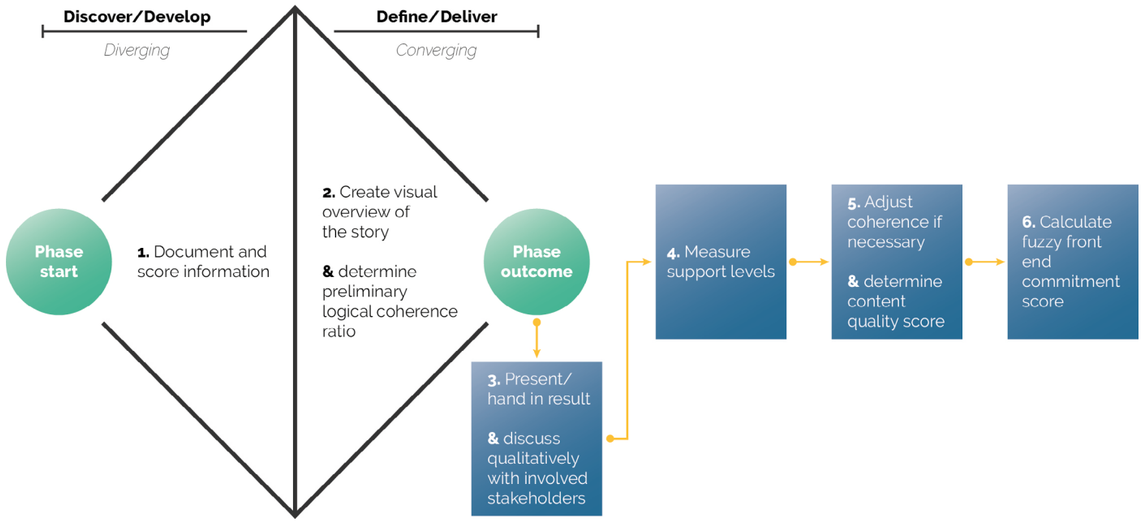


Figure 4.2: Strategic Design performance measurement workflow.

4.3 Interpreting the KPI

Due to the KPI consisting of multiple elements, interpreting the outcomes, and drawing suitable conclusions based on them, requires some knowledge. The following sections are a brief overview of how different outcomes can be interpreted, starting with an explanation of the main scores, followed by an explanation of the two pairs of sub-scores.

Main scores

Figure 4.3 shows a simplified overview of the different possible outcomes of the Fuzzy Front End Commitment Score, based on the Content Quality Score, and the Total Support Level, if both are either high or low. What these four quadrants mean with regards to Strategic Design performance is explained below.

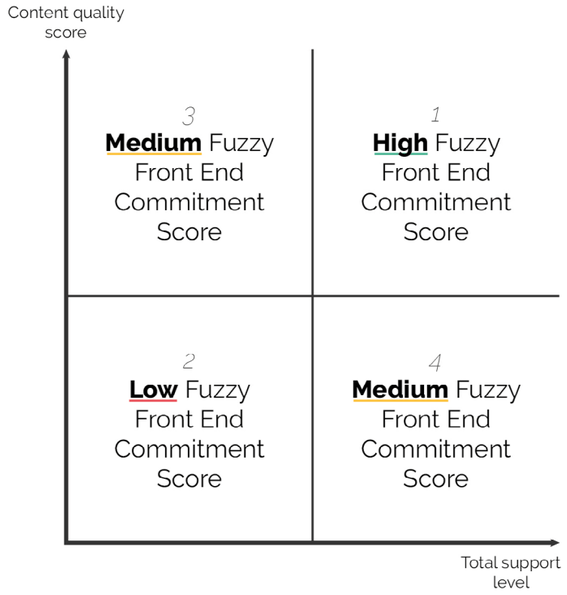


Figure 4.3: Overview of possible Strategic Design KPI outcomes and their meanings.

1: High overall scores:

All aspects of the KPI work in such a way that a higher number represents better performance. This means that high scores along both axes, and as a result a high Fuzzy Front End Commitment Score indicates that the Strategic Designers in question perform well.

2: Low overall scores:

Lower overall scores are an indication that performance is not optimal, and that changes should be made to improve. The best approach to such changes can be found by looking at the underlying metrics, and assessing the differences.

3: High Content Quality Score & low Total Support Level:

A high Content Quality Score, but a low Total Support Level indicates that although the Strategic Designer's content development has been good, they have not sufficiently considered the context in which they are working and/or failed to sufficiently involve the relevant stakeholders in their process.

This results in an outcome that is not suitable for the organisation, or is an indication that the necessary stakeholders do not feel connected to the outcome, resulting in a lack of commitment to make it a success later on.

4: Low Content Quality Score & high Total Support Level:

A low Content Quality Score, but a high Total Support Level indicates that the Strategic Designer has been successful in terms of involving stakeholders, and convincing them of the results, but not in terms of the quality of content development.

If this is the case, it can be expected that there will be more problems in further development of the innovation, due to overlooked factors, or a lack of detail, which could have been addressed earlier.

Sub-scores

The sub-scores of the Content Quality Score, and the Total Support Level provide insight into different aspects of Strategic Design performance. The following sections provide a brief explanation of how differences between these sub-scores can be interpreted.

Information Comprehensiveness Score vs. Logical Coherence Ratio

A high Information Comprehensiveness Score, and a low Logical Coherence Ratio, indicate that the Strategic Designer is gathering information effectively, but not applying it efficiently. If this is the case, the Strategic Designers are most likely struggling to make sense of the information that they are gathering, or are overly focussed on diverging. This will result in an endless process, or poorly formulated results, despite extensive knowledge of the content.

A low Information Comprehensiveness Score, and a high Logical Coherence Ratio, indicate that although the Strategic Designers can create a comprehensive story, they are not sufficiently diverging. If this is the case, it is likely that relevant aspects of the content will be overlooked, or results will turn out shallow, which will cause problems in further development and implementation of the innovation.

Managerial Support Level vs. Internal Support Level

Within the Total Support Level, the different elements (managerial support and internal support) represent the different stakeholder groups, with their own perspective, and requirements. In that sense, differences between each level indicate which stakeholder group was better addressed by the Strategic Designer relative to what they require. Lower levels are therefore an indication that the Strategic Designer needs to put in more effort into the stakeholder management of that particular group.

4.4 KPI elements in detail

Fuzzy Front End Commitment Score

The Fuzzy Front End Commitment Score (see figure 4.4) is the overall, single number which represents Strategic Design performance in the fuzzy front end. It is meant to give quick insight into Strategic Design performance, however it does not provide additional information into the reasons for success, failure or changes in performance. It is most suitable for higher levels of management to gain insight into whether or not Strategic Design performance needs to be addressed, or to track the effect of changes on a higher level.

The Fuzzy Front End Commitment Score is built up of two elements, which indicate the potential Strategic Design success in the fuzzy front end:

1) the Content Quality Score, which represents how well content is developed

2) the Total Support Level, which represents how well the content is perceived by stakeholder within the organisation

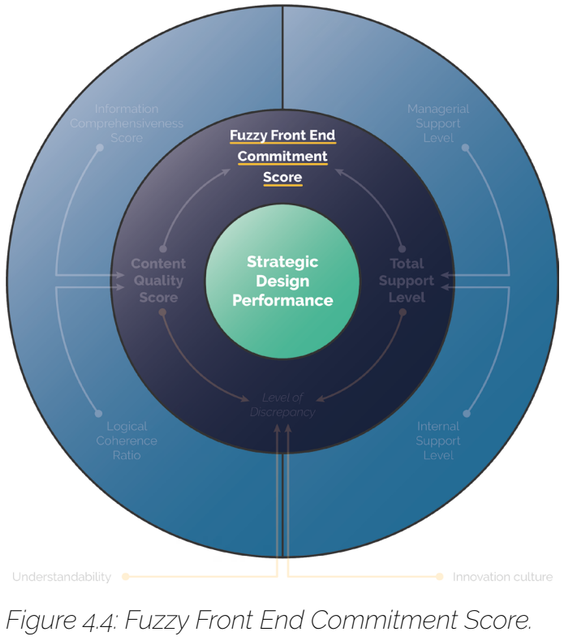


Figure 4.4: Fuzzy Front End Commitment Score.

The Fuzzy Front End Commitment Score, being the summarising number of the KPI, is calculated by averaging the Content Quality Score, and Total Support Level. This can be done with a relative weight, if an organisation chooses to prioritise one above the other.

The resulting number is on a range of 1-7, where a higher number indicates better performance.

The Fuzzy Front End Commitment Score can be calculated as such:

$$\text{Fuzzy front end Commitment Score} = \left(\text{Content Quality Score} \times \textit{Relative weight}\right) \times \left(\text{Total Support Level} \times \textit{Relative weight}\right)$$

Content Quality Score

The Content Quality Score (see figure 4.5) provides an indication of the quality of the content development during the fuzzy front end, independently of the perception of stakeholders. It serves to explain the effectiveness and efficiency of Strategic Design efforts as objectively as possible, given the uncertainty that characterises the fuzzy front end and Strategic Designer's work.

Since the uncertain nature of Strategic Design makes it impossible to objectively judge the quality of Strategic Design content itself, the Content Quality Score provides an indication of the quality of the development process instead.

The Content Quality Score also consists of two elements both based on the fact that Strategic Design processes follow a structure of diverging and converging activities:

1. the Information Comprehensiveness Score, which indicates the quality of diverging activities
2. the Logical Coherence Ratio, which indicates the quality of converging activities

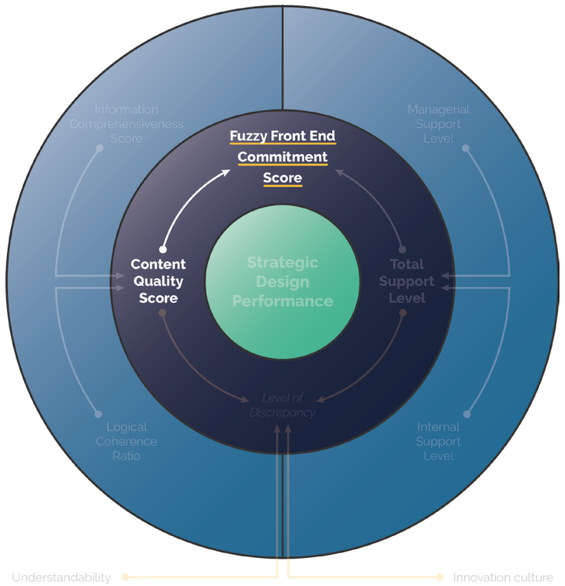


Figure 4.5: Content Quality Score.

The Content Quality Score is derived from the Information Comprehensiveness Score, and the Logical Coherence Ratio, by multiplying them. Subsequently, it should be converted into a scale that is comparable with the Total Support Level, by dividing by a constant. The Content Quality Score should be converted, because it is unlimited, and the Total Support Level is measured on a scale, as will be further explained in the following sections.

The Content Quality Score can be calculated as such:

$$\text{Content Quality Score} = \frac{\text{Information Comprehensiveness Score} \times \text{Logical Coherence Ratio}}{\textit{Conversion constant}}$$

Information Comprehensiveness Score

The Information Comprehensiveness Score (see figure 4.6) is an indication of diverging quality by quantifying the comprehensiveness of the information gathered throughout the Strategic Design process, both research insights, or creative input.

The comprehensiveness of information is measured, because it determines the potential quality of Strategic Design content, and potential impact of what is developed during the fuzzy front end.

Comprehensiveness is a combination of:

- Broadness of information, which is necessary to gain a holistic understanding of the content, as well as to avoid blind spots to relevant aspects
- Depth of information, which is necessary in order to gain sufficient understanding to apply information in a meaningful way.

Furthermore, the Information Comprehensiveness Score accounts for how well-grounded information is, in order to increase the reliability of the information.

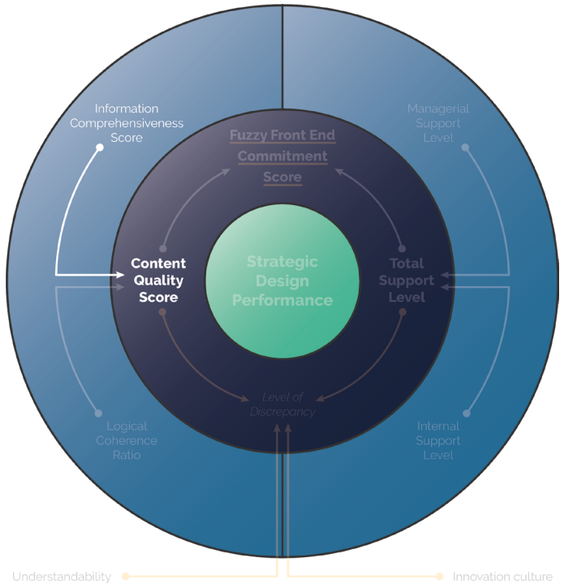


Figure 4.6: Information Comprehensiveness Score.

The Information Comprehensiveness Score is derived from a point system, where points are awarded for information that is gathered throughout diverging activities. It is created as an unlimited score to encourage exploration, while also stimulating structure and overview by requiring documentation of information in order to receive points.

Points are awarded for every research insight, and for a standard unit of creative input, such as idea clusters. This means that more points are awarded for broader information. Furthermore, extra points can be awarded for deeper information, as well as for more grounded information. Additional points for deeper and more grounded information are limited to avoid rewarding overworking the same information.

Phase	**Research**	**Ideation**
Range	*5-15 points per insight*	*5-15 points per cluster*
Broadness	5 points per insight	1 point per final idea cluster
Depth	1 extra point per additional layer of information, with a maximum of 5	1 extra point per 10 unique ideas within each cluster, with a maximum of 4
Groundedness	1 additional point per source, with a maximum of 5.	total amount of points (per session) multiplied by amount of involved stakeholder groups, with a maximum of 3

Figure 4.7: Scoring information comprehensiveness.

The exact way of scoring can vary per organisation, however, figure 4.7 shows an example of how this scoring system can be structured.

Logical Coherence Ratio

The Logical Coherence Ratio (see figure 4.8) is an indication of converging quality by quantifying the coherence of Strategic Design results, in relation to the information gathered through diverging activities.

The coherence is measured, because it determines how well information is integrated into a meaningful result, which determines the extent to which the potential quality, and impact that is created through diverging, can be converted into practical value.

Determining the coherence of Strategic Design results can be done by creating a visual overview of the explanation/story of a result. In this overview, every insight, and unit of creative input is portrayed as individual elements (hereby referred to as tokens), and argumentation about how these tokens relate (hereby referred to as ties) is portrayed by linking them together. Figure 4.9 shows an example of how such an overview can be structured.

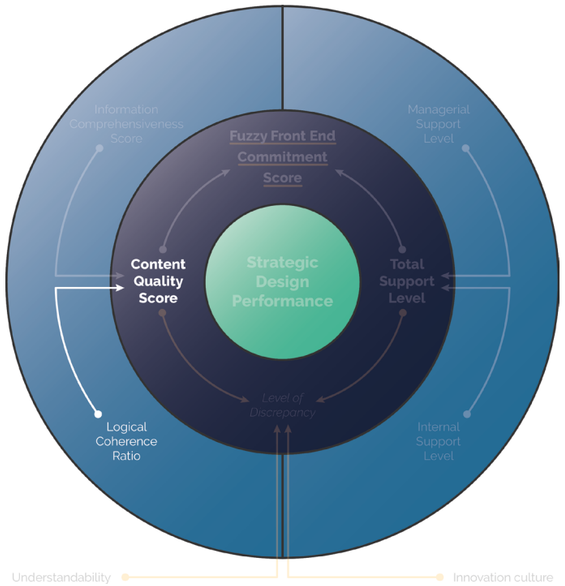


Figure 4.8: Logical Coherence Ratio.

The Logical Coherence Ratio is calculated by dividing the number of ties in a result by the total amount of available tokens, including tokens that are not part of the final result. By including every available token in the calculation, it is rewarding to account for all available information, and 'cherry picking' information does not contribute to a better score. Creating a well coherent 'story' is the only way to retain a good score for the quality of the content as a whole.

The ease of determining this ratio depends on the overview of the story that the Strategic Designers create. This encourages them to make their argumentation explicit, whether it is proven or assumed, and allows them to more easily discuss specific elements of the story with stakeholders. The final score should be under reservation until the story is accepted, to avoid rewarding points for assumptions, argumentation and conclusions that are not accepted by other stakeholders.

The formula for the Logical Coherence Ratio is as follows:

$$\text{Logical Coherence Ratio} = \frac{\text{Total amount of ties}}{\text{Total amount of tokens}}$$

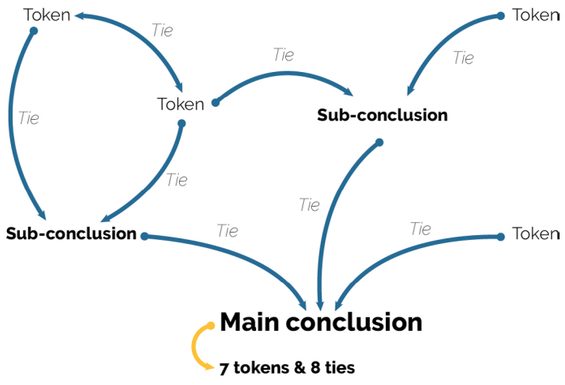


Figure 4.9: Evaluating logical coherence.

Total Support Level

The Total Support Level (see figure 4.10) is an indication of stakeholder's support for fuzzy front end results - describing a sense of approval, and willingness to accept responsibility for proposed outcomes - based on the intuitive judgement of the Strategic Designer's work by said stakeholders.

The Total Support Level serves to provide clear, structured insight into stakeholder's intuition, as well as provide more insight into underlying reasons for accepting or rejecting results other than the quality of the content.

The Total Support Level consists of the two primary stakeholder perspectives that influence fuzzy front end success;

1. the Managerial Support Level, which summarises the perception of managing/ decision making stakeholders.
2. the Internal Support Level, which summarises the perception of other stakeholders within the organisation that will be the owner of the results, responsible for further development and/ or affected by proposed changes.

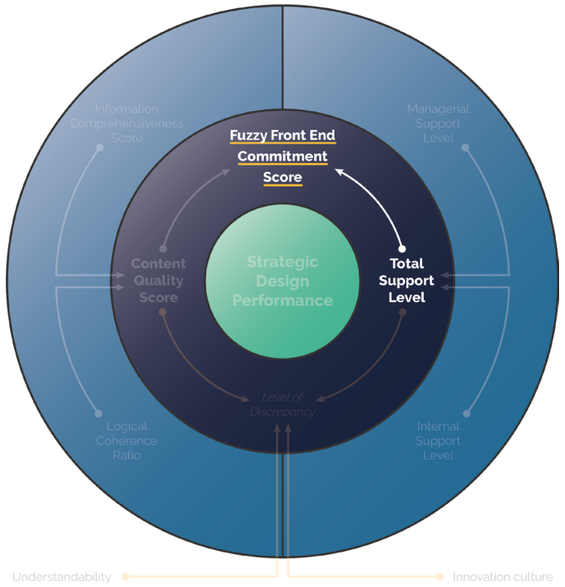


Figure 4.10: Total Support Level.

Both support levels can be evaluated by applying existing customer research tools for quantifying people's perspectives, with outcomes that are quickly and easily understood. A suitable approach along these lines is to apply questionnaires, and measure support with Likert scales. This means that the support levels, and consequently the KPI as a whole, are measured on a scale of 1-7.

For Strategic Designers, this way of evaluating support, should be seen as a quick activity that provides a quantitative summary of their qualitative conversations, and not as a replacement of their normal way of working.

The Total Support Level can be measured by calculating the average of the Managerial Support Level, and the Internal Support Level, with a relative weight if an organisation values one over the other.

The formula for the Total Support Level is as follows:

$$\text{Total Support Level} = \left(\text{Managerial Support Level} \times \textit{Relative weight}\right) \times \left(\text{Internal Support Level} \times \textit{Relative weight}\right)$$

Managerial Support Level

The Managerial Support Level (see figure 4.11) indicates the level of support of managing/ decision making stakeholders for fuzzy front end results, based on the intuitive, qualitative judgement of this stakeholder group.

This is important to measure, because the decision of management determines whether, or not the organisation commits to further development of a result. In other words, a lack of managerial support guarantees an unsuccessful fuzzy front end.

On top of the perception of content quality of the Strategic Designer's work by managerial stakeholders, the Managerial Support Level is influenced by the strategic fit of the content. Strategic fit describes whether the proposed content fits within the context of the organisation, and its goals. A lack of strategic fit will result in a lack of commitment for the proposed outcomes, regardless of the quality of the content.

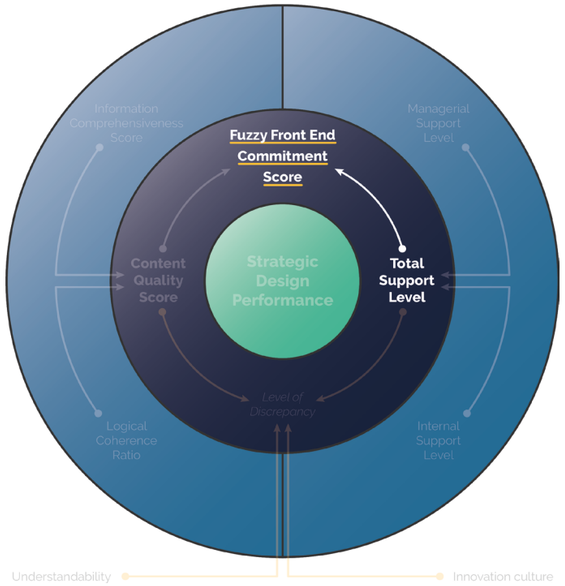


Figure 4.11: Internal Support Level.

Internal Support Level

The Internal Support Level (see figure 4.11) indicates the level of support for fuzzy front end results from other stakeholders within the organisation, such as stakeholders who will be the owner of the results, responsible for further development and/or affected by proposed changes.

This is important to measure, because internal stakeholders greatly influence the potential success of fuzzy front end results, after they move into the following development stages. In other words, a lack of internal support increases the likeliness of failure of results, proposed in the fuzzy front end, in later stages of development.

Internal stakeholders are concerned with what can be described as continuity. Continuity describes the organisation's perceived ability to successfully develop and implement what is proposed in the fuzzy front end, from the perspective of the internal stakeholders. Internal support does not guarantee success after the fuzzy front end, however, a lack of it will almost certainly cause failure in further development

Level of Discrepancy

The Level of Discrepancy (see figure 4.12), and the connected elements indicate how representative the KPI is, similarly to significance for statistical research.

It is important to evaluate how representative the KPI's outcomes are, because the KPI contains elements that can be influenced negatively, without fairly representing Strategic Design performance. Evaluating the potential underlying reasons for discrepancy between the KPI's elements, when there are significant differences, can help to avoid drawing wrong conclusions.

There are two factors that can explain a high Level of Discrepancy:

1. Understandability, which indicates the Strategic Designers ability to convey the content, independently of the quality.
2. Innovation culture, which indicates the organisation's ability to innovate/change.

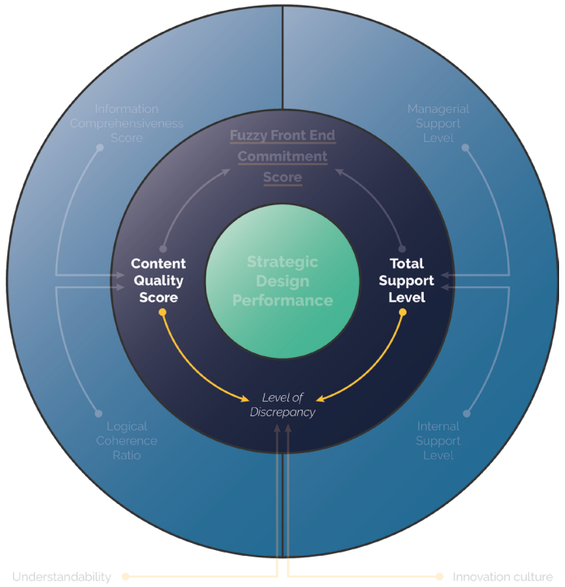


Figure 4.12: Level of Discrepancy.

Evaluating whether or not the Level of Discrepancy is acceptable can be done by detracting the converted Content Quality Score from the Total Support Level, and comparing it to a predetermined benchmark score.

Understandability

Understandability (see figure 4.13), which indicates how well the Strategic Designer can convey their work, independently of the quality.

This is important to check, because the fuzzy front end heavily relies on qualitative and intuitive judgement. In order for such judgement to be fair and/or reliable, it is crucial that all involved parties have the same understanding of what is discussed. This is crucial to avoid speaking 'past each other' by differently referring to the same thing, or similarly referring to different things.

Understandability can be calculated as a ratio, and evaluated using a benchmark indicating what is sufficient.

Measuring the understandability can be done based on the overview created for the Logical Coherence Ratio. First, the Strategic Designer should determine the critical tokens and ties of the story, and subsequently ask stakeholders to explain their understanding of the result. To what extent that explanation is in agreement with the critical tokens and ties can then be evaluated.

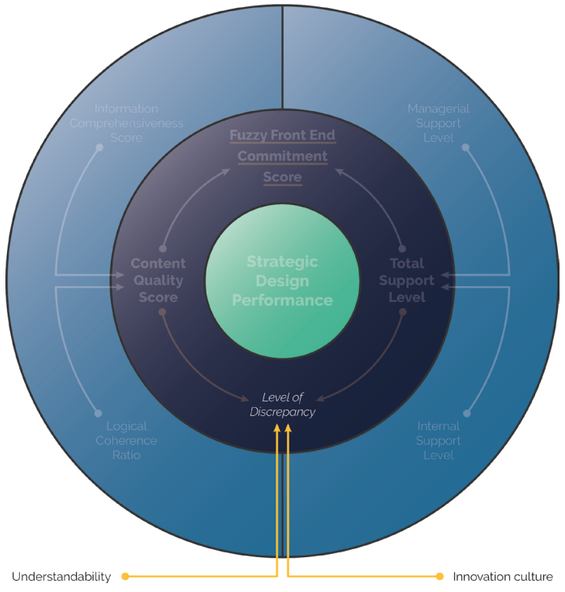


Figure 4.13: Understandability & Innovation culture.

Innovation culture

Innovation culture (see figure 4.13) describes an organisation's ability to innovate, or deal with changes.

This is important to be aware of, as it determines the scope in which Strategic Designers can operate. Organisations with a 'low' innovation culture will be unable to deal with more radical innovations, while organisations with a 'high' innovation culture might be less interested in incremental innovations.

For Strategic Designers, knowing the innovation culture in which they operate, can help to understand and anticipate the levels of support that they can receive for different levels of proposed changes, and deal with it accordingly.

To measure innovation culture, existing measurement systems, such as those mentioned in chapter 2.2 can be used.

5. Validation:

Does the Strategic Design KPI concept work in practice?

Whether the Strategic Design KPI has real world value, or is just a nice concept, depends on its practical applicability. Real-world testing was not possible within the scope of this project, however that does not mean that it is impossible to make a first estimation of how well the KPI works.

This chapter describes the comparison of two projects, in order to validate that the proposed KPI concept is a suitable way of measuring Strategic Design performance.

5.1 Method

In order to evaluate whether the proposed Strategic Design KPI works ideally it should be tested in comparable real-world projects. Considering the limited scope of a graduation project, however, this is not realistically possible. Furthermore, the reliance on underlying information - not only what can be derived from results, and stakeholder views, make it difficult to fully evaluate the KPI through a project retrospectively. Let alone using multiple projects for comparison, which is necessary to understand the outcomes of the Content Quality Score relatively.

Fortunately, one of the first courses of the Strategic Product Design Master (Design Strategy Project) consists of two consecutive projects, which can be seen as fuzzy front end projects, for real world clients with the same project teams, over roughly the same time period. The underlying information of these projects can be partly retrieved and reconstructed, and an estimation of stakeholder views can be made, for a pair of such projects from personal experience as a SPD student. This means that these two projects can serve to give a rough estimation of how the KPI would work in practice, especially considering that the first - although painful to admit - was not great, and the second was far better. This means that not only are these two projects comparable, and can the necessary information be partly retrieved or reconstructed, the performance of the team was arguably very different for both, which should result in a more insightful comparison. Admittedly, there are shortcomings, which are discussed below, and make this comparison questionable as a scientific study, so they will only serve as a quick exploration to reflect on the potential of the KPI, and not for hard conclusions.

Cases

As stated above, the two projects in question were part of the Design Strategy Project course of the Strategic Product Design master (in the academic year 2018-2019).

The first project (which will be called project 1 from now on) was done for Barco. The brief was mostly open; to design a strategy for Barco, with an emphasis on identifying ways to better engage with end-users of their products, and/or internal transformation of product development. The (educational) grades awarded for the project are not a reliable indication of performance, as the project primarily serves educational goals, and not business goals, however it does provide insight into how well the team performed compared to other teams in the same context. The grades were not given by the same people, but benchmarked, so they are comparable. Project 1 was rewarded a 6,5 (out of 10). This was also the lowest grade that any group received for the first project during the course that year, so it is safe to say that the team's performance was not good.

The second project (project 2) was done for Ford. Their brief was to create a strategy to become more appealing to Gen Z, with an emphasis on the novelty of the outcomes. In contrast to project 1, this project was rewarded with a 9, implying far better performance of the team during this project.

Considerations

There are shortcomings for a proper, reliable comparison between the projects, in order to estimate the practical effectiveness of the KPI.

Firstly, although it is possible to retrieve the final results, which were presentations, including the notes used to create it, not all information that was gathered was documented in such a way that it was retrievable within a reasonable amount of time, if even at all. As a result, it is still impossible to fully evaluate the Content Quality Score as intended. Instead only the information that made it into the final result and the coherence of the final result can be evaluated. This means that the Logical Coherence Ratio will be higher than they would have been in reality. This is especially true for the ideation steps, as they were hardly documented. For that reason, the comparison will be limited to the research and problem-solution fit only, leaving out the resulting concepts.

Secondly, support levels were not measured, so any claims about that are mostly speculative. Looking back at the projects, however, there were some clear differences that, based on the process, as well as the responses from involved stakeholders, that hint towards differences between support for both projects.

Lastly, although the projects were done for corporate clients, the teams were not internal and did not have access to stakeholders and resources like an internal team would have had. For that reason, it cannot be expected that the levels of the KPI - especially on the support side - can be representative of real-world outcomes, but they can provide insight in comparison to each other.

Overall, the comparison between the two projects is not fully representative due to the aforementioned shortcomings, however, they can serve to provide an estimation of how sensible the KPI is based on practical experience, especially for the Content Quality Score, since that can be partially reconstructed.

Analysis

The main goal of comparing two Design Strategy Projects is to evaluate to what extent the KPI could explain Strategic Design performance. Since the content, in the form of the final presentations, is the most reliable and accessible, the evaluation was primarily based on that. Due to insufficient documentation of ideation for a full analysis, the analysis was limited to the argumentation up to the point of introducing the concept. Both presentations had roughly the same structure, so this gave comparable results.

The presentations were analysed along the following steps:

- Using the notes that were used to create the presentations, the presentations were broken up into the separate chunks of information that they consisted of.
- The chucks were sorted based on the type of content they represented; insights, (sub-) conclusions, and argumentation.
- An estimation was made of the score that should be rewarded for every insight, based on sources and explanations listed in the presentations and notes. The sum of these scores indicates the Information Comprehensiveness Score for this part of each project.
- The separated elements of the presentation were then rearranged to create a visual overview of how different insights and conclusions are linked by argumentation in order to create a 'story'. This provides insight into the number of ties in each presentation, and consequently in the Logical Coherence Ratio.
- The focus of each insight and sub-conclusion (internal, external, or a combination) was evaluated. This was done to help estimate how support levels could have been influenced by the content.
- Lastly, the project specific information was removed, leaving only the visual structure of each presentation's story, and a label describing the type of content of each element.

Following the analysis of the content, estimates of support levels were made based on the involvement of stakeholders throughout the project, and their responses after presentations, and related to specific content elements where possible.

5.2 Findings

Figure 5.1 shows the visual overview of the content for project 1. What stands out, is that the insights are not interlinked at all, implying that the story is not very coherent. The Information Comprehensiveness Score is also low when compared to project 2, indicating that the research insights remained relatively incomprehensible. Furthermore, the proposed direction is fully dependent on two sub-conclusions, meaning that any rejection of insights, or arguments from stakeholders will leave little of the story intact. Unfortunately, that also turned out to be the case, as the company representative did not agree with the argument and resulting conclusion marked in red, and did not understand how the insight marked in red related to their company.

This also ties in to the complete lack of support that this project would probably receive. Only one company representative was involved in the project, meaning that nothing could be done in order to gain internal support, or ensure continuity. Furthermore, the single company representative was not involved during the process at all, resulting in the team developing a direction which the company representative did not agree with in the end. This would probably mean a bad strategic fit, and low managerial support if performance was measured using the Strategic Design KPI.

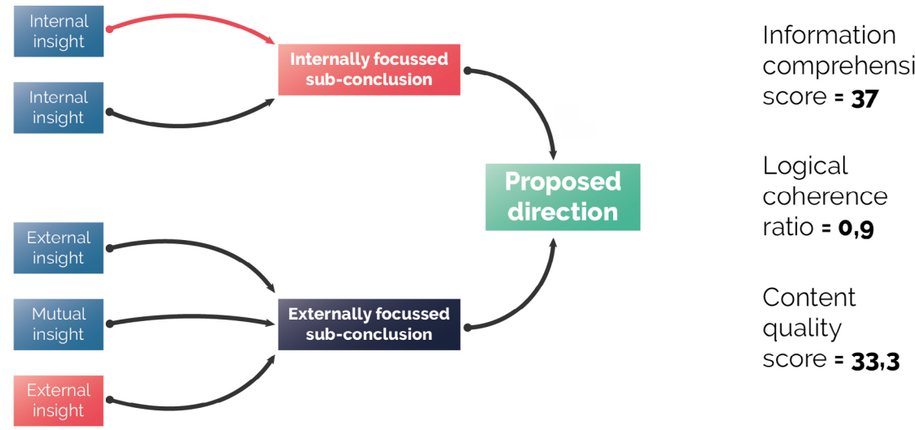


Figure 5.1: Estimation of the Content Quality Score of project 1.

Overall, the overview in figure 5.1, and the Content Quality Score, as well as the lack of stakeholder involvement and support would suggest that performance for that project was suboptimal. Considering the low grade awarded for this project during the course, this would be an accurate evaluation.

Looking at figure 5.2, which shows the visual overview of the content for project 2, the difference to project 1 is quite apparent. Firstly, the Information Comprehensiveness Score is much higher, indicating that more relevant information was applied. On top of that, the story is also far more coherent, and relies a lot less on the acceptance of a single insight or conclusion. From a content quality perspective, project 2 seems to be clearly better, as the information is more comprehensible, and the story more coherent.

On the support level side of the KPI, project 2 would also most likely have been better. More stakeholders were involved throughout different moments in the project, allowing better finetuning of expectations and probably leading to more support (managerial) as a result.

The link marked by the yellow arrow, labelled as 'validated assumption' also played a crucial role in the project, as it was well researched (and validated), but also received a particularly positive response from the involved stakeholders. This ended up leading to the addition of the working principles on top of the suggested direction, which then made the whole story more comprehensible and coherent in addition to gaining more support from stakeholders, for following up on their input.

What was lacking in hindsight, was the internal support. Although the result was a satisfying outcome to the brief, met by a decent level of managerial support, too few stakeholders that were concerned with continuity were involved to properly address that aspect.

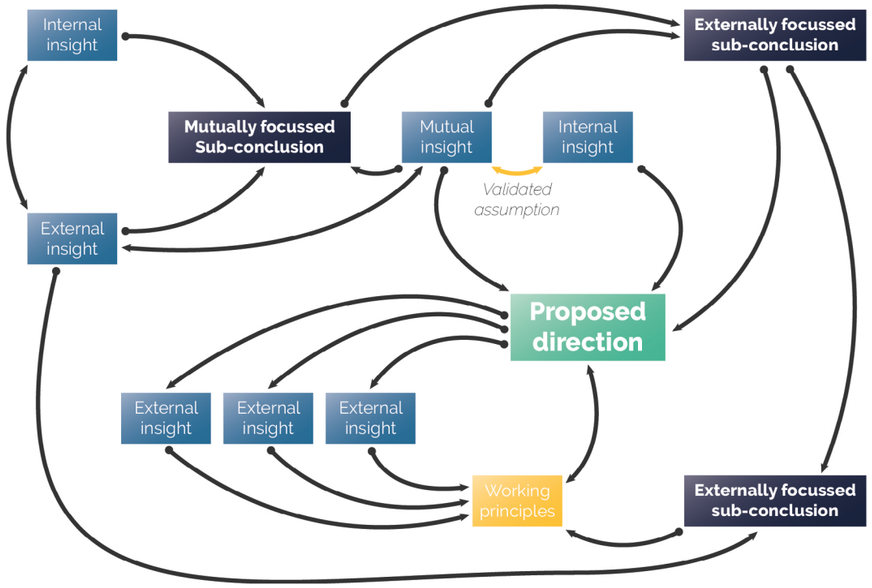


Figure 5.2: Estimation of the Content Quality Score of project 2.

Overall, project 2 was better in terms of content development, but also in terms of stakeholder involvement, and therefore probably support as well. Comparing project 2 to project 1, and the respective grades as indication of their relative quality, this would again imply that the Strategic Design KPI could be an accurate representation of the team's performance.

5.3 Conclusion

Comparing the Content Quality Scores and the underlying scores of both projects, it seems credible that this part of the KPI can work to provide insight into Strategic Design performance. Obviously two numbers based on an incomplete overview are not enough to draw a firm conclusion, or indicate what a normal range for the scores would be, but they are a positive first sign.

The Total Support Level was unfortunately not quantifiable retrospectively, however multiple hints to the necessity of this aspect in the KPI can be found throughout both projects.

Overall, the elements of the KPI seem to make sense based on the comparison of these two projects, and the calculations of Content Quality Score show potential as well.

6. Discussion:

What does the project accomplish?

Looking back at the initially described problem, and resulting brief, the question arises to what extent this problem was solved and the brief met. As a reminder, the problem and brief were described as follows:

“To summarise; design has the potential to be a suitable field for dealing with global issues, and its value has been proven in practice, especially when it is also applied at a strategic level. However, the lack of suitable metrics leaves Strategic Designers unable to justify and explain their efforts, and to receive the responsibility and influence required to apply the full extent of their capabilities.

For these reasons, the goal of this graduation project is: to design a Key Performance Indicator or metric for Strategic Designers, with the goal to be able to justify and explain their efforts.”

This means that there are two main purposes the final result should serve; justification; to show that the efforts/resources that Strategic Designers apply are right or reasonable, and explanation; to provide clarity on Strategic Design efforts. The means to do so should be quantitative, hence the ‘KPI or metric’.

The extent to which the brief was met, as well as some considerations for putting the result in perspective, are discussed in this chapter.

6.1 Limitations

In order to properly evaluate to what extent the goals of the project are met, it is fair to point out any limitations that influenced the project. The limitations to the process, and the outcome of the project are discussed in the following sections.

Process

Looking back at the process, two main limitations stand out. The first, being more practical, is that in an attempt to apply the research findings, and to not develop everything in isolation, a lot of the findings and results were discussed with multiple people, during various stages of the project. Although this helped to create a more coherent, and better formulated story, this process was not structured, or documented. As a result, these efforts and influences cannot be explicitly found throughout the reports, which makes it impossible to evaluate them.

The same goes for some input from the research participants. As explained in chapter 3.1, the results are mostly based on what was common between participants to make the results more reliable despite the small sample size. However, there have been aspects of the participant's input that influenced the results, without explicitly being part of the research findings. This effect is enforced by the parallels that could be drawn between the subject matter of the project, and the project itself; it being a fuzzy front end process. A stronger emphasis on researcher reflexivity would have helped to address these influences.

The second limitation of the process is completely different in nature, and has more to do with the content of the research. The scope of the research and project was limited to Strategic Designers working within corporates, however, differences between Strategic Designers within corporates were not addressed. The last research participant rightfully pointed out that some internal design teams practically behave like internal consultants, and are probably indistinguishable from externals from this project's perspective. This is a valid point, as there were notable differences between participants' teams and their place in their organisations.

The data was analysed, but not gathered with these differences in mind. This means that it is possible that differences between roles of internal Strategic Designers have an influence on Strategic Design performance that was not uncovered through this research. This is a point to address in any potential future research, or development of the KPI.

Outcome

The biggest limitations of the outcomes, as will be the case for most graduation projects, is that there will most likely be blind spots, and it is not 'finished'.

Due to the time and resource limit of the project, it is impossible to address everything, and sometimes progress has to be prioritised. In this project specifically, the sample size of the qualitative study was small.

Furthermore, the end result still has some aspects that are not completely implementation ready. The calculations of each of the KPI aspects do not include any data to determine relative weights, or conversions, or are acceptable ranges for each score. This is partly due to the fact that they can logically vary between organisations, or even change over time, but it is safe to say that more development would be necessary to bring the concept to a point where it can be used.

6.2 Contribution

How the project relates to existing knowledge, and what the results contribute to academics and practice, is discussed in the following sections.

Relation to existing knowledge

Throughout chapter 2, the problem at the heart of this goal, and the essence of this problem were established. The impression that Strategic Designers have the ability to contribute positively to society, but face the lack of understanding for their work from a quantitative perspective as a major challenge, was found to be in line with literature.

Mismatch between worldviews

At the heart of this challenge lies the fundamental mismatch between the qualitative worldview of design, and the often data driven, quantitative worldview of most corporate organisations. It was argued that nothing was wrong with either worldview, but that a solution to this problem should embrace both worldviews, and provide quantitative insight into Strategic Design, without altering the qualitative nature of it.

This pragmatic approach to explaining/justifying Strategic Design efforts is not new, but it is uncommon, and relatively unexplored. As a result, further research yielded insights that were unconventional, but still in line with existing knowledge, as is explained in the following sections.

In the end, the Strategic Design KPI seems successful in its pragmatic intention, as it is compatible with a Strategic Design approach, but results in simple, quantitative indications of performan0ce.

A process-based metric

Process-based metrics - being somewhere between productivity-related, and content-related - were found to be the most suitable approach to create a metric/KPI suitable for Strategic Design in chapter 2 as well.

In hindsight, process-based metrics can be seen as a pragmatic approach to performance measurement in general, and as novel in itself. It is safe to say that the Strategic Design KPI is indeed somewhere in that rather broad area, and for that reason alone, the KPI can be considered to be a novel approach to explaining and justifying Strategic Design efforts.

Content development & stakeholder management

More specifically, the Content Quality Score is a good example of how process-based metrics add a novel perspective, as it comes quite close to indicating productivity, but adds a layer of information that cannot be achieved through measuring productivity only in its design-specific focus.

The Total Support Level is more content related, than process-based, but that does not take away the fact that focussing on internal stakeholder perspectives is an unconventional approach to evaluating performance in the context of an innovation process. This is actually surprising, since the interlinked nature of content development, and stakeholder management is not new from a design perspective.

Comprehensiveness & coherence

Although the Information Comprehensiveness Score is new, it is in line with existing design literature. From a creativity perspective. It is believed that in creating ideas, quantity generates quality, and that broader ideas, as well as more detailed ideas in earlier ideation phases lead to better final ideas (Tassoul, 2012).

This holds up in a more Strategic Design specific topic, such as design road mapping. There, the extent to which is diverged can be related to how 'far' results can be achieved (Simonse, 2017). In the context of road mapping, 'far' refers to how far in future something is, but it can also describe the extent to which results are different from competition, or alternatives (see figure 6.1).

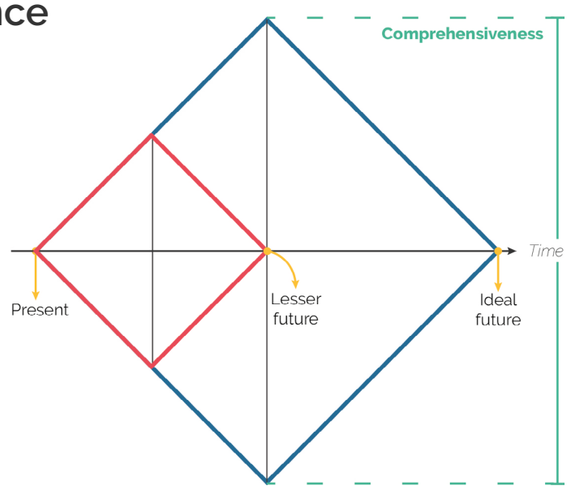


Figure 6.1: The effect of comprehensiveness.

The same goes for the Logical Coherence Ratio; the approach to measuring converging quality is new in this application, but the importance of coherence makes sense from a design perspective.

Measuring support levels

Although the types of measurement that are applied for the support levels are far from new, the essence of embracing internal stakeholders' intuition as a valid form of justification and quantifying that, is a new approach to measuring performance. Admittedly it is not very different from user research methods, but applying them internally in early development of new ideas is uncommon at the very least.

Overall, the research conducted in this project provides multiple novel perspectives to existing knowledge of Strategic Design through its pragmatic lens. As a result, the Strategic Design KPI is a truly new method of evaluating Strategic Design performance, while remaining close to existing literature and existing measurement approaches.

Conclusion and implications

So to what extent does the KPI serve the purposes of justifying and explaining Strategic Design? The safe, but true answer is: more or less.

The KPI provides a novel perspective to explaining Strategic Design, using a quantitative approach. It is still a concept, however; a mostly theoretical, first step towards a solution for the initially stated problem. It is arguably a small first step, but it is specific, and novel enough to open new possibilities for both academic, and practical application.

In the current state, the KPI admittedly provides little basis for justification of Strategic Design efforts, however. Justification requires evidence that the KPI works, and that high Strategic Design performance is related to the positive results it promises.

Given the quantitative perspective that the KPI is intended for, it was unlikely that a purely qualitative study would provide convincing evidence in that sense. In other words, justification was a vision, rather than a realistic goal for this project.

Overall, the final result can be seen as a first step of something bigger. Both for practical and academic application, it would need more attention, but it provides a novel perspective, which can open the door to much more.

6.3 Recommendations

Based on all information until this point, it is clear that more can and should be done to solve the initially described problem. Who should be responsible for this is a question that will stay unanswered unfortunately, but the recommended steps based on this project are described below.

Further development

As stated multiple times throughout this reflection, the result is not fully ready for implementation, and therefore further development is the primary recommendation.

The Content Quality Score needs to be tried out in practice, and fine-tuned to be applicable if necessary. Furthermore, it needs to be used throughout multiple projects, to gain an understanding of the meaning of the score, and to be able to interpret its outcomes. Most likely this fine tuning will be specific for any organisation wanting to apply the KPI.

The support levels could firstly use more research to further establish exactly how the different stakeholder's support influence success, and how to apply their qualitative judgement in the KPI, as it is currently a relatively 'open' part of the KPI.

Further research

After finalising the KPI, quantitative proof will be necessary for it to be applicable. The whole idea of making a KPI depends on the ability to prove a positive relation between the KPI, and desirable outcomes. This remains a significant challenge, however, due to the Strategic Design characteristics, and associated challenges for performance measurement, as described in chapter 2.2. The KPI does provide more basis for further testing, however. In other words, the newly proposed measurement options that the KPI provides, create a chance to do thorough quantitative research into the impact of Strategic Design.

Further research into the Strategic Design performance measurement based on the Strategic Design KPI, can be divided into three levels, each proving a different layer of impact, building on the previous, which are explained below, and can be seen in figure 6.2.

Internal impact - accuracy

The first step of quantitative testing would be to test if the KPI does in fact provide enough insight to reach better results; a higher level of commitment for fuzzy front end outcomes. This relation would prove that the KPI is indeed a good representation of a Strategic Design performance, and allows for better management of efforts. This comes down to testing if the theory that was qualitatively created in this project, holds up in the real world. In other words, is the Strategic Design KPI an accurate, and effective representation of reality?

Contextual impact - reliability

The next step of quantitative testing would be to test if better Strategic Design performance leads to better (innovation) results in later stages of development and potentially implementation. This relation is what would allow Strategic Designers to justify how their work influences the organisation, and why their approach/methods are suitable beyond the more traditionally known applications for design. In essence, it would test the reliability of Strategic Design performance as an antecedent of innovation quality, and the KPI's reliability of indicating that.

Overall impact - value

The last step of quantitative testing would be to test if the influence of Strategic Design on innovation outcomes actually has a noticeable long-term effect. This can be seen as a test of the notion that the application of a KPI for Strategic Design will allow an organisation to benefit from the added value of design, which was the starting point of this project. Unlike the research described in chapter 2.2, however, this would provide insight into how this value can be achieved, and not only that it is there.

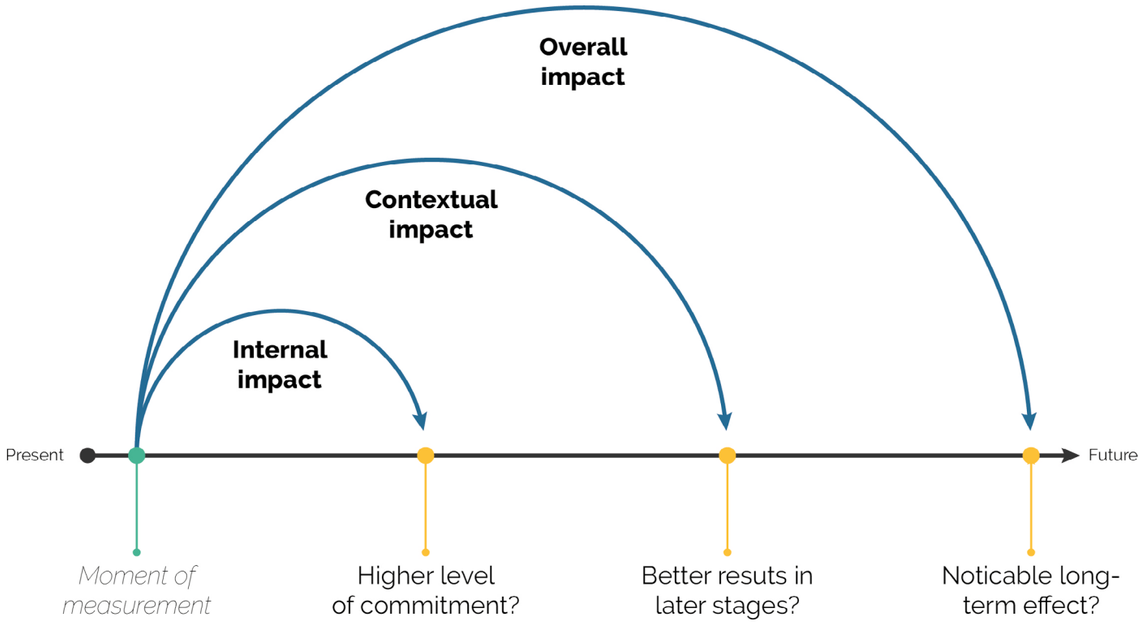


Figure 6.2: Testing different aspects and levels of impact of the Strategic Design KPI.

Reflection:

A critical look into the project.

Since this project marks the end of my time as a student, it is only fitting to finish it with a typical end to a student project; a critical reflection on the project, where I make a point of what could have been different, if I were to do it all again.

On one side, this is where I demonstrate that I have learned something, and on the other hand, it can hopefully help a potential reader of this project to better understand how it came to be, and how it can be interpreted.

COVID-19

COVID-19 has had a tremendous impact on most aspects of daily life, and it should go without saying that graduates have not been unaffected during this period. As a result there have been limitations on what was possible during this project, for practical reasons, as well as more personal reasons.

Firstly, since the project was set to start roughly when the initial lockdown started, causing a lot of uncertainty for the economy, the company that was initially involved pulled out of the project. This not only meant reiterating the focus of the project, but also caused a lack of input from practice, and little external urge for tempo throughout the project. Admittedly, the neutral perspective turned out to be a positive influence on the project - especially the research, but it did not positively affect the pace of the project, or access to input and resources.

Secondly, on a more personal note, the working conditions caused by COVID-19 were far from ideal. Having the space and resources to work from home has been a luxury, however working mostly in isolation has not had a positive effect on motivation and productivity. This was also not helped by the timing of the project; bridging the summer - a period in which many people took time off - which resulted in a setting that seemed even more isolated than it already was. It is fair to say that this could have been addressed much more effectively, but it has had its effects on the project and should therefore be acknowledged.

Intention

It was clear from the start that the subject was ambitious, potentially impossible and that the quality would depend heavily on depth. For that reason, the focus of the project initially leaned towards a more scientifically oriented project, with the intention to explore whether a Strategic Design KPI would be possible.

Towards the end, however, the desire to come to a concrete result became stronger than the desire to remain purely objective. This does not mean that the result is subjective, or not grounded in decent research, but it is fair to look at the project as a design project, and not as a research project.

This is reflected in the process, which primarily served to reach the goal of designing a KPI, as well in the content itself. Findings that complicated the content were always treated as challenges to overcome, but never as reasons to argue against creating a KPI in the end.

In the end, I am excited about the result, and believe that I took a valuable step towards solving the problem of measuring Strategic Design performance.

I hope that you, the reader, feel the same way, and I would like to thank you for taking the time to read my work!

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Appendices

A: Research guide

Research question

How can process based metrics be used to measure the performance of Strategic Designers, during the fuzzy front end of an innovation process?

Sub-questions

1. What are essential elements of a Strategic Design process?
2. What are characteristics of a good/successful Strategic design process in the fuzzy front end?
3. Which attributes of a Strategic Design process can be measured?

Method

The study consists of two parts, which all participants will go through in one session;

1. A context map of a Strategic Design process.
2. A simultaneous semi-structured interview based on the context map.

Checklist before start (~5 min)

1. Explain purpose of interview

   "This research is part of my graduation project of the Strategic Product Design Master at the TU Delft.

   I am conducting a qualitative study about measuring the performance of Strategic Designers in the fuzzy front end of innovation projects in order to enable Strategic Designers to reach their potential business value.

   The goal of this interview is to learn from your experiences with regards to my subject. This means that there are no right or wrong answers, and I am looking for your personal thoughts and ideas."

2. Mention why the interviewee is selected

   "You have been chosen as a participant of this study because of the relevance of your experience in practice to my research subject.

   As mentioned in our email conversation, I was looking for Strategic Design practitioners, working internally for a corporate, on the fuzzy front end of innovation projects."

3. Explain confidentiality

   "In order for me to learn anything from this interview, it is important that we are able to discuss the contents of the project that you have chosen. However, the contents of the project are not actually relevant to my research, so I will not use them in any way, other than to understand and interpret your experiences.

   All of data will be made anonymous, and your identity, your company, and the project will not be mentioned in the results"

4. Check permissions
   - TU Delft informed consent form
   - Recording
5. Start recording

Introduction (~5 min)

"According to multiple studies, Design is valuable from a business perspective, especially if it is also applied at a strategic level. However, one of the biggest obstacles for the successful application of design, is quantitatively justifying design efforts through the use of metrics.

Especially in early stages of an innovation process, where the uncertainty is the highest and organisations are not yet committed to a direction; the fuzzy front end, there are no usable metrics for Strategic Design performance.

Process based metrics can be used to deal with uncertainty due to long-term orientation, or a lack of predetermined outcomes, however there are no metrics that are useful for a combination of both.

What I'm trying to find out through this interview is: how process-based metrics can be used to measure the performance of Strategic Designers, during the fuzzy front end of an innovation process?"

Process map & interview

1. Assignment & outcome (~10 min)

Tasks

- Give a short description of the initial assignment, and put it on the start of the process map.
- Give a short description of the final outcome(s), and put it on the end of the process map.

Questions

- The project was chosen because it was successful. Can you explain why you consider this project to be a success?
- How did the client - designer relationship work for this project?
- Has performance measurement played a role in this project?

2. Timeframe, workload, resources, roles (~5 min)

Tasks

- Explain the timeframe, and team composition of the project team.
- Explain the resources that were provided to you, and list them on the process map.
- Explain any differences between what was initially provided, and what was used in reality, and mark it on the process map.

Questions

- How were the boundaries of the project determined?
- How did you deal with responsibility and justifying using resources?
- If notable, how did the team composition and/or timeframe influence the project?

3. Milestones & deliverables (~10 min)

Tasks

- Mark all process milestones and/or deliverables on the map, and provide a brief explanation.

Questions

- How do you determine the value and/or quality of each deliverable?
- What worked well and what did not, in determining the quality of your work, and why?
- To what extent was that value recognised by your client?

4. Steps & activities (~10 min)

Tasks

- Mark the general steps that were taken to reach the final result on the process map.
- Explain what (design) activities were part of each step, and mark them on the process map.

Questions

- To what extent is this a typical or standardised process?
- To what extent were alternatives considered?
- How was the choice for these particular steps made?

5. Reflection (~15 min)

Tasks

- Looking back at the process, mark which (1-3) steps and activities worked the best, and which (1-3) did not.

Questions

- How would you do things differently, knowing what you know now?
- What do you think were good practices, and why?
- What are essential elements of a Strategic Design process?
- What are characteristics of a good/successful Strategic design process in the fuzzy front end?

Ending checklist (~10 min)

1. Bring interview to an end
    - Allow participant to add any final remarks
    - Allow the participant to ask questions

2. Check interest for further involvement
    - Interested in final results
    - Tips for interesting directions for further research or analysis

3. Try to generate further research opportunities
    - Ask for an opportunity for a follow up with the client
    - Ask for leads for other interviews

4. Check if participant wants to see/approve the interview transcript
    - Thank the participant
    - Stop recording after participant disconnects

B: Developing the KPI

The qualitative study provides a basis for a Strategic Design KPI, however, additional research was needed to make the translation from the research findings to an applicable KPI.

The following sections provide an overview of the extra information that served to create the Strategic Design KPI.

B.1 What makes a good KPI?

In addition to the characteristics described in chapter 2.2 (quantitative, time based, actionable), there is more to creating an insightful KPI. There are multiple challenges associated with applying KPIs, in particular with the practicality in relationship with the added value.

The essential, underlying problem of such challenges can often be explained through the problem of local maxima. What the problem of local maxima describes, is that optimisation does not always lead to the optimal result, but instead to the optimal possibility of what is currently available; a local maximum. In reality, however, better results can often be achieved through more significant changes. As seen in relation to the local maximum, these changes can be seen as negative progress at first, however it leads to better results later on, as visually represented in figure b.1.

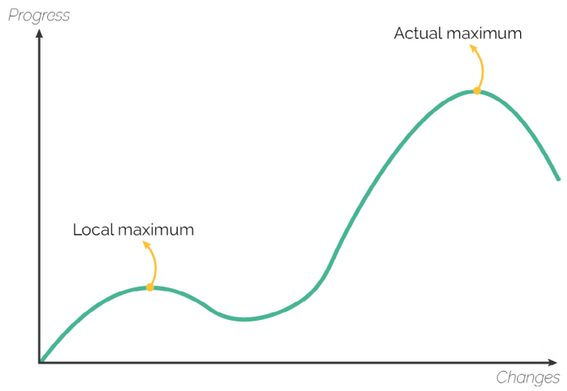

Figure b.1: The problem of local maxima.

The following sections go into three types of practical challenges associated with local maxima and the application of metrics, as well as principles on how to avoid them.

Metric monsters

Metric monsters is the term that Zage, Zage, & Wilburn (2015) gave to 'the stumbling blocks' that get in the way of development. They identify multiple specific types of metric monsters in the domain of software development. One particular type of metric monster that is interesting to keep in mind, are those that falsely identify crucial aspects of the content that need improvement. It goes without saying that false metrics are not useful, but metric monsters can be more complicated than that. The metric monster, in this case, describes the metrics that are in themselves true, generate actionable insights, and can therefore seem as good KPIs, but in reality do not lead to the optimal outcome.

If the problem of local maxima was a story about climbing a mountain, the metric monster points towards the lower mountain, distracting from the actual highest point (see figure b.2).

An example of such an element is customer perception. As Steve Jobs famously said while quoting Henry Ford:

"Some people say give the customers what they want, but that's not my approach. Our job is to figure out what they're going to want before they do. I think Henry Ford once said, 'If I'd ask customers what they wanted, they would've told me a faster horse.' People don't know what they want until you show it to them. That's why I never rely on market research. Our task is to read things that are not yet on the page."

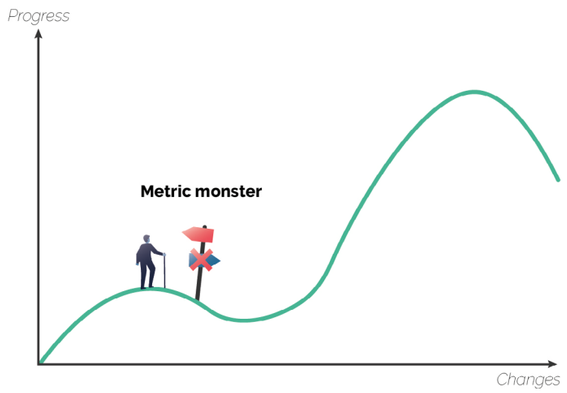

Figure b.2: Metric monsters in relation to the problem of local maxima.

Although Henry Ford did not actually use those words, he did share a similar view with Jobs, in saying that customers are unreliable when it comes to understanding and judging things that do not yet exist (Vlaskovits, 2011; Smith, 2019). As a result, focusing on customer perception in early development stages of new products and services, is not likely to lead to better results, thus making it a metric monster, which draws attention away from aspects of development that are more likely to lead to success.

A side note: this does not mean that it is not important to involve and listen to (potential) customers/users in early stages of an innovation process, as practically all design literature suggest that it is extremely valuable. The point is that customer perception is not a reliable metric during early innovation stages, as well as the fuzzy front end.

In order to avoid metric monsters, the only truly reliable method is quantitatively testing the relationships between different metrics and outcomes. In the context of this project however, where the testable metric does not exist yet, the best way to prevent metric monsters is to base the Strategic Design KPI on aspects that are not controversial. In other words, the elements that research participants agree on, and that are common from different points of view.

Vanity metrics

Vanity metrics is a term used to describe metrics that seem impressive, but lack practical value in reality. Vanity metrics can fall short in a number of ways, for example by a lack of actionable insights, because changes in the metric cannot be influenced by actions and decisions from the organisation, or because the metric is not a fair representation of reality.

Another category of vanity metrics is those that represent information that is not actually critical to an organisation, or their goals. Such metrics could be seen as performance, or result indicators, which is useful in some places, but do not have a practical use for innovation (Parmenter, 2015), and would therefore be vanity metrics if applied there.

An example of such a vanity metric comes from Doug Bowman's reasoning on why he left Google. In his explanation, he mentions how they would test 41 shades of blue to determine which one was best. Obviously, Google is good with data, and doing well from a business perspective, but testing 41 shades of blue is arguably excessive. The data driven focus in this case can be seen as a form of extreme optimisation (Porter, 2010), where the means no longer serve the goals effectively, if the goal is to innovate.

In the mountain climbing analogy, vanity metrics can be seen as a cloud that hides the highest mountain, effectively making the local maximum seem unnecessarily important, and a bigger achievement than it is in reality (see figure b.3).

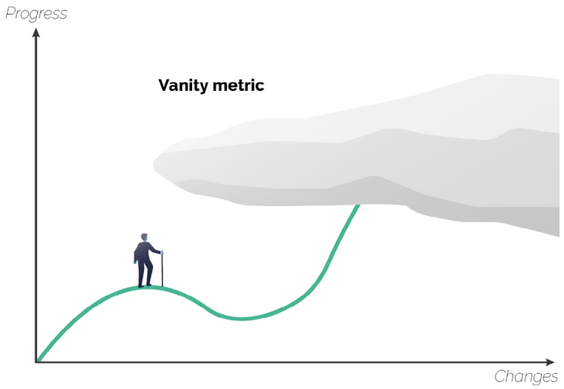

Figure b.3: Vanity metrics in relation to the problem of local maxima.

In order to avoid vanity metrics, it is important to remain as close to the crucial success factors as possible. The crucial success factors are the attributes KPIs are generally based on, and describe what makes or breaks the success of the goals that were set. For Strategic Design in the fuzzy front end, this means that a suitable KPI should be representative of the Strategic Designer's ability to achieve commitment for proposed solutions.

Box ticker

The third challenge associated with the application of metrics, comes from Graeber's (2018) book; Bullshit jobs: a theory. In his book about jobs that are useless in the sense that they do not provide practical, real world value. Among these jobs are those that fall into the category of box tickers. What box tickers do, according to Greaber, is create work to show that work is being done, which diverts time and resources away from the purpose of the initial work itself. Although this is not specifically associated with performance measurement, it raises a valid point about it. The point being that when performance measurement starts to take up more time and effort, than what can be gained from it, it is a useless endeavour.

In the mountain climbing analogy, the challenge can be seen as a chain, physically holding the mountain climber in place, not allowing him to climb the mountain (see figure b.4).

Ensuring that measurement activities are quick and effortless is arguably a suitable approach to avoid the previously discussed challenge. The question remains whether this is practically possible, however, considering that all measurement activities are extra compared to the current (most common) situation.

A different approach would be to accept the potential extra effort, but ensure that the measurement activities also contribute to better results. This may seem counter intuitive, but since Strategic Design does not deal with a clear-cut task, extra activities that contribute to the structure and focus of the process can be beneficial, as well as compatible with performance measurement activities. The challenge then lies in striking a balance between a standard structure which is useful for performance measurement, and conserving creative freedom.

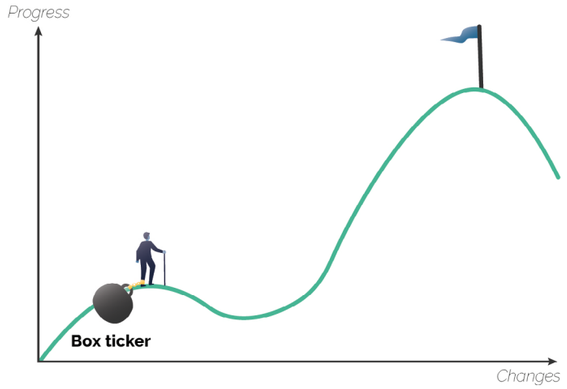

Figure b4.: Box tickers in relation to the problem of local maxima.

In short, ideally measurement activities are quick and effortless, however, if this is not possible, bullshit jobs can still be avoided if the measurement activities positively contribute to Strategic Design activities, and can be embedded in the Strategic Design process.

B.2 How to deal with human nature?

The reliability of intuition

In chapter 3.2, it was established that intuition is the best way to judge quality in the fuzzy front end. Traditionally, intuition was seen as an unreliable way to process information. However, more recently, as more research has gone into the inner working of intuition, it has been argued that it is in fact reliable in a suitable context. Lieberman (2000) argues that although intuitive judgement is not as absolute as purely logic driven information processing, it can be valuable when questions contain multiple layers, and perspectives, and lack clarity. The reason for this, is because intuition contains and links far more information than can realistically be processed through logic only. Where logic is arguably objective, it relies on the availability of information. Intuition on the other hand is the result of both social understanding, and implicit learning, meaning it does not only take currently available information into consideration, but also the objective and subjective learnings from past experiences. In other words, intuitive judgement contains more information and consideration than pure logic ever could. In contexts which are characterised by a lack of available information, this can be a valuable tool, if applied correctly.

A point of criticism that can be brought up for making decisions on the basis of people's intuition, is that people are inherently biased. This is a valid concern, and one that should ideally be addressed in the design of a KPI that relies on the use of intuition. There is a myriad of different biases that can be taken into consideration, however realistically not all can explicitly be addressed within the timeframe of this project.

Below, three biases are discussed that were selected, because of their relevance to Strategic Design, and because they have seemingly contradictory antidotes.

1) Blurry vision bias

2) Cognitive fluency bias

3) Confirmation bias

The first, and arguably most relevant cognitive bias for Strategic Design, is the blurry vision bias. What this means, is that people find it difficult to think about the future, because they have not experienced it (Carton & Lucas, 2018). As a result, people tend to discuss and explore the future using abstract, hard to grasp language. For Strategic Designers, who try to make, and discuss concrete predictions about the future, this is a challenging phenomenon to deal with. This becomes even more difficult considering the cognitive fluency bias (Schwarz et al., 1991) which in short describes people's emotional preference for what they can understand easily (see b.5). Add in the confirmation bias (Mynatt, Doherty, & Tweney, 1977), which describes how people tend to accept information that follows their beliefs rather than what is objectively true (see figure b.6), and Strategic Designers are left with a challenging cocktail of biases.

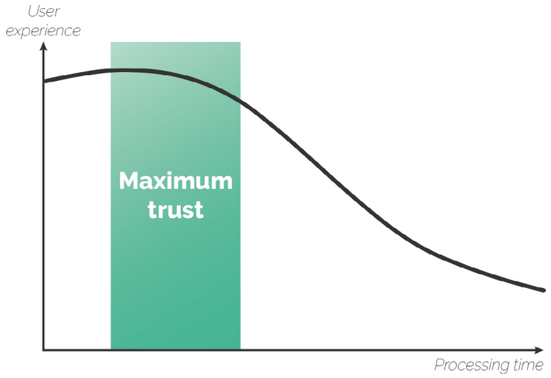

Figure b.5: Cognitive fluency bias.

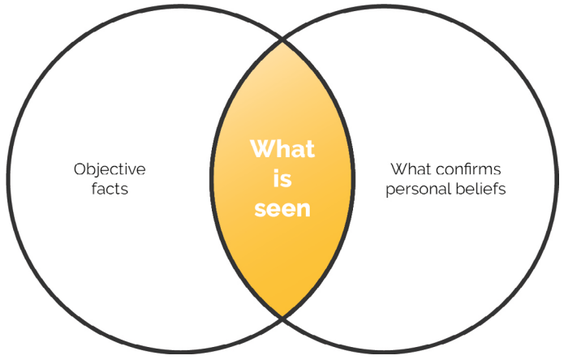

Figure b.6: Confirmation bias.

The reason the combination of these biases is so tricky, is because the approaches that help to deal with them contradict each other. Starting with the blurry vision bias, the best way to overcome the hard to understand abstract use of language about the future, is to rely on visual communication (Carton & Lucas, 2018). Visual communication helps people to understand what is proposed about the future more easily, which should also make them experience those predictions more positively. The problem however, is that by making the content easier to understand, it becomes harder to deal with confirmation bias, since confirmation bias tends to decrease, when understanding something takes more effort (Alter, 2013; Hernandez & Preston, 2013).

The result is a conundrum where any approach to deal with one bias ends up negatively affecting the ability to deal with another. The challenge then lies in finding a balance of complexity that is easy enough to prevent negative responses due to the cognitive fluency bias, and difficult enough to avoid subjectivity due to the confirmation bias, while simultaneously dealing with the challenge of understanding the future. This is relevant to the Strategic Design KPI, as it relies on intuitive judgement, so these aspects and challenges should be taken into consideration for its design.

Effects of learning

In many ways, the Strategic Design process in the fuzzy front end can be seen as a learning process. As pointed out in chapter 3.2, there is heavy emphasis on gaining and applying new information. A KPI in such a context, can affect the way the process is experienced, as it gives insight into the state of certain aspects, both positively, and negatively. The psychology of learning, and the effects of the availability of data are quite out of scope for this project, but there are some aspects to take into consideration in order to create a KPI which is insightful, but not discouraging.

In a practical experiment about teaching people how to code through a game, where one group had points deducted for failed attempts (5 out of starting point of 200), and a second group did not, Rober (2018) found that the people who were not penalised had an overall higher success rate (68%) than the group that was penalised (52%). Both groups were allowed infinite attempts, but the group that was penalised gave up after an average of 5 tries, where the other group attempted the challenge 12 times on average. He explained this outcome by the lack of negative stimuli that the group without penalties experienced, that made them more willing to learn. He called this effect the Super Mario effect (after the Nintendo game), and it is an example of how positive stimuli influence successful learning.

These findings make sense from a creative and design perspective as well. Positivity, and even playfulness positively affect how creative people can be, and lead to overall higher creative quality (Tassoul, 2012). This applies to both diverging, and converging.

This positive attitude works under the assumption that there is a clear end goal which can be achieved. For Strategic Design, however, this is hardly the case, since the end goal and the means to get there are developed simultaneously (as pointed out in chapter 2.2 & 3.2). Seeing the Strategic Design process as a learning process without an end point, a different effect comes into the picture, namely the Dunning-Kruger effect. The Dunning-Kruger effect explains how people evaluate their own competence, relative to their actual knowledge of a subject. What this shows (see figure b.7) is that as people learn more about a subject, their evaluation of the competence decreases at first (Kruger & Dunning, 1999). In the fuzzy front end, this can mean that good results are preceded by relatively negative self-evaluation. Based on anecdotal evidence from the experiences of designers, this seems to be the case in reality, as design projects often have a low point in which things may seem desperate, but also become clear, before finally leading up to better results. The challenge then lies in not being discouraged, but keeping up momentum.

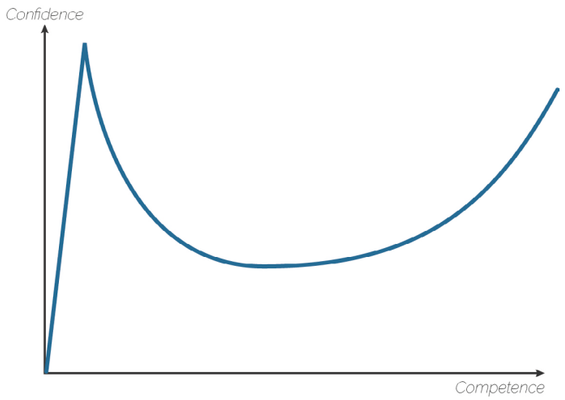

Figure b.7: The Dunning-Kruger effect (Kruger & Dunning, 1999).

What this means for a Strategic Design KPI, is that for the designers, a KPI should ideally be encouraging and positive, for it to contribute to overall success. From a business perspective, however, a KPI must be insightful, and as objective as possible. In this case, a KPI that can only be positive is hardly useful. The challenge then lies in finding the balance between the overall usefulness of the KPI for the organisation, and the usability of KPI for the Strategic Designers.

B.3 How to measure the essential aspects of success?

The attributes of a successful Strategic Design process in the fuzzy front end, as described in chapter 3.2, were selected on the basis that they can be measured. However, since they are unconventional from a performance measurement perspective, there are no metrics readily available for them.

The following sections are an overview of how the measurability of these attributes, as well as the previously described challenges of making a good KPI, and dealing with human nature, were addressed.

Content quality

Given that Strategic Design and the fuzzy front end are characterised by uncertainty and a lack of information, performance and quality cannot be measured based on progress towards a goal, or a pre-set standard. This means that metrics cannot be based on ratios, or percentages, but instead require a progressive scale, using scores that can increase unlimitedly.

The challenge then becomes to achieve the highest possible total score, representing the total amount of effort that goes into developing the quality of the content. This way, development efforts are measured in a positive, rewarding manner, while applying well-chosen scoring criteria can help to ensure effectiveness and efficiency.

The total score that is achieved through a project can be compared to other projects, in order to gain insights into the relative performance as far as the quality of developing the content is concerned.

This type of scoring system can also be used to track progress/performance within a project, or phase, as plotting the accumulation of points over time can give an indication of how effective and/or efficient efforts are. It can also help to quantitatively assess when a point of saturation is being reached, where the added value of previously effective activities is decreasing, for example because they no longer yield new information, at which point it is probably time to move on to a next activity or phase.

In order to apply this type of scoring system holistically with other metrics, it can be necessary to create a conversion system, which converts the score into a metric that is comparable with others, in order not to overly influence metrics that cannot increase unlimitedly.

Comprehensiveness

As explained in chapter 3.2, comprehensiveness - being a combination of both width and depth - is what determines the quality of diverging activities in the context of the content quality. Comprehensiveness is not a straightforward objective, however, as it is not yet possible to know what is required. What is clear, however, is that the act of gathering information is an effective way to gain an understanding of what is necessary, as well as an effective approach to collecting the information necessary to reach a 'higher level of comprehensiveness.

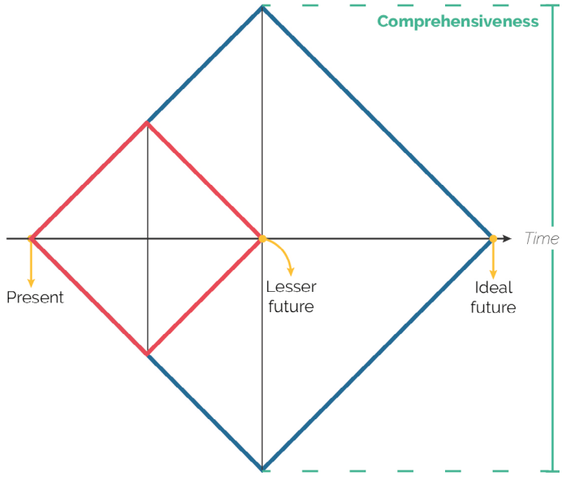

Figure b.8: The effect of comprehensive information.

A way to explain how comprehensive information leads to better results, as explained in Design road mapping (Simonse, 2017), is that the extent to which is diverged determines how 'far' results can be achieved. In the context of road mapping, 'far' refers to how far in future something is, but it can also describe how far results are different from competition, or alternatives (see figure b.8). Diverse information also gives more flexibility, and possibilities to change according to new information, compared to more linear approaches. This is another benefit of complete information, from a long-term perspective.

Gathering information in research (insights), and in ideation (creative input) is different, so comprehensiveness is not entirely the same for the first and second diamond of a Strategic Design process. The measurability of each is explained separately below, however both follow the same basic principles: points are rewarded for broader information and for more detail (i.e. depth), and a higher score represents more comprehensiveness.

For research insights, this means points are rewarded for each insight. The exact definition of an insight may vary, but it should be noted that it is not raw data/information. An insight involves data, as well as a (small) conclusion in the working context. For example, an increase in global temperature due to global warming is not an insight, however, the expectation that people will consume more ice-cream due to an increase in global temperature due to global warming, can be an insight for an ice-cream company. Similarly, the popularity of a particular type of social media may not lead to insights for a farmer, but it probably will for a marketing firm.

On top of a base score for every insight, more points can be rewarded for depth, and for how well grounded an insight is.

How well grounded an insight is, is important, as it can help to gain deeper insights, as well as give importance to insights that are more certain. The scoring for how well-grounded insight is, can be based on the amount and variety of sources that can be connected to the insight. This means that if an insight is supported by many, and diverse sources, the resulting score is higher than when an insight is not. In order to avoid over-researching a single insight, which does not benefit the width of information, it is recommendable to reward points for extra sources until a pre-set maximum is reached.

In the case of the previous example of popularity of social media, it can be interesting to have multiple papers, as well as more practical sources, about the popularity of Instagram, however spending time to find 15 sources stating that Instagram is most popular among 20 year olds, instead of stopping after 5 will not likely result in better results by the end of the fuzzy front end.

Following up on a single insight is beneficial, if it results in a deeper understanding. To stay within a design research context, a suitable way of assessing depth, is by using insight/knowledge ladders (Sanders & Stappers, 2012). This means that different levels of knowledge about the same phenomenon can be put into a ladder (see figure b.9). Asking why-questions gives insight into underlying reasons, which can help to gain better understanding of an insight. For example, an increase in ice-cream consumption, an increase in global temperature, and global warming can be seen as a ladder, where every phenomenon has the same cause, but provides a different insight at a different level. In the case of the ice-cream company, this will tell them that the increase in ice-cream consumption is likely to remain over a longer period of time, and therefore suitable to act upon.

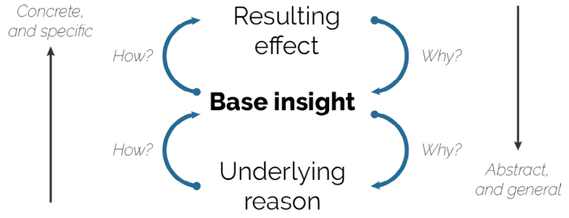

Figure b.9: Creating a ladder of knowledge.

In addition, asking how-questions, when laddering knowledge, can help to gain insight into the resulting effects of a phenomenon, which can help to make insight more specific and usable.

In the context of scoring points for insights, points can be rewarded for every additional level of knowledge, and therefore understanding of a single insight. In order to avoid excessive research on a particular ladder, again, the amount of points can be capped after a certain amount.

When it comes to scoring points for ideation, it becomes more complicated, as there is more variation between approaches and results. For this reason, this explanation will retain relatively much flexibility, as further detailing will require context and application.

More points should be rewarded for broader, and deeper information - creative input in this case. Following the approach of scoring points per insight, an organisation should firstly choose the base level of detail at which points are scored (resulting in more points for more/broader ideas), for example idea clusters, or distinct elements to use in a value proposition can be chosen as a base level. Secondly, how points are rewarded for the depth of ideas should be chosen. For example, when brainstorming, extra points can be awarded for different amounts of unique ideas within a cluster, or for variations to similar elements in the example of a value proposition. Assessing how well grounded an idea is, can be done by rewarding additional points for the diversity of stakeholders involved in ideation, meaning that involving experts (and not only designers) will lead to a higher score. Practically, this cannot be done per idea, so should be done per session instead.

Phase	**Research**	**Ideation**
Range	*5-15 points per insight*	*5-15 points per cluster*
Broadness	5 points per insight	1 point per final idea cluster
Depth	1 extra point per additional layer of information, with a maximum of 5	1 extra point per 10 unique ideas within each cluster, with a maximum of 4
Groundedness	1 additional point per source, with a maximum of 5.	total amount of points (per session) multiplied by amount of involved stakeholder groups, with a maximum of 3

Figure b.10: Scoring information comprehensiveness.

Figure b.10 shows a table specifying how comprehensiveness of both research and ideation information can be scored.

Coherence

Coherence is in many ways a subjective quality, however there are approaches to quantify it. Hassan's (1984) Cohesive Harmony Index is such an approach, where the cohesion of texts is measured by counting the number of ties between different textual elements, which he calls tokens. Tokens can be seen as single representations of portions of a text which describe the same subject. For example, the previous sentences describing tokens, including this sentence, can be seen as a token. The next sentences which describe how the Cohesive Harmony Index works. are a different token.

The number of ties between tokens, compared to the total number of tokens within a text, gives a ratio, which represents the cohesion of a text, where a higher number is better. This ratio is not limited to a maximum of 1, as it is possible to have multiple ties for a token.

Ties in the context of Strategic Design can be seen as argumentation which connects insights. Tokens can be seen as elements of information, such as insights, and ideas.

The question, how to deal with assumptions, then arises. Due to the uncertainty in the fuzzy front end, not everything can be based on validated/proven logic, and assumptions need to be made. This can be addressed by making the scoring for coherence with reservation, until they are either accepted by stakeholders, or proven. If assumptions are not accepted, and cannot be proven, they should not be applied in the content at all.

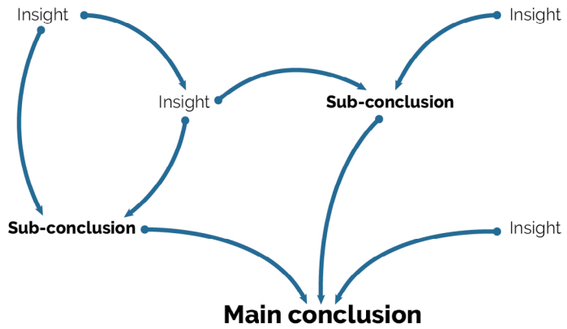

Figure b.11: Visualising the structure of Strategic Design results.

In order to apply Hassan's (1984) Cohesive Harmony Index to Strategic Design, the Strategic Designer will have to create a visual overview of all information, with every insight/idea as a separate point, and visually link the element together (see figure b.11). This makes the ties relatively easy to count, and forces the Strategic Designer to be explicit and clear about each tie, also making it easier to discuss specific ties, compared to a situation where the ties are implicit, or explained textually.

Applying this approach to the content quality point system, the ratio resulting from the number of ties, compared to the number of tokens, can be multiplied by the total amount of points for the insights, in order to come to a final score for the content quality. This means that the score representing comprehensiveness is multiplied according to the coherence, to come to the final score representing content quality. Multiplying the scores in such a manner makes it rewarding for the Strategic Designers to be thorough in their logic, and apply as much information as possible. This does not mean that every element must be part of the final story, but it should be addressed (whether positive, or negative) in order to retain a high Content Quality Score. This helps to avoid cherry-picking, where important, but negative information is left out of the story in order to be more convincing, as ignoring information will lead to a lower coherence ration, and therefore a lower score.

The coherence ratio itself can be compared between different phases and projects, in order to get an understanding of the relative performance of different projects.

With the box ticker challenge of creating a KPI in mind, the question can arise whether or not the described approach to creating insight into argumentation is compatible with a Strategic Design process. At this point it is impossible to know if it is, however there are reasons to believe it can be. Creating a visual overview of findings and argumentation is not a standard practice for Strategic Designers, but is definitely not unheard of. One research participant (P1) from the qualitative study described a nearly identical approach in his own way of working, and from personal experience working in Strategic Design student groups, it seems to be a common practice. The only difference is that it is not always documented in a way that would be suitable to assess the coherence. The crux of the compatibility thus becomes a question of how time-consuming this documentation process would be. Obviously, it is more time-consuming than not doing it. However, it can be relatively quick compared to writing text that provides the same level of overview. The previously mentioned participant described this visual way of working as far more efficient, and compatible with a design approach, than writing reports, which was standard practice in his company. Based on personally trying out this approach for the validation (described in chapter 6), it also seems to be a far quicker and easier process than it initially seemed.

Furthermore, this visual approach to argumentation should help to avoid the biases discussed in section B.1, by rewarding a visual representation, which makes the content easier to oversee, without oversimplifying the actual content.

Content Quality Score

To summarise, the content aspect of Strategic Design performance can be measured using a point system, in which points are rewarded for gathering information (diverging), and multiplied with the coherence ratio that represents how well information is integrated into a result (converging).

This score can be converted into a final number which is comparable with the other aspects of Strategic Design performance.

Support

Support is an important aspect to measure, since it serves to clarify the fit of results. When quantifying people's perspectives, customer resource methods are a suitable approach. This means that support could be measured through short questionnaires, using Likert scales (Jamal, Foxall & Evans, 2009), or other, similar approaches.

The benefit of such an approach, is that various stakeholders can easily contribute to a metric which is specific to Strategic Design. For a Strategic Design KPI, it is best to measure how successful the stakeholders think the result is, indicating strategic fit, or continuity, and their perception of the quality.

Overall, this results in a metric that is an indication of how well Strategic Designers have performed in terms of the fit of the results, and how convincing they are.

A support metric can be compared between phases and projects, to indicate the relative performance. Within a phase, such a metric can serve to gain intermediate insights into the performance of the Strategic Designers as perceived by stakeholders, however the question is whether or not this indication is always relevant, as the perception of the means is not always an indication of the final quality. The perception of activities can influence the final support, however, (strategic fit and continuity), so it may be interesting to track, especially for longer projects.

Understandability

The main point of addressing understandability for Strategic Design projects, is to be able to properly discuss the content, and make valid qualitative judgements. Without a sufficient level of understanding, this becomes impossible. This can be obvious if there is little to no understanding, however, when all involved stakeholders think they understand, but have different ideas about the content, it is easy to fall into meaningless conversations.

To avoid this, a common understanding must be established. A quick way to do this, would be to ask involved stakeholders to explain a result in their own words, and compare it to the Strategic Designer's explanation, making an estimation of the similarity. For obvious reasons it is not possible to recite full presentations, or reports, however the core message is a good starting point. Counting how many elements of the core message can be found in a stakeholders' explanation can give an indication of understandability. This is easier if results are based on a standard format, such as a value proposition, however also possible for other formats.

Innovation culture

Metrics for innovation culture already exist, such as those mentioned in chapter 2.2. Given the scope of this project, the topic of measuring innovation culture is not further explored.

C: Original brief

DESIGN FOR our future

TU Delft

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT
Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME
Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy".
Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !

family name: Helbing 4044
initials: A. V. given name: Adam
student number:
street & no.:
zipcode & city:
country:
phone:
email:

Your master programme (only select the options that apply to you):
IDE master(s): ( ) IPD ( ) Dfl (★) SPD
2nd non-IDE master:
individual programme: - - (give date of approval)
honours programme: ( ) Honours Programme Master
specialisation / annotation: ( ) Medisign ( ) Tech. in Sustainable Design ( ) Entrepeneurship

SUPERVISORY TEAM **
Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair: Marina Bos de Vos dept. / section: DOS/MOD
** mentor: Erik-Jan Hultink dept. / section: DOS/MCR
2nd mentor:
organisation:
city: country:
comments (optional):

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

Second mentor only applies in case the assignment is hosted by an external organisation.

Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

IDE TU Delft - E&SA Department /// Graduation project brief & study overview /// 2018-01 v30 Page 1 of 7

Procedural Checks - IDE Master Graduation

TU Delft

APPROVAL PROJECT BRIEF
To be filled in by the chair of the supervisory team.

chair Marina Bos de Vos date 27 - 03 - 2020 signature Marina Bos-de Vos Digitally signed by Marina Bos-de Vos Date: 2020.03.27 09:49:22 +01'00'

CHECK STUDY PROGRESS
To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair.
The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: 6 EC

Of which, taking the conditional requirements into account, can be part of the exam programme 6 EC

List of electives obtained before the third semester without approval of the BoE

★ YES all 1st year master courses passed

NO missing 1st year master courses are:

name Colinda van der Bunt date 31 - 03 - 2020 signature

FORMAL APPROVAL GRADUATION PROJECT
To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **.
Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: ★ APPROVED NOT APPROVED

Procedure: ★ APPROVED NOT APPROVED

comments

name M. von Morgen date 14 - 04 - 2020 signature

Personal Project Brief - IDE Master Graduation

TU Delft

Key Performance Indicators for Strategic Design project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple.
Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 25 - 03 - 2020 20 - 08 - 2020 end date

INTRODUCTION **
Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

Design is one of many fields that focuses on innovation, and its scope and influence is expanding rapidly. Design is no longer limited to the creation of products based on briefs, but has moved into the strategic domain of organisations as well (Calabretta, Gemser & Karpen, 2016).
Strategic Design can be defined as: "[...] the professional field in which designers use their principles, tools, and methods to influence strategic decision making. Strategic decision making includes decisions that have a long term impact, involve multiple stakeholders and require a substantial commitment of monetary and non-monetary resources" (Calabretta, Gemser & Karpen, 2016).

The long term scope, and ability to deal with multiple stakeholders make Strategic Design an interesting field to approach global wicked problems, however the design field (especially the strategic design field) is still relatively young, and does not yet have a lot of influence in most organisations (Calabretta, Gemser & Karpen, 2016).

On a global scale, we are now facing challenges that require us to adapt, and innovate radically (i.e. social and environmental sustainability) (Delft Design for Values Institute, N.A.), which is an opportunity for Strategic Designers to make an impact.
Strategic Designers can work in many different contexts, and organisations, both as an internal part of the organisation, or as an external party in the form of a consultant.

A challenge for Strategic Designers however, is that their work is typically early in an innovation process (see the fuzzy front end, figure 1), which means that the goal/outcome is not always clear form the start. It also means that their work can serve as an intermediate result, which will lead to more specific outcomes later on, making it difficult to pinpoint the exact added value of the work of the Strategic Designer. This can make it difficult to explain and prove the added value of Strategic Design, as is described in more detail in the problem definition.

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introduction (continued): space for images

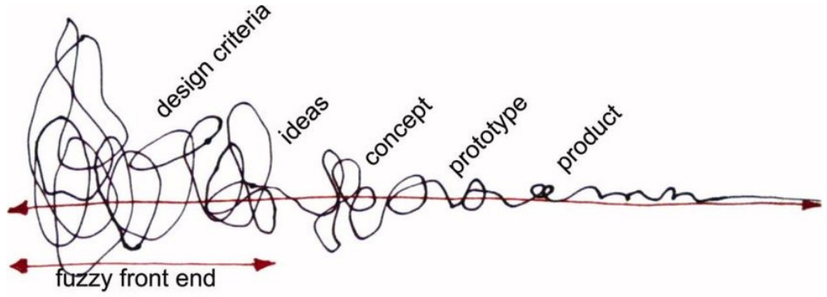


image / figure 1: Adaptation of the design process, Sanders & Stappers (2008)

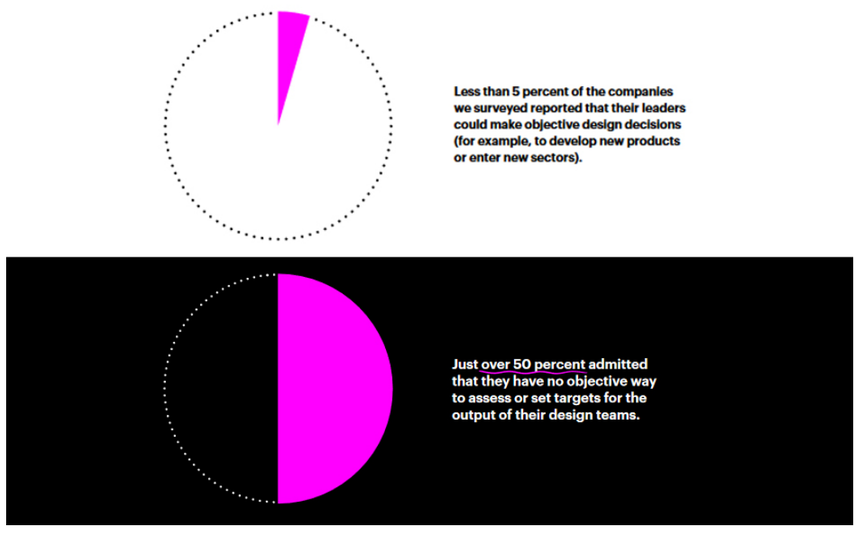


image / figure 2: A lack of objectivity for Design performance - Source: The Business Value of Design, McKinsey

PROBLEM DEFINITION **
Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

According to 'The Business Value of Design' by McKinsey (2018), one of the key factors that determine a company's design potential is being able to objectively measure design performance, however in practice, more than half of companies admit that they are not able to (see figure 2). This often results in insufficient support and investment from the company, and design efforts not reaching their full potential.

McKinsey also points out that less than 5 percent of the companies they surveyed reported that their leaders could make objective design decisions (see figure 2), and stresses the value of Design Metrics to make design as measurable as time or costs. In practice however, Design Metrics are rarely reliable (Feldman, 2017). The problem with Design Metrics for Strategic Deisgn, is that they are often limited to (current) consumer insights, and fail to cover long term potential, or types of value that are not translated into business value.
Another aspect that complicates Design Metrics (or other forms of performance indicators in the context of design) is that metrics are in essence quantitative (Huang, 2019) Design on the other hand, is primarily a qualitative field.

This leaves Strategic Designer practitioners challenged, when it comes to measuring their own performance, and the quality of their work. This limits their credibility and lowers the potential value that they have to offer.

ASSIGNMENT **
State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

Design 'Key Performance Indicators' for Strategic Design in a consultancy context, with the goal to be able to objectively measure the performance of Strategic Designers and/or quality of their work. Keeping in mind that Strategic Designers have a qualitative nature, and can work towards long-term goals, in complex multi-stakeholder contexts where value is not always limited to only business value.

Given the broad interpretation possibilities of the subject matter, a (short) study will be conducted in order to define the unit of analysis, and create a clear understanding of the following terms:
1) Strategic Designers (role, and type of work)
2) Performance

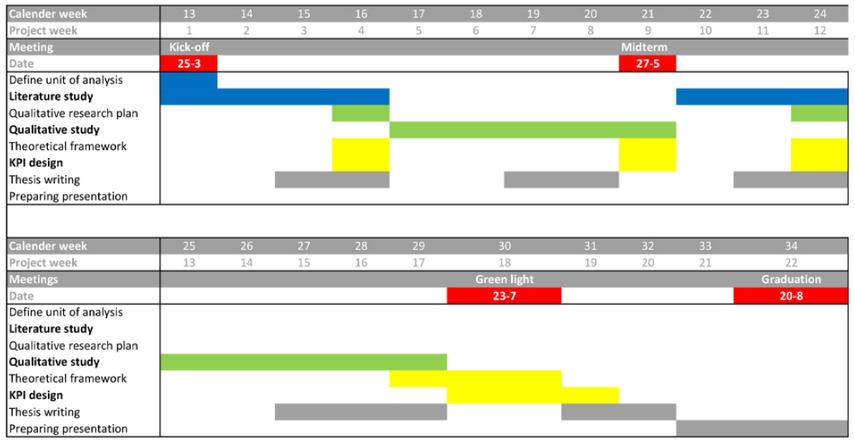
Based on these definitions, the assignment will consist of:
1) A literature study of performance measuring (and similar subjects) in various strategic design related contexts, including but not limited to: (radical) innovation, design metrics, and non-business value.
2) A qualitative study using interviews about measuring Strategic Design performance with Strategic Design experts, and Strategic Design practitioners.

which will lead to:
1) A theoretical framework of performance measuring in Strategic Design
2) A design of Key Performance Indicators for Strategic Design

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 25 - 3 - 2020 20 - 8 - 2020 end date



The planning accounts for free days within the semester, as specified in the TU Delft academic year.

The project is structured into two phases of research, and a parallel process of synthesising a comprehensible and usable derivative of the results.
The research is split into two phases in order to gain more depth by following up the results of the first phase of research.
The synthesis of results happens iteratively based on the knowledge that is gathered until that point.

The first research phase will consist off:
1) A literature review, to create an overview and synthesis of different existing knowledge fields.
2) A series of 5-10 interviews with experts about their experiences in the context of Strategic Design performance and metrics.
Based on these activities, the goal is to create a first theory about how to measure Strategic Design performance.

The second research phase will consist off:
1) An additional literature review, consisting of 5-10 case studies in order to find/create exemplary scenarios for exploring Strategic Design performance measuring.
2) 5-10 interviews with current Strategic Design practitioners from innovation consultancies and/or corporate innovation departments, to test and explore the theories found until that point using the scenarios defined in the literature study.

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

The idea for this graduation assignment started throughout my SPD Master, as I noticed that Strategic Designers often lack the ability to be quantitatively convincing from a financial point of view. I noticed this during courses such as Strategic Value of Design, Design Consultancy Practice, and In-house Design, as well as during conversations with recent graduates about their working experiences.
I want to address this challenge, because it limits our potential after graduation, since most organisations are financially driven, and require Strategic Designers to have a certain degree of quantitative credibility in order for them to apply their knowledge and skills to their fullest extent.

My goal is to create a way to be credible in a quantitative context for my client, myself, and potentially my peers, outside of an academic context, while maintaining the qualitative richness of our work. In order to do so, I have defined the following ambitions for myself throughout my graduation project:

1) Gather and synthesize research findings in a holistic, comprehensible manner, while balancing academic rigor and practical applicability.

2) Create a strong, convincing argument about the results, focusing on the viability of Strategic Design.

3) Manage the project, and present the findings and results in a professional manner.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.


TUDelft