YOURS AND MY DATA QUALITY

a case study of word perception and the influence on transdisciplinary collaboration

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Techno-Anthropology Master Thesis
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June 2024
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Abstract

Exploring a case study from within an international software company. Seeking to investigate how various subjective interpretations of words and concepts can lead to miscommunications and misalignments and the implications of this on transdisciplinary collaboration. Highlighting the complexities of integrating different professional perspectives and how techno anthropology can help bridge this with solution proposals influenced by Participatory design methods.

By applying a phenomenological approach and utilizing Controversy Mapping the findings reveal significant variability in understanding, influenced by professional backgrounds, cultural contexts, and individual experiences.

1 - Scoping and Introducing the Issue

Imagine this scenario: You show up for work. You step into a meeting. Someone is presenting at the screen and talking "We have a new project we need to get started. We need to focus on several different aspects, e.g. ease of use, sustainability and data quality"
Your mind starts racing. Because who is the user, sustainability in relation to what and what is data quality. I know what data quality is, but does everybody else in this project…?"

Graphic 1 - Own rendering of the scenario, made in Canva

In my own experience this scenario is not uncommon. Through insight from observing the implementation failures and successes of internal IT systems as a biomedical laboratory technician and later during my academic and professional engagements, the conception of this thesis came to be. From thinking that transdisciplinary collaboration is something you just do, to realizing how complex these interactions are and the impact a collaborations success and alignment can have on the finished system or product. These experiences underscored the critical need for a deeper investigation into how different professional backgrounds perceive and integrate the understanding of a word or concept.

The understanding of words and concepts as data quality is rooted in theories or frameworks established by specific branches of science and philosophy, which then shape their perception of reality (Juul and Pedersen 2012, 9-22). What occurs when these established understandings clash with alternate perceptions, where the concept of i.e. data quality may not hold the same significance or even be relevant. When they are forced into a collaboration that requires that they not only accept their own perception of the world and words, but also that of others.
Several focuses were in play in the early stages of this thesis; exploring how data quality can be perceived in 'soft' vs. 'hard' sciences, focusing on quantitative and qualitative dimensions of data quality, and doing a comprehensive overview study of how different perceptions of data quality exist.

Various philosophical and theoretical lenses could be applied according to the choice of focus. Applying a positivistic view, seeking a singular truth and defining a specific definition to a concept like data quality without subjective values (Gilje 2012). Phenomenology on the other hand with its aim to leave the objective behind and place value to the subjective and intersubjective

realities, offering diverse ways to understand data quality (S. Juul 2012, 65-106). Moreover, approaches like Actor-Network Theory (ANT) and Feminist Science and Technology Studies (STS) could be applied to gain an overview of different definitions and provide insights into power dynamics and the socio-technical translation of concepts (Jensen 2021 and Adrian 2021).

The broader aim of this study is not to pinpoint a definitive definition of data quality, but to explore how differing perceptions of this concept impact transdisciplinary collaboration. Using data quality as an example, and a starting point for a more general dive into investigating how different professional backgrounds perceive and integrate words and concepts. It seeks to investigate whether a common language is necessary for effective collaboration or if other mechanisms, such as the use of boundary objects (Star and Griesemer 1989) or other tools, can bridge the conceptual gaps and facilitate smoother transdisciplinary collaborations.

With this focus, taking on a phenomenological mind-set and delving into a case study, seeking out the essence and challenges of data quality and its role within transdisciplinary collaborations in an international software company. Taking an onset in the example of the concept of data quality and the different perceptions that arise from this. In relation to these differing perceptions seek to find possible barriers in understanding and misalignments and reflect on how this insight can help further transdisciplinary collaboration and foster a more holistic work process. Leading to the problem statement of this thesis below.

1.1 - Problem Statement

> *What constitutes the understanding of the concept of data quality in an international software company? Do differences in perception of concepts like data quality influence transdisciplinary collaboration, and can an awareness of these differences enhance such collaborations?*

To answer this question, I will start by utilizing the method of *Controversy Mapping* (Venturini og Munk 2022) the gain a superficial overview of the many perceptions of data quality, using this as an arguments for the need to diving into a few of the many perceptions and uses of the concept data quality. Following this pursuing a case study from an international software company, hereafter named Company XX, interviewing six informants from this company. Finding underlying themes in the case by a hermeneutic and iterative approach (Juul and Pedersen 2012, 107-148). Applying on top of this various theoretical frameworks from within the anthropology, social psychology and Science and Technology studies (STS) arena. Rounding off by putting the case in perspective by applying insights from an external informant, from a similar company, and giving my techno anthropological contributions, seeking to enhance the practice of transdisciplinary collaborations.

2 - State of the Art By Controversy Mapping

This section is traditionally used for a literature search surrounding the subject matter one wants to investigate. This is done for several reason, among these; presenting background knowledge on the topic, giving context to the topic of research, demonstrating why the research is relevant and identifying potential gaps in knowledge hereby giving an idea of the benefits of highlighting this specific topic. I will in the following present the intention of using the method of controversy mapping to scope the topic. Explaining the theory behind it, the technical specifications and protocols, and present the findings.

2.1 - What is the Talk on ‘data quality’

I want to show how taking on a more non-traditional method of researching literature can provide insights on the topic, situating why this specific topic is detrimental. My literature review is not done by finding relevant articles and going into the specifics of these, but rather by the method known as controversy mapping. This method provides more of a visual overview of how broad the perception and use of the term ‘data quality’ can be. Using this as an onset for diving into the understanding of the term ‘DATA QUALITY’, how it unfolds differently in different areas and professions and how this difference affects collaboration.

The intention of using this method is threefold. First off is researching the area of interest. Getting an impression of what the talk of data quality is about and what areas use it the most and how broad the concept can be.

Second off it shows how broad and multifaceted the concept can be, giving an idea of how using the concept without reflection from the sender, can result in different perceptions according to who the recipient is. Thus, creating a basis for potential misunderstandings.

Lastly is used for narrowing the scope. Once ascertained that data quality can be many different things, choosing an area of the map to zoom in on. Examining the whole map would be immensely interesting, but due to time, resource and space constraints within the parameters of a master thesis, this examination would not be possible.

Controversy mapping, but more specifically the visual part of this method, gives a way of quantifying and visualizing qualitative data. This can provide a more manageable view on a very complex dataset. (Venturini og Munk 2022)

2.2 - The Theory Behind Controversy Mapping and its Uses

Controversy mapping is an approach rooted in the field of Science and Technology Studies (STS) that aims to visualize the intricate dynamics of public debates and technological controversies. This methodology is based on the idea that controversies are not just disputes over facts but are deeply entangled with socio-technical networks of meaning, interpretation, and influence. It is a digital tool in the anthropological toolbox, to help make sense of complex issues. (Venturini og Munk 2022)

Actor-Network Theory (ANT), developed by Bruno Latour, Michel Callon, and John Law, serves as a foundational theoretical framework for controversy mapping. ANT claims that both human and non-human actors form networks that influence and shape their mutual relationships (Jensen 2021). In the context of anthropology, controversy mapping uses an ANT mindset to trace how different mentions of 'data quality' emerge, overlap, and conflict across various discourse communities.

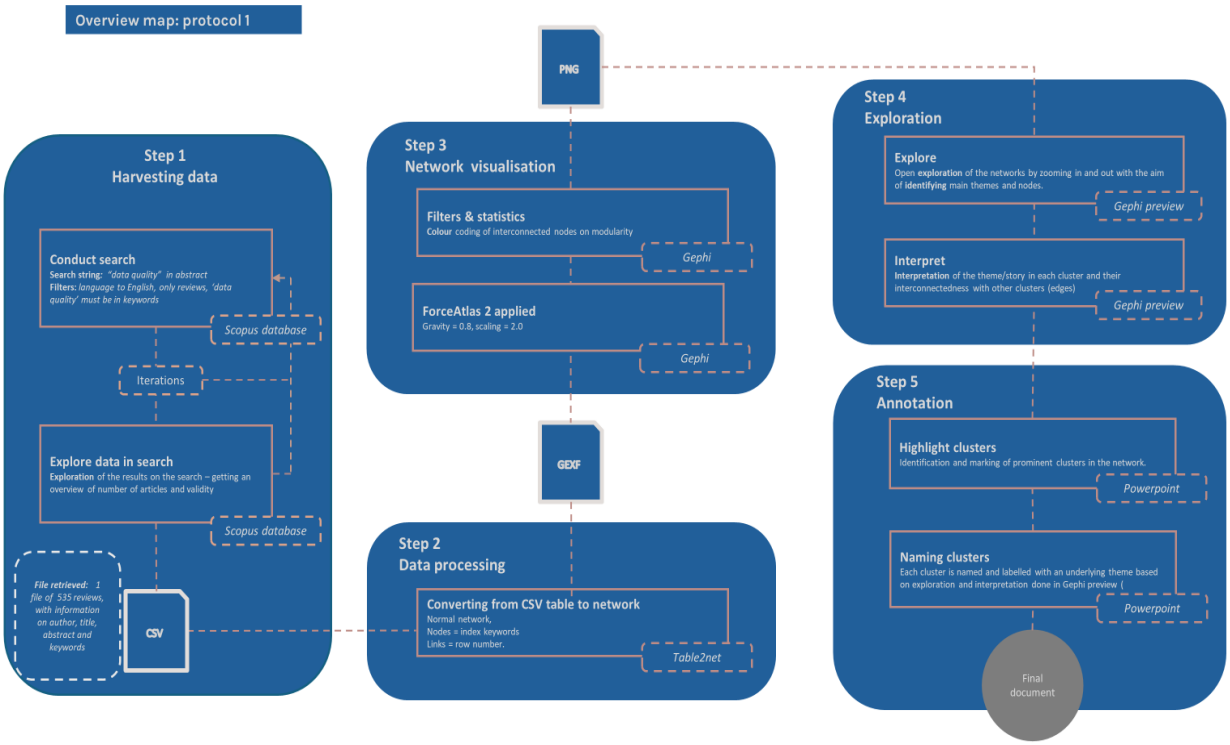
The methodology of controversy mapping involves constructing a visual network that represents how different actors (which can be individuals, groups, institutions, or even concepts) are linked. These links manifest through textual references, citations, or thematic similarities found in academic and technical literature. In my thesis, I utilize the software Gephi, which is a tool for network analysis and visualization, to map these relationships. (Venturini and Munk 2022, 189-212)

A network can be set up to incorporate many different variables, depending on what the scope is and the dataset being used. In this thesis we see what is called a ‘normal network’. This type of network consists of two different components: nodes and edges. Nodes are the dots, and edges are the lines or links between the dots. (Ibid.)

2.3 – Protocol – Going From Data to Visualization

When compiling data for a network visualization, many technical steps are involved. To gain an overview of these, and be able to document the search and process, protocols are developed. Protocols summarize the steps and choices made from initial search in Scopus, until the final visual presentation with annotations. (Venturini and Munk 2022, 189-212)

The dataset used, is compiled from reviews indexed in Scopus that mention 'data quality' in their abstract. The search underwent several iterations and ended up with the search string noted in Protocol 1 below. A larger version of Protocol 1 can be found in Appendix 1.



Graphic 2 - Protocol 1, Overview Map

Because this thesis is looking into the concept of 'data quality' and not the words 'data' or 'quality' in themselves, Boolean operators were used to ensure the right search string. The search was filtered for only English, to assure that connections between keywords could be made, and to do this the keywords must be in the same language. This first search generating 35,675 hits, was way too large a dataset and needed to be limited. Next filter added was to only look at reviews. This decision because the object of this map is to get a general overview, and as reviews are a kind of overview in themselves, this was a logical step. Now the search was at 2,106 hits. This dataset was initially converted and imported to Gephi. However, it resulted in a network with too many variables, and it was not possible to work with it due to lack of computer resources. Returning to the Scopus search, another filter was added. Filtering for reviews with 'data quality' as a keyword. Resulting in a search of 536 hits, which was accepted as the dataset for the final map.

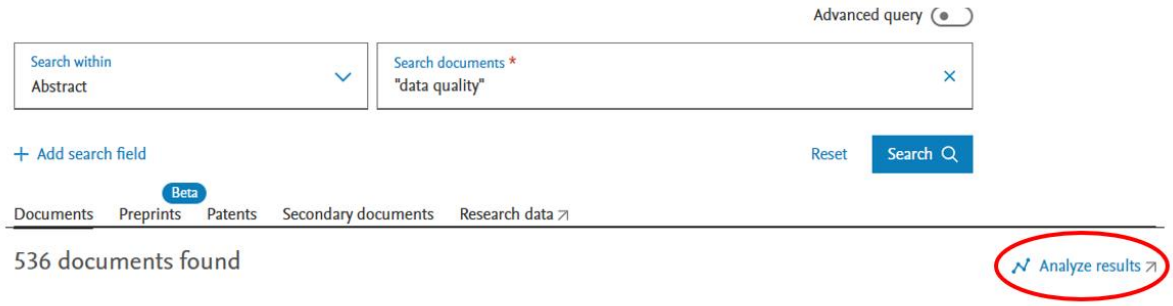
The dataset was uploaded (Step 2) to the webpage *Table 2 Net* (medialab.github.io u.d.), which can convert CSV files to GEXF graph files that are compatible with the program Gephi. Each *node* in the network represents an index keyword extracted from the articles, encapsulating a facet of the 'data quality' discourse in that article. The *edges* (lines between the nodes) are identified by the row number in the dataset, and act as unique identifiers that tie these keywords to specific articles

or contexts. This network structure allows me to visualize and analyze the topology of the discourse, highlighting which keywords (and thus which aspects of data quality) are more central or peripheral, and how they interconnect.

Importing the GEXF file to Gephi (Step 3), tuning different filters and statistics, ending up with the ones noted in protocol 1. This resulted in an image that can be exported to PowerPoint. Now Step 4 and 5 are performed simultaneously, going back and forth between PowerPoint and Gephi, exploring and annotating until a certain amount of insight into the map has been reached and noted, ending up in the final visualization; Graphic 5 - Overview Map in section 2.4.

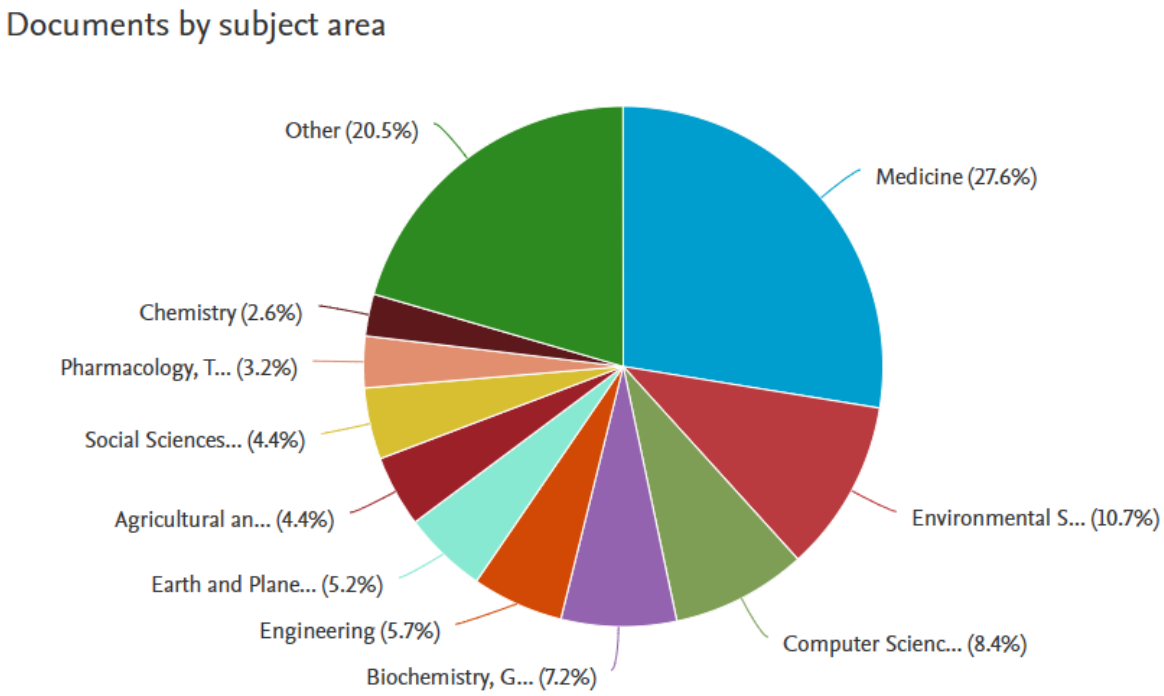
2.4 - The Overview

The search from Protocol 1 gave insights already from viewing the 'Analyze Results' tool in Scopus' (see Graphic 3 below).



Graphic 3 - Search string example from Scopus search

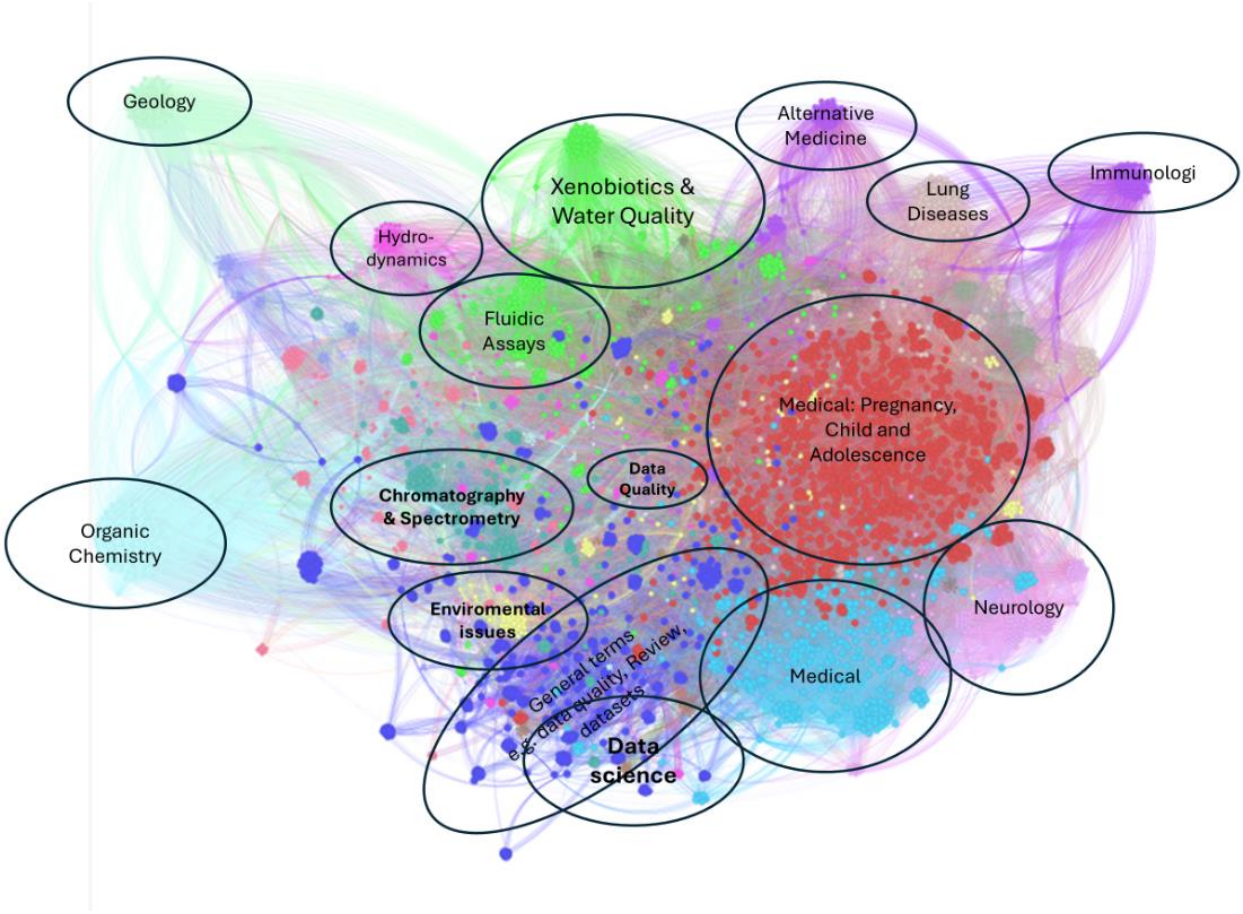
Using this tool generates several statics of the search, e.g. publication year, authors, country of publication and most relevant for this thesis; Subject Area (see Graphic 4 below). This subject area visualization gives an idea of how the author and reader of all things 'data quality related, can potentially descend from very backgrounds and disciplines. We can ascertain that medical -and natural sciences are the most prominent users of this concept. Under the category 'Other' is primarily specific branches of medicine -or natural sciences.



Graphic 4 - Pie Chart from Scopus Analyze Results tool

Moving on with this dataset in protocol 1, we can generate a map, creating an overview of all index keywords used in reviews that mention 'data quality' and how these reviews are linked to one another, according to how the same index keywords are used in various reviews. This provides a broad context for exploring how the concept 'data quality' is framed and used across various academic fields.

It is important when looking at the map to differentiate between colors and clusters. Colors are given based on an algorithm in Gephi called modularity. Modularity looks for communities in the network, meaning nodes that are more connected than others. The clusters we see are also based on nodes with a strong connection to each other. But while the clusters often appear when a group of nodes are primarily drawn to each other, some nodes can have a strong connection to different communities. They will therefore not always appear in a cluster but will be assigned to the color belonging to the community it has the most connections with. (Venturini and Munk 2022, 189-212)



Graphic 5 – Annotated overview map, Generated in Gephi from Protocol 1

We see both a distinction in color and clusters in many places. Some of which we can categorize into specific disciplines. We can ascertain some smaller very dense clusters of nodes, some very isolated, but also many of which are in the middle of a lot of other nodes and larger clusters. For the most part these represent a singular review and the keywords used by this. Where the small clusters are more isolated, that is because a review has most of its keywords used exclusively and a few in common with other reviews. The places where the small clusters become more muddled with larger clusters and nodes of different colors, they have more keywords in common with others.

The whole right side of the map is primarily focused on medical issues. The area is so large and contains many separate clusters where focus is on different branches of medicine e.g. neurology (light purple), lung diseases (nude) and more general medicine (light blue).

Moving to the left side and top part of the map, we have some more distinct outliers; geology (mint) and organic chemistry (very light blue). These coupled with the green and pink areas gives a distinction between the human/medical related part of the map, the environmental/

surroundings/landscapes and the more widely used terms (dark blue) that in a higher degree spill into the other areas.

There is quite some overlap between most of the map and a few areas that draw distinctively away from the rest, showing that these areas perhaps use the data quality to describe something less related than the other areas, or are not that focused on data quality in the same sense as the rest of the map.

We cannot of course say that this map tells us exactly what they talk about or if data quality is even the main topic in these reviews. But it gives a general idea of how many topics where it is relevant to mention data quality

Many areas and aspects of this map could be interesting to delve into, and the ideal scenario would be to uncover all of them to some extent. My initial interest lies exactly in how many different perceptions there can be of 'data quality' and other terms and what happens in collaborations where this variety in understanding becomes apparent. However, due to lack of time and resources in this thesis, it is not possible to go into all areas of the map.

With this having made an argument for data quality, not just being data quality but dependent on the context I will dive into the case study and the subjective perceptions found here.

3 - Methods - Chasing the Knowledge

In this section I will introduce my position in the arena of this thesis and the methods that lay to ground for the empirical data collection. Including an introduction to phenomenology and hermeneutics and arguments in favor of using these as a methodological approach in my thesis. A brief introduction of theory on case studies, the informants, and other relevant choices made in the process of writing this thesis.

3.1 - Taking a Phenomenological Approach

This section explores the phenomenological mind-set exercised throughout the process of this thesis.

Seeing as the scope of this thesis is not to determine a *the one truth* (Gilje 2012) on the concept 'data quality', but to explore how different understandings of this concept can exist within a collaboration, I sought to gain insight into the informants' reality and their subjective experiences. Hearing their perceptions and linking them to each other through the process of *inductive coding* (Kristiansen 2010, 451), I wanted to explore the *microworlds* they were embedded in and the *intersubjective* knowledge arising from these microworlds or interdisciplinary collaborations. (S. Juul 2012)

The focus being on asking 'how' and 'what' and not so much 'why, and by understanding their experiences and perception of the matter at hand we can seek to enlighten whether their heightened awareness of the subject can alleviate misunderstandings in future collaborations. (Ibid.)

I had preconceptions about issues relating to different understandings of words and the subsequent misunderstandings and communication issues arising from this. This of course being a prerequisite for the interest in the subject and the shaping of initial thesis design. I did however early in the preliminary stages decide to take on a phenomenological approach, choosing an inductive way into the material and trying to shed my own preconceptions as described by this being one of the most important traits of the phenomenological approach. The inductive way of working goes very well in hand with using hermeneutics for analyzing the empirical data when coding. (Ibid.)

3.1.1 - The history of phenomenology

Phenomenology, as a methodological approach in anthropology, focuses on the study of structures of experience from the first-person perspective. Developed by Edmund Husserl and furthered by scholars like Martin Heidegger, Maurice Merleau-Ponty, and Max van Manen, phenomenology seeks to uncover the essence of experience before the imposition of pre-existing theories or biases.

Phenomenology breaks with the traditional notion of separating ontology and epistemology, as seen in positivism. (S. Juul 2012)

The notion in positivism is that to find the truth one must rely on empirical evidence gained through experiments and observations, that can be compared and prove or disprove a hypothesis. It is key to be objective and only use objectively collected data, thus eliminating all research that relies on subjective notions, beliefs, and ethical and religious considerations. (Gilje 2012)

Phenomenology however values these subjective stories and observations as it is believed that when dealing with people, you must see them as subjective beings in the world. In this context there can be no one objective truth or story, but understanding of a social context goes through realization of the subjective. (S. Juul 2012)

In the context of interviews, a phenomenological approach is employed to access the interviewees' lived experiences as truly as possible. This approach involves a bracketing process called *epoché* (S. Juul 2012, 70), where the researcher suspends their preconceptions and biases to engage with the interviewee's descriptions of their world. By focusing on descriptions of everyday experiences, researchers can reveal how individuals perceive, feel, and live in their world, providing invaluable insights into their cultural and social contexts. Leading back to the focus on what happens and how it happens, and less on why it happens. (S. Juul 2012)

3.2 - Case Studies and Narratives

Case studies are a critical method in empirical research, particularly valued for their depth and detailed exploration of complex issues within real-life contexts (Karpatschof 2010, 409-428) . Doing a case study allows the researchers, me, to delve into the intricacies of this particular case, capturing the dynamics and interactions that quantitative methods might overlook (Pedersen 2011). And again, as I do not aim to find the one and only truth or perception of data quality or collaborative practices, but focus on all the different perceptions, it is relevant to use a method that allows for a deeper understanding of individual experiences.

Inspired by philosopher Paul Ricoeur, the narrative approach to case studies emphasizes the "narrative" and "interpretation of narrative" as fundamental to understanding human experiences and actions (Pedersen 2011). Ricoeur advocates that narratives are double-referential; they relate to both the real world and an interpreted world, thus providing a rich, nuanced language close to everyday speech for articulating complex realities. Narratives embed thoughts, opinions, values, attitudes, and actions, making them a potent basis for dialog and understanding due to their open and dynamic nature. (Ibid.)

The validity of case studies in empirical research is strongly supported by Bent Flyvbjerg, who argues that detailed case studies are necessary for understanding and learning from human

behavior and societal changes. According to Flyvbjerg, the power of example is paramount; a single, well-documented case can offer invaluable insights and challenge established theory, leading to improvements in generalizability and theoretical reach. (Flyvbjerg 2006)

The primary objective of utilizing narratives in case studies is to convey wisdom by interpreting, as narratives arise from and reflect the world, we place ourselves in. The goal is not just to document, but also to influence understanding and improve the capability and possibility for people to orient themselves and act within their environments. Through narratives, I as a researcher together with the interviewees narrative create and share meaning. Their narrative thereby contributes to a deeper knowledge of their experiences and understanding of the case. (Pedersen 2011)

The employment of case studies, built on narrative data, offers a way of trying to obtain objectivity with subjectivity, and employ science with the use of experiences. Through the lens of Ricoeur's narrative theory (Ibid.) and Flyvbjerg's empirical rigor (Flyvbjerg 2006),case studies validate their worth as an essential research method. It not only provides a detailed understanding of an issue, but can also bring forth the human experience, making it invaluable for the purpose of this thesis.

3.3 - Interviews

I have done a total of seven interviews. Six of these seven are with people representing the case study of this thesis, also mentioned in the problem statement, and are from Company XX. They range from managers within different teams to data migration specialists, however they all move within the arena of Post-Merger. Post-Merger is a term for when a company is bought and integrated into another company (Markager 2024). Company XX is comprised of 12 different tracks, e.g. Finance, Marketing, IT. Within each track there are a multitude of teams with various objectives and daily tasks. These tracks and teams are alle assigned to a business unit with a HR representative. (Markager 2024)

The focus in the case interviews was on illuminating the experiences surrounding different perceptions of data quality, and how different perceptions of words and concepts come into play in transdisciplinary collaboration circumstances. The informants were picked by a contact person I was referred to, also known as a *gatekeeper* (Hammersley 2007), hereafter called PK. PK did not handpick only these informants, but contacted several employees asking who would be interested in contributing to my thesis. The six informants were the ones that responded. They are all listed and described in Table 1(section 3.4).

The remaining interview (see Table 2 in section 3.4) was done with an external informant, with insights on the same topic, but from another large company. His viewpoints are introduced into

the discussion as a way of bringing into perspective whether the experiences in the company are an isolated case, or if the same issues exist elsewhere. This interview was not a part of the original research plan. The opportunity to integrate this perspective, presented itself by chance through my personal network. It could be construed as a case of serendipity, which is described by Ingraham (2019) as a term for discoveries that are not a part of the original design and "*is first about the encounter and possibility of entering into a new relation, and only thereafter about discovery and fortuity."* (Ingraham 2019, 112). The opportunity presented itself through my child's playdates, and the informant is a parent of this playdate. By personal interest he struck up conversations on how my thesis was going and what I was writing about. Upon hearing about my research, he on his own started talking about experiences he had encountered in his professional lives. After reflecting on some of the initial observations he introduced, I realized how valuable this insight could be and how his central role in a company of similar size could provide a broader perspective on my case findings. Expanding on this notion I decided to set up a more formal interview, using insights from the case interviews and analysis done on the data collected from these, to form the conversation around. The interview was not conducted until the analysis of the case was already done. This in an attempt at separating the case from the external insights until the point of the discussion. Acknowledging that it would be hard to separate the insights and not let them affect my interpretation of the case. Following this reasoning the external informant will not be mentioned at all in the analysis, and both his background and insights will not be presented until the discussion.

3.3.1 - Interview Guide

Keeping in line with the phenomenological approach, I wanted first of all to focus on what the informants' experiences where and how this influenced their understanding and collaborative practices. An interview guide for *semi-structured interviews* was drawn up. The semi-structured way was chosen to ensure that the conversation was kept within the themes of the thesis framework. All the while giving enough space to ensure that the conversation was dynamic and open to the informant's own narrative. (Brinkmann and Tanggard 2010, 37-42)

Starting out with basic questions about professional role and education was used as a way of getting to know the informants, building up *rapport* (Spradley 1979, 44-45) and leading to the more complex and subjective questions. In Graphic 6, excerpts from the interview guide can be seen, reflecting how the informants were encouraged to share their own subjective experiences. The full interview guide can be seen in Appendix 2.

Graphic 6 - Examples from interview guide

In several of the interviews I ended up not adhering strictly to several of the questions in the interview guide but keeping in line with the themes and the essence. This due to the conversation flowing naturally and often ended up with a focus relevant to the informant, but at the same time often resulting in answering my questions without me having to actually state them. This validated the relevance and coherence of my interview guide.

3.3.1 - Informants

Below are two tables depicting the informants. Table 1 holds the informants from Company XX which represent the case study. Table 2 holds the informant representing an external perspective on the issues found in the case, that will be presented in the discussion.

NAME	POSITION	LOCATION	REMARKS
AS	Marketing and Sales Onboarding Lead	Denmark	No previous knowledge of the questions
LD	Onboarding Manager - Specialized in NetSuite	Denmark	No previous knowledge of the questions
ME	Post Merger Integration Manager	Denmark	Questions sent beforehand
NR	Data Migration Consultant	India	Questions sent beforehand
BC	Data Migration Manager	India	Questions sent beforehand
ND	Data Migration Consultant	India	No previous knowledge of the questions

Table 1 - Informants from the case

The informants in the case will be briefly introduced with education and professional background in section 5.1. All individual informants have been anonymized and will only appear by the letter in the first column. Company XX has also been anonymized. Anonymization has been done by

professional curtesy to informants, and because the informants and the company names hold no relevance to this thesis.

NAME	POSITION	REMARKS
JP	HR Business partner with specialty in IT departments	External perspective

Table 2 - Informants from External Organization

3.3.2 - Coding

When coding collected empirical data two main strategies are widely used, inductive coding and deductive coding (Kristiansen 2010). Within these lies many varieties and mixed approaches. Working with a phenomenological mind-set I have chosen to do a form of *inductive coding* (Ibid.) and use a *hermeneutic spiral* (Juul and Pedersen 2012) approach to coding.

Hermeneutics complements phenomenology by focusing on the interpretation of texts and spoken words. Originally it was developed for interpreting religious scriptures and later expanded to broader textual analysis by philosophers like Friedrich Schleiermacher and Wilhelm Dilthey. Hans-Georg Gadamer further articulated the process as a fusion of horizons, where the understanding of a text involves a dynamic interplay between the interpreter's preconceptions and the meanings embedded in the text itself. (Ibid.)

In anthropological research, hermeneutics is used to interpret transcribed interviews, viewing them as textual embodiments of spoken narratives. As I am focusing on a case study, the aim is to understand the socio-cultural contexts of the interviewees and use the narratives they have as expressions of their experiences. Putting these experiences into the context of the others and creating meaning from that. Hermeneutics in this sense is an iterative process of engagement with the text, seeking deeper understanding through continuous revisiting of the interview content considering both my own evolving insights as a researcher and the theoretical frameworks that inform the research. (Ibid.)

Some codes emerged already during the interviews, as they sprung to mind immediately. The code: *Word alignment* i.e. was repeated by almost all the informants. Other codes evolved as a part of the iterative process of going through the transcriptions. Examples of the codes used can be seen below in Table 3. A complete rendering of the codes can be seen in Appendix 3.

I started from one end and went through all the transcripts, writing down themes and excerpts. After going through them all, I started over with new knowledge and insight gained from some of the later interviews. Dividing the material into themes and putting them in relation to the

whole. Thereby some of the final codes were merged from initial codes, that when viewing the material as a whole made sense to combine. (Juul and Pedersen 2012)

In a theoretical hermeneutical circle, this iterative process and interpretation can go on forever. In a practical sense however, the researcher must find a place to stop the process and accept the findings. This happens when some sort of coherent understanding between the parts and the whole are reached (Juul and Pedersen 2012, 115). This is what I aimed to obtain with my coding and following analysis.

EXAMPLES OF CODES
Word Alignment
Misunderstandings
Solutions
Cultural understanding

Table 3 - Examples of Codes

3.3.3 - Translation and Other Choices

Before, during and after the interviews, several choices were made as to how to conduct, record and further treat the data, before actually being able to analyze the collected data.

Three of the interviews were done in Danish, as that is the native language of both me, the interviewer and the three interviewees, and therefore would provide the best nuances in the conversation. One was done in person and two over Microsoft Teams. The three remaining interviews were done in English, as that was the common language in these cases. All three of these were conducted over Teams.

They had all received a written invitation (see invitation in Appendix 4) to the interview and been informed of the purpose of the thesis and my background. Giving them some context to the interview, gave them a better sense of how to angle their answers, yielding almost exclusively relevant information and filtering some misunderstandings that could have potentially taken time and focus from the interview. In this invitation was also the offer of getting the questions beforehand. Some of the informants took this offer and some didn't. I didn't notice any difference in answers between these two groups, but if it made some of them better at ease knowing the questions beforehand, the consideration was that it would make for better interviews.

In this offering up some knowledge of myself I opened for them familiarizing themselves with me and creating *rapport* (Spradley 1979). This also helped along by the fact that I have been interning in the company before and am still employed part time. I work in a different team and part of the company and did not know any of the informants beforehand, but just the fact that the communication comes from the ‘inside’ creates trust.

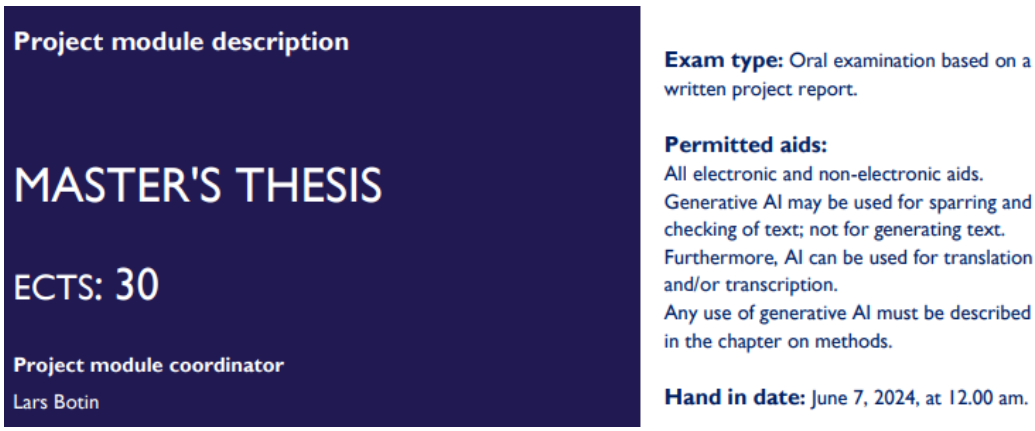
As 5 of the interviews were carried out over Microsoft Teams, and Teams offer the option of automatic transcription during the interview, the transcriptions however turned out to be filled with flaws, and I decided to use another transcription service and use the same one on all interviews.

All interviews were recorded and afterwards converted to mp3 files and run through the automatic transcription service GoodTape (https://goodtape.io/ 2024). Automatic transcription makes the process much faster, but does have its limitations, things like tone of voice does not show. But due to it only being me both doing the interviews and reading the transcriptions afterwards while listening to the recording, so corrections could be made, and some underlying meanings could be noted. This was a nice and time-saving option in this case.

Translation was done by a joint usage of Google Translate and manual translation. Only the excerpts used directly in the final thesis were translated.

Frontpage and most of the graphic made by myself, were made with Canva.

At times through the process of the thesis generative AI, as ChatGPT and Bing Copilot has been utilized within the constraints given by AAU and the semester description (see screenshot below in Graphic 7). Due to writing this thesis on my own, I sometimes lacked the sparring from co-students as emerged in the process as myself. In this context generative AI did on occasion provide me with ideas or insights. Mainly in relation to relevant theoretical frameworks outside the traditional techno-anthropological arena. Ideas from generative AI were critically assessed and the original references found and read through to understand the relevance and how to apply it.



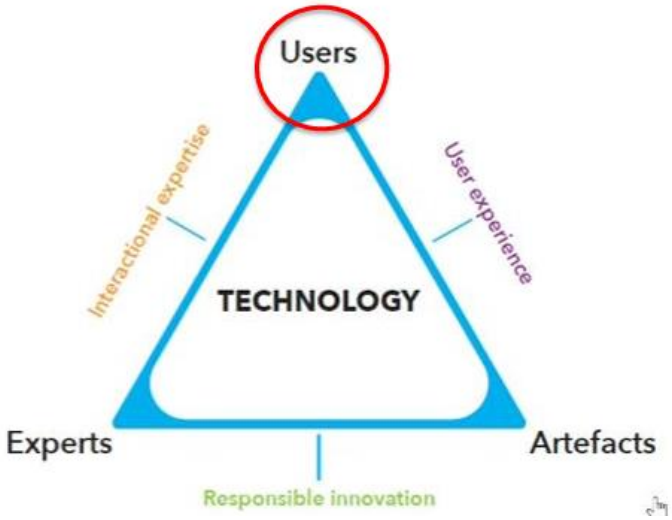
Graphic 7 - Screenshot from AAU Semester Description for TAN10 F24

3.4 – My Positioning in this Thesis

In this section, I reflect on the role my professional experiences played in the initial interest and exploration of the focus of this thesis. I will also touch upon my opportunity to investigate the case in Company XX and my preconceptions related to this.

Initially, my journey began as a biomedical laboratory technician, where I was directly involved in the implementation of internal IT systems. This firsthand exposure to varying levels of success and failure in system implementations ignited my interest in system design and user interaction. I often observed misunderstandings and different perceptions of what was said versus what was intended as a contributing factor to the lacking success of a project and the inherent implementation.

This practical experience was pivotal, positioning me at a critical vertex of the *Techno-Anthropological triangle* (Børsen and Botin 2013), as both a user and an observer. The frustrations and successes I encountered led me to pursue a master's in Techno Anthropology, aiming to fuse my practical insights with academic theories to better understand and influence internal systems development in companies and organizations, with a focus on the employee as the user.



Graphic 8 - The Techno-Anthropological triangle – Showing the components in the Techno-Anthropological research domain: technical experts – technical artefacts – users. Also shows the interfaces between the components: interactional expertise – user experience – responsible innovation. (Børsen and Botin 2013)

During my Techno-Anthropology masters studies, my view evolved. Transitioning from a goal-oriented clinical environment to the academic, curious and debate-rich atmosphere. Learning to explore not just outcomes but the processes and people involved in technological development and implementations. Using controversies as a way of being curious and looking back to be able to move forward. This holistic view was further enhanced during my internship and subsequent role as a student assistant at Company XX. Here, I gained a perspective on the intricacies and inner workings of a large international company. As shown in an excerpt from one of the interviews done, my own

reflections on the HR department were my internship and my current student assistant position is situated. This excerpt embodies quite well my experiences with how different people work and perceive information.

> *"And HR Operations is also quite an intriguing place in a Company like XX, because they go across the entire company. Both all the employees who sit and do things primarily within the company and operate, but also all those who work outwards with the customers... And I can see that there is a very big difference in how they do things."* (Markager 2024)

These combined experiences were all instrumental in shaping my approach to internal systems, focusing on user-centric and collaborative approaches, while observing how often misunderstandings occur and can complicate a project unnecessarily.

The concept of data quality was chosen as it is a concept used widely in both my old profession as a biomedical laboratory technician, but also in Company XX. Furthermore, it is one among many complex concepts that is used in many professions and can cause misunderstandings.

3.4.1 – Opportunities and Preconceptions

My position in Company XX gave me the opportunity to do exactly this case study. As described in section 3.3.1 it probably also provided some good will and trust from the participants, that I was an 'internal colleague'. My position gives me knowledge of the company that is not necessarily known to all and is hard to document as it is not something that is written down but a direct consequence of being a part of that particular company.

I tried to pursue the case with an open mind. I did however not completely succeed in setting aside preconceptions and biases. For one thing it was these preconceptions and observations from previous professional and academic observations that spurred my interest in the thesis focus. But especially in the interviews done later in the process, it was difficult as I had already extracted some information from earlier interviews and started to form thoughts on it. This became apparent when I, during interviews, referred to other interviewees and their statements. This was however done in an effort to elaborate what I meant or move the conversion along when it was lagging or getting sidetracked. Several times it also gave the interviewees an onset for reflection upon a given situation or suggestion and how that fit into their perception of things. It gave words to some interesting thoughts on their part and made them think about things neither I nor they would have thought of mentioning, had it not been for the other interviewees.

4 - Theoretical Foundation

In this chapter the main theoretical frameworks used to make sense of the data in the analysis, create perspective in the first part of the discussion and come up with solution proposals in the second part of the discussion.

Deciding to dive into this thesis with a phenomenological mind-set affected the choice of theoretical framework. Not directly, but in the sense of letting the gathered data guide the direction. Going into the project I had preliminary thoughts on theories that could become relevant. However, not wanting to force the data to comply with one or two specific theories, I kept an open mind. This resulted in the theoretical framework being quite broad and a mix of smaller aspects from different frameworks, however all in the spectrum of anthropology, social psychology and Science and Technology studies (STS). The common denominator being the interplay between humans and humans and technology.

4.1 - Culture Definitions and Linguistic Pragmatics

To help aid the conversation on cultural differences as a prerequisite for understanding each other and collaborating across cultures, a brief introduction to the many-sided concept of culture and the concept of linguistic pragmatics will be introduced here.

4.1.1 – Definitions of Culture

Culture is a multifaceted concept that encompasses various aspects of human life. The definition and emphasis on certain elements of culture can differ significantly depending on the perspective taken, be it anthropological or sociological.

Anthropologists typically view culture as a *complex whole* (Tylor 1891) that includes knowledge, beliefs, art, morals, law, customs, and other capabilities and habits acquired by humans as members of society. This broad and inclusive definition, expressed by 19th-century English anthropologist Edward Burnett Tylor in his work Primitive Culture (1891), highlights the dual nature of culture. It encompasses both material aspects e.g. tools, techniques, and works of art, and non-material aspects such as language, beliefs, and customs. Tylor's definition underscores the holistic nature of culture, reflecting its extensive influence on human behavior and societal development.

Sociologists, on the other hand, tend to focus more on the non-material aspects of culture. This could be values and beliefs, language and communication, practices and assumptions. These aspects shape and define daily interactions, cultural norms and how we share knowledge with each other. This perspective highlights how cultural norms and values influence individual and group

behaviors, social relationships, and institutional structures. (Berger and Luckmann 1966 and Parsons 1951)

Summing up and viewing culture in a broader perspective it encompasses a wide range of aspects and becomes not only a product of historical and social processes but also a dynamic and evolving phenomenon that interacts with various aspects of human life. It is through the interplay of these different elements that culture exerts its influence, shaping individual identities and collective experiences. Using this broad perspective to analyze how different professional languages and underlying knowledge of different educational and professional backgrounds influence collaborative culture. Accepting that culture is not one thing, but a *complex whole* (Tylor 1891) and is ever changing in its nature.

4.1.2 – Linguistic Pragmatics

Linguistic pragmatics is the study of how context influences the interpretation of meaning in language. This field of study is crucial for understanding how language functions in real-life communication and how it relates to culture.

Bronislaw Malinowski, a pioneer in linguistic pragmatics, emphasized the significance of context in understanding language with this quote from the early 1900s rendered by Gunter Senft in his article 'Bronislaw Malinowski and Linguistic Pragmatics' (2007); *"the meaning of any single word is to a very high degree dependent on its context."*. His perspective highlights that the interpretation of language cannot be isolated from the cultural and environmental circumstances in which it is used. This perspective has been echoed several times in the last hundred years and Malinowski's work laid the foundation for anthropological linguistics, which views language through the prism of culture (Senft 2007) .

Seeking to uncover the cultural understandings and social functions behind language use, it examines language as both a cultural resource and a practice, providing insights into the social structures and communication patterns of a community. By considering the cultural context, anthropological linguistics helps to explain how language shapes and is shaped by social interactions and cultural norms. (Ibid.)

Pivotal to this thesis and the analysis of the case from Company XX is gaining insight into how professional language is used and evolves as a result of an intricate relationship between language, culture, and knowledge. Underlining a point of the importance of context in meaning-making of words and concepts, making this framework relevant.

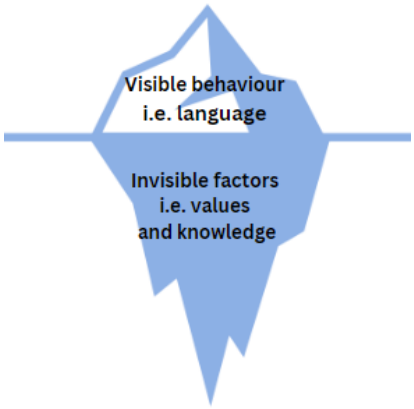
4.2 – The Double Iceberg Theory

In the context of multidisciplinary collaboration, the nuanced understanding of language and culture becomes pivotal. The double iceberg theory, an extension of the traditional iceberg model of culture, provides a comprehensive framework for analyzing how visible and invisible elements of culture influence interactions.

In this thesis the theory is particularly useful for examining how differences in both linguistic, but primarily educational and professional culture influences our onset for understanding certain words and phrases. Furthermore, using it to highlight how company and team culture can impact transdisciplinary collaborations.

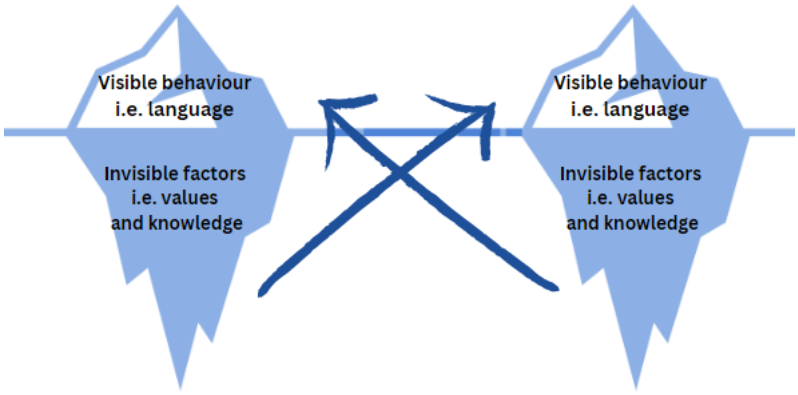
The traditional iceberg model of culture, introduced by Edward T. Hall in the 1970s, posits that culture has both visible and invisible components (see graphic 9 for my own rendering of this model) .

Graphic 9 - Own rendering of the iceberg model of culture



The visible components, often referred to as the "tip of the iceberg," include observable behaviors, customs, language, and artifacts. These are the aspects of culture that are immediately noticeable and easily identifiable. However, beneath the surface lies the larger, invisible part of the iceberg, which encompasses beliefs, values, thought patterns, and underlying assumptions (Hall 1976).

The double iceberg theory builds on Hall's model by recognizing that cultural interactions involve not just one, but two or more cultural icebergs. Each culture, whether national, linguistic, or organizational, has its own set of visible and invisible elements. Understanding the dynamics of these interactions requires exploring both the surface and the underlying aspects of each culture . What becomes apparent with the double iceberg theory, is that we use our own invisible aspects to understand and judge the visible aspects of another person or culture. It becomes a visualization of how understanding of each other is a two-way street, and our ability to perceive someone else's actions and words, is deeply connected with our own invisible aspects. (Trompenaars and Hampden-Turner 1997)



Graphic 10 - Own rendering of the double iceberg theory

Applying this theoretical framework can give us insight into how misunderstandings often arise in multidisciplinary collaborations when individuals interpret each other's visible behaviors through the lens of their own invisible cultural assumptions. For example, a term or phrase that is common in one departmental culture might carry a different connotation in another, leading to confusion or conflict. Effective cross-cultural communication involves understanding both the visible and invisible elements of each culture, allowing for a more nuanced interpretation of behaviors and language (Hofstede, Hofstede and Minkov 2010).

4.3 - Common Corporate Language

In today's globalized and interconnected business environment, the concept of a common corporate language (CCL) has gained significant importance. A CCL is adopted within multinational corporations and other large organizations to facilitate communication and collaboration across diverse linguistic and cultural boundaries (Neeley 2012). This theory section explores the origins, significance, and implications of implementing a CCL in a corporate setting. CCL is traditionally meant to establish an actual language i.e. English or Danish within an organization, but in this thesis using the theoretical lens and shifting it so it can give insights into professional and specialist language variations and their impact on multidisciplinary collaboration.

The concept of a common corporate language can be traced back to the rise of globalization and the need for standardized communication within multinational corporations. Research on organizational communication highlighted the challenges posed by linguistic diversity, such as misunderstandings, inefficiencies, and barriers to collaboration (Feely and Harzing 2003). As a response, many corporations began adopting English as their official corporate language, given its status as a global lingua franca (Neeley 2012).

A common corporate language is a designated language used for official communication within an organization. It serves as the primary medium for internal documentation, meetings, and

correspondence. The adoption of a CCL aims to streamline communication processes, reduce language barriers, and enhance mutual understanding among employees from diverse linguistic backgrounds (Charles and Marschan-Piekkari 2002).

The primary advantage of a CCL is the enhancement of communication and operational efficiency. By standardizing language use, organizations can minimize misunderstandings and misinterpretations that often arise from linguistic diversity. This standardization facilitates clearer and more direct communication, enabling quicker decision-making and more efficient workflows (Marschan-Piekkari, Welch and Welch 1999). Drawing on especially this feature to illuminate how the concept of a common professional language can facilitate overcoming collaborative barriers or if the awareness of different specialized professional languages can do the same.

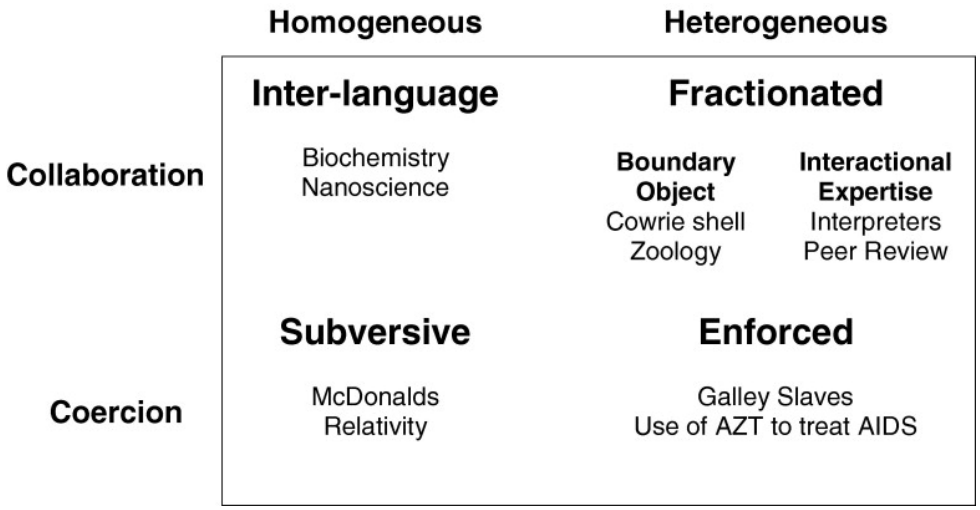
According to Welch et al. (Welch, Welch and Piekkari 2005) a CCL can serve as a unifying tool that bridges disciplinary divides in settings where professionals from different disciplines or teams work together. By providing a common linguistic framework, it facilitates clearer communication and mutual understanding, essential for successful collaboration. (Ibid.)

4.4 - Trading zones and Boundary Objects

Do we need a common language or can transdisciplinary communication challenges be handled in other ways than streamlining language and making sure we all have the same point of departure. This is exactly what the concept of *trading zones* (Gallison 1997) takes on, and why it is relevant to bring into play in this thesis. Trading zones and *boundary objects* (Star and Griesemer 1989) can represent a different view on collaborations than the traditional principles of CCL and language conformity.

The concept of trading zones originates from the field of science and technology studies (STS) and was introduced as a concept by historian and philosopher of science Peter Gallison in his book ‘Image and Logic: A Material Culture of Microphysics (1997). Gallison introduces ‘trading zones’ in the context of analyzing how experimental and theoretical physicists manage to work together, despite different worldviews and methodologies. Trading zones refer to these spaces or contexts where diverse groups with different expertise, goals, and languages collaborate and exchange knowledge, despite not always having the same perspectives and potentially conflicting interests. In these trading zones, participants negotiate, communicate, and create shared meanings or tools that allow them to work together effectively. Gallison's work emphasizes the importance of material culture and local practices in the production of scientific knowledge, highlighting how trading zones enable collaboration across disciplinary and cultural boundaries. (Collins, Evans and Gorman 2007)

Collins et al (2007) introduces a general model of trading zones to view the different dimensions of trading zones on two axes. The vertical describes the level of coercion involved in a trade, while the horizontal describes a trades outcome, leading to a new homogeneous culture or a fractionated one. Another distinction brought forth by Collins et al (2007) introduces is whether a trading zone exist or if it is just a trade. A trading zones is dependent on the level of communication difficulties, put in their own words a trading zones occurs when *"communities with a deep problem of communication manage to communicate".* Trades occur when there are no inherent communication problems. (Ibid.)



Graphic 11 – A General Model of Trading Zones (Collins, H.; Evans, R.; Gorman, M. 2007)

Within interdisciplinary collaboration, where trading zones occur, the concept of boundary objects emerges as a tool to bridge the disciplines and their varying objectives. Introduced from the work of Susan Leigh Star and James R. Griesemer (1989) boundary objects refer to objects that can be used by different social worlds or disciplines, to serve as "meeting point" of common understanding or a translation tool between different groups. Since Star and Griesemer introduced the concept, it has taken on many forms, and their work on boundary objects predates Gallisons work on trading zones. However, they are both important and intertwined aspects of transdisciplinary collaboration. Below is the original concept described by Star and Griesemer:

> *"(…) an analytic concept of those scientific objects which both inhabit several intersecting social worlds (…) and satisfy the informational requirements of each of them. Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites."* (Star and Griesemer 1989, 393)

Boundary objects hold qualities like interpretive flexibility, common understanding, usefulness and stability. They are flexible enough to adapt to the needs and constraints of each group or user, creating a common understanding for something and allowing for interpretation with a certain degree of ambiguity. However, this flexibility must be kept within the boundaries of what all users can tolerate, while keeping the common understanding in mind and retain a certain amount of stability. (Star & Griesemer, 1989). They come in many forms i.e..; collections which are collected objects providing knowledge and information, standardized forms which enable communication and sharing of information, ideal types in the form of i.e. a map that is abstract enough to be used by various stakeholders for their own purpose. (Star and Griesemer 1989)

4.5 - Participatory Design and its Methods

This section will introduce a brief history of *Participatory Design* (PD) and its core principles and the method relevant to this thesis, which is *Design Games* (DG). In the context of this thesis PD and DG will not be utilized as its original intent, as we are not dealing with a design process or end-users in the traditional sense. The mind-set in PD and the development of a DG is however deemed relevant and useful for developing a possible solution proposal in the second part of the discussion, as the DG approach incorporates a playful and open mind-set to collaboration in general (Brandt, Binder og E.B.-N. 2013, 145-188)

Participatory Design (PD) is a methodology emphasizing the direct involvement of end-users in the design process. Rooted in democratic and collaborative principles, PD aims to create more effective and inclusive technologies, tools, and environments by incorporating the perspectives and expertise of those who will use them. (Simonsen og Robertson 2013)

PD originated during a crucial shift in design practices occurring in the 1970's. There emerged a growing attention to the need for more innovative methodologies and collaborative approaches that focused on actively engaging users from the initial stages of the design process. Using the definition and understanding of PD as outlined in the Routledge Handbook of Participatory Design (Simonsen og Robertson 2013), as this book is specifically rooted in a Scandinavian workplace context evolving from the European and Scandinavian work movement. Further emphasizing the relevance as the case of this thesis and the organizations the solutions aim to target, is mainly based in Scandinavia.

Central to PD is the belief that those affected by design outcomes should have a say in the design process. This democratization ensures that diverse voices contribute to shaping technology that meets real needs and contexts. Collaboration and Co-creation are another of PD's core

principles. PD thrives on the collaborative effort of multidisciplinary teams and stakeholders, encouraging co-creation to address complex design challenges. The last core principle mentioned here is that PD believes in contextual Understanding, with emphasis on ethnographic and contextual research. Seeking to understand the environments and practices of users to create more relevant and sustainable solutions. (Ibid.)

By making users active participants in the design process, PD aims to draw on their expertise and understanding, experiences, and needs. This leading to a solution specifically aimed at the end-users' requirements, resulting in greater usability, improved user satisfaction and chances of successful implementation. Uncovering ideas and insights that might have been overlooked otherwise is an additional asset of employing a PD methodology. (Ibid.)

4.5.1 - Design Games

As a method within PD, Design Games hold a modern approach to design processes and collaboration practices. Design Games are playful, structured activities that facilitate creativity and collaboration. (Brandt, Binder og E.B.-N. 2013)

The purpose of DG is to engage stakeholders in exploring design possibilities, generating ideas, and making decisions. DG provides a safe and inclusive space for participants to express their thoughts and contribute to the design process. By gamifying collaborative initiatives, you encourage participation and creativity (E. Brandt 2006). They can aid in breaking down hierarchical barriers and fostering a more democratic design process and help uncover insights that might not emerge through traditional methods. (Brandt, Binder og E.B.-N. 2013).

Various types of design games exist, each one tailored to different stages of the design process, the stakeholders involved and the objective of the overall purpose of the game. For example, brainstorming games might be used in the early stages to generate ideas, while role-playing games could help test and refine concepts later on. There isn't' a specific instruction on how to create a DG or rules to be followed. It all depends on what you aim to achieve with the game. (Ibid.)

4.6 - Situated Knowledge

The concept *situated knowledge* (Haraway 1988) will be used to put into perspective how different departmental cultures and linguistic backgrounds shape the understanding and use of specific terms. By recognizing that knowledge is situated, it provides a critical lens through which to understand the dynamics of transdisciplinary collaboration. Exploring how different perspectives influence

multidisciplinary collaboration and communication, aiming to enhance the efficacy and inclusiveness of transdisciplinary collaborations by acknowledging and leveraging the diverse perspectives and expertise of all participants.

The concept of situated knowledge, introduced by Donna Haraway (1988), challenges the positivistic *view from nowhere* notion that knowledge is objective and universal (Gilje 2012), arguing instead that all knowledge is situated, reflecting the specific contexts and perspectives of those who create it, both physical, cultural and historical. Harraway posits that taking on this situated perspective can help acknowledge partiality and perspective-dependence of knowledge and lead to more robust and socially responsible science. Including diverse viewpoints and experiences can create more accurate and meaningful understanding. Advocating for a pluralistic approach to knowledge production, where different perspectives are not only acknowledged but actively sought out and integrated. (Haraway 1988)

Transdisciplinary collaborations involve integrating knowledge and methodologies from multiple disciplines to address complex, real-world problems. These collaborations require the coordination and cooperation of experts from diverse fields, often including stakeholders outside of academia, such as industry professionals, policymakers, and community members. (Klein 2004). In the context of this, situated knowledge is particularly pertinent to create more well-rounded concepts and word understanding across teams and disciplines.

4.7 - Priming and Cognitive Dissonance

The last two theoretical frameworks presented stem from social psychology and will mainly be utilized in the discussion to substantiate the argumentation for the solutions proposed.

In the transdisciplinary settings, where the case takes place, diverse expertise and perspectives converge. Finding solutions or tools to align communication and objectives is particularly challenging yet critical. Serving as a catalyst for aligning and alleviating barriers in transdisciplinary collaborations. This section will a theoretical argument for the development of the solutions in the second part of the discussion.

Priming is a psychological phenomenon where exposure to one stimulus influences the response to a subsequent stimulus, without conscious guidance or intention. In cognitive psychology, priming is

crucial for understanding how subtle cues can shape behavior and thought patterns. (Bargh and Chartrand 2000)

An example could be that individuals exposed to words that connote awareness of cultural differences and understanding are more likely to engage in these behaviors spontaneously. Applying this concept in a workplace culture campaign, strategically crafted one-liners can subtly nudge employees toward more aligned and collaborative interaction styles. These one-liners act as cognitive cues that trigger desired thought patterns and behaviors, effectively setting the stage for deeper, more consistent cultural shifts in the organization (Ibid.).

Cognitive dissonance theory, developed by Leon Festinger (1957), describes the mental discomfort an individual experiences when they are faced with contradictory beliefs, ideas, or values, or if they are confronted by new information that conflicts with their existing beliefs. This discomfort leads to an internal drive to reduce the dissonance. This could comp altering existing beliefs or rejecting new information. (Festinger 1957)

In the context of influencing workplace culture to align words and concepts when doing transdisciplinary projects, introducing one-liners that challenge existing norms or highlight discrepancies between current practices and ideal behaviors can provoke cognitive dissonance. This discomfort can motivate employees to reflect on and realign their actions and spoken words with the broader goals of their transdisciplinary projects. By fostering an environment where dissonance is safely explored and resolved, the campaign encourages a deeper organizational commitment to align objectives and understanding.

5 - Analysis

The following analysis will investigate and highlight themes in the collected data. Taking a dive into the narratives of the six informants representing the case of this thesis. Applying a layer of the above-mentioned theoretical frameworks, to gain insight into the complexities of the case and overcome some of the barriers identified. The analysis is divided into 5 main themes, with sub areas to these. Presenting the informants and their background and their thoughts on data quality. From here moving on to underlying issues of word perception and transdisciplinary collaboration. Rounding off, I will present some of the solution proposals posited by the informants in the interviews.

5.1 - What is Data Quality in this case?

During the interviews the interviewees were asked; “When I say data quality what do you think about?” - this to create a baseline for understanding the informant's point of view and showing how the perception of the word varies. Starting out by briefly introducing the informants and what they answered to this question.

> *“Crap in, then it's crap out. So it is about some fundamental information that should preferably be correct.”* (ME 2024)

ME continues talking about if the data quality is low then you won't get the right information or information on what you intended to. If the data quality is good, then you at least have a foundation for getting the right information and moving forward with a solid base. ME’s background is within marketing and communication, and she defines herself as a kind of bridge builder between people in charge of the technical aspects, the company’s products and the client. Referring to clients, it can be an actual paying client that wants to buy a software product. However, in her current position the client is more the companies that are acquired by Company XX, and the product is the necessary systems and processes the acquired company needs to be integrated into. She also explains how she might be biased in her definition of data quality because of her years of working with individuals from a technical background. One could therefore read into that statement, that her own definition of data quality purely based on a marketing and communication background, would be quite different.

> *“to have data quality and to have an understanding that data works across platforms…shit in, shit out”* (AS 2024)

AS also comes from an educational background of marketing and communication, but has worked with Merger & Acquisition for 25 years, with a focus on liaising between the buying company and the acquired company. Working within this transformation process, analyzing workflows, data needs and processes to see how they fit into the company and can be onboarded in the best way possible. She talks about being data-minded, data-maturity, data-awareness, data proficiency and being data savvy. She is clearly familiar with using these terms and applying them, underlining how data needs to be applicable across platforms and solutions. All the while expressing how she observes in some teams, a general lack of understanding for the concept: if you put bad data into a solution, you get bad data out.

LD talks about data migration, and how ensuring that the data is correct is an important step in the on-board implementation process. She is an engineer by education but has been working with Enterprise Resource Planning (ERP) for 20 years and is very system and process oriented. She doesn't define data quality as the other informants but dives straight into how different tracks of the company have their own focus and prioritization in terms of data quality and data migration. "...*we have many integrations, so we also have many requirements in relation to data."* (LD 2024), here she speaks into the requirements for data migration, and touches upon the same as AS, that the data needs to be suitable for several platforms at once, so it requires a mutual understanding of this across tracks and teams.

BC defines data quality very short and concisely according to six parameters; completeness, uniqueness, validity, accuracy, how up to date the data is and how consistent the data is across different systems - *"So a combination of all of this, is what good quality data would be."* (BC 2024). This coincides with a general data quality framework, used widely across several industries, an example of which can be seen at Zendata (Establishing a Data Quality Framework: A Comprehensive Guide (zendata.dev)). BC is an engineer by education, with years of experience within data analytics and has as he puts himself *"very much a technical background"*. He works from India, and manages a team of data migration specialists, who migrate and integrate acquired companies onto a solution called Netsuite, used by Company XX. An intricate part of this process is working with the Business Units (BU's) of the acquired companies, making them aware of what data is needed for the integration to be completed.

> *"I'm currently working on a framework within the data migration team, where we would be able to measure and define what data quality exactly is."* (ND 2024)

ND is also an engineer by education, and he has worked as a developer for 11 years. He is a project manager within the same area as BC, working with BU's to migrate their data. He has technical knowledge, but in his role as project manager he is also a part of managing the whole migration process and communicating with the BU's. He is on the side working on a framework to be able to define data quality, and is considering some of the same parameters as in this thesis. If everybody had one common understanding of data quality, we could define it as such and move on. But as shown until now, and to be further examined, perception of data quality and other concepts are subjective and understanding can be affected by several parameters. ND talks about the quantitative side of data quality, which can be measured, but that there is also a qualitative aspect, based on subjective experiences and overall satisfaction with a system.

> *"...for me it's how complete the data is, is it correct, is it what the business expects it to be, is it accurate, how it has been collected or how it was collected from the first point till the end. How it reaches and is it valid according to the field it is defined to or where we are filling in the values. Is it valid for that particular field or the column or the table."* (NR 2024)

As the two previous NR works from India, with an engineering background, but switched into the software industry and testing systems and integrations. His technical background also shows in his perception of data quality, which resembles the parameters BC listed. He also works closely with BU's of acquired companies, with migrating their data into company xx solutions. He emphasizes how big a variety in perception and understanding of data quality he meets according to what people work with and their background. This has great impact on the amount of misunderstandings and time spent on the start up of projects.

As this walkthrough of the informants view on data quality goes to show, even within one company and within a group of people working with the same objectives, but with a focus on different aspects, there isn't complete alignment of what data quality means. They are all aware that this difference in perception exists and in agreement that the issue only becomes more complex, when working with different tracks of the business, whose key objectives differ significantly. The difference in perception

isn't isolated to data quality either, but encompasses a long line of words and concepts, which generates misunderstandings in interdisciplinary and trans team collaborations.

5.2 - Misunderstandings and Lack of Alignment

When looking at the case it becomes apparent that misunderstandings in trans team collaborations occur regularly. The misunderstandings can vary in severity and consequences. It also differs when in a project process the misunderstandings occur and when they are discovered and handled.

The most common misunderstanding is the case of insufficient alignment. Alignment of roles and tasks, but also alignment of words and terms. The latter will be explored in this chapter.

5.2.1 - Word Alignment

> *"And there are quite a few of them. Cases like this where the same word is being used across the board, but for different things."* (AS 2024)

This excerpt sums up very nicely the overall impression one is left with after going through the data from the case. Several examples of how one word can be used to describe different things, and how one thing can be called several different words.

AS gives an example from when she was quite new in the job. She was attending a meeting where everybody kept saying 'contract', but it was so confusing because the way representatives from the different systems used it didn't align with how the others used it. So, she said *"When you say the word contract, can you each tell us what we are talking about?" (AS 2024)*. This is an example of how a person in a collaboration quickly became aware that there was a misalignment in use of a certain word and acted upon very directly. It is however also evident in the interviews that this level of awareness is not always present so early on, or that they don't know how to address it.

To mitigate this potential for misunderstandings, some methods are being employed. AS calls this the 'Welcoming phase'. Here acquired companies are introduced to the new company, their systems and their processes. They do this as a general introduction, initiate some thoughts on the newcomers' side as to what the company is likely to ask them about, and to start the process of word alignment. Two examples of this is listed below;

"…what we call an opportunity, they will most likely call that a deal, and what we call a contract, well, they will probably call that an offer, and so it goes on.." (AS 2024)

"So, for example, if we need a customer's name, it will be a customer name in the CRM solution Salesforce, and another in ServiceNow, which is the case system, and a third in NetSuite, which is the main mothership ERP solution." (AS 2024)

The last one shows that to get an output so relatively simple as a name, you can come across three different labels in three different systems, and to migrate data between these three systems you need to be aware of all these labels' existence.

LD also mentions this process of finding the different perceptions of where people are at and understanding, and what is necessary for an integration to be successful. Then trying to process the different perceptions, translate them to a collected understanding and going back to them asking "*this is how I believe you are doing things, is that correct?*" (LD 2024)

She believes that it is necessary to have this alignment of words and processes, a 'word calibration' to ensure that everybody is talking about the same thing. The more people and systems are involved, the more complex the collaboration is and it becomes thus more pivotal to undergo this alignment or calibration exercise. Creating a common language gives fewer misunderstandings and gives basis for a smoother collaboration.

Alignment is not only applicable to specific words but can also concern a format. When talking integrations and data quality, the format of data is important to understand. If we don't have the same understanding of the format the data comes in, and how crucial it can be to adhere to this format, a project can take an unfortunate turn and be prolonged, as stated in this excerpt;

"..if we start the project with a format A, and we all(data migration team, red.) know we are going to get this format A, but right before we are moving to production, we see the format has changed. That's a big problem. We don't have time to accommodate that code change." (BC 2024)

They are employing methods to foresee and prevent these misunderstandings or misalignments, but they are however not close to the finish line yet. ME mentions that some processes could be easier - *"we certainly haven't calibrated our terminology internally, which might make it easier"* - but she

also has doubts on whether it is worth it to throw the whole ‘concept package’ up in the air and redefine everything. Especially if it is done in plenary, where everybody needs to agree on some common words and concepts. When talking about systems and processes already in place, it would be very resource demanding, because many of the systems have defined labels for their data input and output fields. It wouldn't necessarily be worth the time needed, and furthermore it would take massive negotiations and convincing of people with strong opinions. As she puts it *“it would hurt!”* (ME 2024)

5.2.2 - Misunderstandings and countering them

Misunderstandings arising from disparate perceptions and interpretations of key terms, are not only prevalent but have significant implications on collaborative efforts and project outcomes. *“As soon as the phone is hung up, 15 people run around with 15 perceptions of what it was that was going to happen.”* (AS 2024)*, this illustrates the chaos that can ensue after a meeting if the communication has not been clear* and the absence of a shared understanding or standardized interpretation of terms and objectives discussed between the parties involved. It is not enough to be focused on your own part, because then you run the risk of missing important alignments.

> *“There are these words which mean different things. This is also what makes it possible to sit in meetings and have these discussions, and then find out afterwards that we will have to meet again, because we haven't actually talked about the same things.”* (AS 2024)

It becomes apparent how inefficient a project can be carried out when linguistic diversity leads to scenarios where teams sit through meetings and discussions, only to realize post-factum that there was no mutual comprehension or agreement on the topics discussed. Such revelations often necessitate additional meetings, thereby slowing down the decision-making process and increasing the workload unnecessarily.

In response to these challenges, one practical solution was highlighted by almost all informants. The creation and use of a glossary as a tool to standardize terminologies across the board, providing a reference that helps bridge the interpretive gaps between different departments or teams. AS noted, this glossary was in theory thought to be a tool for clarifying that *"these words are different things,*

depending on where you come from in the system." (AS 2024). As will be addressed later on in section 5.5.1 this glossary tool has not quite done what they hoped it would.

However, while technical solutions like glossaries and focused training sessions on business and system understanding can be helpful, they do not address the underlying need for interpersonal understanding and communication methodologies. ND expresses along with both BC and NR, how crucial this interpersonal understanding is for alleviating misunderstandings, and furthering the collaboration. As seen in the excerpt below, ND expresses that there is no well-defined method for doing this.

> *"...there are a lot of sessions (meetings and trainings, red.) for understanding the business, understanding their systems, and understanding their data. But there isn't a system, a call or a methodology by which we try to get to know the other person. And to be honest, I don't think it's feasible. Also, because that can take forever."* (ND 2024)

The better you get to know someone and understand their work objectives and where they are coming from, the better solutions you can make together. There is however a limit to the time spent on this relationship building process, as it can take a very long time and that is seldom a priority from a cost vs. benefit point of view.

As demonstrated, all involved agree that misunderstandings occur, often to many, and would like to bring down the need for redundant clarifications and excess time spent. But in a diverse working environment, with different objectives it can be challenging to find a method that works for all involved, while at the same time being cost efficient. Outlining roles and responsibilities is mentioned by BC as a very basic thing to be done and improved upon.

5.2.3 - Under the Radar

Until now all the examples mentioned are incidents that were discovered. But what about all the times we don't uncover the misunderstandings, or where they aren't noticed until the final stages of a project. One informant laughed when I asked her about whether she had any examples of this happening. She told me that if they weren't aware of a misunderstanding happening, she couldn't really tell me about it. But based on how many misunderstandings they uncover quite late in the process; her estimate was that there would inevitably be some that were never discovered. Typically, it is discovered when a discussion just goes on and on, without reaching agreement. Eventually

somebody in the project realizes that there must be a misunderstanding, or by chance asks a question that triggers a joint epiphany as to why they don't understand each other.

When initially explaining to my gatekeeper PK, what my project was about and the kind of people I was interested in talking to, he jumped right into an example of his own of a misunderstanding going under the radar. He was a part of a project where a certain product was mentioned several times by the two teams involved. It wasn't until the final stages of the project, that all involved realized that each team had a product with the same name, but the products were two completely different ones and non-related. So, through an entire project they had been referring to a product, they thought the other team was familiar with and vice versa. Reality was however that they were talking about different products without being aware of it.

Like LD expresses below there are situations where you catch a misunderstanding or misalignment right away, simply because it makes no sense the way you understood it. Then you can confront the issue and get it clarified.

> *"And the one with the test is easy, because it's when they start talking to me, it doesn't just come like that, everything is just bouncing around in my head, and you don't relate to what they said at all. And then it is easy to catch, that there is something we need to calibrate here. But if you're sitting and everything makes good sense, it's super hard to catch."* (LD 2024)

But then there are these hard to catch situations, where everything makes sense to everybody, as in the example above from PK and as LD mentions in the last part of the excerpt. In such a situation, how are you supposed to know that there was something to align. LD describes this can almost only be done by being aware that you are talking to someone coming from a different point of view than yourself. She does also mention that the Merger & Acquisitions process team, with among others AS and ME, try to head this calibration process. Trying to gain an overview, seeing the process or project in question from both sides and foreseeing barriers and misunderstandings. In that role they have a unique opportunity to identify emerging issues. But they are dependent on the knowledge and insight gained from those embedded in the processes in question.

5.3 - Underlying - Culture & Knowledge

5.3.1 - The Many Cultures

Culture can encompass many aspects, with emphasis on different elements depending on if you are looking at it from an anthropological or sociological angle. What the two have in common however is that language, communication, knowledge, habits, capabilities and customs are viewed as related to the culture one is embedded in. Culture can be determined by the country and society you live in, it can also be contexts one enters into during life i.e. educational and work. In the following I will show how different types of cultures come into play and interact, the issues that can arise from this mix and how it can culminate in misunderstandings as the ones described in section 5.2.

5.3.1.1 - Language Culture by Country

In exploring the case and the intricacies of how they collaborate and understand one another, one of the first things revealed is that basic linguistic diversity, thereby impacting interdisciplinary collaboration. The existence of this diversity becomes evident in the following excerpt.

> *"...you would also be able to deal with some of the language barriers that exist. Finland, they want to... We speak English with them. When we talk to the Swedes. Now I'm Swedish, so I speak Swedish. So, I don't have to speak Danish or English with the Swedes. But there is always... There is a language barrier, whether we like it or not."* (AS 2024)

Recognizing and addressing these differences can lead to more synchronized efforts across departments, enhancing overall productivity and reducing redundancies that arise from misaligned interpretations. Thus, an acute awareness of linguistic nuances becomes an invaluable asset in the quest for improved interdisciplinary collaboration within global corporate structures.

As evidenced by the communication challenges expressed by employees when interacting with colleagues from Finland and Sweden, the necessity of a common language emerges as a crucial facilitator of understanding and cooperation.

> *"Just like when you talk to the Swedes and Norwegians. What kind of words are Scandinavian? Because they sound different, or have different meanings in each*

language, right? That you often switch to speaking some common language instead of it. Because then there are no misunderstandings." (LD 2024)

This excerpt highlights that despite sharing a geographical and cultural proximity, Scandinavian teams often resort to English, a neutral linguistic ground, to mitigate the risk of misinterpretations that stem from subtle nuances in their native tongues (Welch, Welch and Piekkari 2005). This linguistic shift, while practical, underscores the broader theme of how variations in language affect the comprehension a concept like data quality. Understanding these language-induced disparities is not merely an exercise in enhancing communication efficiency. As Haraway (1988) underscores; situated knowledge and understanding the context from which a word arises or who is uttering it, and their context is pivotal in fostering a cohesive approach.

This company is international and while it is mainly based in Scandinavia, it also operates in the Baltics and India. The more widespread both geography and language becomes the more important it is to have a common language, which is English. All the while being aware that even though we all speak English to each other, differences in culture can still affect our interpretation, be it culture determined by country, workplace or educational background.

5.3.1.2 - Language Culture by Profession and Education

In the exploration of the case a significant challenge identified is the variance in professional language cultures influenced by employees' educational backgrounds and professional specializations. This diversity manifests prominently when individuals approach tasks from different foundational understandings—as illustrated by LD's process-oriented perspective contrasting sharply with other colleagues' systems-oriented viewpoints.

"And I will always do that from a process perspective. But I can hear that several of my colleagues would do it from a systems perspective." (LD 2024)

This divergence underscores the relevance of the Common corporate language theory, which advocates for a shared linguistic framework to enhance mutual understanding across disciplines. Common corporate language is as described above originally meant to determine an actual common language, i.e. English (Neeley 2012). The theory can however be transferred to a more fleeting understanding of a common language, a common professional language. Establishing this common language and the inherent need to modify this language, according to project, objectives and stakeholders, requires awareness and understanding of each other's viewpoints and backgrounds.

In this context the theoretical framework of the double iceberg theory can be applied. Focusing on the at times unseen layers of personal experiences and professional training, can according to this framework divulge new insights. As employees from varied functional and technical backgrounds collaborate, initial misunderstandings are common, as they may not fully grasp each other's methodologies or terminologies at the outset. (Trompenaars and Hampden-Turner 1997). As reflected on by BC you do not always understand other people's perspective:

> *"So, and you cannot, when you're starting out, you do not know how the other person works, what their background is. Not all the time. So it's only after you work with them or have a few meetings with them, then you start to get their perspective*." (BC 2024)

Over time, through continuous interaction and concentrated efforts to comprehend divergent perspectives, a common ground can gradually be established, facilitating clearer communication and smoother project progression. Several informants describe how vital this interaction is for the project's success, and how much they learn from other collaborators' points of view. LD mentions that being aware of who you are talking to and that they can be speaking from another perspective. ME observes the variance in requirements for background information and systemic understanding among employees, contingent on their specific roles and the nature of their tasks - *"What do they actually need to do their job? So, what matters to them?* (ME 2024). This variance is not merely about information quantity but about its type and strategic use, as some teams require intricate, detailed data to support customer interactions and others operate with a straightforward 'plug and play' approach. This discrepancy can lead to significant communication challenges if not effectively managed through a shared professional language or tools. Taking Collins et al (2007) viewpoint on when we have a trade or a trading zone, it becomes apparent that there is in fact a communication challenge or problem that needs to be managed.

> *"Because when I come from a particular background, I have a tech background, I have a data migration background, I have an ETL background. So, I expect certain things by default. That the other person would know this, but they don't, right? I can't expect you to understand what ETL is any more than you can expect me to understand how a pharma process works."* (ND 2024)

ND's comments illustrate a critical point of intersection between professional backgrounds and expectation management. His background in tech, data migration, and ETL shapes his assumptions

about what others know, which often doesn't align with the reality of their expertise. ND highlights an example with an invoicing process. Explaining how the process might seem simple from the outside, if you know nothing about all the underlying details and what is a part of the iceberg that lies under the water. (Trompenaars and Hampden-Turner 1997). However, for those knowledgeable about the process it is in fact very complex and dependent on multiple factors and data points being accurate and transferred through several systems in the correct way. An additional layer to this example is to also be mindful of when you encounter different businesses, you cannot just assume that invoicing is the same across the board.

To bridge this gap in understanding by familiarizing oneself and each other with the different needs, underlying professional culture and background knowledge another theme emerges from the interviews - When have we gotten to know each other enough?

This theme is especially displayed in the interviews with the three Indian informants working with data migration. This interaction and attempt at getting to know people must have an end point. You need to be aware of when you have reached a saturation point and need to move on. As expressed by NR in the following;

> *"So we can try to understand the process, but again, since we are from technical background and they from a functional background, it might not always be a hundred percent sure or clear on both sides. So we kind of have to reach a point where it's okay. Now we are clear on the process. We can proceed with the project without any major issues."* (NR 2024)

This strategy and the degree of effort and detail put into getting to know each other professionally, can be modified according to the length of a project or collaboration. It also depends on if you share some kind of common ground with the others involved or if you have recurring collaborations with them. Most of the projects the data migration team are involved with, are one project acquaintances. Meaning that it is one migration project running over a period to onboard a newly acquired company onto a specific system. When this migration has been done successfully, the projects and the collaboration end and the data migration team won't work with this same group of people again.

All these mismatches in expectations and understandings necessitates a foundational level of communication, to build a mutual understanding. It involves recognizing and respecting the unique

informational needs and expertise levels of various teams. By actively clarifying and aligning these diverse professional languages and expectations, the company can facilitate more effective collaboration and minimize miscommunications. The informants all display some insecurities in how to handle this alignment and yearn for a structured approach to cultivating a common professional language within the company. However, being mindful of coming from different educations and backgrounds, it is not realistic that we will ever achieve the exact same understanding, they need an approach that can get them some of the way there.

5.3.1.3 - Culture by Workplace

In the previous section it became apparent how much the culture and underlying understanding can be influenced by education and profession. In extension of this and as an additional layer, the following will show how the workplace culture easily becomes affected by those inhabiting the workplace and the preconceptions they come with. What happens when the workplace solely or primarily consists of people with the same background, i.e. data migration experts, salespeople or financial specialists. Do specific notions of understanding appear on a basis of this.

The informants' experiences show that the composition of a team significantly shapes its collective understanding and operational approach. When a workplace is predominantly filled with specialists from a similar discipline, such as data migration experts or financial specialists, there is a tendency for a shared, but sometimes very implied, culture to become ingrained. Reminiscent of the *native language* referred to by Senft (2007), taking on a certain perspective when making observations (Senft 2007, 82). This homogeneity can foster a streamlined communication within the group, where certain assumptions and methods are *"gradually learned and then just accepted that that is how it is,"* as ME noted. This can speed up internal processes but might also limit the team's ability to effectively interact with or adapt to external or diverse groups. LD's experience with internal language use when collaborating with external partners highlights this challenge:

> *"But I just found once in a while that when people came from outside, that I had to translate it into what others call it on the "outside" (refers to people outside Company XX)"* (LD 2024)

The necessity to "translate" terms and concepts into a different professional language not only adds a layer of complexity but also underscores the potential barriers to understanding created by a homogenized team environment. NR refers to an example that further illustrates this point by

contrasting interactions with technically proficient teams versus those more focused on process and function without a strong technical foundation. Teams strong in both technical and functional aspects grasp concepts quickly and can rectify issues promptly, which significantly enhances collaboration efficiency. In contrast, NR describes the difficulties in communicating with teams that lack technical understanding. The need to involve additional personnel to bridge this gap not only complicates the communication process but also slows down project progression. This situation emphasizes the challenges of working within a siloed expertise environment where understanding does not easily transcend the boundaries of specialized knowledge.

As experienced by the informants a uniform background can simplify some aspects of teamwork, it also necessitates a proactive approach in cultivating a more versatile and adaptive workplace culture. Encouraging cross-disciplinary learning and interaction can mitigate the drawbacks of a homogeneous team composition, promoting a more inclusive and dynamic workplace environment that is better equipped to handle diverse challenges and collaborate effectively on a broader scale.

5.3.2 - Knowledge

Building on the findings that misunderstandings and misalignment can be exacerbated by both a lack of knowledge and insufficient knowledge sharing, it becomes evident that enhancing communication and educational practices within organizations is essential for operational success.

In this section I will show excerpts and examples to illustrate various scenarios where the gaps in knowledge transfer have directly impacted business processes and collaboration efforts.

> *“So they are not collecting that data at all. And that is because of a lack of knowledge. Sometimes that is because it's just convenient to only keep the information they need. And I think a proper education and a proper knowledge transfer would help these situations. But often this is again because their primary focus is running the business and generating revenue. Getting the time to get this knowledge to them. Sometimes it is a challenge.”* (BC 2024)

BS’s experience highlights a fundamental issue where critical data is not collected, often due to a combination of convenience and a lack of understanding of the bigger picture. Circling back to what is shown in the previous parts of the analysis - you perceive and understand based on your own knowledge and experiences. This situation is further complicated by the focus of employees on immediate business goals such as revenue generation, which may deprioritize the essential but time-

consuming process of knowledge acquisition. In this example the need is to ensure that all team members understand the importance for others in the collaboration to establish a comprehensive data collection and management. On a more general level the need for structured education and knowledge transfer programs that are integrated into the workflow.

But how do we ensure that structured education and knowledge transfer occurs? AS seems rather knowledgeable in educational and communication methods and theory. She expresses that the brain needs to encounter information 8-12 times before it can fully absorb and consider it. This underscores the necessity for repeated and reinforced learning interventions and that it is seldom enough for information to be verbally mentioned once in a meeting. This cognitive insight suggests that organizations need to design their training and communication strategies to account for the natural learning curves of individuals, ensuring that information is not only delivered but also reiterated in various forms to enhance retention and understanding.

ME describes a chicken or egg situation in the excerpt below, displaying the company's difficulties in finding the right structure for sharing knowledge with new companies on what the process for their onboard and data migration process is going to be.

> *"...i.e. the art of trying to tell them what they have to go through and how things fit together, without them knowing about processes, systems, or getting their hands on any materials."*(ME 2024)

This barrier is faced in several contexts and not just when working with newly acquired companies, but also when collaborating with other teams that have other goals or another professional background and language. Do stakeholders need the bigger picture first, the details, explanation of specific concepts and words or something completely different.

BC and NR both speak of the importance of clear role definition and process transparency, mingled with some details on what is expected of them in relation to data and data quality. By clarifying what each team member is responsible for and how their contributions fit into the larger project, they can pinpoint the people with the right knowledge to be a part of a certain project. That translates not only to a smoother collaboration but also to engaging the right resources that because of their knowledge base and insight are able to relay this knowledge to other relevant stakeholders.

It becomes clear that the company is aware of a barrier when it comes to the current transfer of knowledge, but they do not yet know how to bridge the gap. There is a clear need for enhanced strategies in knowledge transfer, repeated and reinforced learning opportunities, and clearer communication of roles, responsibilities, data requirements and process transparency. However viable solutions that translate easily across the entire company are still a working progress.

5.4 - Are We Segregated or Holistic

> *"As a starting point, XX is a very segregated and silo-oriented company."* (AS 2024)

> *"And so, what we also get feedback on is that we are very silo oriented. So, they also find that they have to answer the same questions several times."* (ME 2024)

The points underlined in these two excerpts contributes to the impression one gets from the preceding analysis. Company XX is somewhat segmented and silo-oriented, revealed by how many teams and tracks possess very specialized knowledge and are focused on their own business objectives. In some cases, this complicates having to work in transdisciplinary collaborations. It creates isolated teams that each navigate the company landscape through its own distinct lens. LD also talks about this when she says, "*that oftentimes we are talking about each of our domains and not about the entirety*" (LD 2024). This creates misalignments in objectives and vocabulary, where certain aspects are a priority to the different stakeholders.

The awareness of this situation is however very dominant in all the informants' narratives. They all acknowledge this segregated structure and its drawbacks. The necessity for a unified perspective is echoed in ND's emphasis on understanding each stakeholder's relationship to the system and data, and the impacts of actions across the spectrum of operations.

> *"I think it starts with understanding the individual as a stakeholder first. Their understanding of the system, their understanding of data, my understanding of the team. And our understanding of everything in reverse." (ND)*

This approach suggests a shift towards a more holistic understanding of processes, as recommended by AS, who stresses the importance of clarity about roles and responsibilities within and across teams. As also emphasized earlier this clarity is foundational to ensuring that tasks are

executed on time, standards are met before responsibilities are handed off, minimizing the risk of errors and rework. Furthermore, as ND points out, effective communication that is clear, transparent, and continuous, is critical to overcoming the challenges posed by a siloed organizational structure. The goal of communication within Company XX should not be communication for its own sake but rather communication that serves to streamline processes and reduce misunderstandings and redundant work.

These organizational challenges align with Gallison's (1997) insights into how the forms of knowledge creation and validation differ significantly across disciplines and contexts, making the communication very complex, but possible. Keeping this in mind Tom Børsen's work on bridging disciplines in techno-anthropology underscores the value of integrating diverse knowledge systems to address complex problems more effectively (T. Børsen 2023).

For Company XX to transition from a segregated working structure to employing a more holistic approach it must cultivate a culture where communication and education across teams and tracks are not just encouraged but put into system and continuously followed up on. This involves not only regular dialogues between departments but also structured initiatives that facilitate the sharing of knowledge and align departmental objectives with the company's broader goals. Ultimately, the aim is to ensure as streamlined a process as possible, with minimal misunderstandings and extra work—achieving this will require a commitment to communication, transparency, and mutual understanding across all levels of the organization.

5.5 - Solutions proposed

We cannot, nor should we strive to change the different underlying cultures. But can we work on solutions rooted in understanding each other's differences, all the while expanding our knowledge and incorporating knowledge sharing as an important practice. On a basis of this we can aim to come up with tools that can help alleviate the barriers shown in this analysis.

Starting out by presenting the solutions or tools presented by the informants, after that moving on to my own ideas for tools, based on what the case has shown and theoretical principles.

5.5.1 – E-learning

One of the most tangible tools proposed for bridging the knowledge and culture gap between teams working together, was to introduce some kind of basic training or introduction material. E-learning was mentioned as a tool to bring diverse teams up to speed on crucial topics of the collaboration, such as data quality and its importance.

> *"…maybe they could do basic training about data…. Maybe a generic training about everything because their background is totally different. They have not been thinking about data quality at all. So, something of a general training about what data is, why do you need to maintain data, why is it important…"* (BC 2024)

BC makes it clear that this is from his perspective, sitting on the data migration side. The courses could go both ways and be chosen from a perspective of what the other stakeholders in a collaboration feel is crucial to have joint knowledge and awareness of. In this case it would be a crash course to the importance of data use and data quality. Not being all that different from e-learning performed in most organizations and companies in everything from cybersecurity courses and GDPR training to company policies and diversity awareness. Generic training can potentially establish a baseline understanding for employees across cultures, background and focus.

BC does however also point out that he doesn't know how much it would help, because it has been seen in the past how a lot of trainings are not implemented and utilized to its full extent. This caveat is also presented by AS as she draws on statistics saying that e-learning might contribute to less than 10% of the actual learning process. She thereby questions its effectiveness when used as the sole educational tool.

> *"And I often experience that too, that we are a bit like - well you who have to learn something, now you have the e-learning here, so you just have to take them there, and then we believe you are set… So how much do they really learn from e-learning? And maybe we should have sat down and talked a little more with the people in question of what their background is for taking in this information?"* (AS 2024)

Combining the viewpoints and observations of BC and AS a suggestion to enhance e-learning impact could involve combining online modules with interactive sessions where employees can discuss the content and how it applies to their specific roles, ensuring a deeper and more practical understanding

(Simonsen og Robertson 2013). This participatory practice could also be employed to impact the decision of which courses are assigned for which employees. Customizing which e-learning courses are recommended or obligatory, according to what other stakeholders in a project deem relevant to a fruitful collaboration

5.5.2 – Glossaries

Creating a glossary or word list has been recognized and tried out as a potentially effective tool to standardize terminology across departments. Such glossaries serve as boundary objects (Star and Griesemer 1989) that can aid in translating jargon and specialized terms between various stakeholders in a collaborative project. This solution was the outcome of experiences with difficulties in understanding words across teams, as the example from AS shows:

> *"And it actually resulted in us making a glossary at the time, where we simply explained that these words are just like different things, depending on where you come from in the system."* (AS 2024)

However, some challenges arose from the wish to draw up and implement glossaries. AS mentions three main challenges; keeping it updated, awareness of its existence and placement to ensure people can find and use it.

But first off someone needs to be charged with making the glossary, this takes a lot of time and resources. Several of the informants express that they are not under the impression that the cost outweighs the benefits in all projects.

> *"We do that often, sitting down and making a glossary. But I am not totally of the perception that it is worth the trouble. Often, we experience that someone has made this rather repetitive piece of work and there is not a lot of payback on it."* (LD 2024)

Some projects are very large and run over a longer period, and some projects are smaller but very similar to each other. In these cases, it can be worth it to put in the time to make glossaries to ease understanding. In others projects they are so small and adverse to other projects that the cost of making glossaries would be too high. Following the notion from the e-learning example and creating generalized glossaries to be used across all teams and projects. This could be the case for terms

concerning data migration and data quality. Again, stakeholders in a project could recommend their colleagues from other teams to make use of certain glossaries, in relation to specific projects.

Then, however comes the job of ensuring their consistent maintenance. For glossaries to be effective and serve their true purpose in this context, they need to be up to date and represent all stakeholders' perception of a certain word or concept. Almost all informants express this difficulty in keeping a glossary up to date.

> *"…where do you place a thing like that, so people know where it is.? …It is transversal knowledge and not just a box you can put it in.* (AS 2024)

Lastly there is the barrier of making everybody aware of the glossaries existence and placement, which is what AS expresses above. Making people aware of this could also be embedded as a part of an introduction or e-learning training. Moreover, giving the glossary tool time and initial awareness, helping it to become an integrated part of the company culture and workflows, contributes to it becoming a sustainable solution. A potential solution to enhance the placement and thereby integrate the glossary within commonly used tools, is to place it central places like an intranet, Customer Relationship Management (CRM) system or other project management software, where it is always visible and can be updated easily by authorized personnel.

5.5.3 – Visualization and Active Participation

Another tool, which is not only a tool, but more of a general mind-set and part of a work culture, is to employ a higher degree of visualization and active participation in meetings, brainstorming and alignment processes. Almost all informants express that active participation and involvement in the other stakeholders and their point of view, is crucial for making a collaborative process work. But especially AS is very adamant that it is not a part of the culture in the company to utilize effective visualization and active participation. She would like to use more of these methods to combat the passive reception of information, which often occurs with static presentations.

> *"Visualize it, yes! … You also draw based on a process mindset. Where there is something that starts and there is something that stops, and what kind of thing is it that we have in the middle? … But this whole thing where you draw as well, so that you support the oral dialogue, to a drawn dialogue, to then turn it into a written dialogue."* (AS 2024)

People forget or just don't understand and take in what they are being told if everything is in static presentations and talk. Visualization not only aids in maintaining attention but also helps in ensuring that complex ideas are more easily understood. Written dialogue has its own benefits, i.e. being able to go back to it again and again, understanding and reflecting upon it when you have the time. Written dialogue however lacks nuances and can be easily misunderstood, so it should not stand alone in complex projects and collaborations.

AS suggests employing dynamic visual aids and interactive tools to tie the whole dialogue together and ensure maximum understanding and participation. Besides using static visualizations, this could involve the use of real-time data dashboards, graphical representations of workflows, or interactive models that require participant interaction, thereby ensuring that all team members are not just viewers but active participants in the communication process. This mindset is also part of what drives Participatory Design and many of the methods employed. Participation creates better designs or outcomes. (Simonsen og Robertson 2013)

5.5.4 – Templates and Test Cases

Templates were mentioned by several informants as a tool to provide a structured format for collaborating and sharing vital information. They aid in ensuring that all necessary information is included and presented in a consistent manner and a format usable to all involved. As described by BC below, it functions as a guide, a working tool and a presentation all in one.

> *"We have a data template where we put the data, where we then paste the data, and we show it to them. So, this is your data that you've provided us. This is how it might look in NetSuite."* (BC 2024)

The template acts as a boundary object (Star and Griesemer 1989), liasoning information between stakeholders and providing them each with a way of aligning their information and understandings with a standardized version for the specific project or collaboration. The templates can be further developed as new experiences are made and can transcend to the next project, taking with it these experiences in a format easily usable to the next project collaboration and its stakeholders.

In the company templates are often used in very data heavy projects, typically projects where the data migration teams play a major role in collecting and extracting data to migrate them

into new systems. They also come into play when the company has some experience and a firm idea of how a project should be done or data should be represented.

> *"Using templates, if you already have several companies on the same system, you will typically see it there. And a lot of alignment is needed. And a lot of talking is needed."* (LD 2024)

As LD describes when you have an instance of a company coming in with a different system or workflow, then what they are being integrated into, templates can play a crucial role in alignment. The templates are however not developed just like that, they build upon many hours of experience, decisions, prioritizations and alignment of words, processes and interest. When the templates are then to be utilized in a specific project, there can still occur quite a lot of alignment to make sure everybody has the same understanding. It does however give them a tangible tool to keep them on track during alignment processes.

While playing the role of a boundary object and relaying information in a standardized format between the stakeholders of a project, the template can also be a tool for visualizing a certain process and drawing out potential pains (problem areas). In some aspects it can function in the same way as test cases.

Test Cases are a new method they are trying to implement in the company. It makes visible some of the same issues that templates and visualization do but goes deeper and is more project specific. Test cases are a commonly used tool for system development and testing (Markager 2024) but in that framework it is used mainly for functionality testing and finding bugs in the system before implementing it.

The test case model being implemented by the company now, is beside testing the system technically, also intended to go through a process from A-Z and draw out potential gaps and pains. They hope that it will make the process more transparent to everybody involved, without everybody having to necessarily understand the whole process and background for all steps. Visualizing it in real time gives the opportunity to realize that there is something you don't understand and question it, allowing for immediate clarification and perhaps improvement. It can help give a common language and impression of the process in question, and its sub-elements. As ND explains it will hopefully remove some miscommunications.

> *“So, once we have shown them how it will look like, how it will flow, that essentially removes a lot of that miscommunication.”* (ND 2024)

The test case method also ensures that each participant gains a practical understanding of their role within the larger process, perhaps making them see that some detail they didn’t think important can have a huge impact further down the line. Or that some issue they keep running into, but can't find the cause of, perhaps lies elsewhere in the process than their key objectives and focus. It can create a workflow fostering a deeper understanding and alignment across teams.

Each solution mentioned by the informants addresses specific barriers to communication and collaboration, expressing a demand but also a wish to pave the way for a more coherent and efficient workflow. Tools, rooted in a deep understanding of each other's differences and an expansive approach to knowledge sharing, are essential for fostering an inclusive and collaborative work environment.

5.6 - Summarizing findings

The analysis has five main themes. With the first one revolving around the informants, their professional background and diving into who the informants are and what their thoughts on data quality are. Supporting the claim that data quality is not ‘one thing and one thing only’ but can be a myriad of individual notions.

Leading to the second part revolving around the misunderstandings that can occur when we don't understand not only data quality, but several words and concepts in different ways. These differences and misalignments create challenges in interdisciplinary and trans-team collaborations, leading to frequent misunderstandings and less efficient project collaborations. Methods are being employed to mitigate these issues, but progress is slow, and redefining the entire 'concept package' is seen as potentially resource-intensive and contentious.

In the third part looking into what might be underlying the root of these misunderstandings, finding that cultural differences, insufficient knowledge and lack of knowledge sharing play a part. There is furthermore an emphasis the critical need for foundational communication within the company to address mismatches in expectations and understandings among different teams. This includes recognizing and respecting the unique informational needs and

expertise levels of various groups to facilitate effective collaboration and minimize miscommunications.

Moving on to findings that support a tendency to be very segregated in workflows and a desire to find more holistic approaches are echoed across the informants, but they are aware that currently a great deal of segregation is the reality.

Lastly five solutions are presented, being a mix of the informants' own ideas and belief in what could be beneficial and tool that have been tried or are in the process of being tested.

Despite efforts to align professional languages and expectations, employees express insecurities about how to effectively achieve this alignment and desire a structured approach to develop a common professional language. However, they acknowledge that achieving complete uniformity in understanding is unrealistic.

Dependence on the understanding of context and cross-disciplinary learning can foster more resilient and adaptable collaborative practices. This approach not only counters the downsides of homogeneous team composition but also supports a broader, more effective collaboration across diverse business tracks, and establishing a higher degree of holistic workflows. Ultimately, addressing these challenges requires a commitment to enhancing strategies for knowledge transfer, including clearer communication of roles, responsibilities, and processes.

6 – Discussion

The discussion part of this thesis will be in two parts. Part one will draw on the findings from the case and bring in views and observations from external informant JP. Using his knowledge on transdisciplinary collaboration and theory on case study generalization, to make an argument for the case findings not being an isolated issue within Company XX.

Second part will introduce two solution proposals of my own. Leveraging past professional experience, findings from the case, perspectives from the first part of the discussion and theoretical knowledge, to create a solid foundation for solutions to be further developed.

Discussion Part One

6.1 – Is It Only In This case?

Building on the findings of the case study, this part of the discussion will examine whether some generalized insights can be gained and used to understand transdisciplinary collaboration and word use in a broader context. The analyzed data exposes some general themes being misunderstandings occurring in transdisciplinary projects, the cultural differences in relation to language use and understanding, lack of knowledge and importance of knowledge sharing.

6.1.1 - Drawing Conclusions Based on a Case Study

Before drawing conclusions based on the case, we need to examine whether one can actually gain general knowledge based on insights into a specific case.

To generalize and posit insights on a broader level from a case study, it's essential to abstract the specific details and identify patterns or themes that may be relevant in a wider context. To identify these patterns involves synthesizing the findings from the case study and considering how they interact with broader theories or trends. Then being able to propose hypotheses or principles that might be applicable to similar situations or contexts. (Yin 2009)

Yin's (2009) understanding of case studies is echoed, but with modifications in Bent Flyvbjerg's work; Five Misunderstandings About Case Study Research (2006). Bent Flyvbjerg, is particularly known for his work on project management and social science research. Flyvbjerg argues for the importance of case studies in providing detailed insights that are often lost in broader analyses. One of his key points is that case studies can be used to challenge or refine existing theories and to develop new, context-sensitive knowledge that is more practically useful (Flyvbjerg

2006). Using this aspect of Flyvbjerg's notion is exactly what I aim to achieve with this discussion. Bringing the case from individual experiences and theory, applying outside perspective and turning insights into practically applicable knowledge.

One of Flyvbjerg's significant contributions, is his advocacy for *phronetic social science*, a methodology that emphasizes the practical wisdom and context-dependent knowledge gained from case studies. Flyvbjerg believes that this approach allows researchers to focus on issues of values and power, making their work more relevant to society and policymaking. This could involve identifying patterns of behavior, decision-making processes, or outcomes that are strongly influenced by contextual factors and considering how these might apply in other settings. Following this notion by coding the interviews from the case, identifying themes and paying close attention to some of the *values at play* or in the language of this thesis' analysis: the cultural aspects that emerge and influence collaboration and misunderstandings. Using this understanding together with a theoretical foundation and in this case the narrative of an external yet context relevant informant, to obtain more general and context flexible insights. (Flyvbjerg 2006)

6.1.2 - Introducing the External Informant

The informant JP represents an external organization, but similar to Company XX in size and geographical reach. JP brings a rich background in both human resources and IT. Holding a degree in education and pedagogy, the informant's educational background took a significant turn from a theoretical focus to practical applications in HR and organizational development. Initially working within HR departments, the informant became closely involved with IT operations following a HR business partner role. His perspective combines insights from HR and IT, providing an additional narrative on understanding of organizational dynamics within technology-driven environments. This blend of expertise makes his contributions particularly valuable to this thesis, when attempting to find out whether the findings from the case are isolated to company xx and the informants experiences, or if they translate into a more general context.

Following the layout of the other informants I also asked JP, what his thoughts were when I said, *data quality*'. Having quality in one's data and agreeing on what that quality is or means, was the essence.

> *"I think several things, so firstly; I have been actively involved once that the company I work for was acquired, and twice that we acquired others. And there the whole data quality aspect becomes insanely important. That is, in the sense of the word, that you have quality in your data. Because when you merge, it is crucial to have the same*

perception of what data is, and what quality should be in it. If this alignment isn't there the when merging it can create enormous challenges."(JP)

Building on this he elaborates that aspects and data points that seem small and irrelevant with most employees, and that most don't even know exist can suddenly result in employees not getting paid or being denied access to buildings or computers, if the data quality isn't secured and aligned across teams from both the acquired and the acquiring company.

Another thing he mentioned as interesting about data quality was its reputation, as being *"just a little boring"* (JP 2024) and comparing it to GDPR rules and compliance. According to JP people have two different approaches to data quality and he compares it to house cleaning. You can have an approach where you do a complete cleaning overhaul twice a year, and it is just something to get done with as quickly as possible. Or you can do a little bit regularly and maintain a certain continuous standard. People who are not aware of the importance of data quality, tend to be in the first category, where they either get told that 'now you have to clean up' or they suddenly find that something doesn't work the way it should, and must do a clean-up before troubleshooting the underlying issue. Having data quality is about having a certain amount of data discipline, JP calls it.

6.1.3 – A New Perspective on Main Findings

Looking at the case, finding that professional and educational culture within the organization plays a crucial role in understanding how interdisciplinary collaboration is impacted and underlines the importance of awareness of word alignment. The findings from the case study highlight those differences in understanding and prioritizing data quality lead to communication challenges and inefficiencies in collaborative efforts across teams. This is mirrored in insights from the external source JP. Emphasizing the importance of being aware that everybody doesn't come with the point of departure and understanding as you. Having several observations that people mean the same thing but call it something different, but also calling something the same word but that word or concept holds different meanings and aspects for the stakeholders involved.

Emphasizing especially one example that he encountered - the generational gap. Witnessing the generational shifts in the IT department, where expectations and approaches became apparent. The more experienced generation had a very rigid approach, and relied on what they knew worked and were reluctant to try doing things in a new way or reinventing approaches they previously had bad experiences with. The new IT graduates prioritize human elements and adaptability over rigid system adherence, aiming to involve the users more and adapt the technical side to that. Displayed in this excerpt:

> *“Let's talk about what kind of needs and requirements we have and what solutions we need to create for our customers or for those who need it. And then we adapt the system accordingly.”* (JP 2024)

Here we see an example of a professional culture evolving. These IT employees come with a lot of the same educational background in relation to technical understanding and aspects, but the new employees have a much keener interest in human interaction and holistic solutions rather than just technical systems. This perspective occasionally clashes with the more traditional, system-centric views held by established professionals. This shift can be seen as a broader cultural transformation within the IT sector, where the focus moves from enforcing standard systems to understanding and fulfilling actual needs and requirements of both colleagues and clients. Such a shift is fundamental, as it dictates how new employees perceive and engage with the concept of i.e. data quality—seeing it not as a static standard but as a dynamic component integral to overall operational success. This sets higher standards to all employees knowing what data quality is and how you work with, even though it is not always a direct part of your main objective and work tasks.

Going back to Company XX and the case, the challenge can then be to reconcile these differing views and foster a culture where such diversity in thought is not only recognized but leveraged to enhance collaboration. They do already seem to have a high awareness and at least from the employees’ side, a wish to create initiatives for fostering a more holistic approach and taking in this diversity in professional culture and approaches. Observed in the case, and echoed by JP’s experiences, they lack more systematic and direct strategies. Not leaving it up to each individual employee and their personal experiences and learning. Creating a combination of awareness that all knowledge and thereby word use is situated (Haraway 1988) and *priming* (Bargh and Chartrand 2000) the employees to bring on a state of *cognitive dissonance* (Festinger 1957), can ensure more optimal conditions for establishing ongoing dialogues. Bringing on structured knowledge-sharing initiatives to help align diverse views. Implementing educational programs and communication strategies and thereby minimizing misunderstandings and leveraging diverse strengths.

In relation to the specific context of data quality, as highlighted by the external informant JP, shifting the culture towards a more data-quality conscious environment is not a simple push of a button. It requires a deep understanding of how data quality can be employed and how it impacts every aspect of work. A shared view between JP and several of the case informants that thinking proactively about

data handling, storage, and accessibility—skills that need to be cultivated continuously and thoughtfully across the organization. This implies that training and development programs need to not only cover the technical aspects of data management but also emphasize the reasoning behind these practices, thereby fostering a mindset that appreciates the nuances of data quality. Understanding how the data is situated (Haraway 1988) in the company, why is it there, who needs it, for what do they need it and in what form.

Aligning terminology, roles, and processes emerges as another critical component. An insight gathered from the case is the importance of a collaborative understanding that not only bridges different professional backgrounds but also facilitates a shared vision across the organization and helps with being aligned. JP tells about operating in a kind of translator role;

> *"A big part of my role has been to help translate for each other… we might start with some different focus areas, but all the time help them say - What we want is that we want some solutions that work. We would like to have some customers who are happy with the solutions we can create for them. And then have them meet there"* (JP)

Coming in from the outside of a project and helping stakeholders to gain perspective and align their objectives, but also asking some of these elaborating questions that are mentioned from LD and AS. Making sure everybody understands; what are we doing, what words are we using and what do they mean.

When aligning processes, it should be considered what practical challenges the teams face and provide solutions that do not compromise pivotal parts of their workflows and objectives. For example, while the data migration team may adhere to stringent, educationally ingrained rules, they encounter a variety of interpretations and needs that must be addressed. Recognizing this, processes should be flexible enough to accommodate these needs while maintaining high standards within data integrity or security. Moreover, consider having a person with a facilitator role who helps bridge differing focuses and guide teams towards a common goal of functional solution. This role is not about enforcing a uniform approach but rather ensuring that diverse methodologies converge towards enhancing customer satisfaction and operational efficiency. This could be the role that JP mentions himself possessing or the one AS from the case embodies.

In many instances within the company, it has been noted that terminology around i.e. data quality varies significantly across departments, leading to potential misunderstandings and misalignment.

According to CCL theory effective communication can be predicated on establishing a common language. This however does not merely seem to be about standardizing vocabulary but about creating an environment where terms are contextualized, allowing team members from diverse backgrounds to understand and apply them appropriately. So, if we are not to establish a professional common language with the purpose of everyone having exactly the same perception and understanding of a word or a concept, what then?

Another approach widely used in organizational as well as public context is boundary objects (Star and Griesemer 1989). Creating tools that can transcend teams and cater to their individual needs, and function even though they don't have the same background or knowledge but aid them in collaborating and maintaining a shared focus.

Echoing across the board is that agreement on a unified understanding of i.e. data quality requires continuous dialogue, openness to learning from each other, and the willingness to adapt processes that respect and incorporate various perspectives. Agreement on the subjective nature of data quality and its implications means acknowledging that while overarching frameworks provide guidance, the day-to-day application will vary by context and interaction.

In the landscape of digital solutions, the knowledge required to build sustainable and robust systems is vast and varied, far exceeding what any single individual can possess. This complexity necessitates a collaborative approach, where different perspectives—whether shaped by age, education, or professional background—converge to enhance the creativity and effectiveness of solutions.

In essence, Company XX must approach the development of a common professional language or tools to overcome the barriers of word and process alignment as an ongoing educational challenge. This involves not just formal training sessions but also creating opportunities for different professional cultures to learn from each other's perspectives, be it a difference in perspectives based on; more experienced employees vs. newcomers or technically educated vs. project management, or other constellations. By doing so, the company can build a more adaptable and inclusive culture that respects and integrates diverse approaches to data quality and word alignment in general, thus better facilitating interdisciplinary collaboration.

6.1.3.1 - Benefits of Holistic Approaches

The data collected from Company XX reveals a critical transition in organizational structure and philosophy, from a traditionally siloed approach which is still dominant to a more holistic,

interconnected mode of operation. Despite efforts towards this shift, there are indications that the change has not yet fully permeated the company's processes and workflows. This evolution, or lack thereof, plays a significant role in affecting transdisciplinary collaboration within the organization, and becomes painfully evident in collaborations with many of the acquired companies. These companies do not have the same inside knowledge of Company XX and are in a vulnerable situation.

This silo mentality is identified as a source of conflict within the company, as it not only hinders the flow of information but also the potential for innovative problem-solving that could benefit from cross-disciplinary insights. When team members are unaware or unconcerned with how their tasks integrate into the larger scheme, it creates gaps in understanding and execution that can lead to project delays, decreased quality, and heightened frustrations among teams.

The experiences from the case are mirrored in comments from the external informant where employees often remain confined within their specific domains or 'main boxes,' focusing solely on predefined tasks from A to D without regard for the broader implications of their work through the entire process from A to Z.

> *"And I also think that it is one of the primary causes of conflicts. That's the thing about staying in your 'main box' a lot….The mentality is often - So, if I solve my things from A to D, then someone has to take over from E. But what happens when we reach M. That is not necessarily a priority for me."*(JP)

This compartmentalization tends to foster a limited perspective, where the immediate responsibilities are disconnected from the ultimate outcomes. Such a segmented approach can lead to inefficiencies where downstream tasks (like those from E to M) might require rework or adjustments that could have been anticipated and mitigated earlier in the process.

There is also an innovation challenge in this mind-set. One aspect is; does it work or not and does something in step D (i.e. inadequate data quality) affect that step M doesn't work, and the workflow stops dead. Another aspect is; okay it works, but can we make it better? Can we make changes in step D, so that when it comes to M some functionalities improve. This kind of innovative thinking comes from understanding the context of other stakeholder's work, in other words where the knowledge is situated (Haraway 1988), and involving all the stakeholders or users as is the tradition in Participatory Design (Simonsen og Robertson 2013). Thus, leading to better and more sustainable solutions.

The challenge often lies in breaking down the knowledge silos that naturally form within an organization. These silos can hinder the free flow of information and impede the collaborative spirit necessary for interdisciplinary success. Sharing the knowledge possessed by each team or individual does not only foster innovative solutions but also contributes to a richer, more adaptable organization. By embracing various 'knowledge cultures', one can leverage these differences to build better solutions, both technical but also more functional for users.
To effectively harness this diversity, it is crucial that knowledge sharing be systematically facilitated. This involves agreeing on shared objectives and processes, which, as noted, can accommodate differing approaches without compromising the overall mission.

> *"…in the past, IT was mainly about making solutions that people wanted or that had to solve a specific task. Now there is an enormous amount of knowledge in creating sustainable systems and it requires great knowledge which is difficult to find in one person. You will have to work across knowledge cultures and share what you know and what can be done from your perspective in order to reach the goal of a sustainable system."* (JP 2024)

Emphasized in this excerpt is what can be read surmised by several of the informants in the case. Just because one person is appointed project manager or lead, it is not necessarily that person who possesses the acquired knowledge of the project in all aspects. The role of IT has evolved significantly in this context; it no longer solely executes tasks but now orchestrates a complex interplay of knowledge and skills across the company. In this *paradigm* shift (Kuhn 1974) of IT, one can choose to involve a wide variety of experts, adding to the number of people that need to be aligned. Another road is to appoint key stakeholders and give them training and tools to collect the knowledge needed to perform this facilitating task.

Based on the findings and insights from the case and the external informant I have identified some crucial steps to aid transdisciplinary collaboration.

First and foremost is leadership commitment, where senior management must advocate and demonstrate the benefits of a holistic approach, aligning all departments towards common goals, so it is not left up to the single employee. Secondly some process reengineering must be effectuated, to redesign workflows to ensure they are interconnected and give stakeholders opportunity and responsibility to make sure their individual tasks contribute to the entire process. From my inside knowledge due to my own position in the company, this is something they are

working on at an organizational level. Major restructuring has been done at the beginning of the year, trying to foster a more holistic mind-set and collaboration across all levels of the organization.
Ensuring that the individual employees are prepared, training, ongoing development and optimal communication channels across teams, is pivotal. Providing training that fosters an understanding of cross-departmental impacts and encourages employees to think beyond their immediate roles. Establishing robust mechanisms for continuous communication across teams, facilitating easier sharing of insights and early detection of potential issues.

6.2 - Pain Workshops and Customer Journeys

In wrapping up the first part of the discussion on how Company XX can address its interdisciplinary challenges and improve collaboration, it is essential to consider innovative solutions that have been implemented successfully in similar contexts. The external informant provides valuable examples that not only resonate with the findings from Company XX but also offer actionable pathways to enhance problem-solving.

The concept of the "Pain Workshop" is a compelling illustration of how organizations can turn negative feedback into constructive change. By gathering all the poor customer experiences from feedback and analyzing them in detail, the workshop participants were able to identify not just isolated incidents, but patterns that pointed to systemic issues. This approach is particularly effective in addressing problems that may be rooted in both human interaction, such as the relationship between the customer and the advisor, and technical processes, like digital solutions that consistently lead to poor user experiences. Adopting a similar workshop could serve multiple purposes, as visualized in Graphic 12.

Graphic 12 - Own rendering of what benefits a pain workshop can have

Identifying recurring problems that affect customer satisfaction and internal efficiencies. Employing cross-functional problem solving, where stakeholders from diverse teams are engaged, and can collaboratively address the issues identified. Hopefully leading to some actionable insights, that move beyond mere recognition, but can lead to solutions or tools that can implement changes leading to significant improvements.

The other, but same basic concept, was making customer journeys, seeking to gain insights from going through experiences and observations from a specific process from A-Z and visualizing it. With a particular focus on steps where something went wrong, or feedback was bad. Transferring these insights into i.e. a checklist specific to the project and its context, all the while creating a foundation for a sort of checklist 'bank' with templates that can be applied and modified according to the next project. Functioning as a boundary object, setting a certain standard that can function across the entire company, but be moldable to fit the specific project (Star & Griesemer, 1989).

Both examples bear resemblance to focusing on pains and gaps, which AS mentioned in the case as something that she could see advantageous to implementing. Especially if it could be done in a context with stakeholders from various teams and objectives. Enabling them all to get a better view on the process in its entirety, and pinpoint steps or words they don't understand or can identify misalignments.

Discussion Part Two

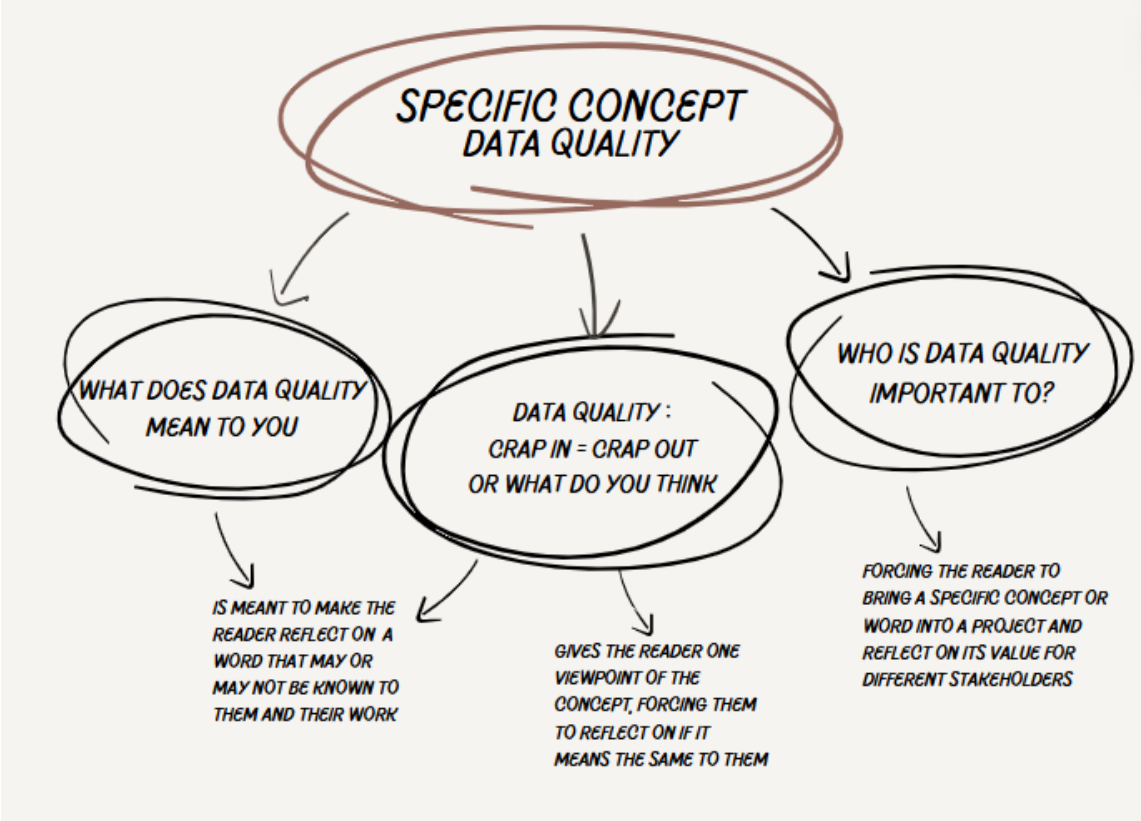
6.3 – Proposals for Enhancing Organizational Communication and Understanding

Based on the insights gained from interviews and theoretical knowledge mainly influenced by participatory design strategies and social psychology principles I will propose some methods that could potentially enhance the communication and understanding in interdisciplinary projects. These methods are less goal oriented than several of the ones proposed by the informants and analyzed in section 5.5. They are not aimed at creating instant and tangible results but are more an attempt at influencing the culture of the workplace and create reflection and awareness of the crucial need to align word use and objectives in transdisciplinary projects.

6.3.1 - Workplace Campaign with "One-Liner" Phrases

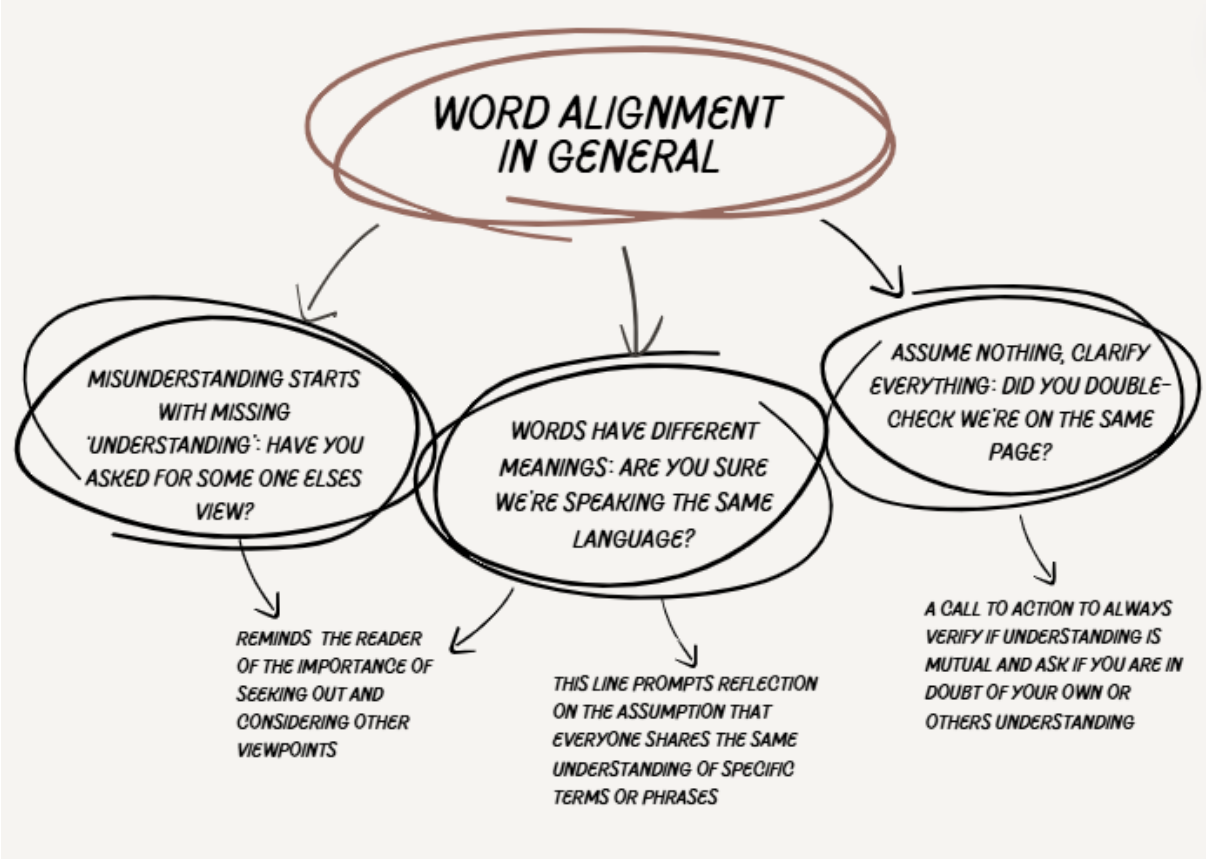
A strategic workplace campaign using "one-liner" phrases and questions could be an approach to sensitizing employees about the diversity of perceptions of words and the importance of clarity in communication.

It could be targeted to create awareness on very specific issues, projects or concepts, such as data quality. Examples of potential one-liners on this topic can be seen in Graphic 13. What they all have in common is to expose readers, in this case employees, to a message that encourages them to reflect upon the common cultural consensus of certain words and concepts (Romney 1986). To gain a true shared understanding of a concept they need to reach agreement in the collaboration, and as shown in the analysis awareness is the first step in being able to ask the questions and gain understanding.



Graphic 13 - One-liner proposals for data quality

The campaign could also be less concept or word specific and more mind-set oriented. Looking at the suggestions in Graphic 14, it could be aimed at raising awareness of the importance of aligning. It can be alignment of words and concepts, roles, objectives, strategies and so on. This increased awareness can naturally lead to more deliberate and clarified communication practices. *Priming* refers to the process by which exposure to one stimulus or topic influences the response to a subsequent topic or stimulus, without conscious guidance or intention (Bargh and Chartrand 2000). By regularly exposing employees to one-liners that highlight the variability in interpretation of terms or prompt questions about assumptions in communication, the campaign can prime (Bargh and Chartrand 2000) employees to be more aware and critical of how they share and interpret information.



Graphic 14 - One-liner proposals for word alignment

Each of these one-liners can be visually represented in posters, emails, or digital displays around the workplace, serving as constant reminders to foster an inclusive and communicatively effective environment. These messages can be rotated regularly to keep the campaign fresh and continuously engaging. Such interventions, although subtle, could lead to significant shifts in organizational culture towards better communication.

6.3.2 - Game-Based Learning as a Project Start-up Strategy

The second proposal involves the introduction of a game at the start of project collaborations. Drawing on Participatory Design principles where emphasizes on the involvement of the end-users, in this case the stakeholders participating in a project, ensures that the outcome meets their needs and is usable. Design games are a tool within this framework used to engage users in the design process, encouraging interaction, discussion, and collaborative decision-making. (Simonsen og Robertson 2013)

Applying this approach to design an 'ice-breaker game' or 'alignment game' to fit the organizational context, where emphasis is on involving scenarios or challenges that reflect real project situations where misunderstandings due to diverse perceptions commonly occur. Participants would be encouraged to express their interpretations and debate their viewpoints in a

structured yet engaging format. One of the benefits on taking the approach of a game format, is to shed some of the stakeholders' usual professional inhibitions and approach the topic in a playful manner, hoping to make the process more open minded. (Brandt, Binder og E.B.-N. 2013)

Keeping in mind that this is a Design Game setup at its early brainstorming phase, and not a finished game. Drawing on the Pain Workshop and Customer Journey notions mentioned by JP in the first part of the discussion, creating a game version of an exploratory as-if world (Brandt, 2006). Utilizing the knowledge of previous projects and collaborations, and what went wrong or were the greatest barriers in them.

As described by Eva Brandt this as-if world or future workshop is meant to *"function as a framework for how to organise events that include the people designed for through processes, which are purposefully structured."*(Brandt, 2006). The people designed for, are in this context the employees embarking on a transdisciplinary project. Setting up structured activities or brainstorming sessions to get them to highlight their own subjective perception of i.e. what words or concepts will be used, what words do they see being easily misunderstood or misused, how would they like a collaboration to unfold or what knowledge do they deem relevant to the project. Making the structure of the game iterative and in several phases.

Leveraging the theory of cognitive dissonance (Festinger 1957) as a trigger point for improvement. By directly confronting the potential discrepancies between collaborators' self-perception, other people's perception can lead to active change, and motivate the collaborators to close communication gaps and misalignments.

Ending up with either a goal of heightening awareness and what do these exact collaborating stakeholders see as potential barriers and assets. Or ending up with a tool or solutions-oriented product to help guide them to a better collaboration.

Both proposals are in their very early stages but offer theory-backed methods to enhance understanding and prevent misunderstandings in a diverse workplace. Needing more refinement, a techno-anthropologist ongoing view on furthering holistic work processes, and a reality check in the form of testing out the ideas on a key person in an organization. Gaining this person's view on what would be realistically actionable to implement.

7 – Summing Up

The themes and informant observations underscore the multifaceted nature of data quality within an international software company. The understanding of data quality varies significantly across different groups and disciplines, influenced by professional backgrounds, cultural contexts, and individual experiences. This variability in understanding affects how data quality is perceived and managed, which in turn impacts transdisciplinary collaborations within the company.

These differences often lead to communication challenges and misunderstandings, which can hinder effective collaboration and reduce the efficiency of joint efforts. Teams find themselves working in silos, with each group adhering to its interpretations and methods, leading to challenges in coherent workflows and outcomes. They struggle to translate their own objectives into something that also fulfill more holistic demands.

An awareness of these differences can significantly enhance collaboration across disciplines. By recognizing and actively addressing the diverse understandings of data quality, the company can foster a more inclusive environment. The informants in the case give the impression that they have a high degree of awareness to these issues. They do however still struggle when it comes to actionable solutions. It is furthermore far from all employees which in their experience have the same level of awareness to these issues.

Awareness can be achieved through structured communication strategies, shared professional language development, and robust knowledge-sharing practices. Such efforts help to align the different perspectives and enable more effective collaboration by creating a common ground for all team members, without them having to all necessarily have a common language. Various tools, such as boundary objects can be implemented, and have their advantages, but are not the solutions in all cases, and furthermore come with their own issues, i.e. a high degree of maintenance and practical barriers.

Each solution should aim to streamline processes, minimize misunderstandings, and reduce unnecessary work, fostering an inclusive and collaborative work environment deeply rooted in mutual understanding and respect for each team's differences and contributions. Although not fully developed the proposals of one-liners and a 'Project start-up alignment game' seek to achieve just this.

References

Adrian, S. W. “Feministisk STS.” In *Videnskab, teknologi og samfund : En introduktion til STS*, by P. Danholt and C. Gad, 101-120. København: Hans Reitzels Forlag, 2021.

AS, interviewet af Tinna Markager. *Case Informant* (April 2024).

Bargh, J. A., and T. L. Chartrand. “The mind in the middle: A practical guide to priming and automaticity research.” In *Handbook of research methods in social and personality psychology*, by H. T. Reis & C. M. Judd, 253-285. Cambridge University Press, 2000.

BC, interviewet af Tinna Markager. *Case Informant* (April 2024).

Berger, P. L., and T. Luckmann. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge.* New York: Anchor Books, 1966.

Bossen, C., and P. Lauritsen. “Symbolsk interaktionisme i STS: Usynligt arbejde, grænseobjekter og grounded theory.” In *Videnskab, Teknologi og Samfund: En Introduktion til STS*, by P. Danholt and C. Gad, 61-80. København: Hans Reitzels Forlag, 2021.

Brandt, E., T. Binder, og Sanders E.B.-N. »Tools and techniques - Ways to engage telling, making and enacting.« I *Routledge International Handbook of Participatory Design*, af J. Simonsen og Robertson T., 145-181. Routledge, 2013.

Brandt, Eva. “Designing exploratory design games: a framework for participation in Participatory Design?” *In Proceedings of the ninth conference on Participatory design: Expanding boundaries in design*, 2006: 57-66.

Brinkmann, S., and L. Tanggard. “Interviewet: Samtalen som Forskningsmetode.” In *Kvalitative Metode - En Grundbog*, by S. Brinkmann and L. Tanggard, 29-54. Hans Reitzels Forlag, 2010.

Børsen, T. (ed.), and L. (ed.). Botin. *What is techno-anthropology?* Aalborg: Aalborg University Press, 2013.

Børsen, T. “Bridging Engineering and Humanities at Techno-Anthropology.” In *Engineering, Social Sciences, and the Humanities: Have Their Conversations Come of Age?*, 151-177. Cham: Springer International Publishing, 2023.

Carlile, Paul R. “Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries.” *Organization Science*, 2004: 555-568.

Charles, M., and R. Marschan-Piekkari. “Language Training for Enhanced Horizontal Communication: A Challenge for MNCs.” *Business Communication Quarterly*, 2002: 9-29.

Collins, H., R. Evans, and M. Gorman. “Trading zones and interactional expertise.” *Studies in History and Philosophy of Science Part A*, 2007: 657-666.

Feely, A. J., and A. W. Harzing. “Language Management in Multinational Companies.” *Cross-Cultural Management: An International Journal*, 2003: 37-52.

Festinger, L. *A Theory of Cognitive Dissonance.* Stanford University Press, 1957.

Flyvbjerg, B. “Five Misunderstandings About Case-Study Research.” *Qualitative Inquiry*, 2006: 219-245.

Gallison, Peter. *Image and Logic: A Material Culture of Microphysics.* Chicago: University of Chicago Press, 1997.

Gilje, N. “Positivisme og Kritisk Rationalisme.” In *Samfundsvidenskabernes Videnskabsteori - En Indføring*, by S. Juul and K. B. Pedersen, 23-64. Hans Reitzels Forlag, 2012.

Hall, E. T. *Beyond Culture.* Garden City, NY: Anchor Press, 1976.

Hammersley, M., & Atkinson, P. “Field Relations.” In *Ethnography Principles in Practice*, 20-40. Oxfordshire: Taylor & Francis Ltd, 2007.

Haraway, D. “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective.” *Feminist Studies*, 1988: 575-599.

Hofstede, G., G. J. Hofstede, and M. Minkov. *Cultures and Organizations: Software of the Mind.* 3rd ed. New York: McGraw-Hill, 2010.

https://goodtape.io/. 2024.

https://www.zendata.dev/post/data-quality-framework-a-comprehensive-guide. 11. March 2024.

Ingraham, C. »Serendipity as cultural technique.« *Culture, Theory and Critique*, 2019: 107-122.

Jensen, T. E. “Aktør-netværksteori.” In *Videnskab, teknologi og samfund : En introduktion til STS*, by P. Danholt and C. Gad, 81-100. København: Hans Reitzels Forlag, 2021.

JP, interviewet af Tinna Markager. *External Informant* (May 2024).

Juul, S. “Fænomenologi.” In *Samfundvidenskabernes Videnskabsteori - En Indføring*, by S. Juul and K. B. Pedersen, 65-106. Hans Reitzels Forlag, 2012.

Juul, S., and K.B. Pedersen. “Hvorfor Videnskabsteori?” In *Samfundsvidenskabernes Videnskabsteori - En Indføring*, by S. Juul and K.B. Pedersen, 9-22. Hans Reitzels Forlag, 2012.

Juul, Søren, and Kirsten Branholm Pedersen. “Hermeneutik.” In *Samfundsvidenskabernes Videnskabsteori - En Indføring*, by Søren Juul and Kirsten Branholm Pedersen, 107-148. Hans Reitzels forlag, 2012.

Karpatschof, B. »Den Kvalitative Undersøelsesforms Særlige Kvaliteter.« I *Kvalitative Metoder - En Grundbog*, af S. Brinkmann og L. Tanggaard, 409-428. Hans Reitzels Forlag, 2010.

Klein, J. T. “Prospects for Transdisciplinarity.” *Futures*, 2004: 515-526.

Kristiansen, S. “Kvalitative Analyseredskaber.” In *Kvalitative Metoder - En Grundbog*, by S. Brinkmann and L. Tanggaard, 447-462. Hans Reitzels Forlag, 2010.

Kuhn, T. S. *The Structure of Scientific Revolutions.* 2. Chicago: University of Chicago Press, 1974.

LD, interviewet af Tinna Markager. *Case Informant* (April 2024).

Markager, Tinna. »Personal notes and insights from professional acquaintance.« 2024.

Marschan-Piekkari, R., D. E. Welch, and L. S. Welch. “In the Shadow: The Impact of Language on Structure, Power and Communication in the Multinational.” *International Business Review*, 1999: 421-440.

ME, interviewet af Tinna Markager. *Case Informant* (April 2024).

medialab.github.io. u.d.

ND, interviewet af Tinna Markager. *Case Informant* (April 2024).

Neeley, T. B. “Global Business Speaks English.” *Harvard Business Review*, 2012: 116-224.

NR, interviewet af Tinna Markager. *Case Informant* (April 2024).

Parsons, T. *The Social System.* Glencoe, IL: The Free Press, 1951.

Pedersen, B. D. “Fortælling om Empirisk Materiale.” In *Bachelorprojekter indenfor det sundhedsfaglige område - indblik i videnskabelige metoder*, by S. Red: Glasdam. Nyt Nordisk Forlag Arnold Busck, 2011.

Romney, A. K., Weller, S. C., & Batchelder, W. H. “Culture as Consensus: A Theory of Culture and Informant Accuracy.” *American Anthropologist*, 1986: 313-338.

Senft, Gunter. “Bronislaw Malinowski and Linguistic Pragmatics.” *Lodz Papers in Pragmatics 3*, 2007: 79-96.

Simonsen, J., og T. Robertson. *Routledge International Handbook of Participatory Design.* Routledge, 2013.

Spradley, James P. “Asking Descriptive Questions.” In *The Ethnographic Interview*, by Edited by James Spradley. Michigan: Wadsworth Group/Thomson Learning, 1979.

Star, S. L., and J. R. Griesemer. “Institutional ecology,translations' and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39.” *Social studies of science*, 1989: 387-420.

Trompenaars, F., and C. Hampden-Turner. *Riding the Waves of Culture: Understanding Diversity in Global Business.* New York: McGraw-Hill, 1997.

Tylor, E. B. *Primitive culture : researches into the development of mythology, philosophy, religion, language, art and custom.* London: J. Murray, 1891.

Venturini, T., and A. K. Munk. “Visual network analysis.” In *Controversy Mapping: A Field Guide*, 189-212. Polity Press, 2022.

Venturini, T., og A. K. Munk. *Controversy Mapping: A Field Guide.* Polity Press, 2022.

Welch, D. E., L. S. Welch, and R. Piekkari. “Speaking in Tongues: The Importance of Language in International Management Processes.” *International Studies of Management & Organization*, 2005: 10-27.

Yin, R. K. *Case study research: Design and methods.* 4th ed. Thousand Oaks, CA: Sage, 2009.