Moving Towards Individualized Work Models

Using the pandemic as an opportunity for a transitional change

Master Thesis in Sustainable Design

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TITLE PAGE

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Title: Moving Towards Individualized Work Practices

Semseter: Master Thesis, 10th semester 2021

Supervisor: Søsser Brodersen

Hand-in date: 04/06/2021

Characters including spaces: 178301

Normal pages: 74,29

Pages in total: 72

AALBORG
UNIVERSITET

ABSTRACT

The COVID-19 pandemic resulted in a vast number of employees moving their workspace from the offices to their homes. Yet, as this was mainly seen as a major challenge, we saw it as an opportunity, using this experience as a means to investigating what a sustainable work practice entails for several employees. Thus, this thesis explores how a flexible work model that supports the needs of individuals can be designed.

Using the theoretical approach of Practice Theory, supplemented with methods that enable participation, we investigate the past and present ways of working and further explore the work practices of employees from three major advising engineering organizations located in Denmark.

We explore how a design specification for such a model can be developed, as a means for designing a flexible work model that accommodates the needs of the practitioners from these organizations.

PREFACE

This project is conducted by Helena Kronby, Stine Bøgh Petersen and Tanja Markussen as part of their master thesis in MSc Sustainable Design (Engineering) at Aalborg University, campus Copenhagen. The project period lasted from the beginning of February 2021 to the end of June 2021. The project's focal point is concerned with how employers in advising engineering organizations can support their employees in the transition towards more individualized and agile work models. By using the pandemic as a window-of-opportunity to create new radical changes in the way work practices function, we aim to support a potential sustainable transition of work models.

We would like to thank and acknowledge our supervisor Søsser Brodersen, head of studies in the Department of Planning at The Technical Faculty of IT and Design. Her personalized guidance, feedback and support during the course of our thesis, helped us navigate through the project in an unusual time affected by COVID-19 restrictions. Furthermore, we wish to specially thank both employers and employees in three of the biggest advising engineering organizations in Denmark (who for the sake of this report is anonymized) for letting us conduct research within the company, providing us with valuable insights. At last, we wish to thank Associate Professor at the Department of Planning, Andrés Felipe Valderrama Pineda for his ambitions for us as Sustainable Design Engineers and for making sure we stayed as motivated as possible during a global crisis.

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1 INTRODUCTION

This chapter serves as an introduction to the report, it will go through the reasoning for conducting the research and study explained throughout. Besides, an explanation of the research question used to keep the focus of the research on track, the chapter will provide a literature review. The review will portray other scholars' work in the same or similar field. The end in a reading guide usable for understanding the graphical distinctions within the report.

1.1 Research Area

This thesis stems from a common interest in the aftermath of a global crisis. We wanted to use the COVID-19 pandemic as a unique opportunity to learn and through radical changes explore whether a re-establishment of society after its ending, was possible. In the period when the lockdown was first introduced to Danish society, a whole range of people had to reinvent or adapt their everyday lives. For some, it meant great consequences, but we wanted to investigate the advantages of what Kramer and Kramer (2020) calls, "...a massive (unplanned) experiment" (p. 2). We want to support this statement and thereby use the pandemic as a window-of-opportunity for transitional change.

The effects of the pandemic were quickly noticeable on people's work lives, where the need for social distancing forced people out of their offices and into their own homes in front of their computers. Requiring new competencies and techniques for conducting their work tasks, practitioners managed to make society run as smoothly as possible. This made us question whether the current practices concerned around work were sustainable and optimal for the modern individual. And thereby whether we should return to these after the end of the pandemic lockdown. In order to narrow our scope, we decided to focus on work practices performed by white-collar workers of advising engineering organizations (see section 4.1 for the reasoning behind the choice of our target group).

In chapter 3 we explore the historical trace of the work practice all the way from the stone age and through the four industrial revolutions that have formed the way white-collar work is performed in western society. Furthermore, we look into the effects caused by the pandemic lockdown and how this shift in worksite has resulted in work practices concerned around remote work. By the use of Practice Theory we discover how a collective work model is supposed to fit an individual work practice. We argue how this is inefficient and unsustainable and we thereby aim to design a framework for flexible work models, supporting individual needs, thus making our research question:

How can we design a framework for flexible work models that supports the needs of individuals, working within advising engineering organizations, using the pandemic as an opportunity for a transitional change towards sustainable work practices?

During the analysis of theempirical material presented in chapter 4, we discover how policy makers play a crucial role, in establishing work models (section 4.2). Not only are they responsible for policies in the area, but also for supporting their employees in regard to their individual work performances. We use Practice Theory to identify work practices of 7 individuals in three of Denmark's largest advising engineering organizations (section 4.3). From which we identify 81 breakdowns, 61 of which are related to working remotely (section X: Breakdowns). We therefore found it necessary to explore the full potential of working remotely in order to better compare it to being physically present. By creating design solutions for remote work, we explore the possibilities and restrictions regarding a framework for future change (section X). We end up validating our initial thought of a framework needed for accommodating individual needs of employees and how different design criterias must ensure this.

1. 1. 1 Litterature Review

The COVID-19 pandemic made the need for policies in regards to work-from-home and flexible work in general, more visible. The research of Navrbjerg & Minbaeva (2021) found that the consequences of the COVID-19 pandemic have been tackled differently by the employees and employers, as some organizations have been better at communicating online and some employees thrive in work-from-home settings. Through their research, they found that "These experiences from the corona crisis indicate that there is a need to pursue a policy in the future homework - partly in relation to the needs of the workplace, partly in relation to the employees' personal preferences" (Navrbjerg & Minbaeva, 2021b, p. 62). Kramer & Kramer (2021) highlight the lack of experience some institutions had with making shifts from work at the office to remote work in conjunction with the COVID-19 pandemic. In relation to this, both Navrbjerg & Minbaeva (2021-b) and Kramer & Kramer (2020) points towards a need for designing a policy of which can help align and structure work-from-home practices, taking the needs and preferences of the employees into account. Faulds & Raju (2021) describe how organizations have adopted work-from-home policies, but as the need for such arose very quickly, there is a chance for them to be forced, and could be facing an adjustment in the future. We hence recognize that even organizations that have already adapted tools or policies, might be facing a reconstruction of such. It seems that lack of policies is just one side of the coin, as the scholars of Kramer & Kramer (2020) further points towards a need for more efficient methods of remote work as they state "...moving to work from home arrangements may require selection of workers who are better suited to work from home, training of such workers on more efficient methods of remote work..." (Kramer & Kramer, 2020, p. 2). In conjunction with this, Ferreira et al., (2020) describe that many employees and managers lack tools and training and that this needs to be addressed if they are to work remotely. Although these scholars do not address exactly how such policies or tools are to be made, Molin et al., (2021) address a need for management to support and engage in implementing a support model that helps identify how work situations can be improved, to ensure a healthy work environment. Although this seems challenging, Jenkins & Smith (2021) points to employee flexibility as being taken for granted by policy makers and employers. They highlight that the COVID-19 pandemic should be seen as an opportunity to 'build back better'. Furthermore Bartik et al., 2020 argue that "...the shift to remote work caused by COVID is testing industry's ability to adapt, and is likely to have implications for the nature of work in the years to come" (Bartik et al., 2020, p. 15).

Although research on work models that support the needs of individuals during the COVID-19 pandemic is relatively difficult to find, we discovered that few scholars focus their research on studying the factors and accessibility of the work-from-home practices in relation to the COVID-19 pandemic. Through the research of Das et al., (2021) we see how within the scope of accessibility, work practices are not often considered. They further suggest that "...to create a more inclusive workplace, organizational norms around remote work must be revisited to integrate accessible practices that are still thought of as optional and "nice to have"" (Das et al., 2021, p. 24). They further describe that all people benefit from accessibility and that this can create a more inclusive work environment.

To summarize, the literature presented in this section has identified a need for developing policies and/or tools for remote working practices. These should take into account the needs of the individuals, as well as managers engaging and supporting such models. Such models are important, as they should support the needs of individuals and hence speak on their behalf. We notice a gap in the literature because none of these scholars present a specific solution or method to how the creation of such a model can be achieved, although we also recognize that developing such a solution might be a challenging task.

1.2 Reading Guide

This thesis is divided into 6 chapters, in which each chapter is assigned a color. Hence every chapter has its own front page, showing that you are entering a new chapter. See figure 1 for the colors assigned. This figure furthermore presents whether the chapters have had a diverging or converging role in our design process. This is, however, a vast simplification of the actual process of the project.

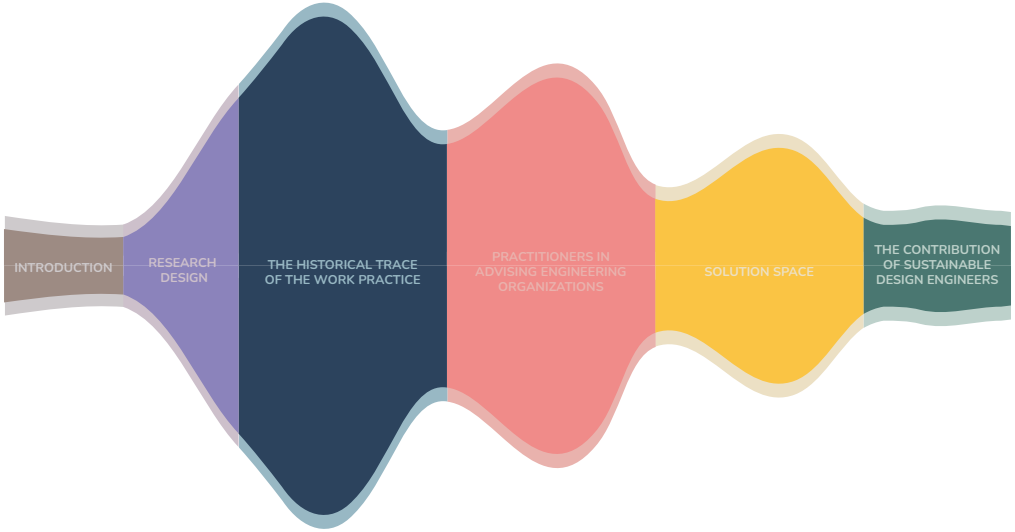

Figure 1: Process figure

The purple section, which you are about to enter, describes the theoretical framework of the thesis as methods and frameworks used for the purpose of collecting the empirical material needed. Chather 3 is in blue highlighting the first part of our analysis, where we investigate through literature how work practices are shaped through history, with traces all the way back to the stone age. Chapter 4, which is pink, highlights the second part of our analysis. Here we investigate the work practices of individuals from three different advising engineering organizations, using our own empirical material. These chapters tie together in the yellow chapter 5 called solution space. Where we present our findings and take the first steps towards designing a flexible work model that supports the needs of these individuals. Finally, chapter 6, which is green will provide concluding remarks, while presenting a conclusion to our thesis, as well as a reflection.

Throughout the report, grey coloured boxes like this will appear. These boxes describe the process and the steps we needed to take in order to conduct this thesis.

2 RESEARCH DESIGN

It is argued by Spurling et al., (2013) that “Understanding the dynamics of practices offers us a window into transitions towards sustainability” (Spurling et al., 2013, p. 4) as understanding the dynamics within practices allow us to shift practices to more sustainable ones (Spurling et al., 2013). We find that the framework of Practice Theory provides an appropriate analytical framework for our thesis, that allows us to dive into individual work practices of practitioners in advising engineering organizations, and understand how these individual practices affect the cultural landscape in which they are apart. We furthermore acknowledge that the framework can provide a view into the opportunities that lie within transitioning towards sustainable work practices.

Chapter 2 hence presents the theoretical perspective of Practice Theory, which is the main theory used in this thesis. It explains the framework of Shove et al., 2012, which is the perspective we took on to analyze our problem framing, accompanied with the framework of Spurling et al. (2002). We will furthermore elaborate on how this perspective is used, and what it brought to the project.
Furthermore, we will present two other theories, that also stem from social sciences. These are Actor-Network Theory (ANT) (Callon, 1984) and Communities of Practice (CoP) (Wenger, 1998), and explain what they could have provided us if we had chosen to take on another theoretical perspective.

This chapter also presents the empirical material used to investigate and analyze our problem framing. Here we are including an elaboration of what data has been produced, for us to be able to answer our research question, while presenting a timeline of the interventions held throughout the project.

2.1 Theoretical Framework: Practice Theory

Process box: Purpose of Online Workshop and Exercise One

The process of choosing a theory for this thesis was very troublesome. Our initial thought was to investigate the relation in and between the communities that engage in a shared process of learning. Furthermore, we wanted to investigate how knowledge travels when work practices are moved to the homes of employees. We wanted to do this by deeply investigating communities within one organization, using the theoretical perspective of Communities of Practice (CoP). Unfortunately, we couldn't establish such a close relationship with an organization needed to collect the empirical material for investigating such communities. Figure 2 shows a timeline of the duration of the thesis, marked with when we changed our theoretical perspective.

Figure 2: Timeline

In the beginning of May, we changed our theoretical perspective to Practice Theory (PT). This also meant that much of our previous work needed to be revisited and in some cases changed completely. We made the choice of shifting our theoretical perspective, as we believe that PT provides a better analytical perspective for the empirical material that was gathered. Hence the scope of the project changed to exploring how the work practices of individuals are affected by shifts in work sites caused by the global pandemic caused by COVID-19.

In this thesis, we have chosen to use the theoretical framework of Practice Theory (PT) created by Shove et al., 2012, because "...practice theory provides a means of uniting studies of innovation and consumption and of conceptualizing dynamic processes inherent both in business and in other realms of everyday life" (Shove et al., 2012, p. 12). These dynamic processes are also described as social arrangements that consist of individual decisions of how to act within the practices (Shove et al., 2012). This theory took its starting point from philosophers Wittgenstein and Heidegger (Shove et al., 2012) who inspired scholars to further investigate practice as a centered stage, rather than a passage between social structure and human subjects (Shove et al., 2012). Ever since, scholars such as Schatzki (2012) have drawn on their work when outlining a theorization of PT. He describes PT as "...an organised constellation of different people's activities" (Schatzki, 2012, p. 13) that is "...understood as forms of, or as rooted in, human activity – not the activity of individuals, but in practices, that is, in the organised activities of multiple people" (Schatzki, 2012, p. 13). From this perspective, practice consists of people's activities, doings, and sayings, which are open-ended in the sense that these activities are temporally dispersed and do not consist of a defined number of activities (Schatzki, 2012). Through his theorization of practices, the focus is on understanding human actions and structures hereof. Reckwitz (2002) describes PT as behavior that is routinized as "...the mental routines and their knowledge [as] integral parts and elements of practice" (Reckwitz, 2002, p. 252). The focus of Reckwitz's (2002) perspective is on the forms of bodily and mental activities. Furthermore, this perspective also focuses on things (objects), know-how, emotions, and motivational knowledge (Shove et. al., 2012). His perspective of PT hence focuses on the routinized behavior of individuals. Although the scholars of Reckwitz (2002) and Schatzki (2012) theorize PT in these two ways, they also agree that "'practices are intrinsi-cally connected to and interwoven with objects'" (Shove et al, 2012, p. 23). As the work of these scholars has been considered in the framework presented by Shove et. al., 2012, both their perspectives are in some way a part of this; including routines, activities, and objects into their theorization of PT. From the perspective

of Shove et al., (2012), PT "...depends on developing a means of systematically exploring processes of transformation and stability within social practices and between them." (Shove et al., 2012, p. 1). Shove et al. (2012) and Spurling et al. (2013) argue that the concepts in which they have developed, allow for the complex nature of dynamics within practices to be investigated. We find that these concepts within PT, can provide us a way for analyzing the intangible nature of dynamics within practices in a tangible way and have hence chosen to use the perspective of Shove et al. (2012) in combination with Spurling et al. (2002) for our thesis.

The framework of Shove et al. (2012) presents a model of three elements of practice. The model contains elements of; materials, competence, and meanings (Figure 3: Thee Elements of Practices). These elements put emphasis on the elements in which a practice consists of; cultural conventions, expectations, and socially shared meanings, that constitute the element of meanings. Objects, tools, infrastructures, that constitute the element of materials and knowledge, and embodied skills, that constitute the element of competence (Spurling et al., 2002). These elements set the stage for defining practices as "...practices consist of elements that are integrated when practices are enacted" (Shove et al., 2012, p. 21). The elements are what constitute a practice. These practices change as these elements are introduced and combined in a variety of ways. In this model, the human actors are not the central part. Instead focus is on the doings of those actors as "...practitioners (those who do) simultaneously reproduce the practices in which they are engaged and the elements of which these practices are made..." (Shove et al., 2012, p. 22). The framework suggests an analytical distinction between practice-as-performance and practice-as-entity (Figure 4: Practice-as-performance and Practice-as-entity). This can on one hand show how combinations of elements constitute a practice-as-performance by putting emphasis on enchantment, meaning "...active integration of elements..." (Shove et al., 2021, p. 119). And on the other, show how combinations of elements constitute a practice-as-entity by putting emphasis on reproduction of practice.

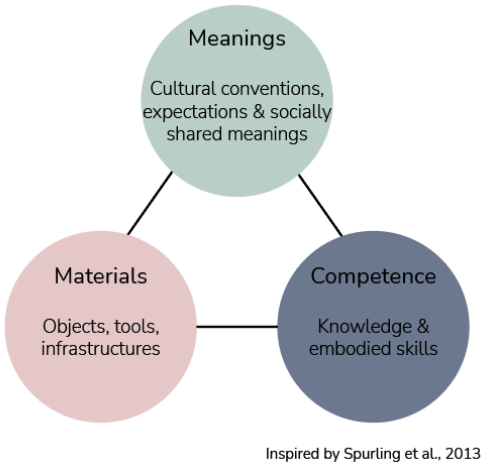

Figure 3: Three Elements of Practice

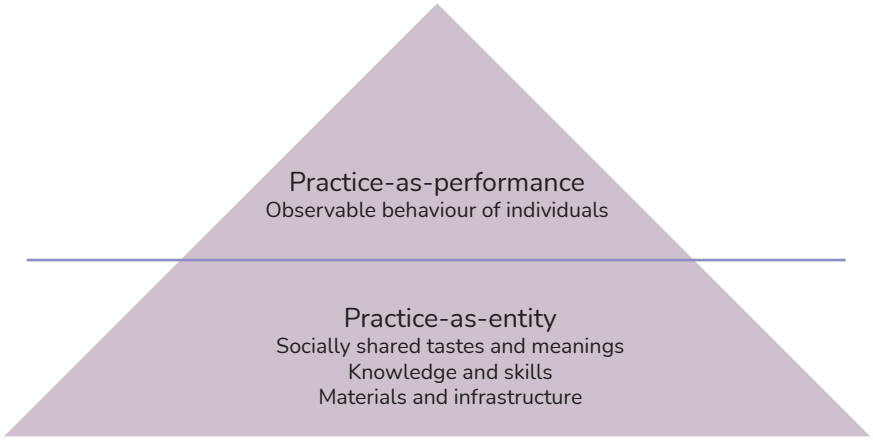

Figure 4: Practice-as-performance/practice-as-entity

The figure above shows that practice-as-performance, the observable behavior of individuals, "...is just the tip of the iceberg" (Spurling et al., 2002, p. 8). Practice-as-entities are about the history and evolution of socially shared tastes and meanings, knowledge and skills, and materials and infrastructures (Spurling et al., 2002).

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As the elements connect, a practice is made and when the connections are broken, the practice falls apart. This can also be described as practices turning into ex-practices. It is important to note that elements can exist without yet being connected in what Shove et al., (2012) calls Proto-practices (Figure 5: Links are yet to be discovered, made, or broken) (Shove et al., 2012).

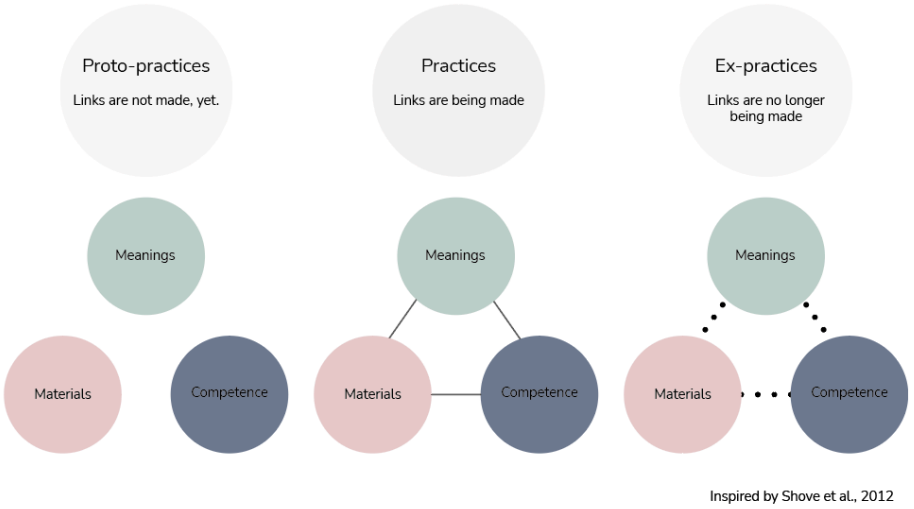

Figure 5: Links are yet to be made, or broken

The elements of practices are mutually shaping. This means that e.g. new innovations may lead to a "...continuous process of reciprocal adaptation of practical skills and materialized knowledge" (Shove et al., 2012, p. 32). The elements can not be seen as being independent isolated elements and are therefore inter-linked (Shove et al., 2012). By recognizing that elements within practices are mutually shaping, it reveals that they are changed and left behind as new elements are introduced (Shove et al., 2012). It is further described that these changes in the elements are traces of past practices, and these "...are part and parcel of the dynamic of practice" (Shove et al., 2012, p. 34). Shove et al. (2012) further suggest that when elements become traces of the past, links of practices are broken whereto the three elements "... disappear in characteristically different ways: vanishing with little or no trace, remaining dormant or taking on new lease of life within and as part of other practices'' (Shove et al., 2012, p. 35).

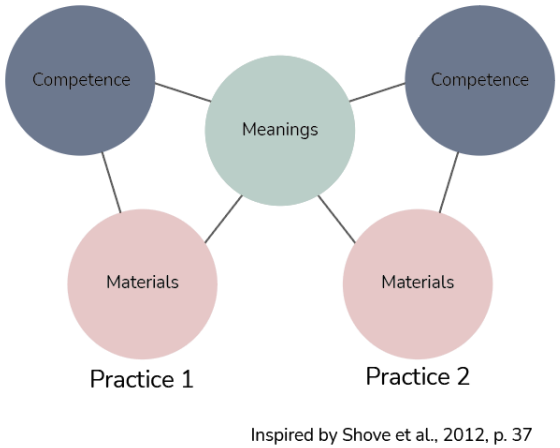

Figure 3: Ripples Through the Landscape

Because practices can not be seen as independent and isolated, elements can be part of multiple practices and can hence "...circulate within and between many different practices, constituting a form of connective tissue that holds complex social arrangements in place, and potentially pulls them apart" (Shove et al., 2012, p. 36). This means that the same meaning can potentially be a part of multiple practices (Figure XX: Ripples in the Landscape).

Here we should note that, if the element of meaning attaches or detaches, it does not only affect the one practice but affects the whole

cultural landscape. This principle applies regardless of which of the elements shares similarities in the practices (Shove et al., 2012).

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The elements; materials, meaning, and competence, in the framework presented by Shove et al., (2012) are described to vary in their modes of circulation. The circulation of materials deals with the availability of given materiality and the distribution thereof. This circulation occurs when the material is physically being transported. The idea of describing elements in these modes of circulation is to understand and "...recognize that whereas forms of (co)location, transportation, and access are typically important for the diffusion of material elements, forms of competence and meaning circulate in characteristically different ways" (Shove et al., 2012, p. 47). Therefore we go on by explaining the modes of circulation of competence and meaning, as these are important to understand the complex dynamics of social practices. Competence circulates between people and practices (Shove et al., 2012). It needs to be abstracted in order for it to travel and furthermore reversed when it reaches its destination. Hence competence circulates when we let it move and make it work elsewhere and are "...typically modified, reconfigured and adapted as they move from one situation or person to another and as they circulate between practices" (Shove et al., 2012, p. 52). The element of meaning "...are extend[ed] and eroded as a result of dynamic processes of association" (Shove et al., 2012, p. 55). This element is described as almost always being mediated. As individuals participate in a variety of practices, they reproduce meanings and order in interaction with the society they find themselves in. Therefore meanings arise and extend in association with the dynamics of practices (Shove et al., 2012). These elements are so closely related, that if new elements arrive, they may "...depend on, the demise of others" (Shove et al., 2012, p. 58).

In the linking of these elements, a practice is formed. Moreover, practices can be linked to other practices through inter-practice relations. These are described by Shove et al., (2012) in three types of formations: Pre-formation (practices are not integrated with each other), formation (practices link to each other and are co-existent or co-dependent), and de-formation (links between practices are no longer present) (Figure XX: Formation Processes of Practices).

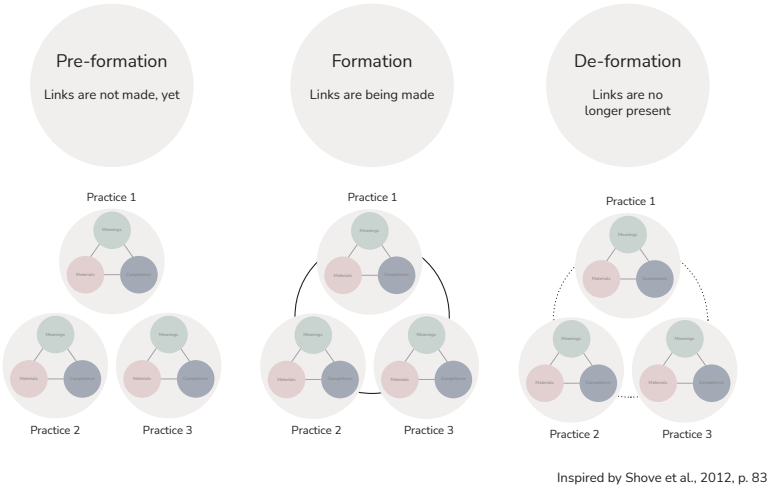


Figure 3: Links are yet to be made, or broken

Shove et al., (2012) emphasize the need for characterizing the linkages between practices when describing the relations between them, because "...one practice cuts into and cuts through multiple registers of interaction, often figuring in several over-lapping sequences and cycles at once. Sometimes merely co-existing, sometimes co-depending, the resulting patterns of cross-practice connection are inextricably interwoven" (Shove et al., 2012, p. 87). As practices affect each other in this way, they form bundles as "Bundles are loose-knit patterns based on the co-location and co-existence of practices" (Shove et al., 2012, p. 81). When they do not only affect each other but become dependent on each other they constitute complexes. These complexes can not be reduced to one entity as "Complexes represent stickier and more integrated combinations, some so dense that they constitute new entities in their own right" (Shove et al., 2012, p. 81). Recognizing that a collec-

tion of multiple practices forms bundles and complexes is described by Spurling et al. (2002) to make it possible to "...identifying how practices interlock with one another" (Spurling et al., 2013, p. 12). In this context, they present two ways of which practices interlock. They can interlock in synchronization of where and when activities take place and they can interlock in sequences of practice as "Our daily schedules are in-part determined by institutions and organisations..." (Spurling et al., 2013, p. 12).

We use this framework in several different ways. In chapter 3 we investigate how work practices have changed throughout history, as we recognize that "...theories of practice draw attention to the historically and culturally specific trajectories of what people do, the details of which reflect distinctive accumulations of meaning, material- ity and competence and the relative positioning of one practice with respect to others" (Shove et al., 2012, p. 145). As these practices are explored as interwoven, they are described as bundles of practices of which constitute the practice of work as a practice-as-entity. We discover how the practice is interlocked in synchronizations, and how the disruption of elements of which the practice consist, can disrupt the whole bundle of practices. We furthermore use the model of elements to explain how changing one of the elements can create a ripple effect to the other elements and thereby shape new elements, resulting in practices becoming ex-practices, as links between the elements are no longer being made. Hence, we use the perspective of PT to follow the trajectory of development that constitutes the way we work today.

In chapter 4 we present the vast variety of shared practices of practitioners of advising engineering organizations. We further use the model of three elements of practice, to pinpoint elements in which these practices consist, using the empirical material gathered during the project. We analyze how these practices change, shifting the location of where the practice of work takes place, describing how the elements connect or disconnect from the given practitioners' practice. We describe how practices can be interlinked with other practices through an inter-practice relation using the three types of formations (pre-formation, formation and de-formation). Hence, we use the perspective of PT to highlight the differences of the practitioners' practices.

2.1.1 Perspectives of other theories

We further ask ourselves what other theoretical perspectives could have provided for the thesis and why we did not find those suitable for our study. We explain and reflect upon two frameworks that also stem from a social science perspective, namely Communities of Practice (CoP) and Actor-Network Theory (ANT).

CoP proposes that learning does not only happen individually but "... involve[s] a process of engagement in a 'community of practice'" (Smith, 2003, p. 1). CoPs are described as self-organizing systems that are created from people that interact on a regular basis that share a set of problems, concerns, or are passionate about a topic. Through this interaction, they deepen their expertise and knowledge (Wenger, 1998; Smith, 2003 & Kirchner et al., 2019). These communities are developed from things that matter to people and are informally bound by what the participants of the community do together. They can arise both intentionally and unintentionally. CoPs can furthermore be "...understood as groups of people who regularly learn together and from each other because they care about the same real-life problems" (Pyrko et al., 2019). Such communities are described to be found within businesses, across business units, and across company boundaries. They are rather defined from knowledge than by task as "A community of practice exists because it produces a shared practice as members engage in a collective process of learning" (Wenger, 1998, p. 2) where an understanding of practice within the community is created amongst the participants.

Using the theoretical framework of CoP depends on us having access to the communities in which we wish to investigate. A way of approaching

such a project, using CoP as a theoretical framework, would have been by investigating how knowledge travels in and across communities in the online communities within an advising engineering organization. Furthermore, we could have used it to identify how this knowledge configuration transforms the practices of which they are part of. CoP could thus have acted as a framework for how knowledge configurations change when a practice within these communities is changed, hence investigating how a change of practice can affect these communities.

ANT proposes that relations, both human and non-human are a part of a network in which these actors are affecting each other, as 'society' is composed of humans (and nonhumans) who are aligned in networks of different extent" (Michael, 2017, p. 3). These nonhuman actors shape the network and furthermore shape the inter-relations between human actors (Michael, 2017). To investigate those relations is also to investigate how controversies emerge, develop, and close in such networks (Callon, 1984). ANT can be used to identify who to involve, and when to involve them. Callon, 1984 describes a Four Moment of Translation model which can guide the researcher into building relations between actors. The four moments of translation; problematization, interessement, enrolment and mobilization, "...constitute the different phases of a general process called translation, during which the identity of actors, the possibility of interaction and the margins of manoeuvre are negotiated and delimited" (Callon, 1984, p. 6). Hence this framework can explore how actors' interests can be translated and how the relations between them can be reconfigured (Michael, 2017).

A way of approaching this project from the perspective of the theoretical framework of ANT could have been by discovering how different controversies appear in work-from-home settings, hence identifying the controversies that might appear in the relations of human, as well as non-human actors. Furthermore, the methodological approach of the four moments of translation would have provided a guideline for the involvement of different actors, highlighting what actions should be taken into account in each phase of the project to ensure that interessement was created, before moving to a phase of enrolment.

Although the three different theoretical perspectives described in this chapter, all stem from social science, they all have a very different nature of theorizing the social. We recognize that ANT follows the actors, relations, and controversies, whilst CoP follows knowledge within communities and PT follows the practices, hence materials, meaning, and competence of individuals. Thus, these perspectives conceptualize the practices, actors, and objects and what it means for the relations between them in different ways.

2.2 Collection of Emperical Material

This section serves as an explanation of the empirical material we have collected in order to conduct the analysis further presented in this report. It furthermore defines how we refer to the participants of the thesis and their respective company, since we have chosen to hide their identities for the sake of remaining anonymous.

Our analysis is conducted on the basis of engagement from employers and employees working within three of Denmark's largest advising engineering organizations. For the sake of anonymous confidentiality and the organizations will thus be referred to as follows; organization I, organization N, and organization R. From the three organizations, a total of eleven employees and employers participated for the contribution of this project. We recognize that this sample size is relatively narrow, hence the research conducted might not be representative for the whole target group (of advising engineering organizations in general) or for every employee within each of the three organizations. The initial aim was to involve a greater number of participants, however, we experienced difficulties in interesting actors as well as establishing contact, conducting interviews, performing workshops, and interventions during a global pandemic. For an elaborated explanation see grey box below.

Process box: Establishment of Contact; different approaches

When we started the project, we initiated contact with a variety of organizations that we recognized as potential collaborators. Our initial goal was to establish contact with only one collaborator, whom we'd wish to thoroughly investigate. By email correspondence, we got in contact with two leading actors from company N, whom we soon after invited to an initial meeting. Here the purpose was to align their wishes with our goal for the thesis. Through this meeting, it was agreed that we could have a close collaboration and we therefore created an illustrative invitation for their employees to take part in a variety of workshops. The invitation included a timeline of when we'd wish to facilitate the workshops. In the first month of the project, we hence focused on establishing contact with this particular organization, sending emails back and forth, and adapting the invitation to what the organization saw as suitable for their employees. After a long correspondence, with slow replies, they finally posted the invitation in their newsletter. During this long period of time we chose to initiate contact with other organizations, due to a concern of the collaboration with organization N being too weak. We did this by posting flyers on each of our linked-in profiles, as well as on a Facebook group for Sustainable Design alumni among others. We quickly became aware that this approach did not work as intended. Hence we created yet another type of flyer targeting one person at a time through email. The invitation was to one workshop only, as we imagined how people might not engage in the project if it demanded too much commitment (if we invited them to multiple workshops at once). This approach led to the establishment of contact with employees from organization I. Furthermore, we also attempted to establish collaboration through previous collaborators. By doing so, we got in contact with an employee from organization R. In an attempt to establish more collaborations we created a short video, presenting us and our project. We wanted it to function as a means to create interest in our project. The video can be watched here: https://www.youtube.com/watch?v=oOssgJLiFy8.

We have below illustrated how the participants are connected to each of the organizations (Figure XX: XX).

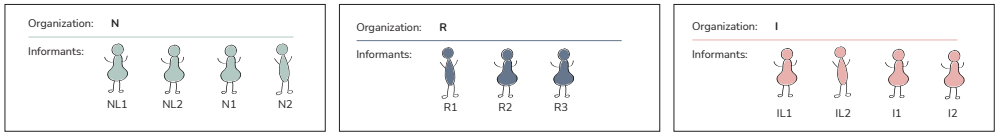


Figure 3: Links are yet to be made, or broken

From organization I we had four participants. Two of them are actors with a leading role within the organization, hence anonymized to the initials IL (Leading role in organization I) and will therefore be referred to as IL1 and IL2. The other two are employees and will be referred to as I1 and I2. From organization N we had another four participants that are anonymized in the same way; participants with a leading role are referred to as NL1 and NL2, and employees N1 and N2. From the last organization, organization R, we had three participants, who all are employees and therefore referred to as R1, R2, and R3. Unfortunately, we didn't succeed in establishing contact with actors in leading roles of this organization, even though we saw it necessary. We make this distinction of the participants because we believe they can contribute with different perspectives to how a framework can be designed. We intend for the framework to be usable for actors in leading roles in order to accommodate the individual needs of the employees. Hence their use of and their role in the framework are different from each other.

Throughout this thesis, we have used a Participatory Design (PD) mindset. This mindset is rooted in an "...understanding of how collaborative design processes can enable the participation of those who will, in the future, be affected by their results" (Robertson & Simonsen, 2012, p. 2). We believe that employees themselves should be a central part of designing their work model, because it affects their work practices. Hence we in this thesis "...strive to learn the realities of the

users' situation..." (Robertson & Simonsen, 2012, p. 2), whilst we make room for participants to "...strive to articulate their desired aims..." (Robertson & Simonsen, 2012, p. 2). Although we would have preferred to facilitate a physical collaborative design process, it was unfortunately not possible. This meant that we could not use the PD mindset to its full potential. Hence we facilitated these processes through online platforms in an attempt to "...directly involv[e] people in the co-design of the [...] environment that shape[s] their lives" (Robertson & Simonsen, 2012, p. 2) anyway.

To enable the participation of employees and employers in our three chosen advising engineering organizations, we facilitated a number of different encounters. The figure below gives an overview of the basis for our analysis. This takes you through when the different participants were involved, what the involvement was about as well as what types of objects were used.

WHEN	WHO	PURPOSE	DISSEMINATION OBJECT	COMMUNICATION CHANNEL
01/02-21	Possible participants	Establishing contact		E-mail
04/02-21	Organization N	Establishing contact		E-mail
16/02-21	Organization N	Establishing collaboration	Process line	Zoom
17/02-21	Organization N	Creating interest	Flyer	E-mail
19/02-21	Ka-Ching	Getting inspiration		Zoom
02/03-21	Organization N	Creating interest	Flyer	E-mail
02/03-21	Possible participants	Invitation to workshop	Flyer	LinkedIn
05/03-21	Organization R	Creating interest	Flyer	E-mail
05/03-21	Organization I	Creating interest	Flyer	E-mail
05/03-21	Sustainable Design alumni	Creating interest	Flyer	Facebook/ LinkedIn
09/03-21	Potential participants	Creating interest	Video	
15/03-21	Potential participants	Creating interest	Video	E-mail/LinkedIn
17/03-21	Participant R1	Online Workshop	Exercises	Zoom
18/03-21	Participant I1 & I2	Online Workshop	Exercises	Zoom
25/03-21	Participant N1	Online Workshop	Exercises	Zoom
29/03-21	Participant N2	Online Workshop	Exercises	Zoom
06/04-21	Participant R2 & R3	Online Workshop	Exercises	Zoom
20/05-21	Participant NL1 & NL2	Online Intervention	Story boards	Zoom
20/05-21	Possible participants	Invitation to intervention	Video	E-mail/ LinkedIn
26/05-21	Participant IL1	Online Intervention	Story boards	Zoom
27/05-21	Participant IL2	E-mail correspondance	Story boards	E-mail

Figure 3: Links are yet to be made, or broken

2.2.1 Negotiation Spaces

As PD in itself does not suggest any particular methods for designing a collaborative design process, we supplemented it with the framework of Negotiation Spaces (Pedersen, 2020). Pedersen (2020) argues that her framework is a means "to open up the process involved in staging, facilitating collective interpretation, and reframing during a collaborative design process" (Pedersen, 2020, p. 60). This framework provides us with a guide for actions to take when facilitating spaces that actively involve participants, taking three main aspects into account: 1) Staging moves, 2) facilitating negotiations and 3) reframing. This framework was used to design and facilitate spaces of involvement through a total of five online workshops (Image X) and three interventions (Image X). We make a distinction between workshops and interventions as these spaces vary in what happened before, during and after.

2.2.2 Boundary Objects

A boundary object (BO) is an object that has a mediating role, enabling transportation of knowledge and the creation of dialogue between different groups of actors (Brodersen & Lindegaard, 2016). Thus, a boundary object makes it possible for actors across boundaries to create a shared syntax, while it provides a means for mutual understanding and learning of differences (Carlile, 2002). In relation to this project, we have used the method of a boundary object in multiple forms and settings. Especially in connection to our online workshops and interventions, we found it necessary to use boundary objects in the facilitation of dialogue. We created objects in the forms of PowerPoint presentations, User Stories and pre-made templates for conducting exercises throughout our workshops (Image X). These enabled the creation of a knowledge-sharing space between us and the participants.

2.2.3 Storyboards

2.2.4 Fishbone Diagram

In the process of identifying elements which are causing unsustainable work practices in physical and remote work sites, we used the method of a fishbone diagram inspired by Ishikawa (also known as Ishikawa diagram). The idea of a fishbone is that "...the head of the fish is the "effect" and the bones represent potential causes" (O'Donohue & Maragakis, 2016, p. 120). The effect can both be a problem statement or the desired goal, depending on the topic under investigation. Hence, the method "...is often applied during the design and production phases of a product or service" (O'Donohue & Maragakis, 2016), since it provides a structuring of elements causing a certain effect. In this project, each bone represents a practice that entails several breakdowns which are causing the effect of unsustainable work practices.

Process box: Project Planning

For us to be able to conduct this thesis, we have used a variety of tools for planning and setting deadlines throughout the project. Some of which are invented by ourselves, some taking inspiration from other methods. Inspired by SCRUM (Sutherland, 2014) we made sprints with the duration of two weeks. At the end of every two weeks we evaluated the process, considering points as to; stop doing, start doing, do more of, and so on. Furthermore, we planned the coming weeks using an agenda document in which tasks were defined as well as who was in charge of the task. As we couldn't use the facilities at campus through most of the period in which the thesis was conducted, we created a 'check-in'-document that was used when we were working from our own homes. Here we took one of the multiple tasks that needed to be solved, and chose a timeslot of which fit the best with when we preferred to perform that given task.

3 THE HISTORICAL TRACE OF THE WORK PRACTICE

Through a recap of the pre-industrial societies, we trace the history of the work practice back to the stone age. We know from Shove et al. (2012) that "...practices-as-entities expand, contract and change as they acquire and lose variously faithful cohorts of carriers." (p. 77), which is why we investigate how the practice has changed through the four industrial revolutions, forming the industrial and the information society. We look into how "...practices-as-entities are shaped by the sum total of what practitioners do, by the variously faithful ways in which performances are enacted over time and by the scale and commitment of the cohorts involved" (Shove et al., 2012, p. 101), to understand how the past has shaped the present.

In this chapter we thus investigate how 'the work practice' in western societies has evolved and developed through time. Provided in snapshots, we want to look into the trajectories that constituted (and still constitute) the practice-as-entities that shape current configurations of work. We wish to "...give a sense of the 'elemental' histories involved and of the succession of composite entities.." (Shove et al., 2012, p. 29) which are a part of forming modern working life. Over the course of history, 'working' has become a recognized and enacted entity that has arisen through the fusion of many different practices, steered primarily by a range of dominant designs. We will argue how 'working' has been black-boxed to the extent where it "...constitutes a single practice" (Shove et al., 2012, p. 82) and how it later disrupts into multiple individualized practices. Furthermore, we establish the basis for a collective work model and how it does not correspond to the modern practices of work. We will illuminate the fact that a transition toward more individualized work models is needed.

3.1 Pre-industrial Societies

The very beginning of human societies started with the stone age. It is the earliest and longest known societal period of humankind and lasted until approximately 10 thousand years ago (Edgell & Granter, 2011). The technology at this time was limited and as the name indicates, stone was used for tools and weapons (Edgell & Granter, 2011). At this time societies were characterized as small-scale, where everyone participated in the work. However, there was an informal division of labor due to different requirements for different practices, among others, affected by biological differences (Edgell & Granter, 2011). Men were in the field hunting, because they were biologically stronger, while women gathered and prepared food. Everyone participated in the building of shelters, both young and old, male, and female. Here the success of building the shelter "...require[d] the careful synchronization of many separate practices" (Shove et al., 2012, p. 86). Which at that time could be seen as a complex operation, dependent on "...efficient and effective sequencing of multiple practices (some have to come before others), [...] and synchronized adap-tation as circumstances change (some practices have to happen at the same time)" (Shove et al., 2012, p. 86), which together constituted a general understanding of the practice: 'building a shelter'. The work performed in this period caused no economic surplus, hence there were no economic inequalities in the market (Edgell & Granter, 2011). It was a more peaceful than predatory society, since the survival of the group required co-operation rather than competitive behavior (Schwartz, 1990).

The period that followed was the Horticultural societies, which lasted until approximately 5000 years ago (Edgell & Granter, 2011). Work in this period was characterized by gardening with the cultivation of plants, using new technologies such as digging sticks and hoes made of metal. Compared to the Stone Age "...the use of metals instead of stone for tools and weapons, led to the creation of a more reliable economic surplus, an increase in the size of the population, and the differentiation of economic activities'' (Edgell & Granter, 2011, p. 3). These changes caused societal inequalities, especially with a distinction between workers and warriors, where some of the first signs of individual distinction in the competencies needed to work, happened. Because men are biologically stronger, they had the best prerequisite to become warriors and women therefore had to stay behind and manage the production of food (Edgell & Granter, 2011). Furthermore, "[...] a stable economic surplus by the majority allowed a minority to form a hereditary aristocracy of males who specialized in politics, religion, and warfare" (Edgell & Granter, 2011, p. 4). Hence the specialization was the beginning of a hierarchy and with control of crops causing surpluses, this resulted in competitive behavior making resources worth fighting for (Edgell & Granter, 2011).

The societal inequalities further increased in the Agrarian society, which began approximately 5000 years ago and lasted until the late 18th century (Edgell & Granter, 2011). This period was characterized by the practice of farming as the dominant work activity. The technological development of the plough and the use of animal power, increased food production and created a greater surplus. Hence, "...economic growth led to a greater diversity of occupations and the emergence of urban centres in which the use of money became the preferred medium of exchange" (Edgell & Granter, 2011, p. 4). Human settlements grew into cities, which was the beginning of urbanization that became the center for trading resources. In the 18th century, 10 percent of the population arranged in urban settlements (Berry, 2008). Due to a shift in the material element of the working practice (going from human power to animal power) the social hierarchy increased with the upper class specializing in ownership of land and people, and the lower class taking care of the manual work (Edgell & Granter, 2011). The upper class was male dominated and concerned with governing as their main work practice and education on warfare and religion as a privileged leisure activity. On the contrary, the lower class was female dominated including productive work, such as farming. The change of the material element thus led to a new configuration of competencies, where the need

for muscle-power increased to an extent where the meaning for the farming practice changed. Although the activities of farming were fundamental for the survival of the societies, it was associated negatively by the political and religious leaders (all males), because it "...detracted from the ability to engage in politics or spiritual contemplation" (Edgell & Granter, 2011, p. 6).

As Shove et al. (2012) puts it; "The details of where practices happen are also relevant in thinking about how they change and diffuse" (p. 130) and it was in the Agrarian period that the separation between work and leisure became evident for the upper class (Edgell & Granter, 2011). Practices shape each other based on their sites and settings, which "...indicates that practice bundles, by which we mean loose-knit pat-terns like those based on co-location, sometimes turn into stickier forms of co-dependence." (Shove et al., 2012, p. 87). However, "...for the vast majority, home and work were still not separated, with the household being the unit of production as well as consumption for its members" (Edgell & Granter, 2011, p. 4). The separation of work and leisure were thereby not reflected in a separation of home and work since the production, as well as the consumption, took place at home (Edgell & Granter, 2011).

To summarize, the pre-industrial societies have developed from the Stone Age characterized by small scale societies, with equal contributions to work, to the Agrarian society characterized by a greater inequality of work among classes and genders. Furthermore, throughout the pre-industrial period, there was a shift in the way people perceived learning and how they accomplished work practices differently (Edgell & Granter, 2011). In the Stone Age children learned from watching the adults and achieved practical experiences within informal circumstances (Edgell & Granter, 2011). On the contrary Agrarian societies were concerned with specialist knowledge achieved in formal circumstances of schools, which emerged with the increased division of work labor (Edgell & Granter, 2011). The time of the pre-industrial societies is a great example of how practices are interlinked through the force of dominant designs of material elements. Thus when a niche-innovation, such as the plough, becomes dominant (meaning that there no longer are a similar alternative design competing with it (Geels & Schot, 2007)), it affects the other two elements used when farming. Hence it shows how disruptions of one element can change not only one practice but a bundle of practices with their own meanings and competencies. In the case of the pre-industrial societies, the shift in the dominant designs led to an increase in inequalities and societal hierarchies which later took part in determining the cultural aspects of today's working life. Practices formed in these pre-industrial societies, also created a synchronization of the work practice, where "...elements [were] consistently and persistently integrated through repeatedly similar performances" (Shove et al., 2012, p. 13). Thus, constituting a stabilization in the way (and by who) work was performed.

3.2 Industrial Revolutions

Radical societal changes of work practices occurred with the industrial revolution in the late 18th century, which were the beginning of the industrial society (Edgell & Granter, 2011). Society changed due to technological developments which provided new opportunities. The first industrial revolution was characterized by the development of the steam engine, which initiated the use of machinery, replacing human and animal power and thereby shifting once again, the material element of the work practice. With this new dominant design inline, this periodic change "...served as fundamental basis for transforming to its present form" (Shatrevich & Strautmane 2015, p. 160) and work in today's western societies is thereby deeply rooted in the historical changes of this time. Over the years great technological developments have led to further transformation of society and affected work opportunities radically.

In the early 20th century, the second industrial revolution took place. The development of electrical power created new work practices behind assembly lines concerned with mass production (Shatrevich

& Strautmane 2015). The third industrial revolution began in the late 20th century with the development of electronics and IT as a means to further automate production (Shatrevich & Strautmane 2015). Currently we find ourselves in the fourth industrial revolution, which is concerned with information communication technologies, by merging real and virtual worlds (Shatrevich & Strautmane 2015).

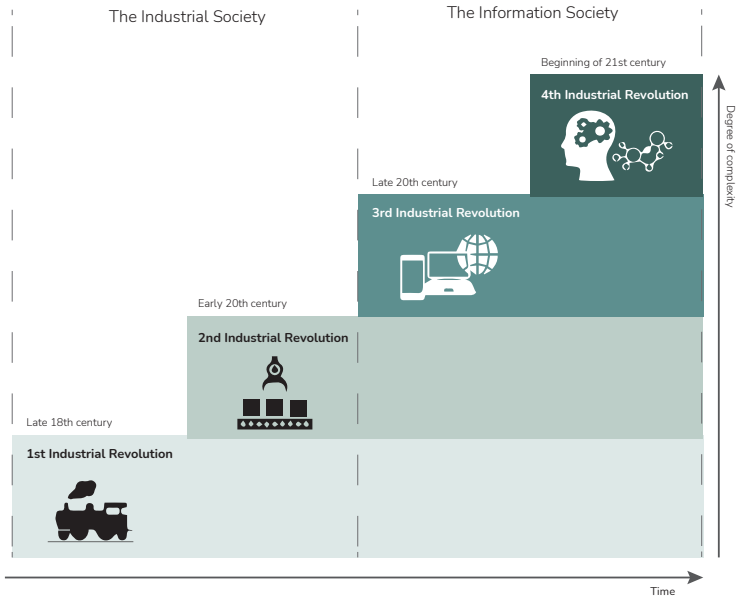


Figure X: The Four Industrial Revolutions

The first and second industrial revolutions characterize what is commonly referred to as the Industrial society, whereas the third and fourth industrial revolutions constitute the post-industrial society, also referred to as the knowledge society (See figure X). These aspects are important because:

> *"Industrial revolutions can be regarded as moments of change and disruption in multiple areas related to society and economy. They are based on the evolution of human knowledge and may change values, behaviors, the management of economic activities and the balance of power on a regional or global scale" (Bonciu, 2017, p. 9).*

The four Industrial Revolutions provide a historical perspective on how technological developments and societal changes have influenced and shaped the work practices of today. An investigation of the past is thereby important in order to understand the present. In the following sections we will elaborate on these periods and account for the technological and social factors constituting work practices from the past until today.

3.2.1 The Industrial Society

The first industrial revolution began in the late 18th century in England and became a transformation of work in western countries during the early 19th century (Edgell & Granter, 2011). This change arose from the possibility of new sources of power "...to drive machinery, replacing water or wind power and human or animal muscle power" (Edgell & Granter, 2011, p. 9). The technological development of the steam engine revolutionized the work industry and is today known by the vast majority because it "...changed the previous economic and social order and defined the main characteristics of what we know as the Western civilization" (Bonciu, 2017, p. 9). As earlier mentioned, practices are inter-linked through one or several of the three elements of materials, competencies and meanings. When the material element of muscle-power became replaceable with the steam engine it did not only change the practice of farming, but multiple practices made use of this dominant invention. Thus, shaping new meanings and competencies eventually making the pre-industrial practice of farming an ex-practice (see section X: Theoretical Framework). The radical innovations at this time affected not only the earlier stabilized practice of work, but the economy and societies "...by creating the large scale industrial production, the development of transport [...], the development of cities and urban life, the change of education and, in the end, the perception about the world and the world economy as a whole" (Bonciu, 2017, p. 7). People were no longer only associating survival with farming (as in the pre-industrial times) but instead with increasing income, which

could contribute to the quality of their survival "...suggesting that practice-historians might also follow individual elements as they change over time" (Shove et al., 2012, p. 32). The meaning of the work practice thus changed from 'survival' to 'surplus' as the perception of survival changed (Figure X).

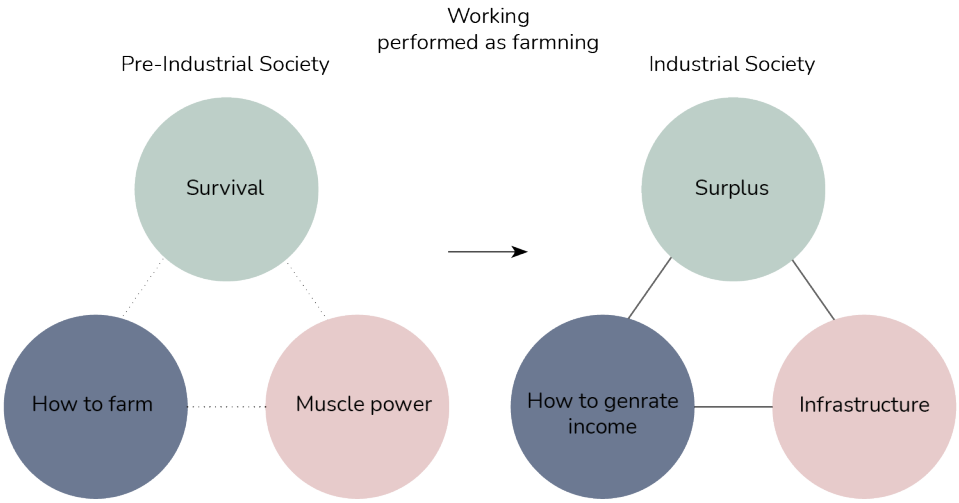


Figure X: How the practice of work, within farming changed from the meaning of survival, to being about generating income, which creates the foundation for multiple practices.

The urbanization created an increased need for transportation. To accommodate this problem, Henry Ford had a desire to build a car that was cheap enough for nearly every American to own (Rees, 2016). As a result, Henry Ford invented new ways of working through the establishment and design of assembly lines, used for the mass production system. This approach is known as Fordism and is characterized by "... mass production of standardized goods, allowing for productivity gains and the pursuit of economies of scale whereby the unit cost can be reduced with an increasing production volume" (Rundshagen, 2013, p. 1860). The uprising of Fordism characterizes the second industrial revolution because it "...spread quickly throughout the manufacturing sector, to products of all kinds, because Henry Ford was so open about the way he designed his factories" (Rees, 2016, p. 9).

Associated with Fordism, another influential person of the time, Frederick W. Taylor, introduced a management system "...in order to increase labor productivity and production efficiency through standardization and synchronization of processes" (Rundshagen, 2013, p. 1860). The idea was to separate hand and brain, with managers responsible for the planning and management of workers, whose tasks were "...simplified to the ultimate degree so that workers would be cheap, easy to train, easy to supervise, and easy to replace" (Hansen, n.d, p. 9). It has been one of the most influential organizational management approaches of time, as "[Taylor's] principles of scientific management provided the cornerstone for work design throughout the first half of the twentieth century, and in many situations prevail right up to the present day" (Hansen, n.d, p. 8). Changes in this period were thereby greatly influenced by the two American engineers, Henry Ford and Frederick W. Taylor, who jointly invented the first production system. Work on these factories was much reliant on the synchronization and sequenced practice of the workers, resulting in a highly collective work model, which constituted the stabilization of a new way of working. However, especially Taylor gained a "...reputation as a major "enemy of the working man"" (Hansen, n.d, p. 8), because "...the increases in productivity have often been achieved at a great human cost, reducing many workers to automatons" (Hansen, n.d, p. 9).

In line with the uprising of Fordism and Taylorism's contribution to a new way of working, labor movements started to spread all over the world, as a consequence of miserable work conditions (Knudsen, 2011). In Denmark, this movement arose with inspiration especially from New Zealand, Australia, USA and Canada (Arbejdermuseet, 2019). In 1889 labor movements of the world joined forces in order to bring awareness to the subject. This resulted in an international agreement initiating the 1st of May as the International Workers' Day, where everyone fought for the requirement of an 8-hour working day (Arbejdermuseet, 2019).

The desire was to achieve a threefold division of the day, consisting of 8-hour work, 8-hour leisure and 8-hour rest. The purpose of the labor movements was to fight the workers' side of the battle and bring better conditions to the workers (Arbejdermuseet, 2019). Danish citizens demonstrated every year for this cause and after 30 years, in 1919, they finally succeeded in passing the 8-hour working day requirement (Arbejdermuseet, 2019). This became a historical achievement in the history of the labor movement. At this time, a normal workday became 8 hours per day and six days a week, resulting in a workweek consisting of 48 hours, which was a decline from 60 hours per week in 1900 (Abildgaard, n.d.). This division of labor and leisure time was in 1926 supported by the danish reigning Prime Minister, Thorvald Stauning, who stated the following: The 8-hour day provides the family man time for a family life, which was not known in my childhood. The father may have time to deal with his children, participate in upbringing and education - also it will leave traces for the future (Arbejdermuseet, 2020).

Furthermore, in the late fifties Danish women started entering the labor market, due to the shortage of labor, which had increased since the economic recovery took place (Danmarkshistorien.dk, 2011). The increase in the employment of women happened during a parallel development within the structure of society. This resulted in an increase of women finding it natural or necessary to conduct work outside the home. Women went from being the primary person enabling all household functions, to gaining an increasingly important role in the labor market (Danmarkshistorien.dk, 2011). Until then household functions had not been considered 'work' on an equal level with paid labor. This resulted in the first disruptions of traditional gender roles and gave women more freedom both financially and at work (Danmarkshistorien.dk, 2011). This historical event also created a need for the division between working and leisure time, because external factors such as 'being a parent' became harder to manage. This division between labor and leisure time affected the work practice in which the site of the work suddenly became important. In line with Shove et al. (2012) "...sites like offices and homes can have emergent consequences for the trajectories of individual practices and hence for the collection of practices that are, and that are not, enacted in such environments" (p.85). The site of performing the working practice became clearly separated from practices performed in the home, which resulted in the association of the work practice changing to a more diverse matter. Surplus were no longer the focal point of peoples concern, which made room for new purposes such as social status and family life. Thus, making the purpose of working more connected with individual preferences (Figure X).

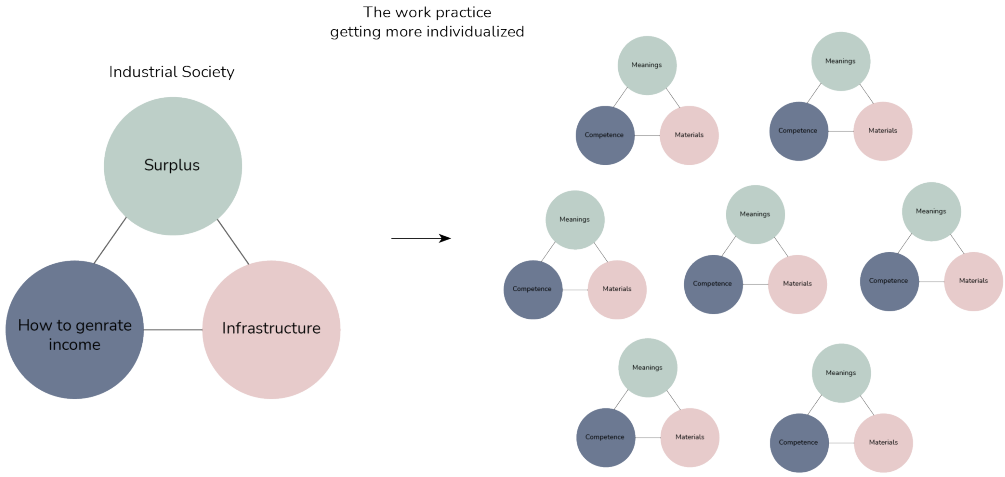


Figure X: The work practice getting more individualized

Hence, the industrial society serves as a means for explaining how "... the attaching and detaching of meaning and signification sends ripples across the cultural landscape as a whole" (Shove et al., 2012, p. 36-37). Practices are thus affected not only by the dynamics of the three elements (materials, competencies and meanings), but also to the site in which the practice is performed and by practices closely connected to each individual person.

3.2.2 The Information Society

During the third industrial revolution the technological development of electronics and IT made it possible for a new synchronization of practices to form. The development meant that the nature of the workplace changed from a mass production economy to a service economy (Narayanan et. al., 2017). It is well established by scholars that the development of technologies such as the personal computer (PC) changed the way in which we perform work today (Grossman, 2012; Kraut et. al., 1989; Dumais et. al., 1988; Andries et. al., 2002). It is during this time that a distinction between blue and white-collar workers took off. It was a way to distinguish between social classes, but also classification of the work itself (Gutoskey, 2021, February 15). Anyone working in an office was associated with wearing white shirts meanwhile people working with manual labor were stereotypically expected to be in blue shirts (Gutoskey, 2021, February 15). Although blue wasn't the only color worn by manual laborers (it was primarily dark toned colors suitable for working at a factory), it was very popular (Gutoskey, 2021, February 15). From thereon the terms blue-collar workers and white-collar workers were unavoidable. For the purpose of our study we will from now on only look at the work practices associated with white-collar workers.

Though the PC is a relatively new invention (with the PC era being from around 1980-2000 (Grossman, 2012)) it quickly became a dominant material element of the work practice related to white-collar work. The first PC that was created by IBM entered the market in 1981 followed by Macintosh that entered the market in 1984 (Dorn, 2015). In this era PCs were used for word processors, spreadsheets and databases. This indicates that the use of the PC in work practices was centered around "...department level information generated by individuals: reports, presentations, budgets, and other work related data" (Grossman, 2012, p. 28). The PC also became a significant part of the office setup, where employees used software applications such as Microsoft Word (Grossman, 2012). Although the software application possibilities were limited, the available software was used for "...eliminating jobs requir[ing] low skill and eliminating the most boring and repetitive tasks within more skilled jobs" (Kraut et. al. 1989, p. 220). From a management point of view eliminating these tasks would improve the employees' personal productivity thus increasing efficiency and hence cut labor costs (Dumais et. al., 1988; Kraut et. al., 1989). Scholars have questioned if increasing productivity would damage the work lives of the employees. Kraut et. al. (1989) describes that the "...jobs [were] less satisfying. It deskilled the jobs, both by making them less complex, interesting and challenging..." (Kraut et. al., 1989, p. 236). Furthermore, it decreased the employees' involvement with their colleagues as the use of PCs reduced their movement in the office by decreasing their need to fetch paper records from elsewhere. By coordinating information through a database most of the direct handover of documents and conversations taking place in such relations was transferred to the PC (Kraut et. al. 1989). Although job satisfaction and involvement with one's colleagues decreased, the research of Kraut et. al (1989) also discovered that "... technology reduced their job pressure and, surprisingly, increased their happiness and mental health" (Kraut et. al. 1989, p. 236). Considerations as to why, are among others, that technology can save the employees time by reducing time spent on "...travel, missing contracts, finding out information, and filling out forms [...] meetings and clerical work." (Kraut et. al. 1989, p. 220). The claim is that reducing wasted time will make the employees' jobs more rewarding (Kraut et. al. 1989).

The technological development did not only change the way in which work at the office was performed. It also made it possible for employees to perform more flexible work. Thus performing the practice of work at different sites (Shove et al., 2012). In the 1970s the term telecommuting was introduced. The main idea behind this way of working was to "...lessen pollution in the environment and give workers some flexibility and better work-life balance" (Narayanan et. al., 2017, p. 2). For some workers, it meant that work practices such as translating, transcribing and typing could be moved from the offices to the homes (Probert & Wajcman, 1988). But it was first in the 1980s that terms

like flexible work and telecommuting started to gain support and organizations slowly began to incorporate it. This was mainly because "... the combination of computer and telecommunications technology has made it technically feasible for large numbers of workers whose jobs involve information processing to work at terminals in their own homes" (Probert & Wajcman, 1988, p. 435).

In 1995 commercial vendors were able to provide the world with the internet (Grossmann, 2012). Which provided another shift in sites, with the virtual world now becoming available. The development opened up new possibilities as Baruch (2000) describes: "New forms of work consideration [...] depend on an effective use of information technology (IT)" (Baruch, 2000, p. 34). Technology was then described to be the chief for transforming jobs, hereto how to organize work for greater flexibility, responsiveness and effectiveness (Baruch, 2000). With the commercialization of the internet, further development of software applications that used the internet as an operating system followed (Grossman, 2012). Through this development, the application of web-based email was created. This software was on another machine where access happened through a web network. Meaning, that the information needed from others to perform certain work tasks was now available on one's own computer (Grossmann, 2012). After the provision of the internet, there appeared to be an increase in the use of computers amongst workers in white-collar jobs (Andries et. al., 2002). Andries et. al. (2002) describes that employees who used computers permanently, often worked with time pressure and little control of the work process, indicating that "...more computer density in the sector mean[t] more time pressure and less job control for those who use[d] a computer for (nearly) all of their working hours" (Andries et. al., 2010, p. 446).

As it slowly became more popular for organizations to offer employees flexible working options (Kelliher & Anderson, 2010), the invention of laptops created new opportunities for employees to change their work practice. Thus making remote work available. From an organizational perspective, using the laptop has had several positive effects as "Organizations may also benefit from increased individual productivity and the ability to access mobile workers who are traveling or working from remote sites" (Cousins & Robey, 2014, p. 35). Furthermore, the technology also made it possible for the employees to save time on commuting to and from work and they could hence use this time to work more (Kelliher & Anderson, 2010). This meant that workers in white-collar jobs began to use the computer permanently and in relation to this the employees showed signs of both physical and mental strain (Andries et. al., 2010). This thereby had some negative effects for the remote workers who showed signs of difficulties to both mentally and physically switch off from work (Kelliher & Anderson, 2010). On the contrary, there were also constraints, seen from an organizational perspective against telecommuting which had "...little to do with technology and the time it takes to commute but rather were related to supervisor unwillingness, concern about lack of visibility to management, household distractions, and a lack of self-discipline to do the work." (Hughes & Hans, 2001, p. 786). The employers were hence concerned with the loyalty of the employees working remotely.

As we have presented "...new practices often take hold at the expense of others which are no longer performed, or not performed as frequently as before" (Shove et al., 2012, p. 83). As we entered the fourth industrial revolution (in which we find ourselves today) the PC was supplemented by a whole range of other (mainly wireless) devices that are connected to the internet and are filled with applications (Grossman, 2012). The technology used in correlation to work practices are extended to online, mobile and social media platforms making manual tools less adequate. The platforms are described to improve communication and the connection with customers and thereby, increasing the revenues in organizations (Grewal et. al. 2020). As we transitioned from web-based applications to wireless devices, it was possible to carry a range of pocket devices that support email and other applications that make it easy to get in touch with anyone, at any day, at any time (Grossman, 2012). An application such as the email has been recognized to be associated with work-related stress (Wajcman, 2018). Through

the research of sociologist Wajcman (2018) it is discovered that "...the fact that we feel the need to respond to email quickly is not due to the speed of data transmission, or the frequency of communication, but because of collective norms that have built up about appropriate response times" (Wajcman, 2018, p. 171). Hence she argues that people feel rushed and pressured, which isn't due to new technologies and its applications, but the norms that exist within an organization and their underlying culture. Even though it is common to imagine the employee always facing the screen and ready to answer, Wajcman (2018) describes how leisure time in fact hasn't decreased over the past 50 years. Actually, the amount of time people spends with their family has increased. The pressure and feeling of bustle are here described not to stem from technology, but the priorities and cultural values we set ourselves (Wajcman, 2018). Miele & Tirabeni (2019) describes that "... organizational relations are shaped through new technologies..." (Miele & Tirabeni, 2020, p. 2) and the technology is described to be used to achieve communication and sharing of knowledge between a team of employees and hence bypass the leader. However, there is a risk that technology can be used to govern and impose control of employees, especially when employees have flexible work options (Miele & Tirabeni, 2020).

The internet (and the applications that followed) can be seen as the design that affects the stabilization of the work practice the most. When provided with such extreme amounts of data and intensive knowledge, people are able to be enlightened in a way not possible prior to the internet. This makes room for people to (a greater extent than before) take a stand and thereby see new possibilities that they did not know about before. Perceptions on how to be, live and act are now affected not only by the perception of the vast majority itself. People are able to seek knowledge from minorities and from their own point of view. Thus, shifting their elements of meanings and competencies in relation to the new material element (i.e., the internet).

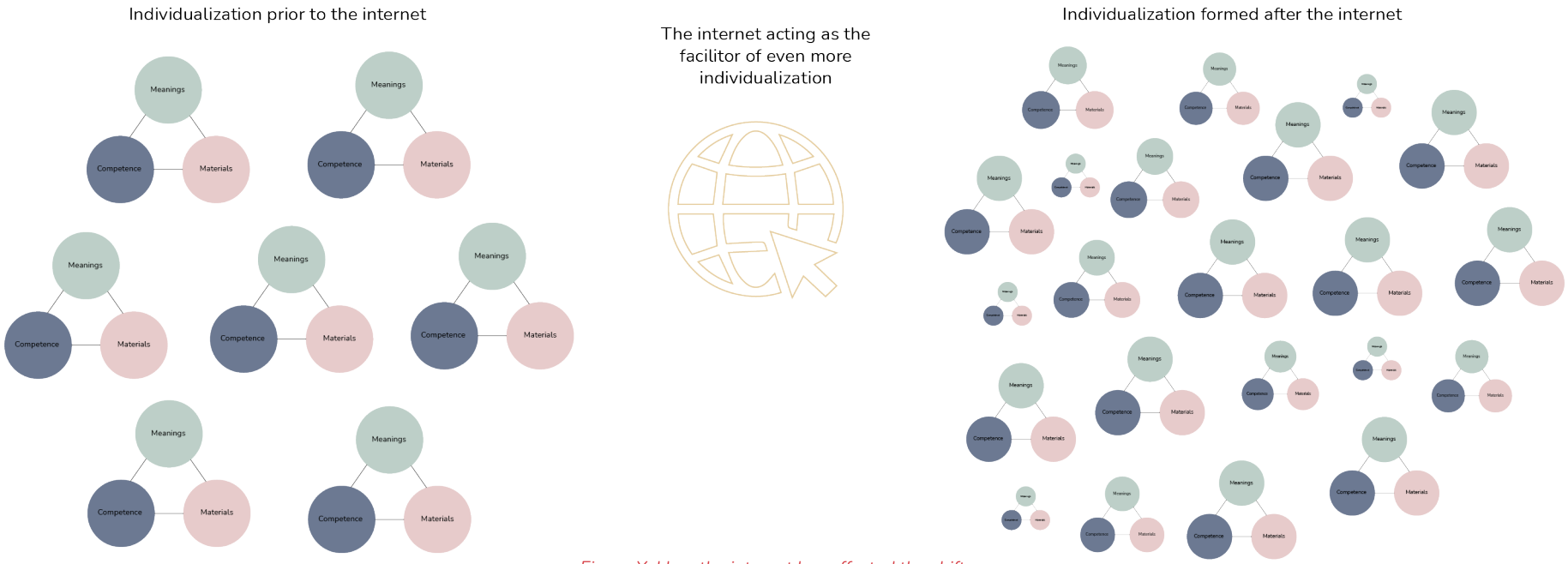


Figure X: How the internet has affected the shift towards even more individualized work practices.

Thus, the internet is acting as the facilitator of even more individualization as it becomes normalized to seek information outside conventional sources. Figure X shows how the work practice is no longer stabilized, due to the fact that people now establish socially shared meanings through a global network of information. Resulting in the creation of complex bundles of practices connected to work.

To summarize "...the notion of dominant design has been used to explain how certain products and technological solutions define the terms on which others compete (and collaborate)" (Shove et al., 2012, p. 91). We have established how the practice of work has followed a certain trajectory of development that has constituted the way we work today (see figure X). We recognized how different dominant designs have affected the way of working through time, as "...we live alongside the material traces of practices past..." (Shove et al., 2012, p. 34). Moving all the way from the stone age, through the industrial revolutions, we can more easily understand how the working practice has stabilized and again disrupted (i.e., has become more and more individualized) in today's knowledge-intensive society. Knowledge of this evolution is necessary in order to understand the perception of work seen by the vast majority today. This can make us able to create changes which can potentially lead to structural changes that can push the current collective work model into a more sustainable one. "Other changes occur when established ways of thinking and working are overturned, as when dominant dis-courses crumble and paradigms shift" (Shove et al., 2012, p. 58) and just as "...history shows that every structural change, every "revolution" has brought forward intense changes in the labor market. They have created new jobs, new opportunities, and new possibilities for gainful employment" (Zürcher, 2017, p. 164).

The technological development of electronics and IT thus "...act as dominant forces resulting in and perpetuating distinctive concentrations and accumula-tions of human and other resources, and consequently shaping path-ways of future development" (Shove et al., 2012, p. 83). Looking deeper into a knowledge-based society, a shift from collective

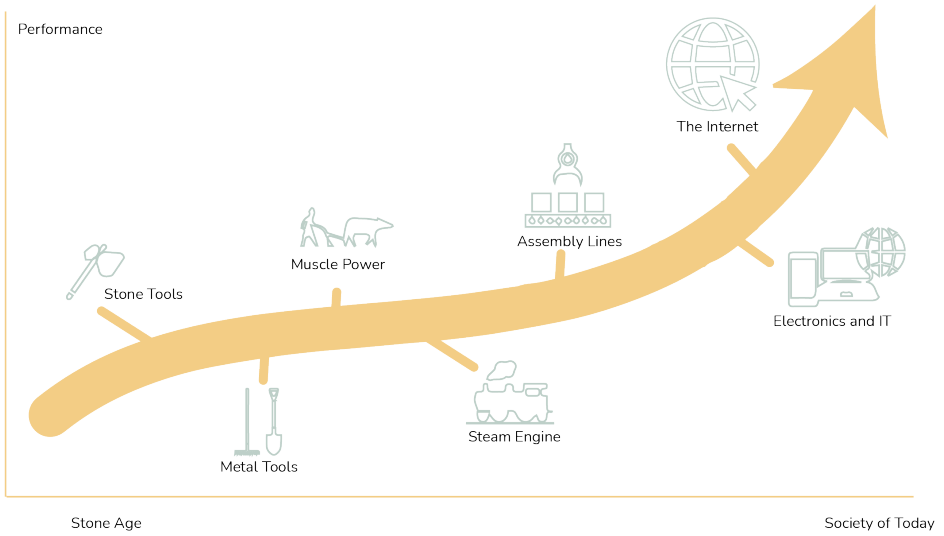


Figure X: The dominant designs related to the trajectory of development for the practice of work

work models towards more individual work models is required, since work practices have become more individualized and dependent on multiple different aspects.

3.3 Society of Today

The societal changes towards more individualized work models have barely evolved in line with the 3rd and 4th industrial revolutions. Today Danes follow a 37-hour workweek, which was enacted in 1990 (Arbejdermuseet, 2020) and typically is divided into a workweek of five days. The majority of white-collar workers still follow the 8-hour division and are working at an office from 8-16 (Kring, 2020).
It has been recognized by several scholars that flexible work increases the sense of autonomy amongst the employees (Miele & Tirabeni, 2020; Kelliher & Anderson, 2010) and employees have shown signs of an increase in job satisfaction, increase in productivity and greater employee loyalty and commitment when having the opportunity to

work more flexible. It has further been identified that "...flexible workers report lower levels of strain and stress" (Kelliher & Anderson, 2010, p. 84). But negative effects such as feelings of isolation and a decrease in job satisfaction have been related to working remotely. Kelliher & Anderson's (2010) research on remote work, describes how new sources of stress have appeared, and that there is reported "...greater evidence on mental ill health than for those based at the workplace" (Kelliher & Anderson, 2010, p. 85). Van der Lippe and Lippényi (2018) investigated whether or not working from home leads to more or less work-family conflicts. In the 1980 and 1990 (during the third industrial revolution) it was seen as cost-effective to work from home because of the options to eliminate work-family conflicts (Van Der Lippe & Lippényi, 2018). Felstead and Henseke (2017) claims that people who work remotely are "...more committed, enthusiastic and satisfied with their job than their conventionally located counterparts, but find it difficult to redraw the line be-tween home and work as predicted by border theory" (p. 208). It is furthermore claimed that, "...working from home reduces work–family conflict because it provides employees control over the scheduling of their workdays'' (Van Der Lippe & Lippényi, 2018, p. 385), but Van der Lippe and Lippényi (2018) also saw how "...working from home increases the permeability of boundaries between work and non-work domains because the physical boundaries between the two contexts are eliminated" (Van Der Lippe & Lippényi, 2018, p. 386). This blur is a threat to people's work-life balance (Appendix X: Work-life Balance) which according to Marsh (2010, May) can be achieved by attending to four sides in humans: The Intellectual, the emotional, the spiritual and the physical side. How to care for each of the four parts is inherently an individual matter and "If you don't design your life, someone else will design it for you, and you may just not like their idea of balance" (Marsh, 2010, may @3.12).

According to the national board of health (i.e., Sundhedsstyrelsen), mental health can be protected through different factors, categorized in 'individual', 'social' and 'structural' factors (Sundhedsstyrelsen, 2020, January 2). And although scholars have identified several positive and negative effects from telecommuting, Hughes & Hans (2001) describe how researchers "...failed to understand the importance of socializing as a source of worker satisfaction and the importance of coworkers in conducting many work assignments" (p. 786). A study performed by Ruiz-Castro and Lupu (2021, January) showed that 30% of the men and 50% of the women interviewed appeared to consciously resist working long hours. One of the danish proponents for shorter work weeks (in order to increase productivity) is Pernille G. Abildgaard, who is the founder of TAKE BACK TIME, a network-based company that argues for a 4-day workweek. Her argument is that "...today we have the tools to work much smarter, much more efficient than we had 30 years ago. At the same time, we are all longing for more time. Time has been our most important resource" (TEDx Talks, 2020, @11:17-11:28). She points to the fact that we no longer live in the industrial society and it therefore is not the length of the work time that determines how many tasks we get done. Instead, we live in an information and knowledge-based society, where our brains are the main production facility. She argues that it is "...the intensity of your work, which dictates how many tasks you get done in a day" (TEDx Talks, 2020, @1:44-1:53). Another danish advocate for increased flexibility in the labor market, is Camilla Kring, who has a Ph.D. in Work-Life Balance and is the founder of B-society. She shares the perception that we are currently operating in a labor market structured to suit the industrial society (Kring, 2020). She argues that value at that time was material in the form of products, machines, and buildings, and "...approximately 80% of a company's value was tangible valuables" (Kring, 2020, p. 125). The 8-hour division of the workday as a "...collective work model, where everyone had identical work hours, a set work location, and the same work rhythm, fit perfectly with the optimization of industrial labour" (Kring, 2020, p. 129). On the contrary, living in a "...knowledge society, more and more work is becoming invisible in its characteristic processes. Today, over 80% of a company's value is intangible values" (Kring, 2020, p. 126). With this argument, she states that "...a large percentage of work is now independent of time and place" (Kring, 2020, p. 126), and we must therefore design our own work practices in accordance.

In the study performed by Ruiz-Castro & Lupu (2021, January) they

found that even though the cases were different, a certain mental pattern for maintaining a work-life balance appeared. “Importantly, our research suggests that this is not a one-time fix, but rather, a cycle that we must engage in continuously as our circumstances and priorities evolve.” (Ruiz-Castro & Lupu, 2021, January, l. 23). This cycle consists of five ongoing steps which individuals must consider when trying to achieve balance; 1) Pause and reflect, 2) pay attention to emotions, 3) reprioritize, 4) consider alternatives and 5) implement changes (Ruiz-Castro & Lupu, 2021, January). However these are only possible if the employees are individually independent and therefore more or less able to structure their own work model.

The research and statements provided by the former, correspond well to what we found when investigating the historical trace of the work practice. We saw how the work practice changed from a stabilized practice, performed simultaneously by the vast majority to a bundle of different practices more focused on individual elements (section X, X, X). Due to the availability of information provided by the internet (discussed in section 3.2.2 The Information Society), practitioners’ elements (materials, competencies and meanings) are affected very differently, making the collective work models unsuitable for what is now the vast majority. We argue, as well as Kring (2020) and Abildgaard (TEDx Talks, 2020), that the fact that work models of today are collective, is disconnecting from the individualized evolution of the work practice. Thus, we believe that a transition towards more flexible and individualized work models is needed. We will argue that a transition is achieved with the occurrence of radical new innovation and through the theoretical lenses of Practice Theory, when practices surrounding practitioners’ work practices and the effects of those, are considered.

3.3.1 The COVID-19 Pandemic as a Window-of-opportunity

In March 2020 the World Health Organization (WHO), announced that the spread of COVID-19, were now so severe that it was categorized as a global pandemic (World Health Organization, 2020, June 29). This led to a global emergency preparedness and on March 11, 2020 the Danish government announced a complete lockdown of the country (Ottosen, & Ancher-Jensen, 2021, February 5). The lockdown forced organizations and essentially every working human (without a critical societal role) to quickly change and adapt to the new normal of working from home (Navrbjerg & Minbaeva, 2020a). According to chief consultant in Dansk Erhverv, Tina Buch Olsson (2020, July 30) at least 40% of employers inside the danish borders were working from their own homes, during the lockdown, which led to work and interactions being conducted almost solely online. Changing the site of the work practice to such a degree, must evidently cause disruptions with the way practitioners perform their practice. From one day to another the computer (as well as access to the internet) attaches to all work-related practices even more than before (Shove et al., 2012) and becomes an indispensable material element.

The final effects of the pandemic are yet to be seen, but various people have already experienced the opportunities as well as the consequences to what the danish media have been calling ‘a great experiment’ (e.g., Bernsen, 2020, March 25; Pedersen, 2020, November 6; Vilien, n.d.; and Mørck, 2020, December 27). Navrbjerg and Minbaeva (2020a) describe how organizations have been equipped differently to the shift into a virtual worksite, depending on how digitized they already were before the pandemic. Overall, three categories can be identified; 1) organizations who already worked with a high degree of digitization on a day-to-day basis, 2) organizations who needed one last push to take digital tools into seriously use and 3) organizations for whom digitalization had badly begun, prior to the pandemic (Navrbjerg & Minbaeva, 2020a, p.9). Furthermore, Ferreira et. al., (2020, October) states how virtual work “...is especially appropriate for knowledge-intensive, whi-

te-collar employees with considerable experience who work alone or whose output can be measured" (p. 21). They state how 80% of white-collar workers have been working remotely at some point during the pandemic.
Navrbjerg and Minbaeva (2020b) describe how the COVID-19 pandemic has had an influence on productivity and organization of work. Participants meet on time, are better prepared and not as easily interrupted (see appendix X Effectivity and Productivity). Furthermore, the lockdown led to a closer collaboration between leaders (Navrbjerg and Minbaeva, 2020b). Figure X illustrates how the organizational energy has increased and decreased during the first period of the lockdown. At first the energy increases because people are filled with euphoria about the situation and a spirit of togetherness is dominating the attitude. After time the curve breaks and people experience "the Corona-wall", where the situation is drawn out and the euphoria is gone (Navrbjerg & Minbaeva, 2020a). The curve has the possibility of continuing in three different directions according to how each company manages to take advantage of the situation as shown on the figure.

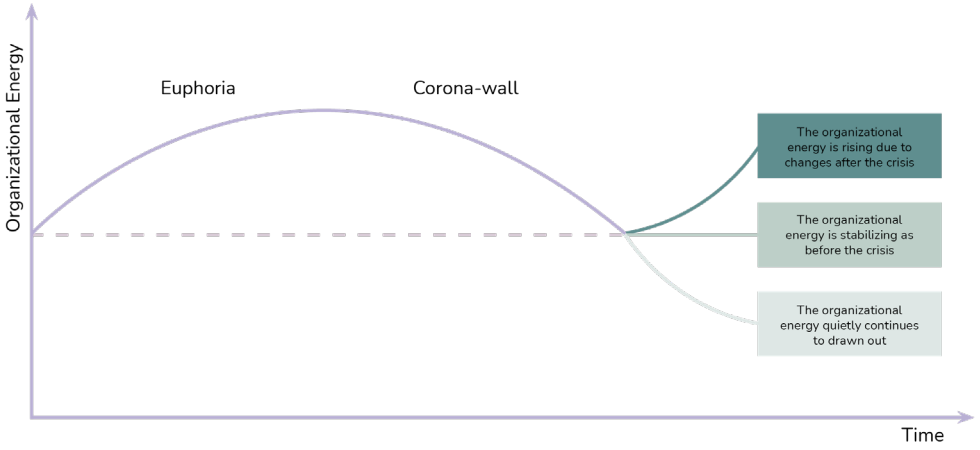


Figure X: Curve, illustrating the possibilities for organizational energy (Navrbjerg & Minbaeva, 2020a).

The pandemic forced people into a situation they had no influence on and many were involuntarily isolated from any social contact apart from online communication; "We have had to accept the silence, broken only by voices in the virtual world..." (Gao & Sai, 2020, p.759), which led to almost a 50% increase in loneliness (Hagemann, 2021, January 28). The psychologists Haren and Bang (2020, October 23) describe how people are in need of physical touch and presence and if not obtained loneliness can occur, due to the lack of oxytocin. The relation between isolation and loneliness is one of the largest obstacles for virtual workers (Bartel et al., 2012). It is especially the notion of silence that affects the feeling of loneliness as Gao and Sai (2020) puts it: "What comes out is the notion of drowning into the silence, being silenced by my reliance on expected engagement like face-to-face interactions, and being silenced by the aggravated loneliness under remote work" (Gao & Sai, 2020, p. 754).
Other health-related issues of this sudden change to a completely virtual site, is the connection to physical inactivity and the cause of zoom fatigueness (appendix X Health). According to Ricci, F., et al. (2020) The World Health Organization classified physical inactivity as the fourth leading risk factor accounting for 6% of global mortality. And this great increase in computer-related activities caused by the pandemic lockdown "...resulted in more sitting time inside the house and a lack of physical activity, leading to physical inactivity" (Selamet, 2020, p. 2). Not only does this kind of inactivity affect your physical health, it can also affect your cognitive skills when communicating (Thorsen, 2021, March 5). The drastic increase in video meetings resulted in the software Zoom becoming the leading software for video conferencing (Bailenson, 2021). Bailenson (2021) explains how the cognitive load on people during continuous video meetings can have psychological consequences, which he calls zoom fatigueness. During video conferences our brain works harder than during physical meetings, because face-to-face interaction and nonverbal communications are much more demanding (Thorsen, 2021, March 5). It is natural to get tired of looking at yourself and especially at such a close range as it is when using software like Zoom. Moreover, due to basic human instinct our brains are

not equipped to be within this short range of other peoples faces and it will therefore interpret it as being either the uprising of a fight or romance (Thorsen, 2021, March 5). But because the rational and logical part of our brains knows that this is not the case, the cognitive load is huge (Bailenson, 2021). Nonetheless, the solution is not necessarily to turn the camera off because "...those who attend conference calls frequently realize that audio-only conversations suffer as groups become larger. Inferring the attention of others is nearly impossible once there are more than a handful of people on a conference call..." (Bailenson, 2021, p. 8).

Working solely online thus meant that individuals were unable to attend to their physical and emotional side, as stated essential by Marsh (2010, May). And as stated in the previous section (3.3 Society of Today) remote work has the ability to increase the permeability of boundaries. Gao and Sai (2020) explain how they also have experienced the "...consequence of the blurring of boundaries between work and home" (p. 757) during the lockdown. In other words, the soft line between work time and leisure time, in correlation to a large amount of computer usage, made maintaining physical and mental health difficult and thereby restricted the possibility to preserve or achieve a work-life balance.

Other effects of the sudden change in the site are more environmentally related. As we moved into our homes the need for transportation decreased "..requiring less structured morning routines and thereby creating both a delayed morning load and reducing morning peaks" (Chen, et al. 2020, p. 2). If compared to each other the average of traffic in 2020 were higher than the average of traffic at the beginning of the year 2021 (see appendix X: Transportation). Especially interesting is the decline in cars by 30%. As transportation is responsible for around 45% of Europe's emissions of nitrogen oxides (European Environment Agency, 2020) it is valuable to recognize how a shift to working remotely has the potential of decreasing this number. Even though transportation time often is seen as a waste of time, 69% (of 1,014 asked) still said they missed some aspects of commuting (Rubin et al., 2020). Especially people with biking as their preferred vehicle, to and from their physical worksite felt the biggest deprivation, whereas people who preferred cars felt the least (Rubin et al., 2020). This could be related to the fact that riding the bike is considered a contribution to physical activity and thereby overall health. Rubin et al. (2020) also state how commuting time is important as they saw how a correlation between the increase in commuting time corresponded with a decrease in deprivation.
Because the pandemic affected the amount of time spent at the physical worksite, a significant change in household energy consumption was seen during the period of 2019 to 2020 (Nielsen & Jacobsen, 2020). The use of electricity especially increased during the daytime throughout the week, where people usually would have been at their physical worksite (see appendix X Workplace and employee expenses). On the other hand, not much changed during the weekend. This could potentially lead to, not only an increase in consumer bills (Chen et al,. 2020) but an increase in overall energy consumption, because of both residential home and commercial office buildings being used during work hours (Gillingham et al., 2020). Depending on the work practice being conducted at both sites simultaneously.

Despite the consequences presented, Felstead and Henseke (2017) suggest that shifting to the virtual site "...is, on the whole, advantageous to employers and employees. [...] while we may not be witnessing a full-bodied revolution, the detachment of work from place is undeniably an important aspect of the changing nature of work in the twenty-first century" (p. 208). The COVID-19 pandemic lockdown showed how a radical but temporary shift in the standardized work model was possible. It did not only force people to work differently, it also forced employers to see that radical change isn't to be feared as much as properly expected. Could the COVID-19 pandemic be the push needed for the transition towards individualized work models? Is it time to learn from the past and present experiences and design the next revolution of work? As the foundation for this thesis, we wish to explore the pandemic as a window-of-opportunity for investigating the disruption with

the collective work model. As a great experiment the pandemic has the possibility of showing us the opposite of business-as-usual and we are therefore able to extract new information based on the new experience of remote work. We believe that the pandemic can give us a great view of different perspectives on how practices around work are and could be performed in the future.

3.4 Sub-conclusion

We have through chapter 3 explored the historical trace of the work practice. We have explained how the practice was first stabilized through synchronization where the meaning of survival circulatated between practitioners (Shove et al., 2012). In line with the developments characterizing the historical period of the industrial society and thereby the first and second revolution, the meaning of the work practice changed. It was no longer 'survival', but 'surplus' which constituted the element of meaning for the work practice.

We have explained how different dominant designs, in the form of technological improvements such as the invention of the computer, followed by the internet, had a great impact on the trajectories of the work practice. This provided insight to how the third and fourth industrial revolution affected practitioners' elements in such a way that the first signs of disrupting the stabilized work practice became visible. We have thereby shown how "Elements of practice change over time" (Shove et al., 2012, p. 33) and thereby how the work practice went from being "...'black-boxed' to the extent that it constitut[ed] a single practice" (Shove et al., 2012, 83) to becoming more and more individualized through the course of time. We then proceeded to investigate whether the now individualized work practice can function in the collective work model. However, we discovered how the collective work model was intended to suit the work practice as an entity and therefore does not consider individual needs, preferences and practices. By tracing the work practice through time we can thereby conclude that there is a need for the creation of a framework for flexible work models, since it seems that the traditional perception of performing work does not fit with practitioners current work practices.

We then went on to unfold different perspectives, learnings and consequences caused by the global pandemic of COVID-19. With the intent to open up the possibility of this sudden and radical shift in work sites, being an opportunity for transitional change. Further on in the report we will explore if the pandemic has created a window-of-opportunity for constituting individualized work models.

During the investigation of the work practice through time, we have discovered aspects that must be considered when designing a framework for individualized and flexible work models. These are summarized into the followed design criteria where...

The framework must...

...provide insight to how division between work time and leisure time is established
...guide the user to consider inter-practice relations between and across the individuals' work practice
...help to understand the individual elements of material, meaning and competencies,
...help distinguish between suitable sites for performing the work practice in the best possible way

4 PRACTITIONERS IN ADVISING ENGINEERING ORGANIZATIONS

In the following section, we will shortly describe the reasoning for our choice of collaborators, as well as present the background for the empirical material that was used in order to conduct the following analysis. Furthermore, we will describe how three organizations, representing our target group of white-collar workers, are dealing with offering remote work. We will furthermore elaborate on their concerns in relation to the changing sites of work.

Subsequently, we will explore practices of employees working within the three organizations. Their practices have been investigated through online workshops, which serves the foundation of the analysis. Through analysing data gathered from different exercises in the online workshops, we will start by exploring practices as observable behavior, afterwards moving into understanding the complexity of practices-as-entities, which leads us to the identification of breakdowns regarding physical and remote work sites. Thus, the chapter will end concluding on the findings achieved throughout this analysis of both employers and employees.

4.1 Our Collaboration with Advising Engineering Organizations

In chapter 3 The Historical Trace of the Work Practice we recognized that white-collar employees are typically not restricted by large tools that are fixed to a specific location but use tools such as laptops, which are easier transported from one location to another (see Appendix XX: Establishment of Project Collaborator). Ferreira et. al., (2020, October) states how flexible work "...is especially appropriate for knowledge-intensive, white-collar employees with considerable experience who work alone or whose output can be measured" (p. 21) making them our target group. In the process of finding suitable collaborators for the project, we wanted them not only to be white-collar workers, but also from places of work that could potentially become our own. In this process, we researched the potential for influencing organizations in a variety of different businesses. Taking these points into consideration, we chose to contact a variety of advising engineering organizations with headquarters located in Denmark. This led to the establishment of contact with three advising engineering organizations. These are all large-scale advising engineering organizations (Definition from DST (2016)).

4.2 The Organizations Relations to Remote Work

Through a meeting and an online intervention with two employers from organization N, whom we in this thesis refer to as NL1 and NL2, we discovered how this organization currently do not have a policy related to working from home as NL1 stated: "...we do not have one today at all, or yes, one can say the one we have is that we do not really offer home jobs. It is not such a part of our way of working..." (NL1, establishing collaboration, February 2, 2021). She did express the need for creating such a policy and how it is rooted in the organization "...having an obligation in relation to the work environment [legislation] and the labor inspectorate" (NL1, establishing collaboration, February 2, 2021). Furthermore, the lack of a policy results in organization N having less control over who has an assignment, what the assignment is about, and which tools the organizations should deliver (NL2, online intervention, May 5, 2021). The lack of policy has resulted in them having difficulties in making demands of the employees because they do not have a formal agreement with them (NL1, establishing collaboration, February 2, 2021). Although this policy is not a part of their work methods, it does not mean that they do not wish to offer employees the opportunity of performing work from home or elsewhere. It seems that their need for including a policy for remote work stems from a need to have more control of what the employees actually are doing when working remotely, and thereby not in order to accommodate the needs of the employees.
A more strict approach was presented by organization N as they expressed a need for including demands for the employees in such policy. NL2 expressed a need for making demands for the time schedules the employees should follow. In her perception "...8-16 that is where we work. It's in their contract. And that's where they're available to customers" (NL2, online intervention, May 5, 2021).
Organization I, had another approach in regards to their work model. As IL1 expressed how they recently have had a focus on flexibility: "it has more been the idea of flexibility: short working days, maybe weekends, maybe in the evenings, so simply so that it suits one's daily life" (IL1, online intervention, May 25, 2021). Hence, their definition of flexibility focuses on flexible working schedules, where it seems that the employees can work in time slots of their own choice. We are unsure whether this flexible work model is applied as such, as another employer expressed that their work model is defined through a conversation between the individual employee and their respective employer (IL2, e-mail correspondence, May 27, 2021). Hence it seems that this model is not necessarily applied, as it depends on the demands of the employer of the section in which the employee is a part.

Neither employer IL1, IL2 or NL2 expressed how the negotiation of the employees' work schedule takes place in practice, and it hence seems that both organizations are putting a lot of responsibility on the employees to figure out how to meet their individual needs, without them

having received any tools or guidance on how to do so. This shows that their way of currently handling their employees working remotely, lacks an understanding of the individualized work practice, as both organizations do not provide any means to define what the needs of the employees are.

Although these organizations seem to have different approaches to remote work, they are all subjects to the Danish Work Environment Legislation. This legislation still applies when the work is carried out from home. However, the rules are limited in the areas of; physical facilities of the workplace (such as the home office), work in front of a computer, the organizations' safety and health, and rest periods/ days off (For further elaboration see Appendix XX: Work Environment Legislation). This legislation applies to employees working from home from one day a week to full time (Arbejdstilsynet, 2014). A remote work policy must therefore meet the requirements of the Danish Work Environment Legislation.

Besides having thoughts on how the work should be performed remotely, the three organizations expressed concerns about the actual shift in sites from working 'at the office' to working 'at home'. Organization N struggles with how they can accommodate the material needs of the employees because they "...offer the employees a lot of facilities that are physically present at the location of the office. It can be a gym, fruit, coffee, tea, dry cleaning service, massage, there are many services which are only available when you enter the office, that means that you will not have access to them when you sit at home" (NL2, establishing collaboration, February 2, 2021). The concern of employees not having access to all these services stems from it leading to the organization not being able to offer similar services in the future. This is because, if fewer of the employees show up at the office they will not be able to provide the services anymore as NL 2 stated: "We calculate [the services] after we have an expectation of a certain number of users, so we can get the good prices. But if we suddenly have half that number of users, then we may not be able to offer those services anymore..." (NL2, establishing collaboration, February 2, 2021).

Organization I, had a concern about what their physical work site should provide the employees in the future. IL1 expressed the need for accommodating physical meetings and informal dialogue because their office space has become too small for every employee to have their own desk. This is due to them renovating their office space and at the same time having hired more employees within the recent year, than their office capacity allows. Changing the location of which the practice of the employees is performed, can affect the elements of which the practice consist as the practice of 'working' has different meanings, materials and competence depending on the site of which the work is performed, thus these elements are mutually shaping (Shove et al., 2012).

Furthermore, IL1 expressed that redefining the office space of organization I is not only due to lack of space and the big renovation currently taking place, but also due to one of their environmental goals, as IL1 stated that they are "...taking the opportunity to save some CO2 by not driving so much in cars, because we will work more at home" (IL1, online intervention, May 25, 2021). Likewise, organization R "...focuses on an environmental aspect, as 50% of those who work in the office come from far away [...] So transport in and out still takes up a lot" (R1, online workshop, March 17, 2021). Hence it seems that an initiative of reducing the amount of transportation carried out by the employees of organization I and R is a concern to them. Although setting these types of environmental goals in the organizations seems like a great idea, it seems that framing these goals is at the expense of the employees' individual work practice. It seems that they do not consider the needs of the employees who prefer working at the office, or those where the concept of 'commuting' plays an important part in the meaning that constitutes their work practice.

It seems that the work models for remote work, as presented by the organizations, are not considering the needs of the individual employees. Even though organization I, attempt to align the work practice of

the employees with their respective employer, they do not provide any tools for this negotiation. Moreover, flexible working is not a part of the work model in Organization N, as it makes it more difficult to control what the employees are doing during their workday. However, all three organizations have expressed the desire to offer remote work opportunities to a greater extent, after the pandemic. But as it seems now they struggle making it a reality and have the risk of falling back to old patterns after the lockdown requirements are lifted.

4.3 Identification of Shared Practices

The vision of an organizational agenda is achieved through practices performed by the employees, who each contribute in different ways through different practices. Hence, we suggest that work models must be provided to accommodate employees' needs.
In order to recognize the needs, we aimed to investigate work practices of employees working in the three organizations. This was done through online workshops with a total of seven employees from the three organizations, who participated either alone or together as colleagues in groups of two. The workshop consisted of the following four exercises; 1) The Sequence Mapping, 2) The Matrix, 3) Pros & Cons and 4) Barometer. The first called Sequence Mapping is described in Box X and analyzed in the following. Subsequently, is the Matrix and Pros & Cons described in Box X, and outputs of these two exercises are presented and analyzed in section 4.4 Work Practices of Practitioners. At last, information gathered from the fourth exercise (Barometer) is used in section 4.4.1 Flexible Work Models. The information gained through online workshops with the seven employees provides the foundation of our analysis of employees working within advising engineering organizations. However, the perceptions shared in this analysis is only a selection of the total data gathered (Appendix X Quote mapping). Following the PT vocabulary, each participant at the workshop is identified as practitioners carrying out practices. Thus, we will throughout our analysis refer to them accordingly.

Process box: Purpose of Online Workshop and Exercise One

In the aim of identifying practices related to working in advising engineering organizations, a total of five online workshops were held. Using the framework of negotiation spaces (Section 2.2.1), we facilitated a space for participants to interpret and express concerns in relation to the problem framing of physical attendance vs. remote work. The space was developed and facilitated through the theoretical perspective of Communities of Practice (CoP), which was the initial theoretical approach of the project (Box XCoP). Hence, the purpose was to identify how tacit knowledge exists among members engaging in shared communities on a regular basis. As a means to bring voice to tacit knowledge and support mediation of knowledge between our and the participants' knowledge worlds, the method of a boundary object was used (Section 2.2.2). The boundary objects were presented in the form of four exercises, which guided the structure of the workshop. The spaces were facilitated through the online platform Miro (an online whiteboard for visual collaboration), which was used as a main stage for the workshop. Using this platform as the main stage for the negotiations, participants were thereby able to create, move and negotiate elements that supported the dialogue based on the four exercises. As several workshops were facilitated, the spaces needed to be re-framed to fit the participants invited into the space and taking feedback of previous workshops into account.

Engaging into the space with only the prior knowledge of the participants' job titles, our desire for the first exercise (called the Sequence Mapping) was to understand how the employees in their daily work, through different tasks, contribute and create value for the respective organization. Participants were asked to map work tasks on post-its and place them in a template (Figure X).

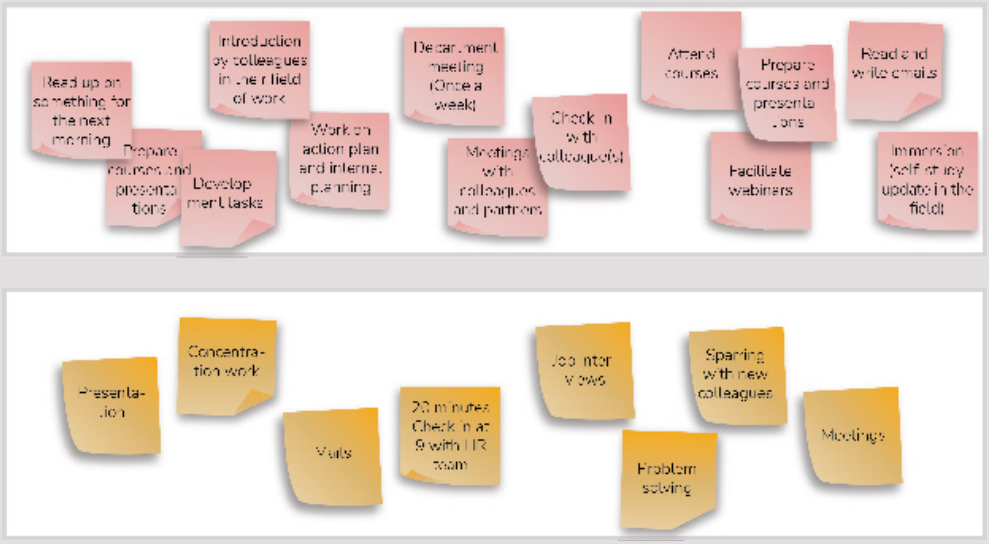


Figure X: Mapping of Work Tasks

The Sequence Mapping was changed and re-framed as we learned through workshops with different participants. The changes were done with the aim of making it the most effective boundary object for mediating knowledge. The initial template invited the participant to map work-related tasks of a typical workday in a sequence from morning to evening. However, we quickly experienced that the participants felt limited by the template with statements such as: "There are no days that are the same" (R1, online workshop, March 17, 2021) and "It is very different which tasks you perform in relation to the working day." (R3, online workshop, April 6, 2021). Therefore, we made the first exercise more low-fidelity giving the participant more freedom to interpret according to what they felt relevant. However, in every introduction for this exercise, we shared our own typical study related work tasks as a means to spark the imagination.

Shifting the theoretical perspective of the project to Practice theory, knowledge abstracted from this exercise provided only information about the observable behavior, however it served as a foundation for further investigation of practices as entities.

First we aimed to start the investigation by clarifying work practices of employees working in advising engineering organizations. The empirical data gathered for this purpose was as mentioned achieved through the first exercise (The Sequence Mapping) in the online workshops (Box X). Each participant was asked to write down as many work tasks they could, which they performed on a weekly basis. For some, the exercise was supported by clarifying questions. The participants shared thoughts such as "We usually start with a check-in with the team in the morning" (R1, online workshop, March 17, 2021) and "I spend a lot of time on the phone talking to different people" (N2, online workshop, March 29, 2021). Comments like these were written down on post-its representing work practices performed by the respective participant. The output of the exercise was a list of different practices (identified by the participants themselves) and included: Attending check-in meetings, send and answer emails, management of finances and many more (see figure X).

In the processing of the collected data, similarities occurred among the practices of each employee. When comparing the individual lists of work practices, similarities were recognized and despite our relatively small group of participants, it provided insights into multiple shared practices of working within advising engineering organizations. The processing of data gathered, resulted in the identification of seven collectively shared practices, illustrated in figure X4.0.

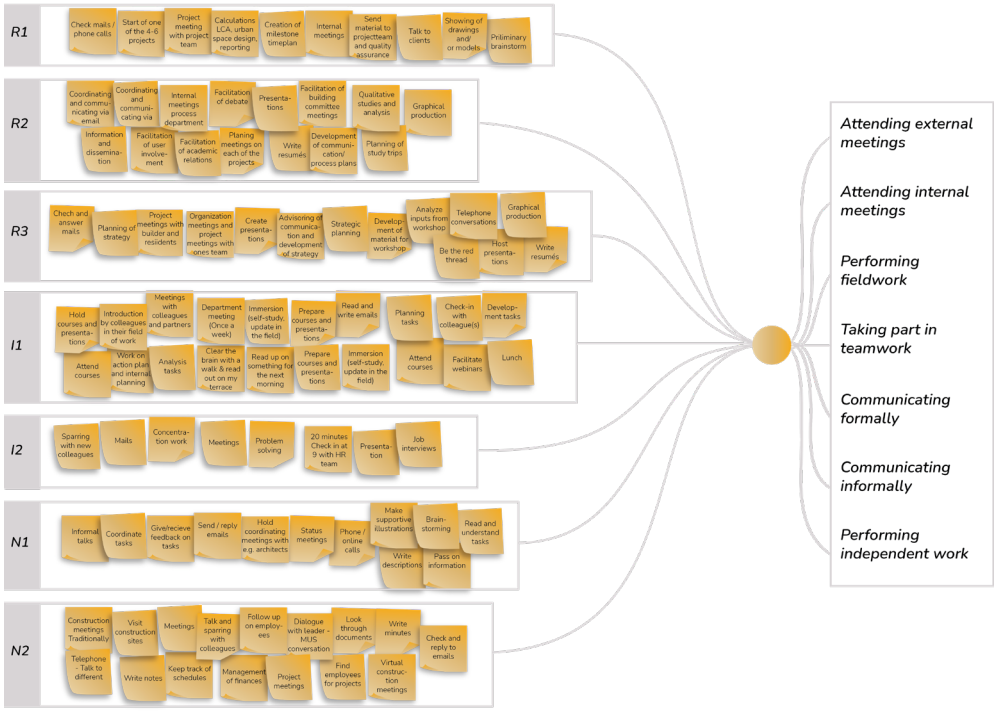


Figure X: 4.0

Each of the seven shared practices is thus constituted by several practices of the individuals. The shared work practice: Development work, is for example constituted by individual practices such as preparation of communication/process plans, brainstorming, analyzing data etc. Hence, the shared practice is a reduction of practices identified by each participant and provides an insight into more general shared practices across the three organizations (Shove et al., 2012).

Identification of each practitioners' practices as well as shared practices, served as a crucial starting point for the sake of understanding core practices of employees working within advising engineering organizations. However, knowledge solely based on the first exercise (Sequence Mapping), provided only information about the practitioners' observable behavior, which according to Spurling et al (2013) "...is just the tip of the iceberg" (p. 21). Hence a more in-depth investigation and analysis will be presented in the following.

Process box: Exercise Two and Three

Exercise two and three of the online workshops were (like exercise one) developed in accordance with the initial theoretical perspective of Communities of Practice (CoP). The purpose of exercise two, called The Matrix, was to understand how each work task (those mentioned by the participants in exercise one) was best performed according to the participants themselves. We wanted to get insight into the preferred location (physical or remote) and whether they wished to perform the task individually or as part of a team. Hence, through the lenses of CoP (Box XCoP) the exercise would preferably provide insights into when employees engage in communities by sharing knowledge in collaboration with others and moreover when employees engage in the organizational defined community through physical presence. Furthermore, the exercise was intentionally made to spark dialogue on the subject of 'physical attendance vs. remote work', using the participants' knowledge on their work prior to and whilst being in a pandemic lockdown.

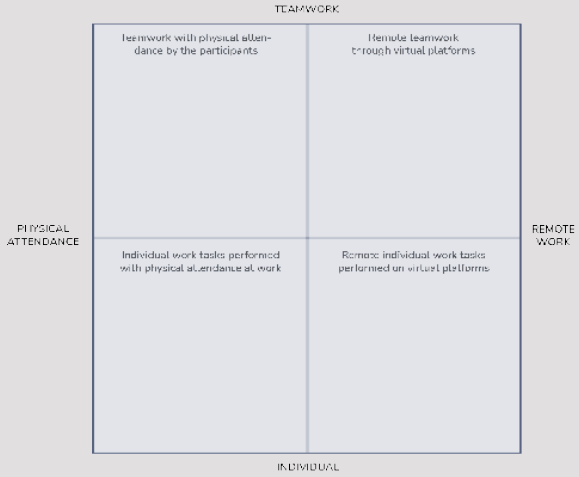


Figure X: The Matrix

The Matrix was designed as a boundary object to support mediation of knowledge between our and the participants' knowledge worlds (Carlile, 2002). Using the platform Miro, the participants could place their formerly mentioned work tasks (from The Sequence Mapping) in the matrix depending on how they themselves preferred to perform the work. The Matrix consisted of four predefined categories as seen in figure X; 1) Teamwork with physical attendance by the participants, 2) remote teamwork through virtual platforms, 3) individual work tasks performed with physical attendance at work and 4) remote individual work tasks performed on virtual platforms. However, the participants were encouraged to place their work tasks more to the corner or even between the four categories, according to their priorities.

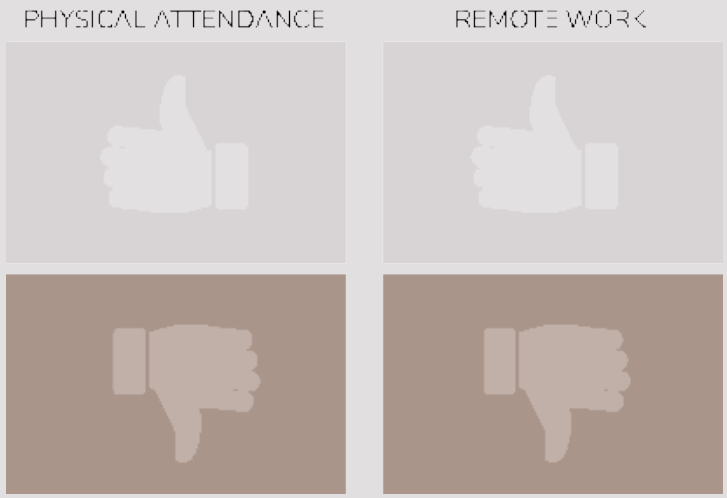


Figure X: Pros and Cons

Exercise three of the online workshop, called Pros & Cons, was similarly created as a boundary object with the purpose of understanding positive as well as negative aspects of physical attendance and remote work.

The purpose was to get the participants to openly reflect upon their perspective on the two work sites, in order to better understand what a potential good work practice could be for each individual. Thus, using the platform Miro, the Pros & Cons was designed as simple as possible in order to get the participant to associate this exercise with commonly known pros and cons-lists (as seen in figure X).

During the performance of the workshops, the Pros & Cons exercise showed how the positive aspects of physical attendance are typically the opposite of the negative aspects of remote work and vice versa. Even though it to some extent was a given, it had the possibility of steering the conversation depending on which aspects were talked about first. As an example, if the participant mentioned a negative aspect to physical attendance, it sparked a conversation on why it was seen as negative, whereas the opposite would just be stated as "it's just the opposite" (I2, online workshop, March 18, 2021) and not sparking much of a conversation as to why.
Furthermore, it came to our knowledge how the parameters: Physical attendance and remote work, (used in exercise two and three) can be understood very differently depending on the individual. Our initial thought was for physical attendance to be understood as at the office, but it became clear that for the participants it could also be understood as at a certain work site or other places where physical attendance used to be obligated prior to the pandemic. Furthermore, the phrase; remote work, can either be seen as virtual work or working at facilities that are not part of the organization, e.g., a café or at home. These different perspectives should not necessarily be ranked according to each other but being aware of what perspective the participant is using, can be crucial for the outcome and mutual understanding of the conversations. Hence, the boundary object lacked the element of creating shared syntax at the boundary between us and them. In retrospect, the online workshops needed a more strict definition of the two locations, either in the sense of terminology or by addressing the participants definition prior to the exercise.

Although exercise two and three initially were created to achieve knowledge about members' practices as part of communities, much information was likewise provided when analyzing the output through the theoretical lenses of Practice Theory.

4.4 Work Practices of Practitioners

As shared practices were identified, a need occurred to unfold each practitioners' practices, since "...changing these seemingly 'individual actions' (performances) requires understanding and intervening in the practice entity" (Spurling et al., 2013, p. 21). The desire was thereby to understand not only the practice based on observable behavior, but practice-as-entities constituted by the three elements: materials, meanings, and competences. When "...understanding practices as 'entities' reveals that rather than being the result of individual choice, such actions are social" (Spurling et al., 2013, p. 21).

However, participants of our online workshops are important because they are carriers of practices (as practitioners), combining elements of which practices are made. According to Shove et al (2012) it is "...in the moment of doing, [that] practitioners (those who do) simultaneously reproduce the practices in which they are engaged and the elements of which these practices are made" (p. 22). Hence, to move beneath the surface and explore practice-as-entities, we analyzed data gathered through exercise two (the Matrix) and three (Pros & Cons) in the online workshops (Box X). Insights gathered through these exercises, made us able to map out each practitioner's practices within the seven shared ones (Section 4.3). Figure X illustrates an example of one of these mappings, whereas the other ones can be found in appendix X Individual Mappings.

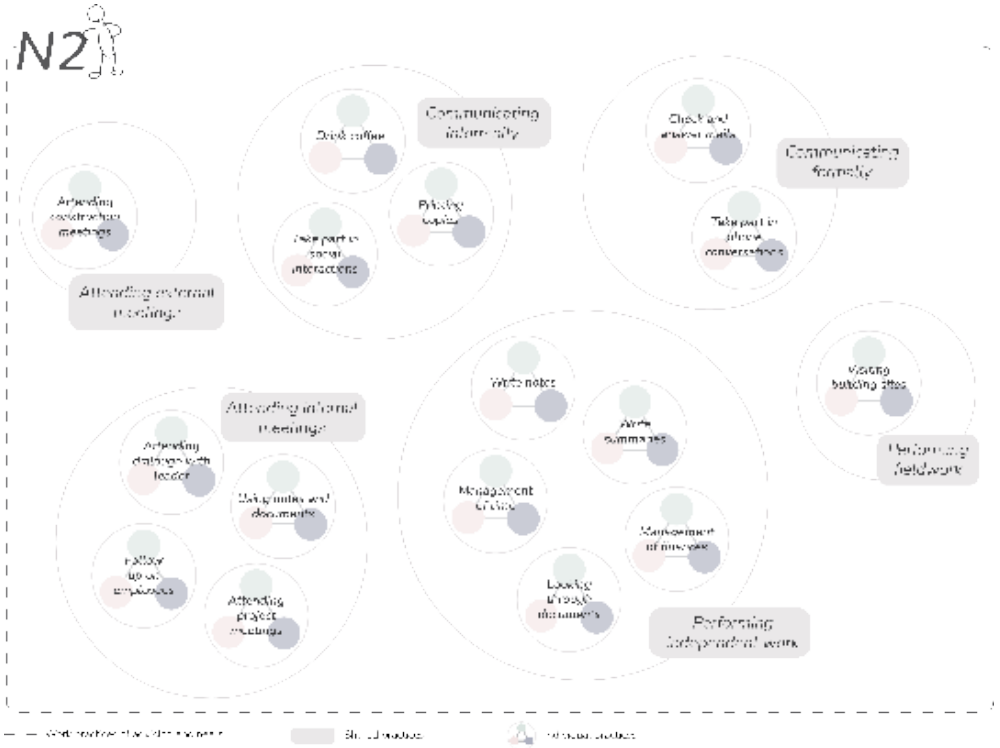


Figure X: Example of X mappings of practitioners diverse practices

Based on the individual mappings of practices, we aimed to explore how practices are constituted by the three elements; materials, meanings and competences, and how these seemingly individual practices interlink with practices of other practitioners.
In order to do so, we start by unfolding information gathered through exercise two (the Matrix) of the online workshops. The purpose of this exercise was to make each practitioner reflect on their preferences regarding physical and remote work practices, related to the previously identified practices (Section 4.3). When comparing all the practitioners' preferences regarding physical and remote work sites (Appendix X Work site preferences), we identified that the majority preferred to perform the following four (out of the seven shared

practices) in physical work sites: 1) Attending External Meetings, 2) Taking Part in Teamwork, 3) Communicating Informally and 4) Performing Fieldwork (see figure X4.1). In the following we will unfold different practices from the individual mappings in order to explore the reasons behind these preferences of physical work sites.

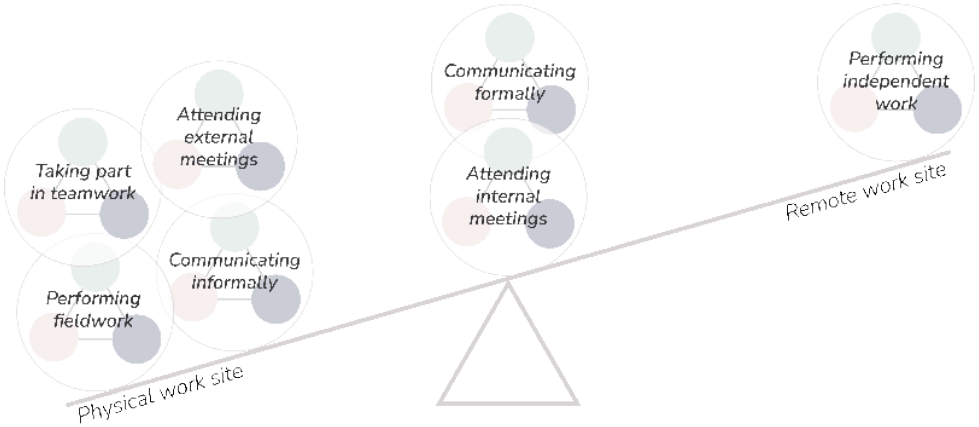


Figure X: 4.1

Attending External Meetings can, according to practitioner R3, not even take place in remote work sites. Based on her individual mapping, the shared practice of Attending External Meetings is constituted by the following three practices: Attending project meetings, attending resident meetings and attending meetings with builders (Appendix Individual mappings). She finds the meetings with residents especially difficult because they do not have the competencies to take part in the online meetings. She expressed that "...our target audience can not figure it out. They do not thrive in it. Especially in resident meetings" (R3, online workshop, April 6, 2021). Thus practitioner R3's practice of attending resident meetings is dependent on competences by others (Figure X). This means that the difference of competence of how to attend online meetings can lead to a stage of de-formation, meaning that links between these practices are no longer being made (Shove et al., 2012).. Thus making it a high priority for R3 to perform the practice of 'attending resident meetings' in a physical setting.

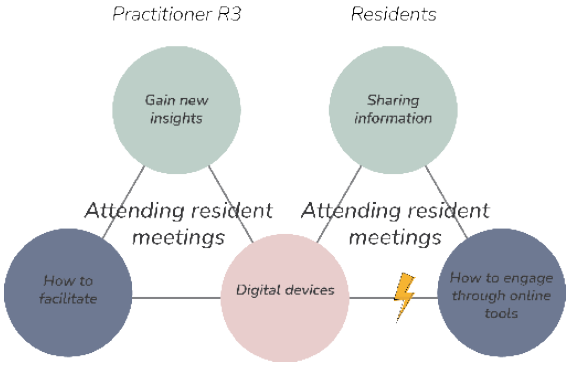


Figure X: Attending resident meetings performed in remote work sites

In regard to the shared practice of Taking Part in Teamwork, practitioner R2 is brainstorming as one of her practices constituting the shared (Appendix Individual mappings). In relation to this practice, she expressed that "It is nice to sit with one's colleagues and decide the frames of the task. Then you can use whiteboards to draw or bring some papers to look at together" (R2, online workshop, April 6, 2021). This means that the element of materials in this practice of 'brainstorming' consists of physical tools such as whiteboards, drawing tools and papers (figure X). In this practice, materials play an important role, thus affecting the element of meaning and competence. Re-locating the site of the practice changes these material elements, thus affecting the elements constituting this practice.

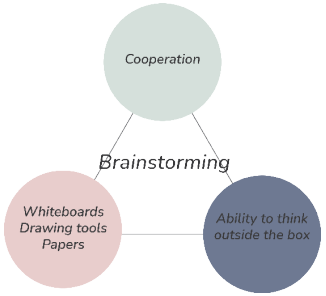


Figure X: The practice of brainstorming

In regards to communicating informally, when unfolding the individual practices of practitioner N1, it entails the following four practices: Sensing of where and who to ask about different tasks, create an overview of the status of peoples different tasks, talk to colleagues for fun, and getting and receiving help (see figure X). She expressed that "Part of my job [...] is also to know and have a sense of where and who to ask about different tasks and therefore the informal talks in the office are important" (N1, online workshop, March 25, 2021). Thus, when working remotely, she experienced that "...you do not get as many inputs when you sit in your own home" (N1, online workshop, March 25, 2021). The site is thereby challenging her ability to perform other work practices properly.

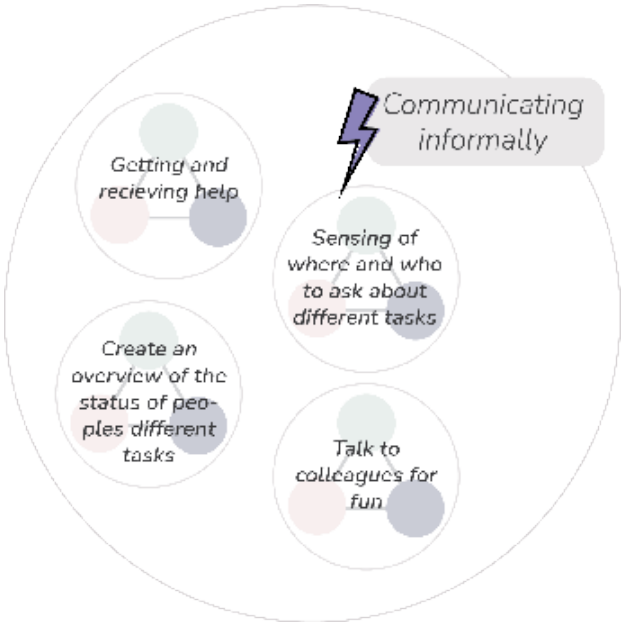
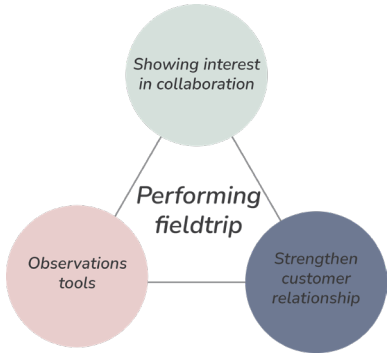


Figure X: The practice of communicating informally

Practitioner N1's practice of 'Communicating Informally' is interlinked with her colleagues' practices of the same matter. These practices are co-dependent, as her practice of 'communicating informally' would not exist if her employees did not share similar practices. This further highlights that "...cross-practice connection[s] are inextricably interwoven" (Shove et al., 2012, p. 87).. When changing the site of which these practices of 'Communicating Informally' takes place, some elements in which N1's practices consist are broken, as she states: "There are some other natural things you just grasp in [the physical] situations" (N1, online workshop, March 25, 2021) as her competence of reading body language is detached when performing the practice remote.



When it comes to the practice of Performing Fieldwork, physical work sites must be understood as physical presence in the field under investigation, and not in the organizational building. Practitioner R1 is performing field trips as a regular part of his work (Appendix Individual mappings) and he expressed that "You get a different relationship with the customer when you are out in their environment and see each other" (R1, online workshop, March 17, 2021). According to him it "... show[s] that you want this relationship. [...] The fact that you show up at their office and take your time. There is a lot of value in that. So it should be prioritized as a physical meeting" (R1, online workshop, March 17, 2021). Thus, the meaning (showing interest in collaboration) of performing field trips is at high dominance of his practice.

Moving on to preferences on remote work sites, the majority of the practitioners preferred to perform independent work in a remote setting. One of the practitioners argued that "The advantage of a home-based workplace is that, for me at least, it's easier to immerse myself in some things and concentrate on some things" (N2, online workshop, March

29, 2021). For this practitioner independent work was constituted by the following practices: write notes, write summaries, management of time, management of finances and looking through documents (Appendix X Individuel mappings).

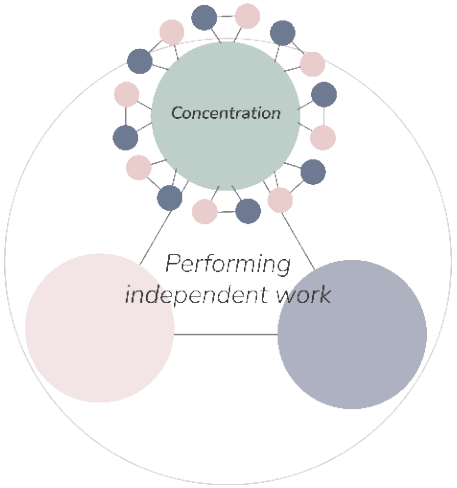


Figure X: The practice of performing independent work

Although preferring to Perform Independent Work remotely, concerns were shared about management of time when he said: "I think the biggest hurdle for people when they sit at home is this about being able to manage time. [...] That you are focused on [work] and not just slipping into everything else" (N2, online workshop, March 29, 2021). Thus, work practices performed remotely might interfere with other practices performed at home.

However, in regards to the practice of Performing Independent Work, all practitioners agreed that remote work sites supported better circumstances for concentration. This shows that besides a range of different practices concerning the performance of independent work, a shared meaning (concentration) is circulating among them (see figure X4.2). In a PT perspective this illustrates the "...distinction between elements – which can and do travel – and practices, viewed as necessarily localized, necessarily situated instances of integration (which do not travel)" (Shove et al., 2012, p. 39).

For the last two shared practices (i.e., Attending Internal Meetings and Communicating Formally) the participants' preferences were distributed equally on the physical and remote work sites (Figure X4.1). One participant argued for remote work sites when Attending Internal Meetings because as he said: "If you have employees on a case that sits in different places and you have to facilitate a design meeting [...] then it makes sense to hold these meetings virtually instead of having to spend time and energy on meeting physically" (N2, online workshop, March 29, 2021). On the contrary another participant argues for Attending Internal Meetings physically because "Often the physical is the most beneficial [...]. I think there would be more dialogue at our meetings if everyone were present physically than now where we sit on Teams" (R3, online workshop, April 6, 2021). And further claims that: "Now you optimize instead where you sit and check emails in the meantime" (R3, online workshop, April 6, 2021). Following this perception, the practice of Attending Internal Meetings forms formations through inter-practice relations to the practice of Communicating Formally. As this example shows, practices bundle together, "Just as elements are linked together to form recognizable practices, so [do] practices link, one to another, to form bundles and complexes" (Shove et al., 2012 p. 81). The two different perceptions on Attending Internal Meetings, does furthermore show how different meanings are constituting the practitioners' different practices (Figure X).

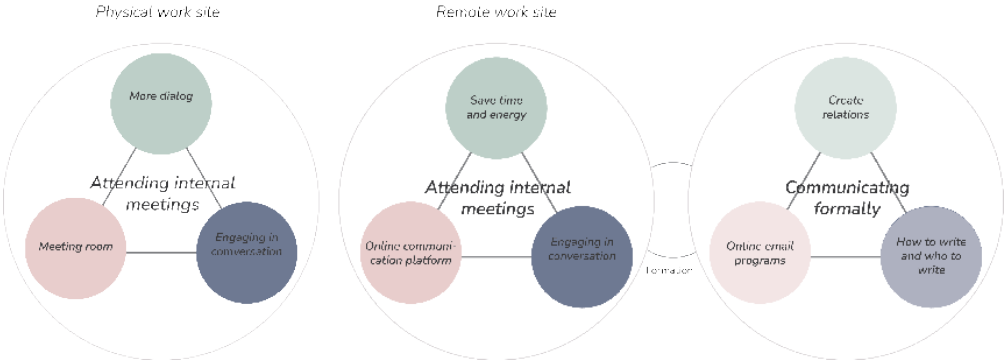


Figure X:

To summarize, as one of the participants recognized for herself: “It depends a lot on the task whether I prefer physical or remote” (N1, online workshop, March 25, 2021). In order to further understand not only their preferences, but the underlying reasons for these preferences, exercise three (Pros & Cons) of the workshop supported reflections on the advantages and disadvantages of work practices performed at physical and remote work sites (see box X).

In regards to information gathered on physical work sites, many perceptions were concerned with informal communication. Practitioners mentioned ”The informal talk with colleagues [as] definitely one of those which are [a pro] on physical presence” (N2, online workshop, March 29, 2021). The practice of Informally Communicating was for many inseparable from the physical work site. Three practitioners associated it with the material element of a coffee machine (Appendix 8 Individual mappings). One argued that ”...when you go out to the coffee machine [...] you just come past someone and talk to them about something, where it doesn’t get so formal” (N2, online workshop, March 29, 2021). The material element of a coffee machine is thereby connecting both the practice of making coffee as well as the shared practice of Communicating Informally (see figure X4.3).

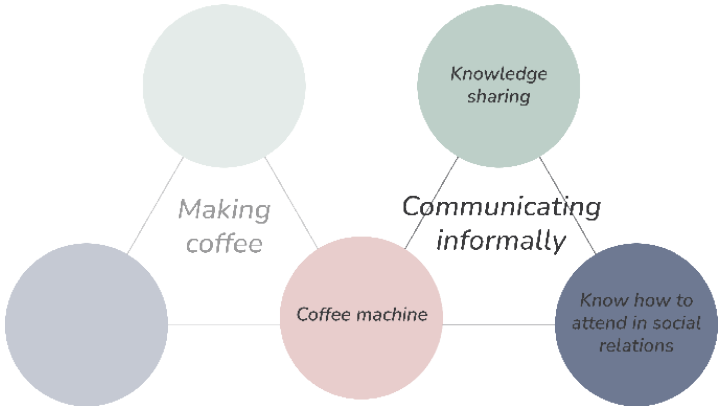


Figure X: 4.3

Thus working remote practitioners are more likely to detach from the practice of Communicating Informally. As R1 describes, ”The relationship with your colleagues is the most important thing. [...] You cannot have a cup of coffee together and talk about something other than work” (R1, online workshop, March 17, 2021).
This means that the remote work site potentially has the risk of creating a detachment to the associating with being social at work (part of the meaning for the practice of Communicating Informally). The concept of what ‘being social’ means “...are important for what happens where, and hence for the range of practices likely to be reproduced in any one space” (Shove et al., 2012, p. 84). Shove et al, (2012) describes how classification and association are important factors for the element of meaning to spread and move between practices. In relation to the practice of Communicating Informally, it is therefore important how practitioners classify the concept of being social. This is because if it is only associated with physically being at the office, a fully remote working model will create a detachment of the meaning, where links are no longer being made, making Communicating Informally an ex-practice (Shove et al., 2012). It is important to understand how this can have negative effects on employees’ well-being as R1 states “It is important to have [the informal communication] as part of your work life. Important for both well-being and knowledge sharing” (R1, online workshop, March 17, 2021). R2 also elaborates on how Performing Independent Work remotely is weighted against Communicating Informally by saying:

> *“When you are doing a task on your own, it is often nice with some peace and quiet [...] On the other hand I wouldn’t want to work at home every time I needed peace and quiet because getting in contact with one’s colleagues, to ask a quick question or start a dialogue, outweighs the peace and quiet in the end” (R2, online workshop, April 06, 2021)*

On the other hand, the most frequently shared con regarding physical work sites is the lack of ability to concentrate. This is for many of the practitioners due to interruptions from noise, mails and colleagues in the need of sparring or casual conversations. One of our participants at the workshop (who is also working in the HR department) shared a discovery she once made. Within one and a half hour, she tracked how many times she was disrupted and concluded that "...in that 1.5 hour, I had managed to sit with what I was supposed to sit with for under 10 minutes" (I1, online workshop, March 18, 2021). This experiment shows how interruptions cause inefficiency when performing independent work. Such perception is shared by many of the other participants, and one argues that it furthermore results in delays because "...when you are physically present in a large office where there are 10 others present, then there is a high probability that you will be disturbed during your day [...] it pushes the entire workload over the course of a week" (R1, online workshop, March 17, 2021). He further argues that this issue "...has gotten better with remote work, because then you can control your own day" (R1, online workshop, March 17, 2021). The disadvantage of the interruptions in physical work sites is thereby reversed to an advantage of few interruptions in remote working sites.
As previously mentioned, the meaning of concentration is highly linked to the practice of Performing Independent Work, which now is associated with functioning best at remote work sites. During the exercise (i.e., Pros and Cons), one of the practitioners stated it as follows: "What I think works freaking well remote, is emails, if I have to make presentations, [and] it is concentration work" (I1, online workshop, March 18, 2021).

Attending Internal Meetings through remote sites has similarly resulted in greater efficiency because people (according to participant I1) are not showing up late or interrupting by talking about something else in the corner of the meeting room. As she says: "...it does not happen on teams because then there is no one who can hear anything" (I1, online workshop, March 18, 2021). However, some think it becomes too efficient leaving no space for important knowledge sharing through informal communication. Knowledge sharing is one of the most dominant disadvantages of remote work sites because "It is important to be able to look people in the eye so that you have a sense of whether [...] we agree on this. It's hard to do digitally" (R3, online workshop, April 6, 2021). It can furthermore be "...draining sitting and talking into the computer all the time" (R2, online workshop, April 6, 2021), since the current technological possibilities of working remotely are oriented around digital devices such as computers (Section 3.3). These devices are material elements circulating and linking the majority of remotely performed work practices and they play a crucial role in determining the constitution of remote work practices.

To summarize, the empirical data gathered through exercise three showed how there are pros and cons to both physical and remote work sites. Thus, comparing different work sites, shows, in line with PT how "...buildings represent sites in which practices are contained, sepa-rated and combined" (Shove et al., 2012, p. 84).
Information from both exercise two and three shows how practices from the individual mappings constitute complexities of practices dependent on each other. Although shared practices are identified among practitioners working within advising engineering organizations, when unfolded complexities of individually carried practices occur. This underlines the necessity of moving towards more individualized work models that supports the different preferences and needs of employees.

4.4.1 Flexible Work Models

As mentioned in section 4.2, the three organizations (in which the participants work) already offer some extent of flexible work models. None of the employees participating in our workshops was working remotely on a regular basis prior to COVID-19. However, some of them benefitted from flexible time schedules. Participant I1 is working flextime and explains: "I am employed where I register my time and then I can come and go sooner or later [...] and it works quite well" (I1, online workshop,

March 18, 2021). For her personally she preferred to perform independent work during the evening because "...that's where [she] thinks best" (I1, online workshop, March 18, 2021), and that is also why she likes the company's concept of 'free of time and place' (see section 4.2). Her perception is furthermore, that these flexible work models support a great foundation for remote work by stating that "We have had this principle of 'free of time and place' and it has helped us during corona because we could switch immediately where we went digital overnight. So we just continued what we were doing on March 12, 2020 [referring to the first day of the danish COVID-19 lockdown (Section 3.3.1 The COVID-19 Pandemic as a Window-of-opportunity)]" (I1, online workshop, March 18, 2021). Another participant working in organization R, shares how they during the lockdown have not been restricted to being available in the same hours as the old 8-hour work division entails (see section 3.3). He says that "There are some colleagues who work until dinner and then work again late in the evening and finish the rest. And that's just fine. So you are not controlled by the 8-16 working week" (R1, online workshop, March 17, 2021). As earlier mentioned in section 3.3 Society of Today, the time division of the collective work model has been stabilized for more than a century. Hence, work practices have become dependent on each other through synchronization of practices, and so are carriers of those practices. However, his experience is that "Customers do not expect one to work in the same way as before" (R1, online workshop, March 17, 2021).

These experiences with more flexible work models show the advantages of diverse meeting times, however none of them are working flexible in the sense of diverse work sites. Therefore, for the fourth exercise participants were asked to consider how many days they preferred to work in physical and remote work sites, when there are no longer restrictions that force them to work remotely. Regardless of the prior mentioned preferences in regard to work performed on physical and remote work sites and the related pros and cons, all participants preferred a flexible model working 2-3 days in the office and 2-3 days remote (see figure X).

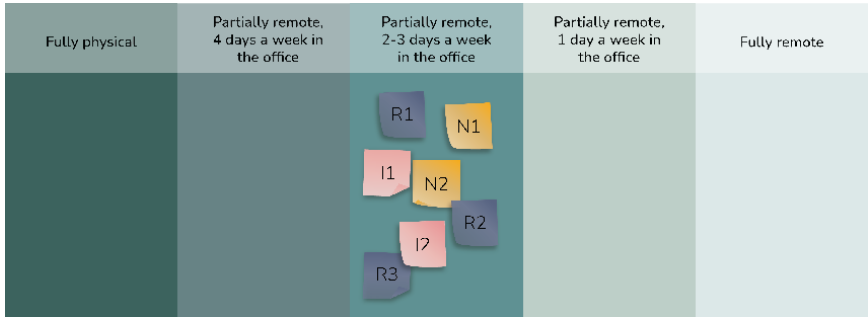


Figure X: Barometer

One preferred to physically attend meetings, however said that "The meetings you have to go through for a week take about two days in total. Then there are also some things in between that last a day and two days where you can sit anywhere in the world" (R1, online workshop, March 17, 2021). Another participant who even leaned much towards physical work sites, expressed that she is "...not sorry that it is online, but [she is] sorry how much it has become" (I2, online workshop, March 18, 2021) and thus prefers a flexible solution. Another one points to the diversity in work tasks and hence the need for adapting. He says "It would be a little different from week to week what tasks there are. It could very well be that there is a period where you sit at home most of the time. And then maybe some other periods, it just fits better that you sit more in the office" (N2, online workshop, March 29, 2021). Thus, a model must be flexible enough to adapt from week to week. Summarizing on data gathered from the online workshops, we have seen that each participant has individual meanings, competences and perhaps materials in regard to working in either physical or remote work sites. Hence a sustainable work model must accommodate individual practices in order to be both economic, social and environmentally sustainable.

4.5 Identifying Breakdowns

In order to create a flexible work model for individual practices carried out in both physical and remote work sites, we aimed to identify potential related breakdowns. Based on the individual mappings we used statements expressed by the practitioners through the four exercises of the workshop, to identify breakdowns within the seven shared practices (Appendix 8 Individual mappings). Since everyone preferred a combination of work performed in physical and remote work sites, we wished to map breakdowns of both. A total of 20 breakdowns were identified regarding physical work sites and 61 regarding remote work sites. According to our analysis, many breakdowns appear to concern remote work sites because practices are in the process of re-formation, where links between elements of materials, meaning and competences have not yet been normalized.

For the sake of clarity, we used the methodology of a fishbone diagram (section 2.2.4 Fishbone Diagram). Two diagrams were made to investigate the breakdowns causing an unsustainable work practice remote and physical. Information shared by practitioners through the online workshops were summarized into bullet points under each of the seven shared practices, as aspects causing an unsustainable work practice. These are identified as sub-causes and represent several breakdowns related to individual practices. Thus, it must not be seen as a checklist for solving unsustainable work practices for everyone. The aim is instead to use the context specific knowledge of each individual practice to bring light to a diverse spectrum of potential breakdowns in order to design a framework for a work model that is flexible enough to accommodate individual needs.

In regards to remote work sites breakdowns were found in all of the seven shared practices and represented the main causes in the fishbone diagram shown on figure X. As recognized in section 4.4, many cons were concerned around Communicating Informally at remote work sites and through mappings of breakdowns we even discovered that more than a third of the total number of identified breakdowns remote, is related to Communicating Informally (Appendix 7 Quote mapping). As mentioned in section 4.4 it is furthermore recognized how the meaning might detach and the practice of Communicating Informally might become an ex-practice, if the meaning of being social shows inseparable from the physical work site. Hence, the practice becomes one of the root causes affecting an unsustainable work practice within remote work sites (figure X).

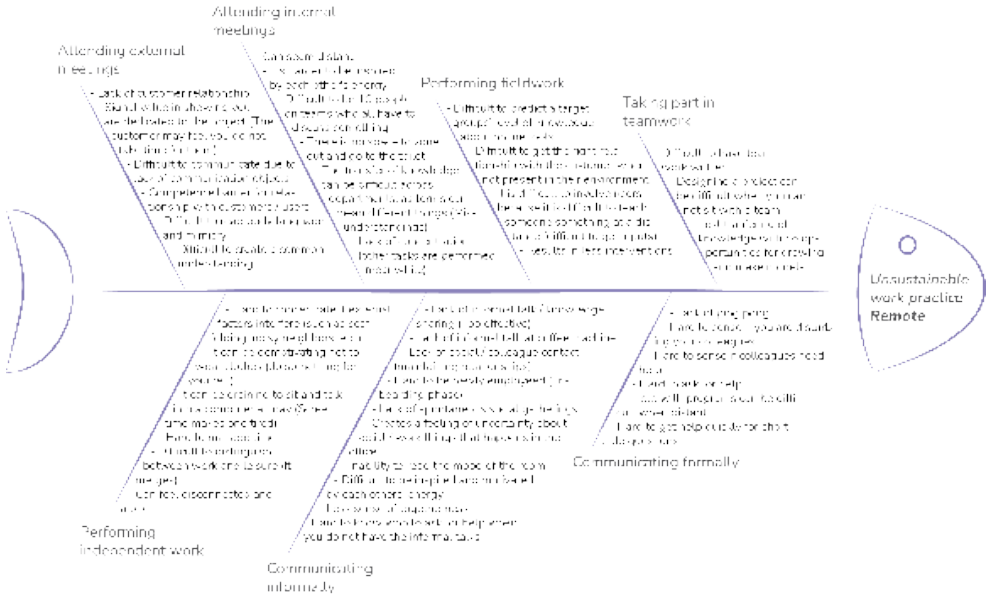


Figure X: Fishbone, Remote

Regarding work practices performed in physical sites, breakdowns were only identified within four of the shared practices as illustrated in the fishbone diagram (Figure X). The mapping of breakdowns shows that more than half of the identified breakdowns are related to Performing Independent Work (Appendix 7 Quote mapping), which makes it a root-cause on the physical work site. The element of meaning was in section 4.4 recognized as concentration when working remotely. On the contrary it is the practice of Performing Independent Work in phy-

sical sites highly associated with the meaning element of regular interruptions. The meaning element of the practice is thus what causes the unsustainable work practice, when performed physical. In general, breakdowns on the physical site were identified by the participant after they experienced how practices could be performed in new sites, which accelerated the ongoing configurations, that "...practices are always in the process of formation, re-formation and de-formation" (Shove et al., 2012, p. 44).

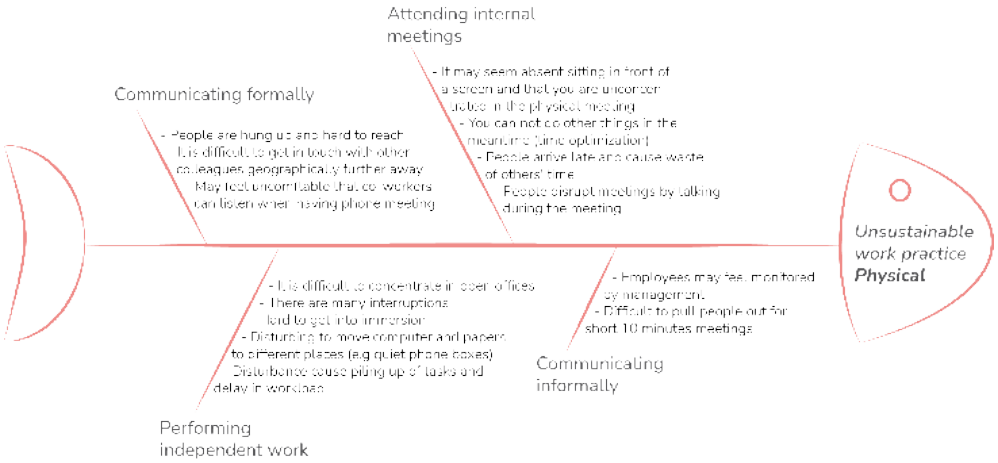


Figure X: Fishbone, physical

The method of a fishbone diagram provided an overview of the breakdowns causing unsustainable work practices within the two sites. Accordingly, it is a method used to break down problems into causes in order to make actionable targets (O'Donohue & Maragakis, 2016), which will serve as a core foundation for the conceptualization in section XX.

4.6 Sub-conclusion

As our analysis shows, lockdown during COVID-19 (section 3.3.1) has opened opportunities for conducting work at new sites and made both employers and employees reflect on their current work model.
Based on 4 interviews with employers of organizations N, I and R, our analysis shows that organizations are willing to support new practices of working remotely. However, policies ensuring the right circumstances are required by the employers in order to meet the requirements of the work environment legislation as well as to ensure productivity and well-being among employees.
From the perspective of employees, our analysis of the five online workshops shows that employees desire more flexible work schedules working part time in the office and part time remote. Furthermore, we have identified that employees have complexes of seemingly individual practices constituted by the three elements of materials, meaning and competences. These elements not only exist in relation to the carrier but travel and circulate among practices carried by other practitioners. Work practices are thus complex configurations of practices. However, among the practitioners of this analysis, we have been able to identify seven shared practices, representing the complex practices connected to working within advising engineering organizations.
Furthermore, our analysis shows that re-locating practices from physical to remote work sites causes changes in one or more of the elements. This is the process of re-formation which continuously links elements of a practice together. However, it has also been identified that some elements might detach and cause a de-formation of the whole practice, which then lead to them becoming an ex-practice. The practice of Communicating Informally has been recognized at risk of this de-formation. The site within which the practice is performed is thereby crucial for the constitution of the practice. In the aim of designing a framework for flexible work models supporting the needs of individuals, we have through this analysis identified the following criteria.

The framework must...

...support a division of two to three days remote/physical work sites weekly
...be flexible enough to adapt from week to week
...entail a formal agreement between employer and employees
...provide flexibility in regard to both time schedules and work sites
...meet requirements of the Danish work environment legislation
...ensure rentable work facilities agreements
...be adaptable to individual practices

Thus, a model must be flexible enough to adapt from week to week.

5 SOLUTION SPACE

This chapter serves as an elaboration of the solution space in which we are located. As explained in section 4.5 Identifying Breakdowns we identified 81 different breakdowns, all in relation to the seven shared practices which we elaborated on in section 4.3 Identification of shared breakdown. We furthermore saw how there was an overweight of breakdowns towards remote work and we therefore found it necessary to explore the full potential of working remotely. In order to do so we decided to create different design solutions accommodating these breakdowns, which will be explained in this chapter. The intent was for the design solutions to be used as directories for actors of leading roles in each of the three advisoring engineering organizations. And thus, establish a dialogue with the aim of giving us insights to what is and what is not possible within the frames of each organization (section 5.1.1 The Organizations' Actions to Accommodate Breakdowns). We wanted to do so, in order to be better equipped for comparing the physical work site with the remote work site in relation to creating a framework for flexible work models (cf. our research question). The chapter ends in a design criterias for the framework.

5.1 Generating Concept Proposals

In order to create the design solutions accommodating the breakdowns, we needed to look at the individual practices of our seven practitioners. As explained in section 4.4 Work Practices of Practitioners, each practitioner has a set of their own individual practices connected to each of the shared practices. During an elaborative brainstorm, we created multiple different design solutions for the individual practices in connection to the shared practices, aiming to accommodate the breakdowns of working remotely. These were then placed in either of the two categories: Radically Different or Incremental Change (figure X). Radically different, refers to design solutions which require more (than the second category), either when it comes to money, technological improvements or resources from the organizations. These are so-called "out of the box"-solutions. The design solutions categorized as incremental changes are implementable more or less right away, requiring very little from the organizations. These are based on well-known concepts or ideas, typically something the employers of our target group are already acquainted with.

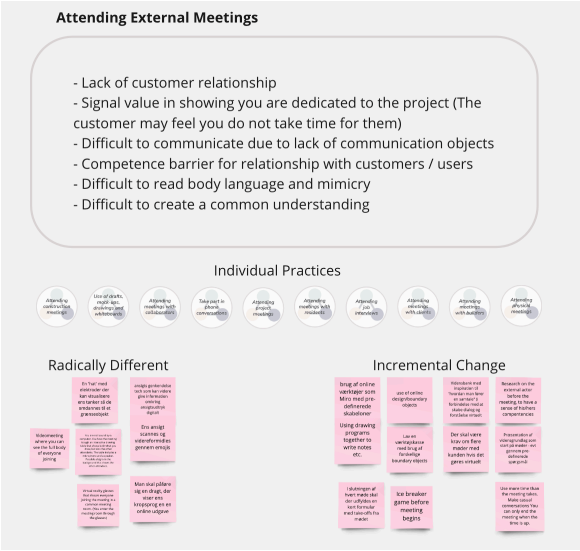


Figure X: Example of the design solutions for accommodating the breakdowns associated with the practice of Attending External Meetings.

As we wanted the design solutions to work as mediating objects, and thereby provide us the possibility to investigate the boundaries for our desired framework. We recognized that discussing all 112 design solutions would become too comprehensive (to see all 112 and their connections to the seven shared practices see appendix 10 Design Solutions).

As stated in section 2.1 Theoretical Framework: Practice Theory it is important to characterize the linkage between practices when describing their relations. And because "...practices are provisionally linked by ties of co-existence or co-dependence" (Shove et al., 2012, p. 83), we can identify if the seven shared practices are linked to each other. These connections can be very obvious to the practitioners, but they aren't necessarily. They can therefore be hard to recognize and thereby change (Shove et al., 2012). Assessing the three shared practices: Attending Internal Meetings, Communicating Formally and Taking Part in Teamwork, the following statements (from employees in the three organizations we have talked to), show how the practices interlink through the material element of the computer (figure X). Employees in organization R states how "Before [red. COVID-19] internal meetings were physical, but now [they] do it through teams" (R1, online workshop, March 17, 2021) and "...now we use teams [for formal communication]" (R3, online workshop, April 06, 2021). This is supplemented with the statement: "We have online meetings internally in the process group, on teams" (R2, online workshop, April 06, 2021). From employees in organization I it is stated how "people are much more available [...] after [they] have shifted to having meetings online" (I1, online workshop, March 18, 2021) and I2 says she "...participate[s] in daily check in meetings on teams" (I2, online workshop, March 18, 2021). In organization N, they refer to how the practice of taking part in teamwork have become difficult "...especially in the projects where we are many people [...] it is difficult to be 10 people on teams" (N1, online workshop, March 25, 2021) and how it is now possible "...to be having the meeting on a screen" (N2, online workshop, March 29, 2021). The computer thereby serves as a means for accessing platforms such as Teams, which in many contexts are used for communication and collaboration and it thus figurates in more than one practice

at a time (Shove et al., 2012).

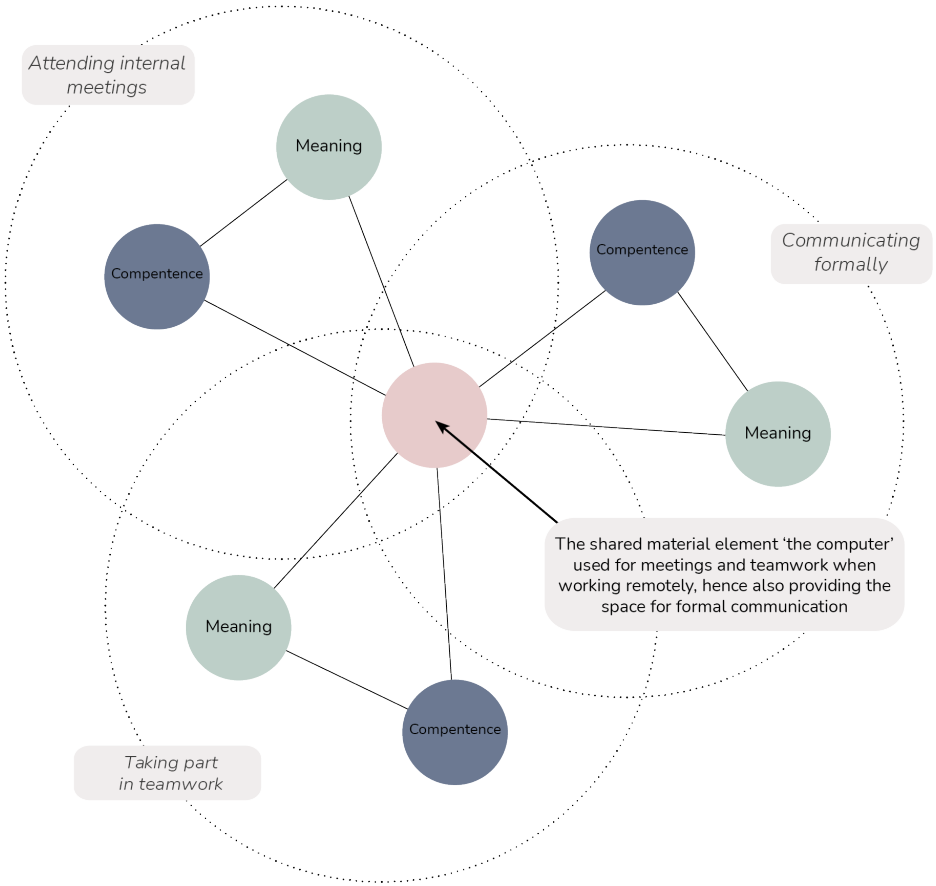


Figure X: The shared element between the practices of Attending Internal Meetings, Communicating Formally and Taking Part in Teamwork. .

As described in section 3.2.2 The Information Society, the computer is a stabilized and dominant design, which in this case acts as an essential material element for the constitution of these practices. It thus provides a "...connective tissue that holds complex social arrangements in place..." (Shove et al., 2012, p. 36). This means that without the computer the linkage between the practices could potentially break. However, we acknowledge how these practices are part of inter-practice relations, where they each are co-depended on each other, since communicating formally is required to take part in teamwork, which in this case primarily happens through attending an internal meeting (Shove et al., 2012). Thus, creating a linkage to each other through their co-existences and providing the possibility to "...sen[d] ripples across the cultural landscape as a whole" (Shove et al., 2012, p. 36-37).

Because these three practices are taking part in this inter-practice relationship, we decided to group them, while combining their connected design solutions into two separate storyboards (Section 2.2.3 Storyboards). The storyboards correspond to the formerly mentioned categories: Radically Different and Incremental Change (figure X and X).

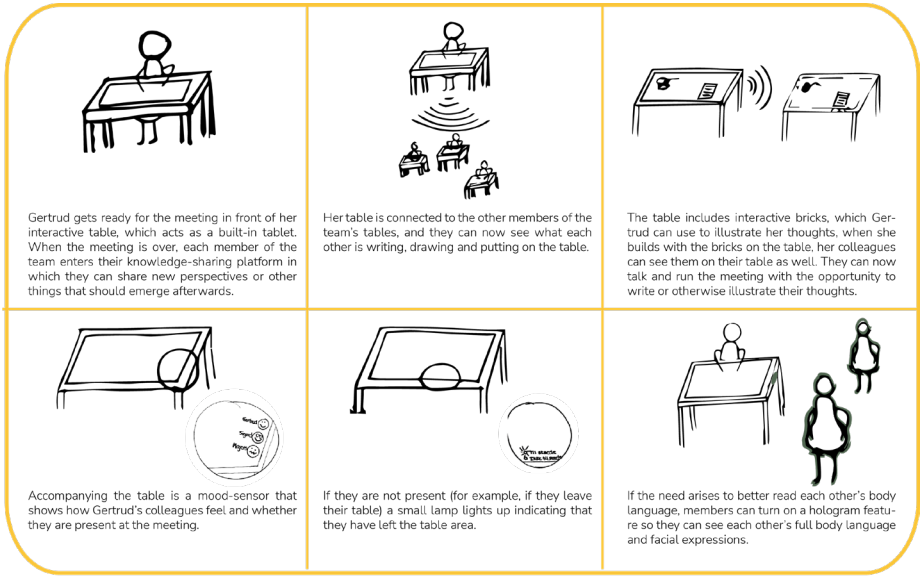


Figure X: Storyboard 1: Representing a future scenario of a radically different concept proposal.

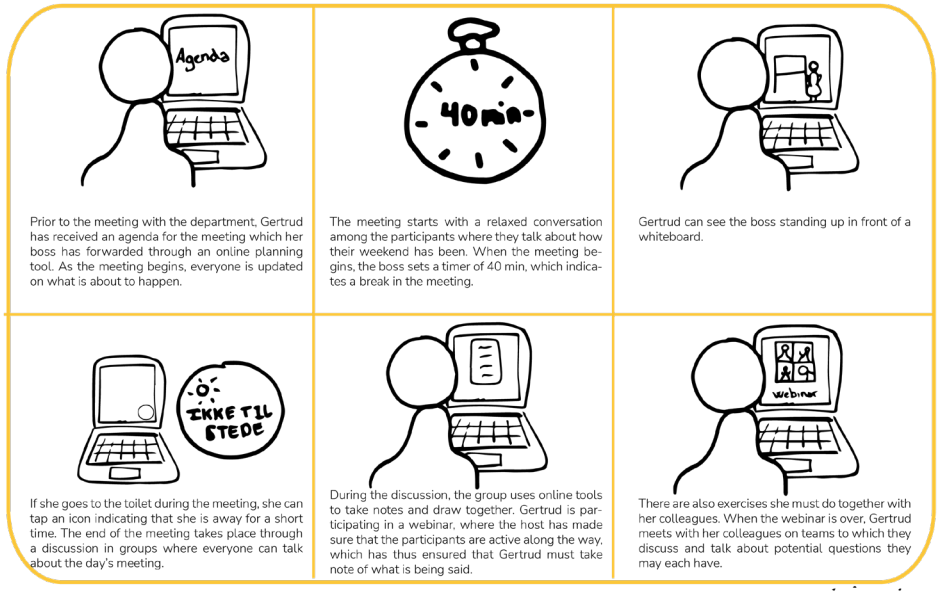


Figure X: Storyboard 2: Representing incremental change in a scenario, where this concept proposal is implemented in present days.

Storyboards 1 and 2 are a combination of the design solutions for all the breakdowns related to the practices of Attending Internal Meetings, Taking Part in Teamwork and Communicating Formally. Thus, constituting our first two concept proposals.

Taking a look at two of the other shared practices, namely Attending External Meetings and Performing Fieldwork, we see how each practice is performed to abstract knowledge from things such as places, people or environments. R1 describes how they in organization R are performing fieldwork to "...abstract knowledge about the customers and their environment..." (R1, online workshop, March 17, 2021) and he also states how "...it is easier to use objects for the extraction of this knowledge" (R1, online workshop, March 17, 2021). Furthermore, R3 elaborates on this knowledge by referring to it as feedback: "...when meeting with residents we want feedback on our suggestions for the bigger renovating projects..." (R3, online workshop, April 06, 2021). N2 empathizes how they in organization N normally "...have to go down and see how it is down at the building sites [...] here we go out and look at what has actually been done" (N2, online workshop, March 29, 2021).

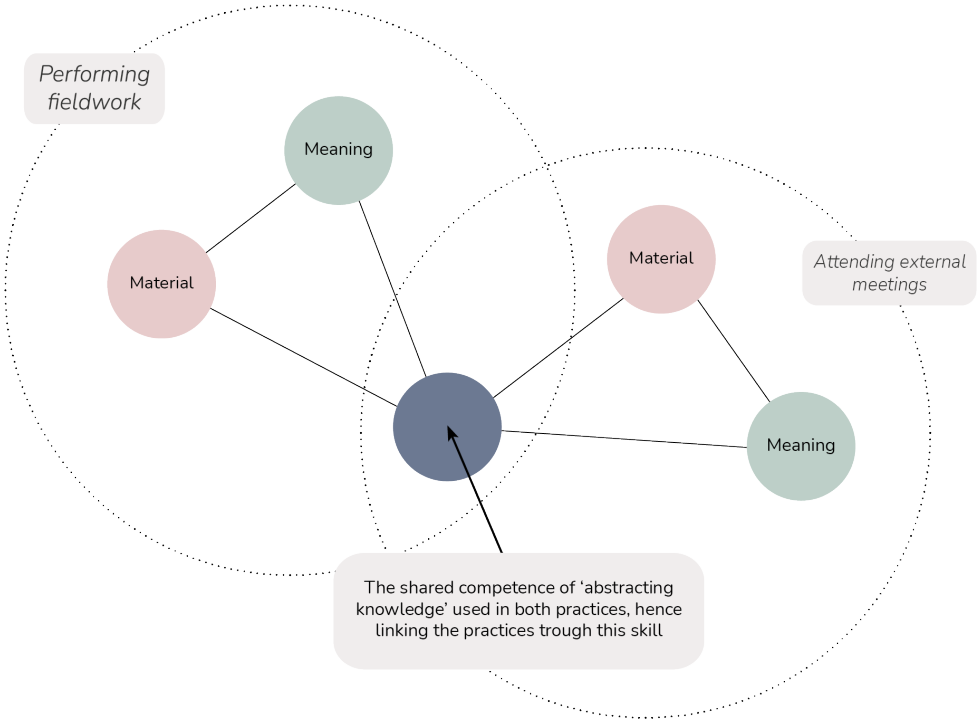


Figure X: The shared element between the practices: Attending External Meetings and Performing Fieldwork.

Much like how the computer circulates between the three practices "Something similar happens when forms of competence circulate (as when skills transfer)" (Shove et al., 2012, p. 37), which in this case is the skill of abstracting knowledge in external settings. This means that the two practices (i.e., Attending External Meetings and Performing Fieldwork) are interlinked through the competence of 'abstracting knowledge' (figure X). Since this competency is required for the constitution of each practice.

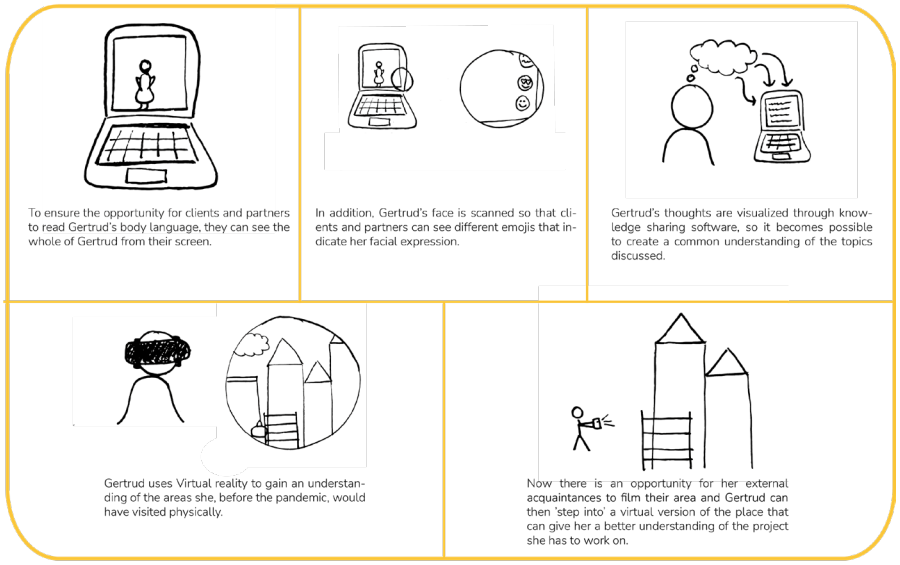


figure X: Storyboard 3: Representing a future scenario of a radically different concept proposal.

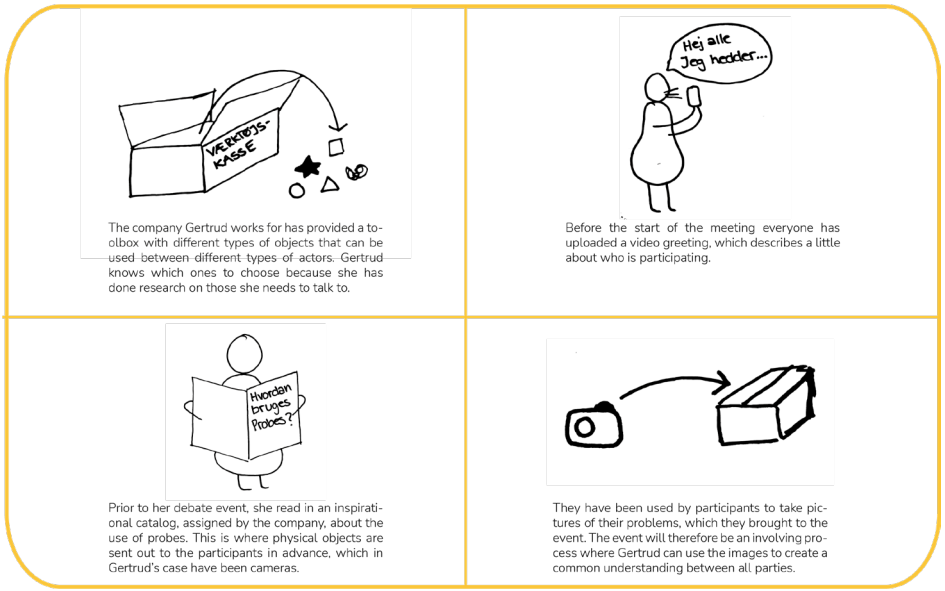


Figure X: Storyboard 4: Representing incremental change in a scenario, where this concept proposal is implemented in present days

Based on the knowledge of the two shared practices being interlinked, we decided to group the two and just as before we combined their connected design solutions into two separate storyboards (figure X and X). One representing a future scenario with a radically different concept proposal (storyboard 3) and one representing incremental change in a scenario, where this concept proposal is implementable in present days (storyboard 4).

The last two of the shared practices (i.e., Performing Independent Work and Communicating informally) does not share an element linking them together, but they do affect each other (figure X).

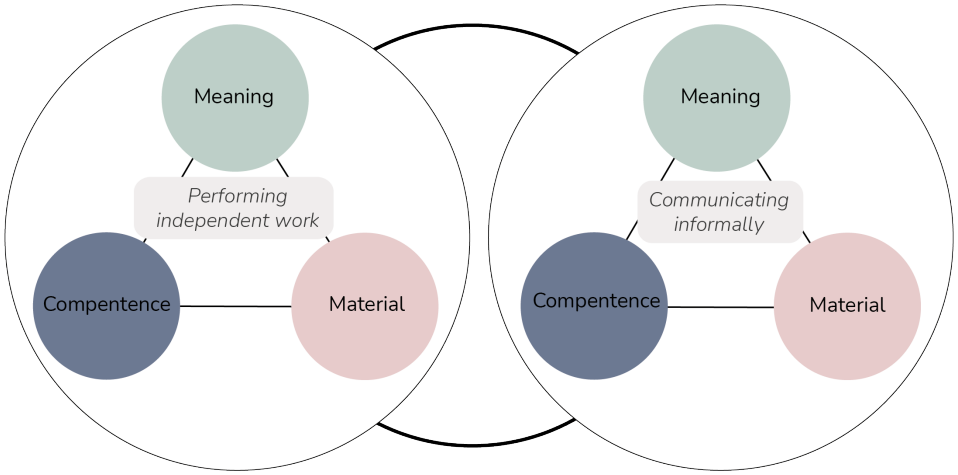


Figure X: The practices of Performing Independent Work and Communicating Informally are affecting and affected by each other.

As elaborated in section 4.4 Work Practices of Practitioners the practice of Communicating Informally is typically associated with the physical work site and especially through the material element of the coffee machine. This means that if employees are working remotely, they are more likely to detach from the practice of Communicating Informally. And according to the employees of the three organizations we have been in contact with during this study, it seems that the practice of Performing Independent Work remotely, is thus very closely affected by

how hard it then becomes to perform the practice of Communicating Informally (section 4.4 Work Practices of Practitioners). I2 from organization I states that:

“The relationship with others and the atmosphere in the room are lacking [when performing independent work remotely]” and how ”...all those micro-involvements are gone because it’s 2-dimensional instead. And these are some of the things that I depend on. I’m a person who reads the room and [...] adapts accordingly and also gets ideas and stuff like that from it” (I2, online workshop, March 18, 2021).

Shove et al., (2012) explains how ‘invisible mediators of action’ are constituted by a system of classification. These are establishing the basis for how different performances are compared “...by defining what any one enactment is a performance of [...] and by reconfiguring elements of the practice and the manner in which they are integrated” (Shove et al., 2012, p. 105). The classification of the concept of being social is further elaborated by employees in organization N: “Maintaining social relationships will definitely be on the plus side of the physical. It is definitely difficult when you sit in your little cube at home” (N1, online workshop, March 25, 2021) and ”The hardest thing about being home, is that the ping-pong and those little things and the social (that you kind of just talk to someone a little randomly and hear some things) is lost” (N2, online workshop, March 29, 2021).

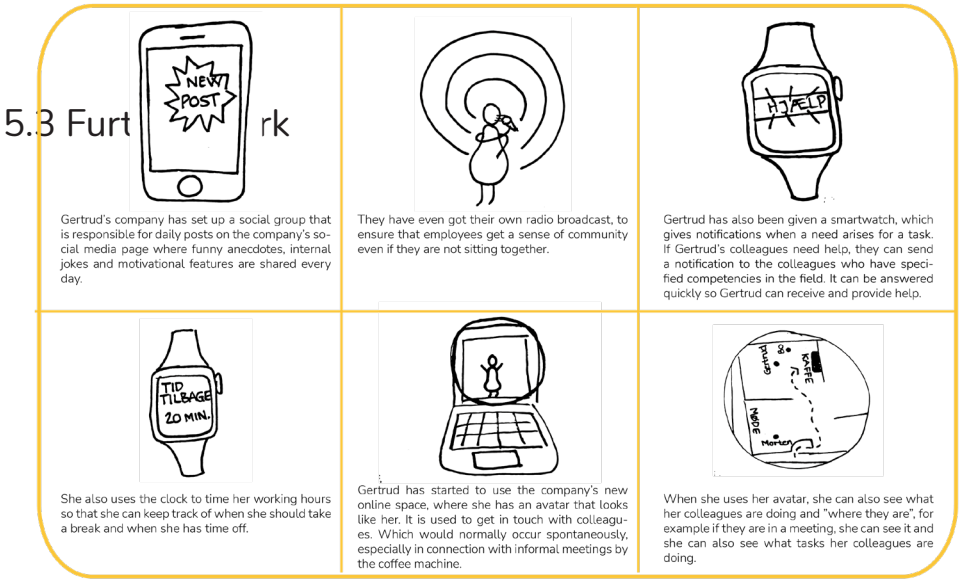


Figure X: Storyboard 5: Representing a future scenario of a radically different concept proposal.

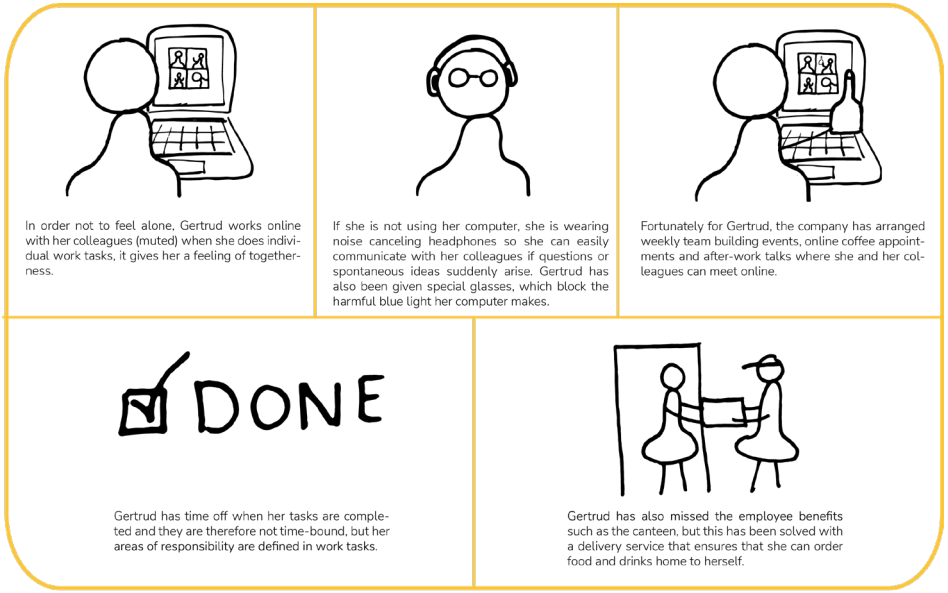


Figure X: Storyboards 6: Representing incremental change in a scenario, where this concept proposal is implemented in present days

We can hereby establish that the two practices are closely connected in the sense of affecting each other. Which is why we decided to group the two for the purpose of combining their connected design solutions, into concept proposals in the form of two separate storyboards (figure X and X).

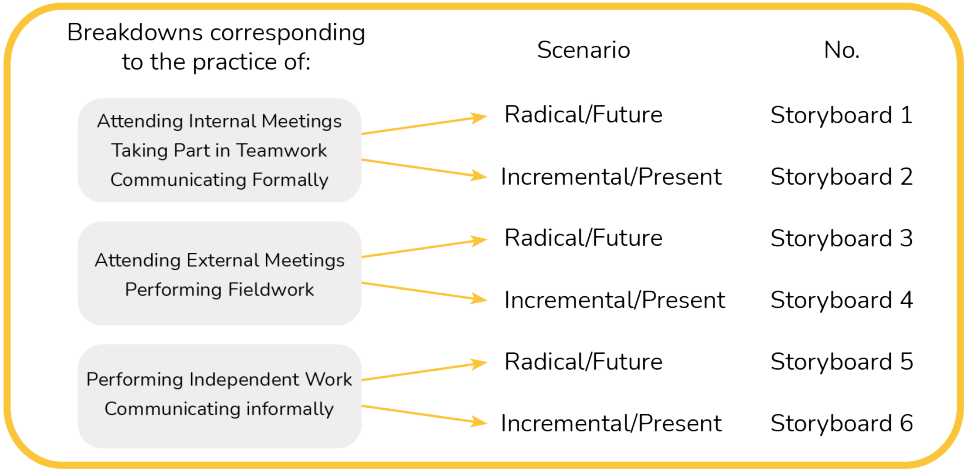


Figure X: Storyboards 6: Representing incremental change in a scenario, where this concept proposal is implemented in present days

5.1.1 The Organizations' Actions to Accommodate Breakdowns

As mentioned in the beginning of chapter 5, we intended to use our design solutions as directories for actors of leading roles to provide us with insight to how feasible it is to accommodate the breakdowns identified in section 4.5 Identifying Breakdowns. In order to make it less comprehensive we created storyboards representing six concept proposals (section 5.1 Generating Concept Proposals). We showed these to four actors of leading roles in organization N and I (see box x), we call these respectively NL1, NL2 and IL1, IL2 (section 2.2 Collection of Empirical Material).

Process box

To gather empirical data and feedback from actors of leading roles within our target group, we staged two online negotiation spaces in which we will refer to as an 'online intervention' (section 2.2.1 Negotiation Spaces). We had a total of two online interventions, one with both NL1 and NL2 and one with IL1. IL2 was asked the same questions (as NL1 and NL2) through an email correspondence. We are aware of the fact that the lack of facilitation could have influenced his answers. Unfortunately, we were not able to get any actors in a leading role from organization R to participate.

We decided to use the platform called Zoom, since it is a widely known and easy to use tool for web-based communication. This platform has especially been used during the period of the pandemic lockdown (Bailenson, 2021), making sure that participants could enter the stage as easily as possible. For it to be a mutual dialogue aiming to steer a negotiation we made use of a PowerPoint presentation where we incorporated our six storyboards with complementary storytellings, which were framing different problems (to view the full PowerPoint presentation see appendix 11 PowerPoint Presentation One). These complementary storytellings were based on the merging of the breakdowns and we hence portrayed three parts of our fictional employees' day (see figure X, X and X). We decided to call her Gertrud as it is an uncommon danish name and we aimed for her to create as little association to real-life persons as possible.

Gertrud's day starts with internal meetings with her team, where she, together with the others, must plan an upcoming project. Later, she will attend a webinar. During Corona, Gertrud has experienced how it has been difficult to have online meetings with many people at once, as it can be difficult to be inspired by each other when teamwork takes place in writing, furthermore she finds it difficult to concentrate.

She has observed how she easily zones out during longer meetings and therefore are not actively participating. She therefore experiences a feeling of distancing between her and her colleagues. Gertrud has also had an experience that the natural 'ping-pong' she is used to having with her colleagues has disappeared. She also feels it can be difficult to know if her colleagues need help, or even ask for help if she needs it herself.

Figure X: Part 1: Problem framing of the first part of Gertrud's day

When Gertrud has finished her internal meetings and webinar, it is time for her to hold external meetings online, after which she will hold a debate event with some clients from an ongoing project.

During Corona, she has experienced how it has been difficult to maintain a good relationship with clients and partners because of the inability to read facial expressions and body language. In addition, it is especially the lack of objects such as drawings and models that has made communication to external actors difficult. Furthermore, Corona has minimized the amount of field work performed and it has been difficult to know what knowledge clients and partners have, about different online tools which has resulted in fewer processes of involvement.

Figure X: Part 2: Problem framing of the second part of Gertruds day

When Gertrud's meetings are over, the day will be spent on performing independent work, where she will solve problems, make graphic illustrations, write notes from the debate event and begin a presentation to her colleagues about the results. During Corona, it has been difficult for Gertrud to concentrate because her building has been under construction and it has made a lot of noise.

Gertrud is a person who works best when she is physically with others. It is therefore difficult for her to cope with her tasks virtually, because she lacks the informal talks and the dialogue that arises in that connection. She has also felt demotivated and tired because she has spent many hours in front of the computer. In addition, it has also been difficult for her to manage her breaks. Gertrud is used to spontaneous conversations, which have given her a sparring and uplift she has not felt during Corona. In this connection, she has also felt alone and lacked a sense of community. Gertrud furthermore, finds it difficult to distinguish between working time and leisure time, because she is at home all the time.

Figure X: Part 3: Problem framing of the third part of Gertruds day

Each part of Gertrud's day was used as a means to mediate dialogue concerning the organizations' own initiatives using an interview guide as a script. Did they know about these problems? How do they secure the needs of their employees, normally vs. now? How have they dealt with it during the pandemic? How are they planning to deal with it?

After the presentation of each of the problem framing stories, a pair of storyboards were presented. As described in section 2.2.3 Storyboards, it was intended for these to function as boundary objects (see section 2.2.2 Boundary Objects). We believe we succeeded as IL1 stated how "It makes very good sense for you to do such a thing .. you know .. making such [storyboards] .. where we look at something with the employees' glasses on" (IL1, online intervention, May 26, 2021) and NL1 expressed how "...it is nicely presented and it makes really good sense to show these future scenarios, it can really start a

conversation [...] good job" (NL1, online intervention, May 20, 2021) where to NL2 agreed.

During the first online intervention with NL1 and NL2, we became aware that the intention of the meeting was not completely clear. We wished to get feedback from organization N, but they thought we were showing them our final submission, which made them comment on how the employees would potentially understand the storyboards instead of providing feedback on their content. In order to accommodate this, we had a small discussion on our purpose with the storytelling, leading the conversation back on the right track. Furthermore, time pressure became an important factor during the meeting, due to the fact that NL2 had to leave much earlier than expected. This made the conversation around the third part of the story a little rushed and we therefore decided to change the length of the PowerPoint before our second online intervention, going from 11 to 8 slides (new slide formation on appendix 12 Powerpoint Presentation Two). Another reason for re-framing the intervention was our realization that presenting all six storyboards was still too comprehensive for the purpose of getting feedback on each concept proposal.

The new presentation started with a presentation of all the breakdowns related to each story and from thereon it contained only the third story, since this was the one we got the least feedback on from the online intervention with NL1 and NL2. Furthermore, we added the results of exercise four from our stagning of the workshop (the barometer, which are elaborated on in section 4.4.1 Individual Work Models). The intent was for it to spark conversation around the future plans around remote work in organization I.

Each storyboard had a complementary, problem framing story, where Gertrud's concerns or worries (based on the breakdowns) were presented (see box X). These were used as a means to gain insight to the organizations prior knowledge and actions on the topics. We wanted to know if the organizations were already aware of and thereby actively trying to accommodate the breakdowns (see box X).

In relation to organization I, we became aware of some of their actions performed to accommodate the breakdowns. In relation to the breakdown stating that 'Many interruptions and a lot of time on the computer weakens the concentration', IL1 explained how:

"...there is a working group consisting of some managers and some employee representatives who are looking at ... if we have to change the interior when we return [...] there is a need for more quiet compartments [...] that you move in to when you need to be undisturbed and then there could be some areas where you must not be quiet, there you must only be relational, so there you can talk, you must not place yourself there if you intend to do something planned" (IL1, online intervention, May 26, 2021)

She further elaborated on the working group as someone who sets "...up some experiments, which [they] will then evaluate. Now [they] try to do it, to see how it works and then when [they] move back in November, [they] have tried out some experiments where [they] then decide what kind of things to go with and what kind of thing to not go with" (IL1, online intervention, May 26, 2021). IL2 also states how it is necessary to experiment with different actions in order to see what works and he furthermore elaborates on how "Most of us who have used teams a lot over the past year are willing to try new things that break the monotony. In general, we believe that if someone has a good idea for more efficient or pleasant meetings [...] they are allowed to give it a go" (IL2, email correspondence, May 27, 2021).

IL2 expressed how "...It's about breaking the monotony..." (IL2, email

correspondence, May 27, 2021), in relation to the fact that it's 'Hard to discuss and be inspired by each other' there is a 'Lack of ping-pong and sense of community feeling' and that 'Sparring is difficult'. An example of how they are trying to break the monotony is in relation to virtual meetings, which IL2 states "...consume cognitive resources in a completely different way than physical meetings. You simply get tired in another way" (IL2, email correspondence, May 27, 2021), they seek to accommodate this by

"...[breaking longer meetings] up into smaller chunks / segments, and in the case of a two-hour management meeting for example, one element can be to do group work as hiking meetings, where you are sent out into the fresh air for 15 minutes with a task to be solved per. phone or teams in small groups" (IL2, email correspondence, May 27, 2021).

IL1 elaborates on the video meetings by saying:

"If we have to have some more creative processes and we have to develop things and start over with something then [...] we would prefer [to physically meet] even if you have a tool called Miro, which can almost make an electronic whiteboard with post-its and everything [...] we think there is more effect of doing it together where you can also combine something like 'walk and talk' and you can essentially just be physically together" (IL1, online intervention, May 26, 2021).

It is thus very much dependent on the purpose of the meeting, whether or not it can be functional in a virtual setting: "In general, it is our approach that 'crises and creativity' are poorly handled in video meetings, while meetings that are more in the nature of reporting can easily be conducted on video" (IL2, email correspondence, May 27, 2021). In relation to it being 'hard to establish and maintain relationships' IL2 expressed how he "...find[s] it harder to build new relationships [than maintaining old ones]. At this point, we have not done much [to accommodate it] other than look forward to the world becoming a little more normal" (IL2, email correspondence, May 27, 2021). We thereby see how organization I, are under the belief that accommodating breakdowns which are related to the concept of being social isn't feasible without the physical connection; "...there is the completely classic need for oxytocin, it simply does not occur in a screen context, it only occurs when people are physically together" (IL1, online intervention, May 26, 2021) and "We have primarily addressed this by allowing colleagues to come to the office when social considerations have required it" (IL2, email correspondence, May 27, 2021). This corresponds well to the statements provided by their employees, which shows how the association to the concept of being social has a great effect on practices where it is part of the meaning. Practices are thus affected by spaces and sites (Shove et al., 2012), which we elaborated on in the previous section.

In organization N, they have the general opinion that "Not everything can work online" (NL2, online intervention, May 20, 2021), which shows in some of their statements such as NL2 saying:

"I do not think we will have employees who are never in the office [...] It's not going to happen here [...] We have someone who is very much out with customers, but they always come into the office [...] they have a hard time being away from their department" (NL2, online intervention, May 20, 2021).

She points to it having to do with the average age of the employees in organization N and states "We have a high average age, we are a different generation [...] [working entirely remote] could be something that comes in your generation" (NL2, online intervention, May 20, 2021). We believe that this is yet another argument for implementing policies and establishing frameworks that are flexible enough to suit the individual needs and practices of employees in advisoring engineering organizations.
Because organization N has this belief they have not focussed very much on how to accommodate people's needs when working remotely, but more on how to make a good comeback for when the pandemic

is over. They are therefore still "...challenged with how [they] make a workplace function when [they] are not all in the same place" (NL1, online intervention, May 20, 2021). However, they do recognize how "It has become more okay to work from home now, than before [red. the pandemic]" and how they before the pandemic "...had decided that [they] wanted to use Teams, but that there were long prospects, as confidence in people to figure it out was low. But then came corona and everyone had to learn it" (NL1, online intervention, May 20, 2021).

5.1.2 Feedback on Concept Proposals

In connection to each of the storyboards, we came up with design criterias based on the breakdowns. The intent was for the concept proposals to be held accountable to some criterias, that would accommodate the identified breakdowns. This resulted in the following 8 design criterias:

1) It must be possible to read body language and mimic clearly
2) Easy access to the use of communication objects must be ensured
3) It should be easy to discuss in teams and be inspired by each other
4) Spaces for ping-pong and a sense of community must be created
5) It should be easy to both sparre with colleagues and know when to do so
6) It should make concentration feasible
7) Room for informal and spontaneous dialogue must be ensured
8) It must be made easy to distinguish between working time and leisure time

It is these criterias mirrored with the six storyboards that constitutes the feedback generated for our concept proposals. Remembering that the intent with the concept proposals is to explore the potential in working remotely, the feedback provides valuable insights to what is feasible in a remote setting. The feedback can thus help establish which of the seven shared practices (section 4.3 Identification of Shared Practices) are best performed at a remote worksite and which are more suitable for the physical worksite.

Many of the radically different attempts to account for criterias such as 'It must be possible to read body language and mimic clearly', are technologies that in some way can scan, see or measure things like people facial expressions, body language or presence. Hence creating a concern for employees' privacy. NL2 says:

"For me it is hard to imagine [remote work] being the future, because it leans towards a community of surveillance [...] That could be something that comes to your generation, but we need our privacy. This is not something that could be implemented in a company like ours now" (NL2, online intervention, May 20, 2021)

And IL2 shares this feeling "The use of emojis seems a bit transgressive [...] to read your facial expression and translate it into cartoons, I think I would have refused" (IL2, email correspondence, May 27, 2021). However, he states how he finds the hologram idea useful: "The idea of the hologram is fun, because one of the keys to better meetings is to be able to sense the other people in the meeting. It's really hard to read people on a screen" (IL2, email correspondence, May 27, 2021).

In the attempt to accommodate breakdowns about lack of informal communication, and thus account for design criterias such as 'Spaces for ping-pong and a sense of community must be created' and 'Room for informal and spontaneous dialogue must be ensured', concept elements consisted of the formation of social events. Here the actors in the leading roles had, once again, a hard time associating social events with the remote work site. Statements like "You can also have fun together virtually, but there are just some things that also happen when you are physically together" (IL1, online intervention, May 26, 2021) and "[The physical awareness and being able to see each other] are the ones who create that psychological security ... that you have some emotional connection to" (NL2, online intervention, May 20, 2021) underlines the point.

In organization I, virtual social events are furthermore not as highly appreciated as having the ability of being social in work related contexts:

"...the employees do not bother with more virtual Friday bars or anything like that, but [...] what they say they want is to keep the morning check-in meetings where you get arranged something you need help to [...] we have a coffee meeting on Thursdays, then we have a coordination meeting on Fridays. So there is simply a touch point every day to know that there you can get hold of a colleague" (IL1, online intervention, May 26, 2021).

IL1 continues to conclude (as we had predicted), how practices that is constituted of or connected to the concept of being social is not optimal at a remote working site:

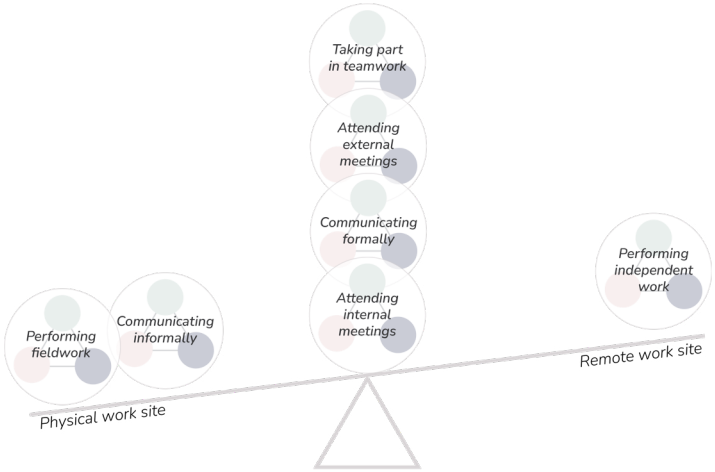
"It hangs in our walls, it is our culture, it is a social capital and all those elements that make an organization stick together, it seems we have been just exactly maintained with all that we have been able to support. But to build on it [...] we must do it physically together" (IL1, online intervention, May 26, 2021). "[When we come back] we will have a very great focus on recreating the relationship [...], so there will be many, many more physical meetings where that is in focus. So we are not going to spend energy on figuring out how to do the best we can at home, because we think that what you were missing when you were sitting at home, is primarily the physical meeting, the informal dialogue and things like that" (IL1, online intervention, May 26, 2021).

However, the remote work site is much more suitable for practices that are not as dependent on connections to other people. The concept proposals accounting for design criterias such as 'It should make concentration feasible' and 'It must be made easy to distinguish between working time and leisure time' seemed to be weighted as optimal solutions. Especially when it comes to structuring employees work time the concept proposals seemed to spark interest with statements like: "The one with timing the meeting is a good idea and a simple way so you can see when a break has been added" (NL2, online intervention, May 20, 2021) accompanied by "It is important to take breaks. You can easily forget to take breaks" (NL1, online intervention, May 20, 2021). IL2 expressed how:

"...the very principle of being very critical of which meetings are necessary - how long they must / should be - and who should participate. There is among many, an experience of sitting and wasting one's time with pseudo-work in ritual meetings, and there is not much energy in it, so being critical of one's meeting structure is perhaps one of the best things you can do" and "The technical solutions are good. Setting boundaries for work is quite difficult, especially if you are engaged in your job or subject area" (IL1, online intervention, May 26, 2021).

This created the sense that, if the ability to help structure employees' working days becomes more prominent while focussing on regulating both the purpose, length and types of meetings becomes a given, the remote work site would be a good place for practices such as Performing Independent Work and Attending External and Internal Meeting (depending on the type of meeting).

The result of the feedback provided insight to why it makes sense to design a framework for flexible work models that combine the physical and remote working site. In section 4.3 Identification of Shared Practices we established how each of the seven shared practices were distributed according to the practitioners preferences. After the information provided by the actors in the leading roles, we have again placed the seven shared practices according to what seems most optimal in an organizational sense (see figure X).
The weight on the physical side has been lifted and the two practices, Attending External Meetings and Taking Part in Teamwork has moved to the middle. Here it is important to consider each meeting or teamwork based tasks individually, since some will be more suitable for the remote site, while others fit better in a physical site.



Seen in an organizational perspective there can be many advantages to providing the employees with the possibility of working more remotely (relative to how much they were working remote prior to the pandemic), but it seems that there is a need for the facilitation of this combination. As stated in section 4.2 The Organizations Relations to Remote Work the organization puts a lot of the responsibility on the shoulders of department leaders or the employees themselves. This can potentially have the effect of it working very well in some departments and very poorly in others, since both the approach and the individuals will be different, which won't help the organization as a whole. This is another reason why we believe that the leaders must be equipped with concrete tools and guidance to facilitate the process of accommodating the needs of his or her employees.

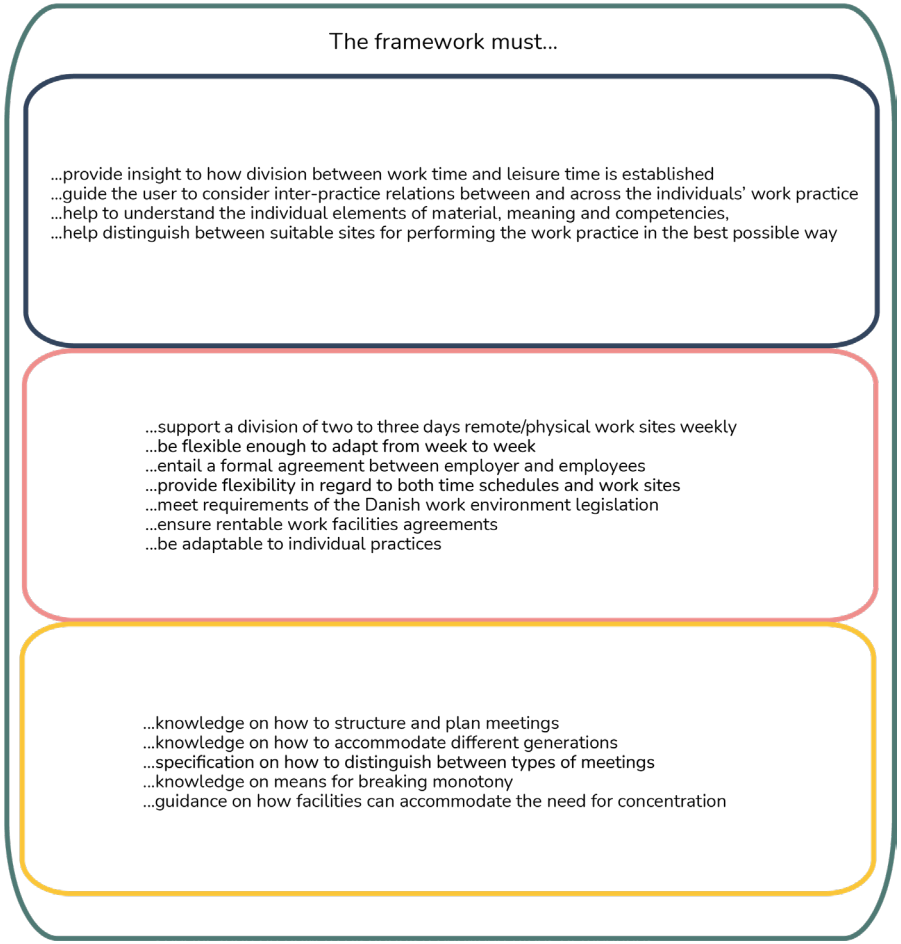
5.2 Design Criteria for a Framework for Flexible Work Models

In the previous sections we have provided an overview of how we have explored our solutions space. We used the seven shared practices, the individual practices and their related breakdowns. We did not only use these to create the 112 design solutions for accommodating the remote working site, but we also merged them into three problem framing stories. Four actors in leading roles from organization N and I, provided feedback to each story.
Moreover, the design solutions were combined into six different storyboards, each representing a concept proposal. Each of these generated 2-3 design criterias, which then also was evaluated and discussed by the four actors.
Through this process of exploring the solution space we have discovered aspects that must be considered when designing a framework for individualized and flexible work models. These are summarized into the followed design criteria where...

The framework must...

...knowledge on how to structure and plan meetings
...knowledge on how to accommodate different generations
...specification on how to distinguish between types of meetings
...knowledge on means for breaking monotony
...guidance on how facilities can accommodate the need for concentration

If we connect those to the design criteria discovered in chapter 3 and 4, we get a total of 17 criterias which the future framework for flexible work models must account for. These criteria put together constitute the frames for the framework we wish to design and should provide the flexible work models with the essentials for supporting the needs of individuals, working within advising engineering organizations. The final design criteria thus states how...



5.3 Further Work

Considering the work of which we have described in this thesis, we will now present the work to be performed until the project's end date on June 24th 2021. We will present the steps needed to take in order to present a final framework and furthermore present how we expect to test the functionality of it.

This thesis ended with 17 design criteria which were created based on the exploration of the history of the work practice, the more individualized practice in connection to practitioners and the solutotin space it was located in. To define how the framework accounts for the design criterias, we intend to test its functionally with practitioners that could potentially be part of it in the end. As the framework we wish to design should be based on accommodating the needs of the individual employees of advising engineering organizations, we will strive to test the content of the framework using several different negotiation spaces where different participants will take part, depending on their role in one of the three organizations.

The framework is supposed to appeal to employees and apply to employers and the employers thereby portray as users. Hence, the material component of the framework should appeal to the employers, whilst the content of the framework should mediate the needs of the employees. This means that it is necessary for the framework to be negotiated and re-defined in negotiation between us and the employees, but also between us and the employers.

Although we chose to investigate work models from the perspective of advising engineering organizations, we do not consent to only providing employees in such organizations the possibility of defining their sustainable work practice. We stress that there is a need to investigate further how such models for sustainable flexible work can be applied in other types of organizations.

Due to the fact that it wasn't possible for us to engage more than seven practitioners in the project, it would be relevant to further aim to engage more practitioners, making the research thus the solution more versatile. This means facilitating a vast number of negotiation spaces in which the topic would be unfolded and negotiated. This should result in data more representative for white-collar workers in advising engineering organizations.

6 CONTRIBUTION OF SUSTAINABLE DESIGN ENGINEERS

In this Chapter we will look into how 'the work practice' in western societies have evolved and developed through time, provided in snapshots. We want to look into the trajectories that constituted (and still constitutes) the practice-as-entities that shapes current configurations of work. We wish to "...give a sense of the 'elemental' histories involved and of the succession of composite entities.." (Shove et al., 2012, p. 29) which are a part of forming the history of modern working life. Over the last 150 years 'working' has become a recognized and enacted entity that has arised through the fusion of many different practices. We will argue how 'working' has been black-boxed to the extent where it "...constitutes a single practice" (Shove et al., 2012, p. 82), much like how Shove et al. (2012) describe the practice of driving:

"When teaching novices how to drive, instructors may break the total performance down into different moves, each treated and experi-enced as a separate practice by the learner-driver and by the instructor alike, but only for a while. The common aim is for the recruit to seam-lessly integrate these procedures so as to reproduce what is now known as 'driving'" (p. 82-83).

Through a short recap of the pre-industrial societies we trace the history of the practice behind modern working life all the way back to the Stone age. We know from Shove et al. (2012) that "...practices-as-entities expand, contract and change as they acquire and lose variously faithful cohorts of carriers." (p. 77), which is why we look into how the practice has changed through the four industrial revolutions all the way to the circumstances caused by the global COVID-19 pandemic lockdown. We look into how "...practices-as-entities are shaped by the sum total of what practitioners do, by the variously faithful ways in which performances are enacted over time and by the scale and commitment of the cohorts involved" (Shove et al., 2012, p. 101).

6.1 Conclusion

Throughout the report we have established how practices are connected to their traces of the past (Shove et al., 2012). We have explained the trajectory of the work practice, from a stabilized and black-boxed entity to a more and more individualized practice. Furthermore, we elaborated on how different dominant designs through time have influenced the perception of work. We then explored it in connection to the traditional collective work model and could conclude how they were detached from each other. We therefore saw how the need for policies or frameworks must be accommodated in order to achieve coherence between the practices performed by practitioners (the employees) and the work models framing the space for performing the practice (provided by employers). We thus investigated if the rare circumstances provided by a global pandemic, such as COVID-19 could provide the push needed for the next revolution of the work practice. We chose to see the pandemic as a window-of-opportunity to explore a radically different work model in comparison to the old fashioned collective one, which is primarily constituted around physical presence. Thus making the pandemic an experiment for transitional change.

During the course of our analysis we explored both the consequences and opportunities of working remotely. Here we identified seven practices, which were shared between employees of three advising engineering companies. We elaborated how even these were constituted very differently depending on the individual performing the practice. And we discovered how the performance of the practice not only depends on the individual, but also the site of performance. Each shared practice is different, depending on the individual, who are constituting their practice on the basis of the three elements (meanings, material and competencies). It must therefore be concluded that employers or other actors of leading roles, in advisoring engineering organizations, need to consider the complex bundle of practices which circulates in connection to 'being part of the organization'. When enacting work models through policies, rules, frameworks or others they must aim to accommodate each individual practice for the cultural landscape within the organization to function as a whole.

Our contribution consists of designing a framework for flexible work models that supports the needs of individuals, working within advising engineering organizations. We have through the report established 17 design criteria for such a framework. How the final framework will be, will be decided after the hand-in of this report, making it the focal point for the further work performed from the 4th of June til the 24th of June.

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Appendix List

1) Work-Life Balance
2) Effectivity and Productivity
3) Health
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5) Electricity Use
6) Establishment of Project Collaborator
7) Work Environment Legislation
8) Quotes Mapping
9) Individual Mapping
10) Worksite Preference
11) Design Solutions
12) PowerPoint Presentation One
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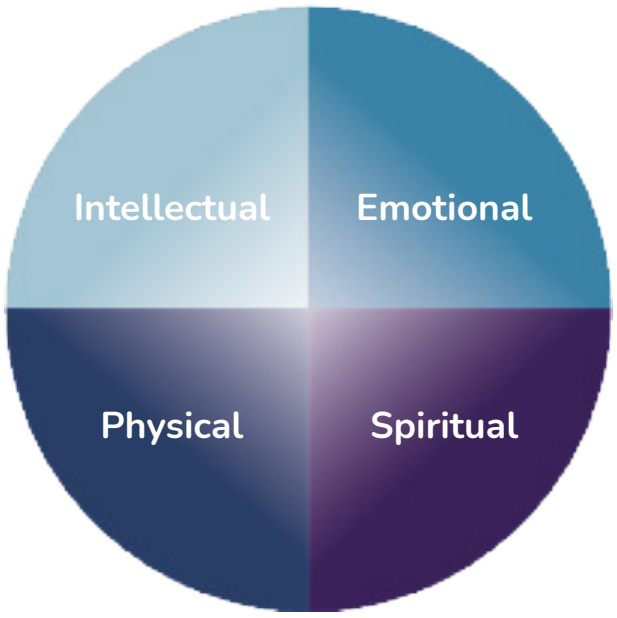
Appendix 1

Work-Life Balance



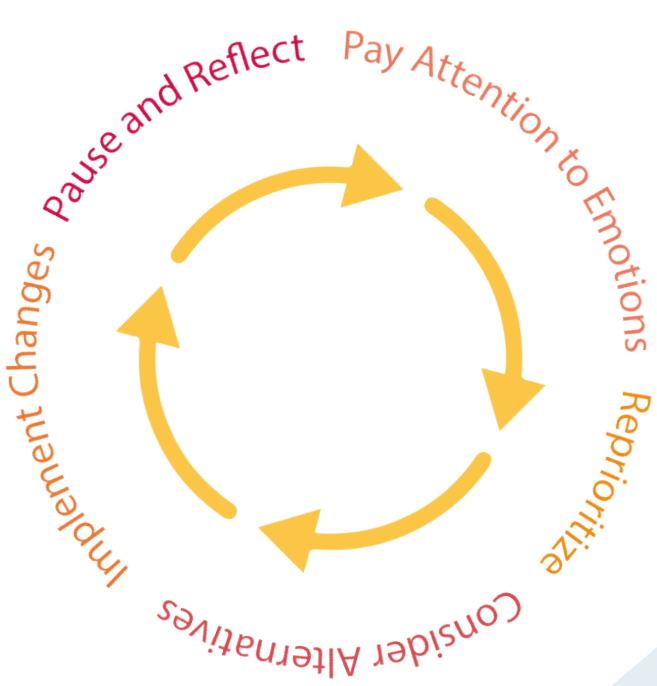
The four parts within humans in perfect balance. Illustrated by the author

Four Parts in Humans

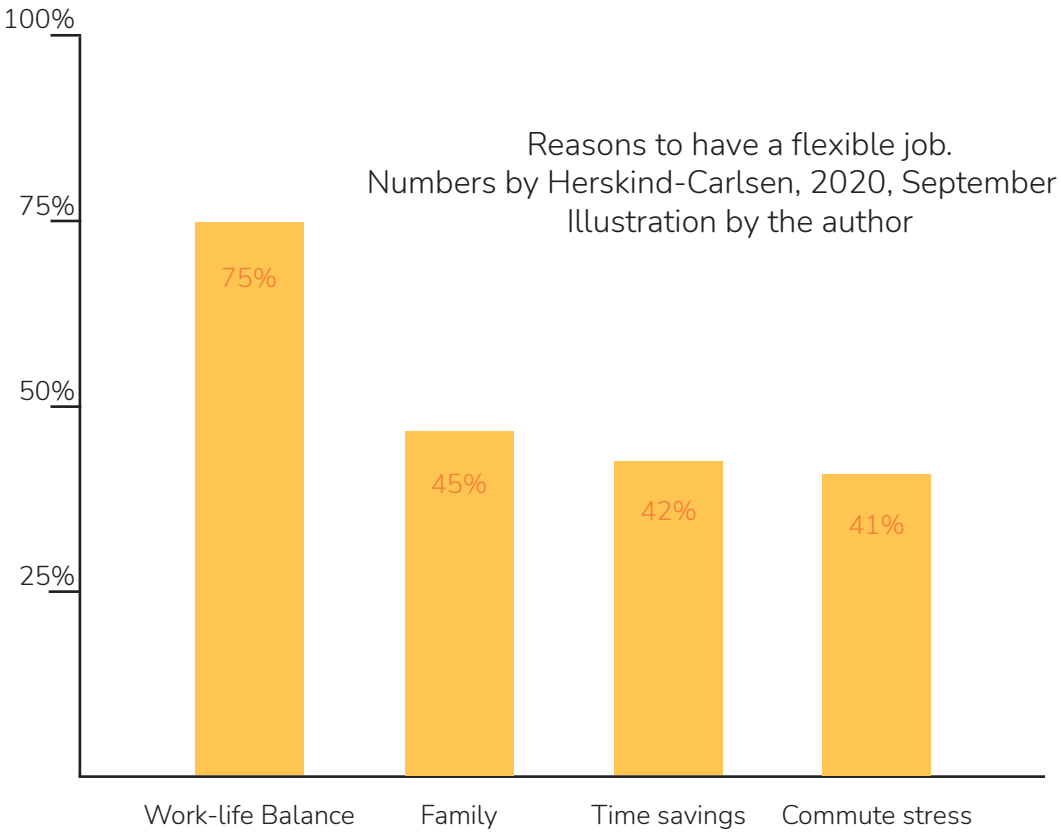
According to Marsh (2010, May) a life in balance can be achieved by attending to four sides in humans; the Intellectual, emotional, spiritual and physical side. He explains that in order to achieve balance within the four (which he states can never be 100% balanced), we need to understand that "...commercial companies are inherently designed to get as much out of you [as] they can get away with." (Marsh, 2010, may @3.47). This means that people are to take matters in their own hands, when it comes to their work-life balance. How to care for each of the four parts is inherently an individual matter and "If you don't design your life, someone else will design it for you, and you may just not like their idea of balance." Marsh, 2010, may @3.12).

Five Iterative Steps Towards Balance

A study with almost 200 in-depth interviews with 78 professionals from London done by Ruiz-Castro & Lupu (2021, January) showed that 30% of the men and 50% of women appeared to consciously resist working long hours. The study was done with an equal number of men and women between 30 and 50 years old. Ruiz-Castro & Lupu (2021, January) found that that even though each case was different a certain mental pattern for maintaining a work-life balance appeared. "...better balance between professional and personal priorities boils down to a combination of reflexivity — or questioning assumptions to increase self-awareness — and intentional role redefinition. Importantly, our research suggests that this is not a one-time fix, but rather, a cycle that we must engage in continuously as our circumstances and priorities evolve." (Ruiz-Castro & Lupu, 2021, January, l. 23)



A Cycle - The Process Towards Balance. Illustrated by the author



Reasons to have a flexible job.
Numbers by Herskind-Carlsen, 2020, September 15)
Illustration by the author

Herskind-Carlsen, C. (2020, September 15) describes a study done by Flexjob in 2019, where 7300 people were asked about job flexibility and working from home. This graph shows the reasons why these people wish to have a flexible job, which all indicates that a flexible job makes it easier for people to attend to 'the four parts' described by Nigel Marsh (2010, May).

7,8% are working permanently from home In Denmark. 5th place in EU (Eurostat., 2020, February 6).

During the pandemic 40% of the Danes were working from home according Danish profession (i.e., Dansk Erhverv) (Olsson, T. B., 2020, July 30).

Source(s):

Eurostat. (2020, February 6). How usual is it to work from home? Products Eurostat News - Eurostat. https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20200206-1
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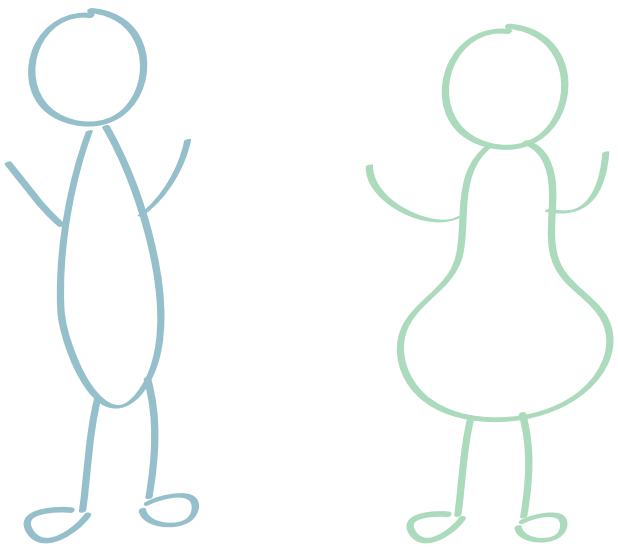
Appendix 1

Work-Life Balance

Work-Family Conflicts

Van Der Lippe & Lippényi (2018) is investigating whether or not work-from-home leads to more or less work-family conflicts. In the 1980 and 1990 it was seen as cost-effective to work from home because of the options to eliminate work-family conflicts (Van Der Lippe & Lippényi, 2018).
Van Der Lippe & Lippényi (2018) argues that "women experience greater tensions between work and family life than men" P. 384, which is why it seems necessary to distinguish between the two when conducting research. "men considered work–family benefits useful when they believed it benefitted job performance, while women tended to judge their effectiveness based on expected reduction of work–family conflict" (Van Der Lippe & Lippényi, 2018, p. 384)



Questions

Is it necessary to distinguish between men and women today?
Does the gender gap in today's society make men believe working from home make them abdicate for a promotion?
Does it put pressure on women to take more family responsabilities?

"On the one hand, working from home reduces work–family conflict because it **provides employees control over the scheduling of their workdays**." (Van Der Lippe & Lippényi, 2018, p. 385)

"...working from home **may interfere with performing responsibilities in the home domain** such as taking care of domestic duties and leads to conflict" (Van Der Lippe & Lippényi, 2018, p. 386)

"...working from home increases the permeability of boundaries between work and non-work domains because the **physical boundaries between the two contexts are eliminated**"
(Van Der Lippe & Lippényi, 2018, p. 386)

Work-Family Culture VS Ideal Worker Culture

A supportive organizational culture is one that acknowledges and supports the employees' family and personal situations, and promotes flexibility, tolerance and support for family needs and obligations. This is the opposite of having an 'ideal worker culture', where it is (for the company) mostly about getting as much out of their employee as possible. Supportive work–family culture produces norms that respect employees' personal and family time, and encourage use of work–family benefits, such as working from home. This can leada to a decrease in work-family conflicts (Van Der Lippe & Lippényi, 2018)

Conclusion

"The first conclusion is that elements of the work context help to explain how working from home can alleviate or increase work–family conflict for both men and women. (Van Der Lippe & Lippényi, 2018, p. 396)

The second conclusion is that the relation between working from home and work–fam-ily conflict is clearly gendered. (Van Der Lippe & Lippényi, 2018, p.397)

The third conclusion is that the work context appears to work differently for men than for women. (Van Der Lippe & Lippényi, 2018, p. 397)

Source(s):

Van der Lippe, T., & Lippényi, Z. (2018). Beyond Formal Access: Organizational Context, Working From Home, and Work–Family Conflict of Men and Women in European Workplaces. Social Indicators Research, 151(2), 383–402. https://doi.org/10.1007/s11205-018-1993-1

Appendix 7

Effectivity and Productivity

The effectivity and productivity is affected by many aspects that constitute the circumstances in which the employees can operate within. Below is listed different experiences that affects the productivity for the advantage or disadtage. The statements on this page is based on data from a large research project about 'Virtual management during the Corona crisis'. The information is based on interviews with 17 workplaces and answers through questionnaires from 594 work-places (Navrbjerg & Minbaeva, 2020). The categorization of the information, however, is our interpretation and division.

Pros...

...of virtual meetings

Is more time efficient

- Participants meet on time
- Participants are better prepared compared to physical meetings (about 48%)
- The agenda is more strict compared to physical meetings
- It's easier to keep the line of speech compared to physical meetings (about 47%)
- There is less informal talk in virtual meetings than at physical meetings (about 92%)

Is more democratic

- There is no head of the table. Everyone participate on equal terms. (Important that everyone is online to avoid meetings within meetings)
- The silent ones gets to share knowledge without interuptions
- It creates closer collaboration internally between leaders (60%)

Cons...

...of virtual meetings

Lack of social interactions

- It is more difficult to create confidentiality compared to physical meetings (about 71%)
- It is more difficult to read the other participants' reactions (about 90%)
- It is difficult for leaders to lead from the distance (37%)
- Leaders loose the feeling of the employees' wellbeing

Less exchange of knowledge

- Without the informal talks, errors and misunderstandings about the organization occurs (41%)
- Valuable inputs from outside is eliminated
- It is not suitable for initiating things, where expectations og goals needs to be established

...of individual work

- The silo construction is being demolished and better collaboration is emerging across the departments (42%)
- Time spent on transport is avoided
- Sickness absence has decreased (61%)
- Employees are more creative and find solutions to problems (66%)
- People can concentrate without regularly interruptions
- It is suitable for tasks in progress

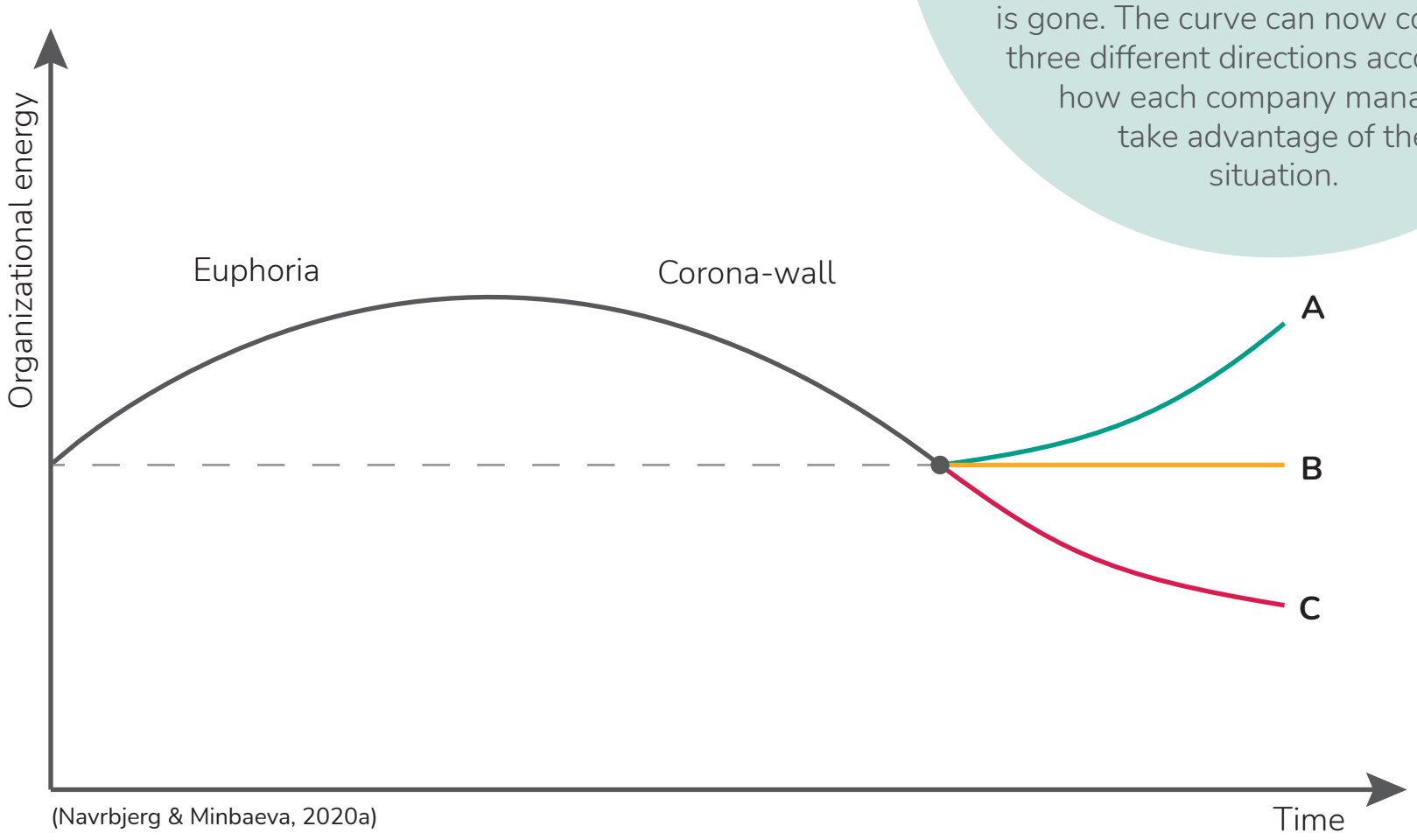
Source(s): Navrbjerg, S. E., & Minbaeva, D. (2020a, June). Virtuel ledelse under corona-krisen Rapport I: De kvalitative studier. FAOS & CBS.
Navrbjerg, S. E., & Minbaeva, D. (2020c, November 18). Virtuel ledelse under coronakrisen - hvad har vil lært? [Slides]. Cbs. https://www.cbs.dk/files/cbs.dk/webinar_2_final_slides_for_distribution.pdf

Appendix 7

Effectivity and Productivity

The questions is now; what have we learned from the crisis about the productivity and what will be brough forward in the future. The answers are yet unknown and companies are now in the situation to decide on this future. However data shows that the pandemic has created new work-from-home expe-riences and that companies have desires to build on these new learnings (Navrbjerg & Minbaeva, 2020a).

The graphic illustrates how the organizational energy has increased and decreased during the first period of the pandemic crisis. At first the energy increase because people are filled with euphoria about the situation and a spirit of togetherness is becoming the dominant attitude. After time the curve breaks and people experience "the Corona-wall", where the situation is drawn out and the euphoria is gone. The curve can now continue in three different directions according to how each company manage to take advantage of the situation.

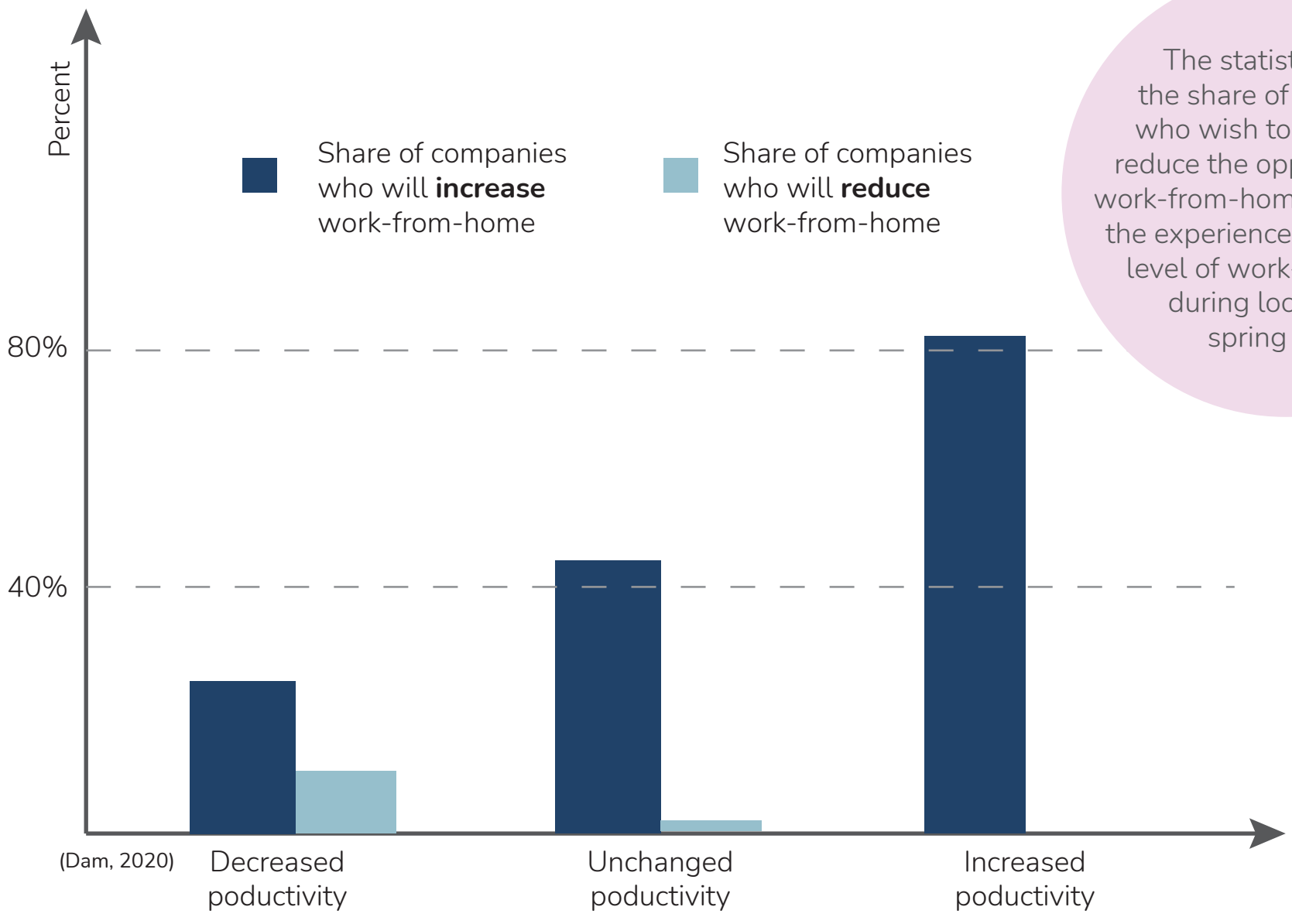


(Navrbjerg & Minbaeva, 2020a)

A *The organizational energy is rising due to changes after the crisis*

B *The organizational energy is stabilizing as before the crisis*

C *The organizational energy quietly contin-ues to be drawn out*



(Dam, 2020)

The statistic shows the share of companies who wish to increase or reduce the opportunities of work-from-home compared to the experienced productivity level of work-from-home during lockdown in spring 2020

80% will increase work-from-home

93% will increase the use of virtual meetings

43% are open for more flexible work hours

(Navrbjerg & Minbaeva, 2020c)

Source(s): Navrbjerg, S. E., & Minbaeva, D. (2020b, June 25). Virtuel ledelse under corona-krisen - de kvalitative resultater [Slides]. Cbs. https://www.cbs.dk/files/cbs.dk/webinar_coronaledelse_25_06_20-_final_distributed.pdf
Dam, J. M. (2020, May). Virksomhederne venter mere hjemmearbejde fremover. Dansk Industri.

Appendix 3

Health

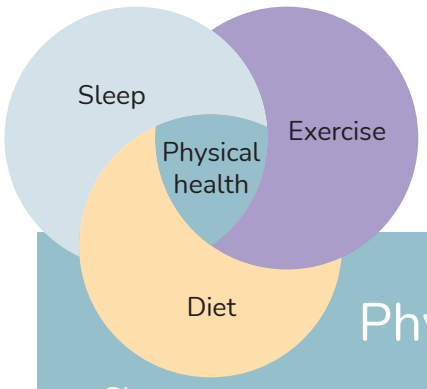
"The health of all peoples is fundamental to the attainment of peace and security and is dependent on the fullest co-operation of individuals and States." (World Health Organization, 2021a)

Definition of health

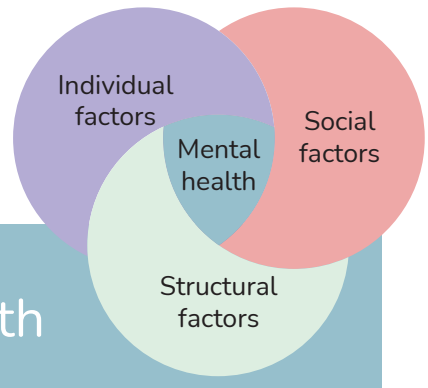
Since 1948 the definition of health has been as follows: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." (World Health Organization, 2021b)

Physical Health vs Mental Health

According to Falck Danmark (2021, February 11) health is very subjective and even though there are guidelines for maintaining a healthy life what works for one person, may not necessarily work for someone else, especially when it comes to the mental health. Health can be divided into two overall blocks namely, physical health and mental health (Falck Danmark, 2021, February 11).



Guidelines



Physical Health

[1]Sleep:
According to Falck Danmark (2021, February 11), it is estimated that an adult needs 6-9 hours of sleep during the night. These are tips to help that happen:
Avoid caffeine before bedtime.
Avoid alcohol before bedtime.
Stay away from energy-rich and fatty foods before bedtime.
Be sure to be physically active during the day, but not right before bedtime.
Make sure the bedroom is well-tempered (18-21 degrees).
Avoid noise above 30 decibels in the bedroom.
Avoid light from screens 1 hour before bedtime.
Make sure the bedroom is dark.

[2]Exercise:
According to The National Board of Health (i.e., Sundhedsstyrelsen) (2020, January 2), adults need at least 30 minutes of physical activity a day, at moderate to high intensity. This is beyond daily activities and can be divided, but must be at least 10 minutes long. At least twice a week, engage in high-intensity physical activity of at least 20 minutes duration to maintain or increase fitness and muscle strength. Activities must be included that increase bone strength and mobility.

[3]Diet:
Eat lots of plants, varied and not too much
Eat more vegetables and fruits
Eat less meat - choose legumes and fish
Eat whole grains
Choose vegetable oils and low-fat dairy products
Eat less of the sweet, salty and fatty
Quench your thirst in water

Mental Health

According to the national board of health (i.e., Sundhedsstyrelsen) (2020, January 2), mental health can be protected through different factors, categorized in 'individual', 'social' and 'structural' factors.

[4]Indicidual Factors:
A positive self-perception
Belief in self-efficacy
Good physical health
Good sleep pattern
Abilities to handle stress and challenges
A sense of meaning and coherence in everyday life
A sense of social belonging and ability to establish relationships

[4]Social Factors:
Caring parents and good family ties
Belonging to the surroundings
Supportive social relationships
Participation in positive communities
Social reputation (e.g., among friends)
Positive experiences with education and working life

[4]Structural Factors:
Safe environment
Good housing conditions
Financial security
Opportunity for employment
Access to social support functions
Access to education
A supportive and safe educational and working environment

Source(s):
[1]Falck Danmark. (2021, February 11). Hvad er sundhed - og er DU sund? https://www.falck.dk/falck-sundhed/raad/sundhed/hvad-er-sundhed/
[3]Fødevarestyrelsen. (2021, February 22). De officielle Kostråd - godt for sundhed og klima. Altomkost.Dk. https://altomkost.dk/raad-og-anbefalinger/de-officielle-kostraad-godt-for-sundhed-og-klima/
[4]Sundhedsstyrelsen. (2020, January 2). Hvad fremmer mental sundhed? Sst.Dk. https://www.sst.dk/da/viden/mental-sundhed/fremme-af-mental-sundhed/hvad-fremmer-mental-sundhed_
[2]Sundhedsstyrelsen. (2019, May 13). Voksne under 65 år. Sst.Dk. https://www.sst.dk/da/Viden/Fysisk-aktivitet/Anbefalinger-om-fysisk-aktivitet/Voksne-under-65-aar
World Health Organization. (2021a). Constitution. WHO.Int. https://www.who.int/about/who-we-are/constitution
World Health Organization. (2021b). Frequently asked questions. Who.Int. https://www.who.int/about/who-we-are/frequently-asked-questions

Appendix 3

Health

The Danish Working Environment Authority's executive order no. 1406 - Executive Order on mental work environment

§ 5. The work must be planned, organized and carried out at all stages in such a way that the impacts in the mental work environment, both from an individual and overall assessment, are fully justifiable in terms of safety and health in the short and long term.

§ 7. Influences in the mental work environment are understood as the following:
The way the work is planned and organized.
The organizational conditions of importance to the work of the employees.
The content of the work, including the requirements of the work.
The way the work is done.
The social relations at work.

(Arbejdstilsynet, 2020, September 26)

It is the employer's task to ensure the work in relation to age, insight, ability to work and other prerequisites.

The law includes:
Work in the employer's private household.
Work performed exclusively by members of the employer's family belonging to his household
Work performed by the military which can be attributed to actual military service.
Work that is not performed for an employer.

(Arbejdstilsynet, 2020, September 26)

The National Board of Health (i.e., Sundhedsstyrelsen) also state a correlation between physical activity and mental health.

Adults are people between 18 and 64 years old.

Workload and time allocated must be in balance, meaning the work is not 1. intensive, including at a high pace or without breaks for recovery, or 2. many hours, which may affect the possibility of recovery.

The work must be planned so that there are no ambiguous requirements and / or conflicting requirements in the work. Requirements which are not clear or which are incompatible, including requirements for work tasks, quality level, work function, areas of responsibility, working methods, workflows, role distribution, time consumption, work pace or working hours.

(Arbejdstilsynet, 2020, September 26)

The law ensures security in connection with:
High emotional demands in working with people.
Offensive acts, such as bullying and /or sexual harassment.
Work-related violence.
Work-related violence at work.
Work-related violence outside working hours.

(Arbejdstilsynet, 2020, September 26)

Source(s):
Arbejdstilsynet. (2020, September 26). Psykisk arbejdsmiljø¸ - Arbejdstilsynet. At.Dk. https://at.dk/regler/bekendtgoerelser/psykisk-arbejdsmiljoe-1406/
Arbejdstilsynet. (n.d.). Hvordan kan man tilrettelægge hjemmearbejdet, så det fungerer godt? - Arbejdstilsynet. At.Dk. Retrieved February 24, 2021, from https://at.dk/arbejdsmiljoeproblemer/covid-19/forebyg-coronasmitte-i-din-branche/hjemmearbejde/
Sundhedsstyrelsen. (2020, January 2). Hvad fremmer mental sundhed? Sst.Dk. https://www.sst.dk/da/viden/mental-sundhed/fremme-af-mental-sundhed/hvad-fremmer-mental-sundhed_

Appendix 3

Health

Work-From-Home Environment

The employer is responsible for (Arbejdstilsynet, n.d.):
Guiding their employee to an ergonomic home office.
Serving working equipment for example a computer.
Clear communication of assignments and requirements.
Supporting social needs, between employees.
Clear communication of work hours.

Møller (2021, February 4) states that pain and discomfort typically occur in

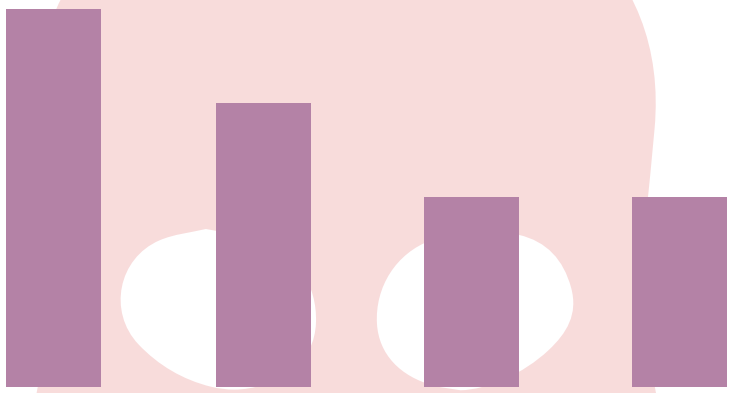
Back
Neck
Arms
Elbow
Shoulders
Lower back

Manage Work-From-Home

Create good routines
Vary your working position
Get up when you can.
Prioritize a daily walk.
Take active breaks

Physical (in)activity

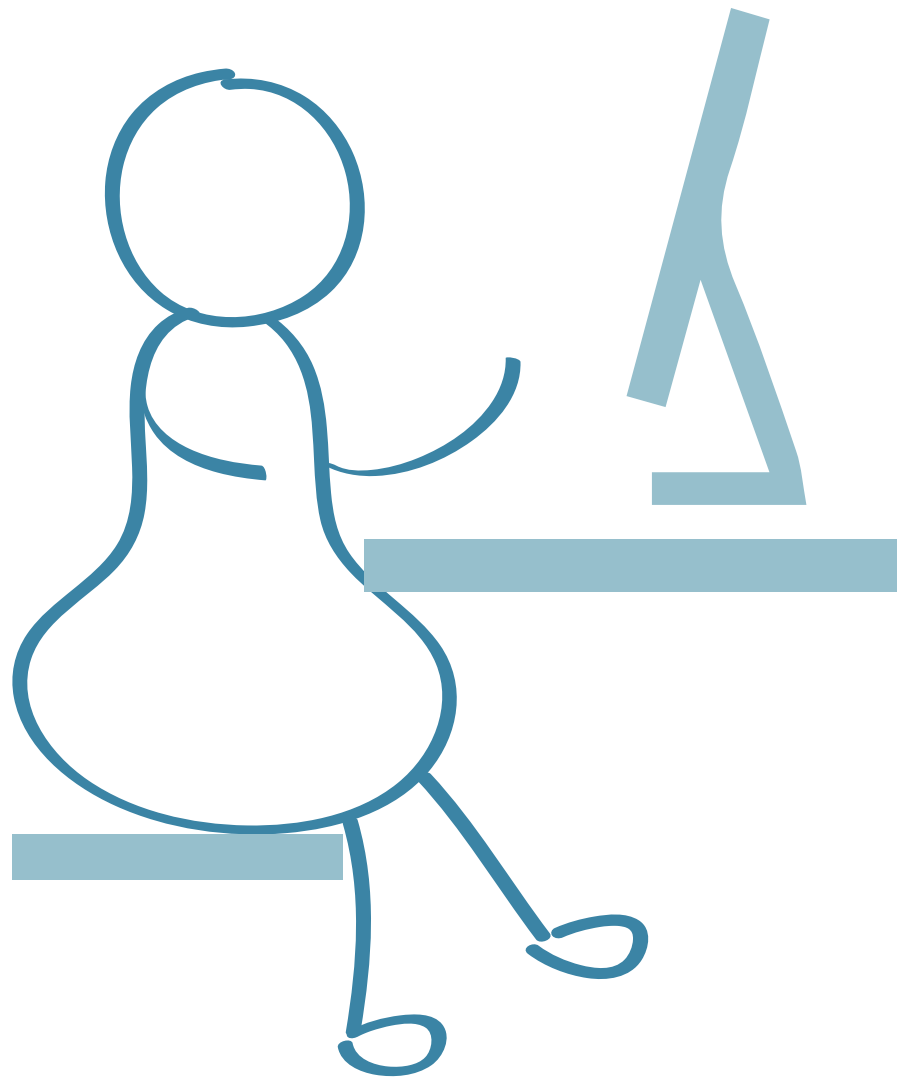
"Phyical activity is defined as any bodily movement produced by skeletal muscles, resulting in energy expenditure." (Selamet, 2020, P.2)



According to Ricci, F., et al. (2020) The World Health Organization classified physical inactivity as the fourth leading risk factor accounting for 6% of global mortality.

"Importantly, in a dose-response meta- analysis of 34 studies, including 1,331,468 community-dwelling participants, total sitting time volumes >8h and 6 h/day were associated with increased risk of all-cause death and CV death, respectively, in PA adjusted analyses." (Ricci, F., et al. 2020, p.2)

"...approximately 3.2 million deaths worldwide annually can be attributed to physical inactivity." (Selamet, 2020, P.2)



Source(s):
Arbejdstilsynet. (n.d.). Hvordan kan man tilrettelægge hjemmearbejdet, så det fungerer godt? - Arbejdstilsynet. At.Dk. Retrieved February 24, 2021, from https://at.dk/arbejdsmiljoeproblemer/covid-19/forebyg-coronasmitte-i-din-branche/hjemmearbejde/
Møller, E. (2021, February 4). Hjemmearbejdsplads I Slip af med smerterne I Få 4 øvelser her. Klinik. https://www.klinik.dk/hjemmearbejdsplads/
Ricci, F., Izzicupo, P., Moscucci, F., Sciomer, S., Maffei, S., Di Baldassarre, A., Mattioli, A. V., & Gallina, S. (2020). Recommendations for Physical Inactivity and Sedentary Behavior During the Coronavirus Disease (COVID-19) Pandemic. Frontiers in Public Health, 8, 1–4. https://doi.org/10.3389/fpubh.2020.00199
Selamet, J. (2020). Human-centered Design Approach toward the Physical Activity Initiative for Work-from-Home Workers during the COVID-19 Outbreak. The International Journal of Designed Objects, 14(2), 1–17. https://doi.org/10.18848/2325-1379/cgp/v14i02/1-17

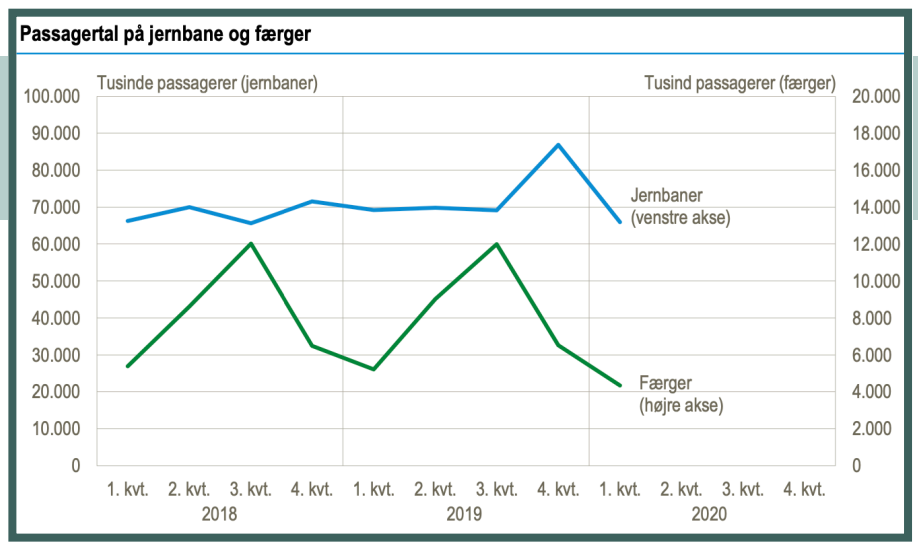
Appendix 3

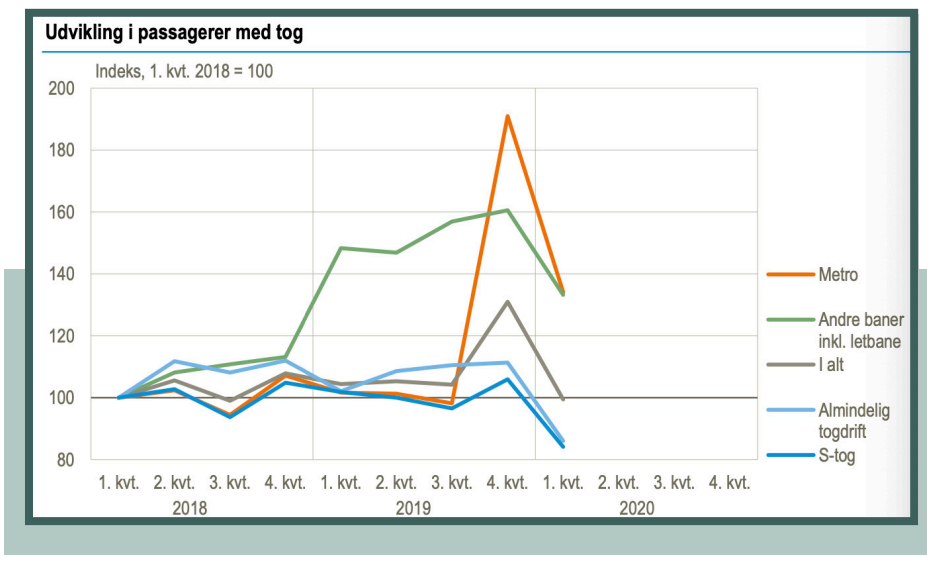
Transportation

”Remote work eliminates commuting needs, requiring less structured morning routines and thereby creating both a delayed morning load and reducing morning peaks.” (Chien-fei Chen, et al. 2020, p. 2) This worksheet will explore, as the quote states, if the shift to work from home due to Covid-19 actually has eliminated commuting needs in Denmark.

Train and ferry

In the beginning of 2020 the number of passengers on ferries decreased by 17 pct. in comparison to same period of time in 2019. On railways the amount of passengers declined 24 pct.

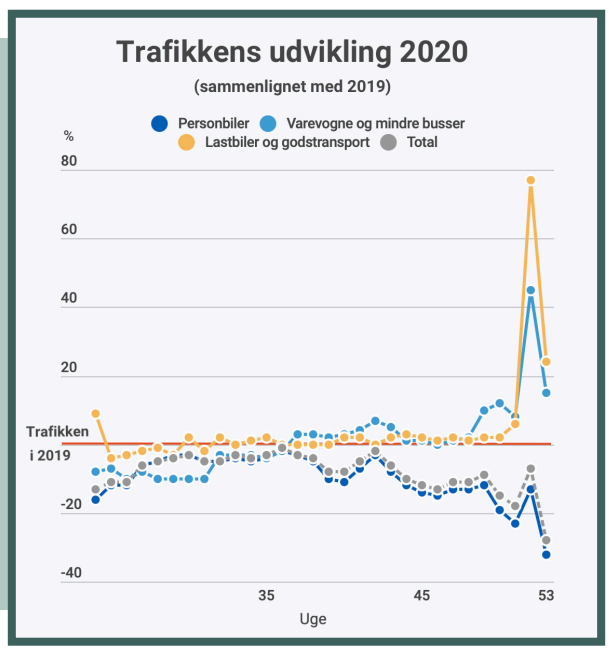




When examining the statistics on the development of passengers using trains, you recognize an overall decrease of passengers. Mostly the Metro took a hit with a decline of 30 pct. This decline is not necessarily based on the Covid-19 lockdown, but also due to maintenance and closure of the M3 city line. Also the ’cityring’ opened in the end of 2019, which shows an increase in the statistic.

Cars

On the statistic shown to the right shows the traffic index for 2020. The red line shown on this diagram is the average traffic in 2019. In week 51 in 2021 it is shown that passenger cars have dropped significantly. The reason is the introduction of further restrictions due to Covid-19.



When comparing the average of 2020 to traffic in 2021 there is about 30% less passenger cars. Nonetheless it seems that truck and freight transportation is stable.

Compared to 2020 there is still missing about 1/3 of passenger cars on the roads.

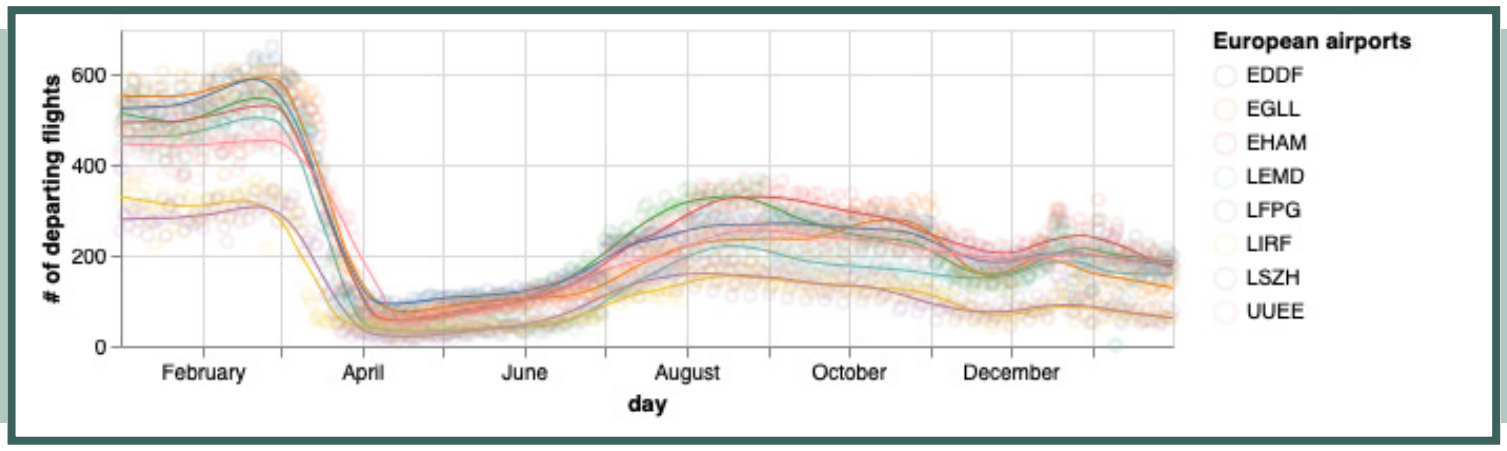
Source(s):
Chen, C., Zarazua de Rubens, G., Xu, X., & Li, J. (2020). Coronavirus comes home? Energy use, home energy management, and the social-psychological factors of COVID-19 (No. 68). Energy Research & Social Science.
Danmarks Statistik (2020). Passagertransport med jernbane og færger 1. kvt. 2020, Stort fald i passagertransport grundet COVID-19, https://www.dst.dk/da/Statistik/nyt/NytHtml?cid=37807
Vejdirektoratet, (24/02/2021). Trafikkens udvikling under coronakrisen, https://www.vejdirektoratet.dk/side/trafikkens-udvikling-i-tal

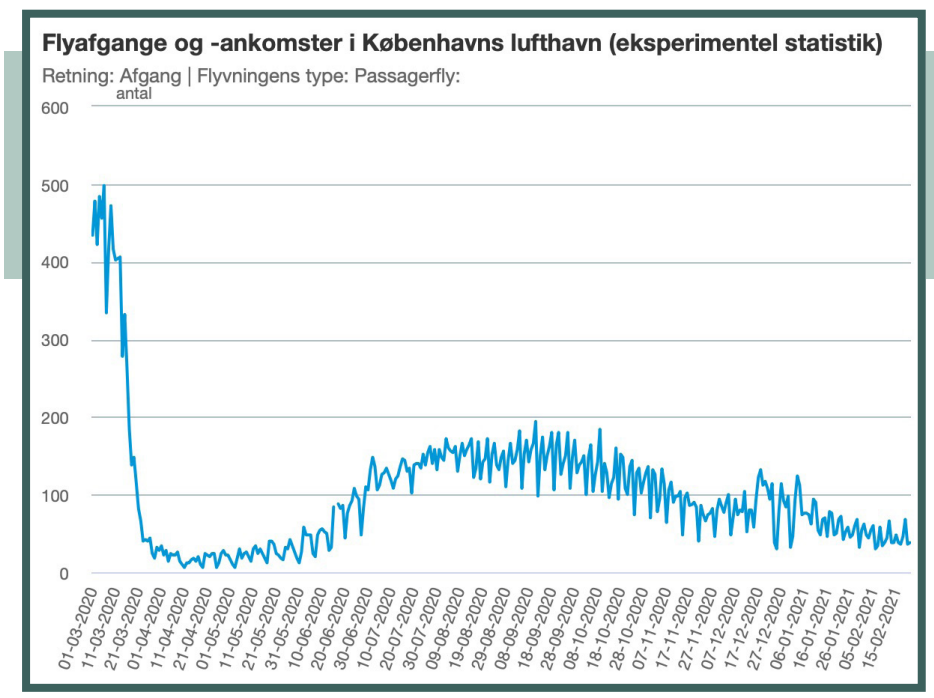
Appendix 3

Transportation

Flight

Because of COVID-19 and the travel restrictions that followed the flights around the world have decreased dramatically. It is clear in the statistic that the number of departing flights has decreased in all european airports.





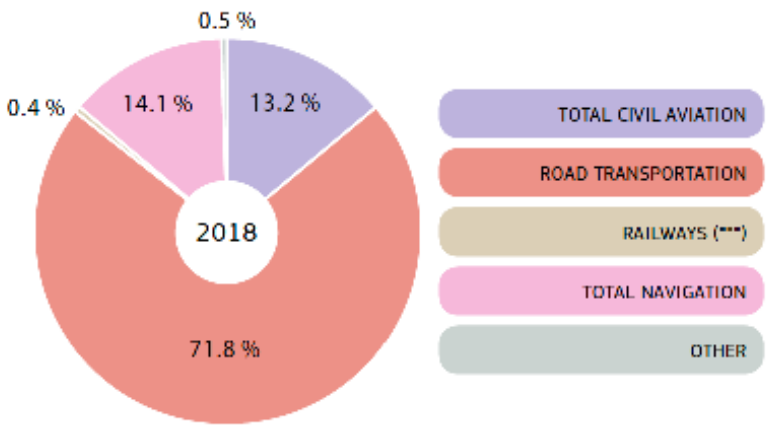
The same is shown of this experimental statistic from Danmarks Statistik. It shows the decrease in flight arrivals and departures in Copenhagen Airport. Both statistics are made from datasets from The OpenSky Network.

Emissions form transport

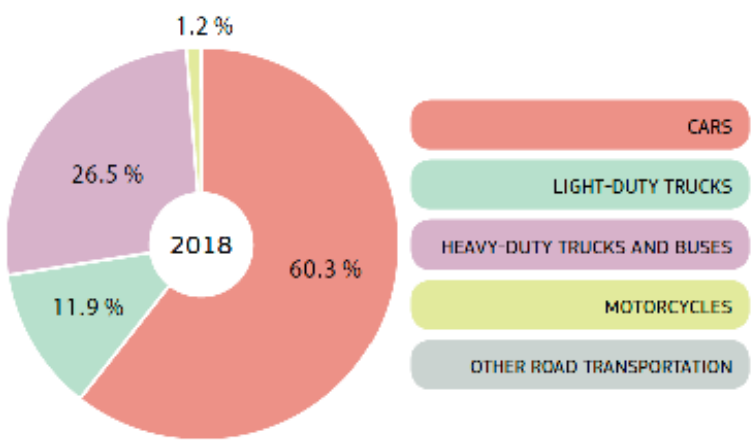
In the handbook of EU transport in figures from the European Commission several statistics are presented. Below you see two of them. It is clear from the chart of GHG emissions from transport that it is the road transportation (71.8%) followed by aviation (13.2%) that emits the most. Diving into the chart of GHG emissions from road transport, GHG from cars on the roads emits 60.3% of the totalt amount of GHG emissions from road transport.

Transport is responsible for around 45% of Europe's emissions of nitrogen oxides and a significant proportion of the total emissions of other key pollutants.

GHG emissions from transport



GHG emissions from road transport



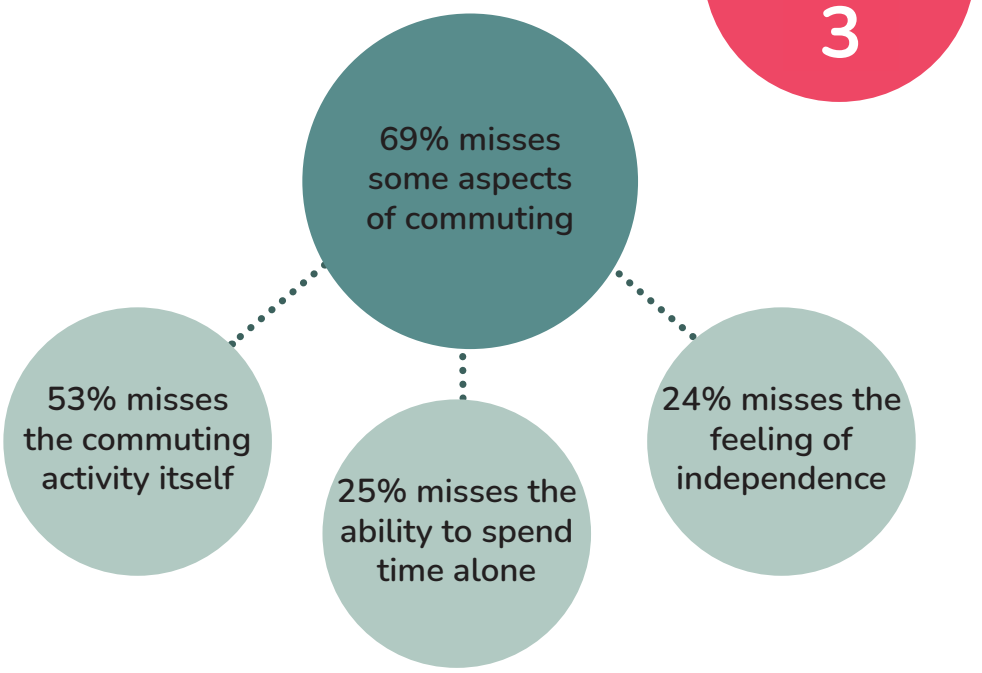
Source(s):
Olive, X., (2021). ONERA: Impact of COVID-19 on worldwide aviation, https://traffic-viz.github.io/scenarios/covid19.html
Danmarks Statistisk, Dagligt antal flyafgange fra Københavns Lufthavn: Flyafgange og -ankomster i Københavns lufthavn (eksperimentiel statistik), https://www.dst.dk/da/Statistik/covid-19-hurtige-indikatorer
European Environment Agency (2021): What is pollution?, https://www.eea.europa.eu/signals/signals-2020/infographics/what-is-pollution/view
European Commission (2020). Directionate-General for Mobility and Transport: EU transport in figures, https://op.europa.eu/en/publication-detail/-/publication/da0cd68e-1fdd-11eb-b57e-01aa75ed71a1#

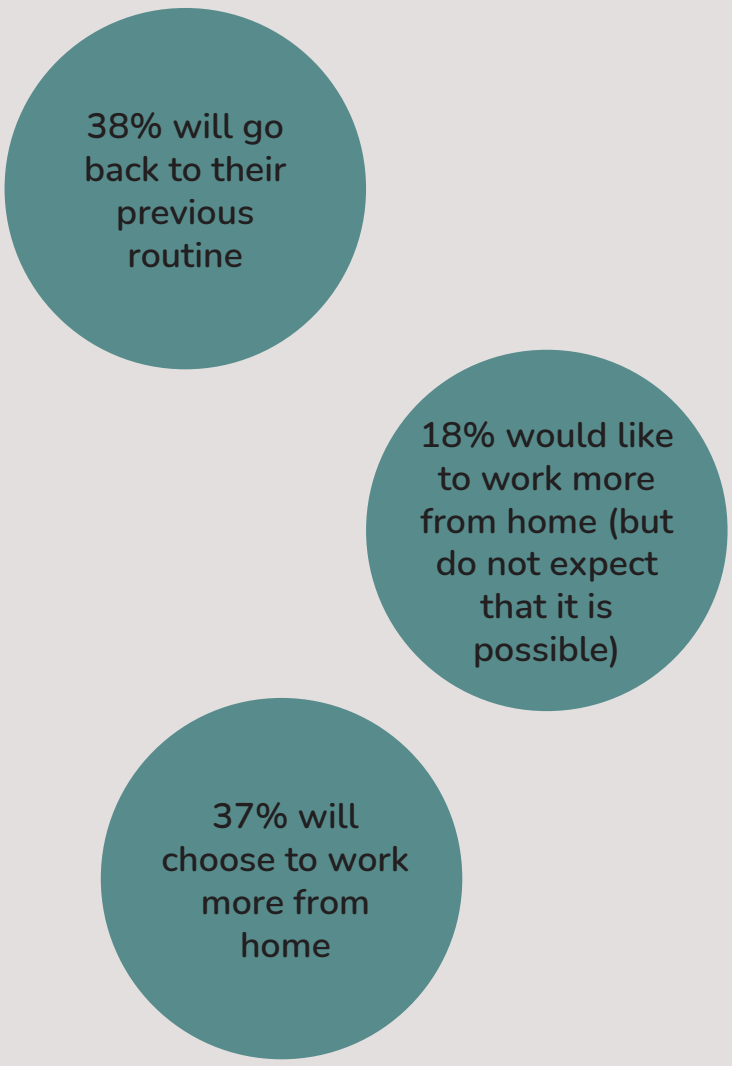
Appendix

3

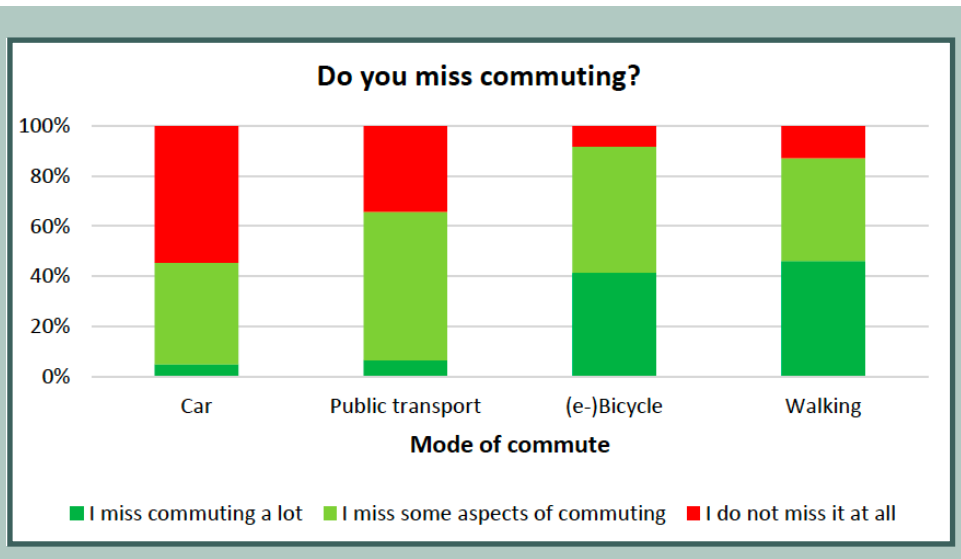
Transportation

Transportation time is often recognized as a waste of time. Which is why the efficiency of transportation systems has become a relevant goal for planners, in order to reduce travel time both to and from the workplace (Rubin, Nikolaeva, Nello-Deakin, & te Brömmelstroet, 2020). Covid-19 forced citizens to quickly change their work site and a lot of people were set to work from home. Here we explore the result of the research done by Rubin, Nikolaeva, Nello-Deakin and te Brömmelstroet (2020)

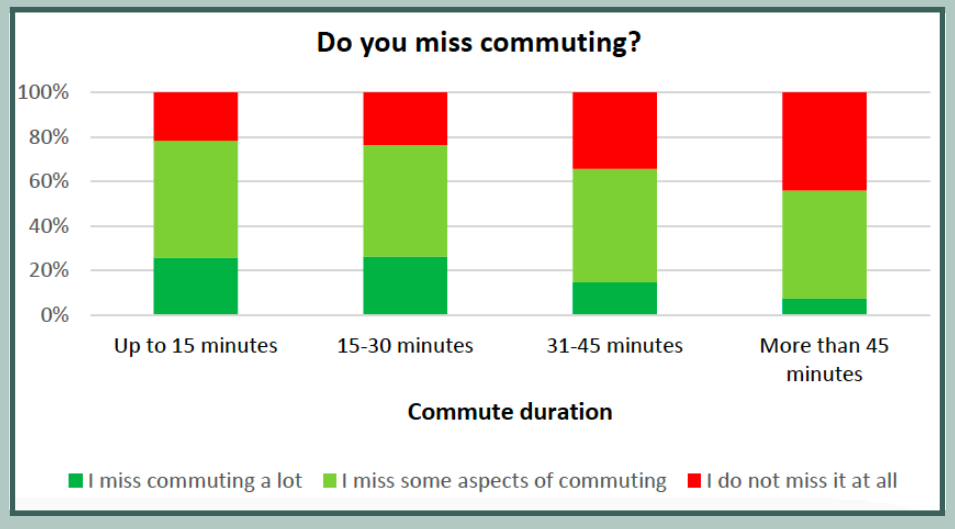




The result of the article shows that most people do not miss long commutes. Mostly if they are by cars. They suggest a more desirable system where you will enable more commuting by cycling og walking together with increased opportunities in working from home.



Even though 69% misses some aspects of commuting, it is very much dependent upon the choice of transportation. As you can see from the statistic car commuters miss commuting the least of the four categories. (E-)Bicycles are the group of commuters that misses the commute the most.



Also the commuting time is an important aspect. It is clear from the statistic that the feeling of missing commuting also decreases when the travel time increases.

Source(s):
Rubin, O., Nikolaeva, A., Nello-Deakin, S., & te Brömmelstroet, M., (2020). What can we learn from the COVID-19 pandemic about how people experience working from home and commuting?. Centre for Urban Studies, University of Amsterdam. Available at: https://urbanstudies.uva.nl/content/blog-series/covid-19-pandemic-working-from-home-and-commuting.html

Appendix 5

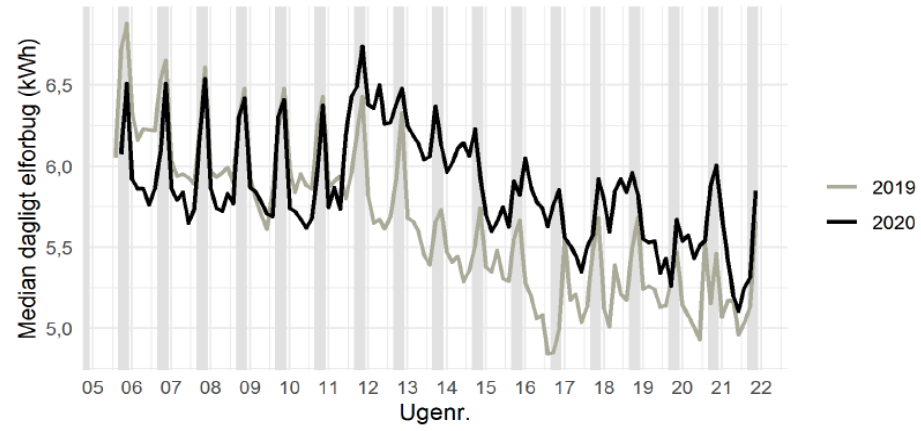
Electricity Use

Energy use: Work-from-home employee and commercial buildings

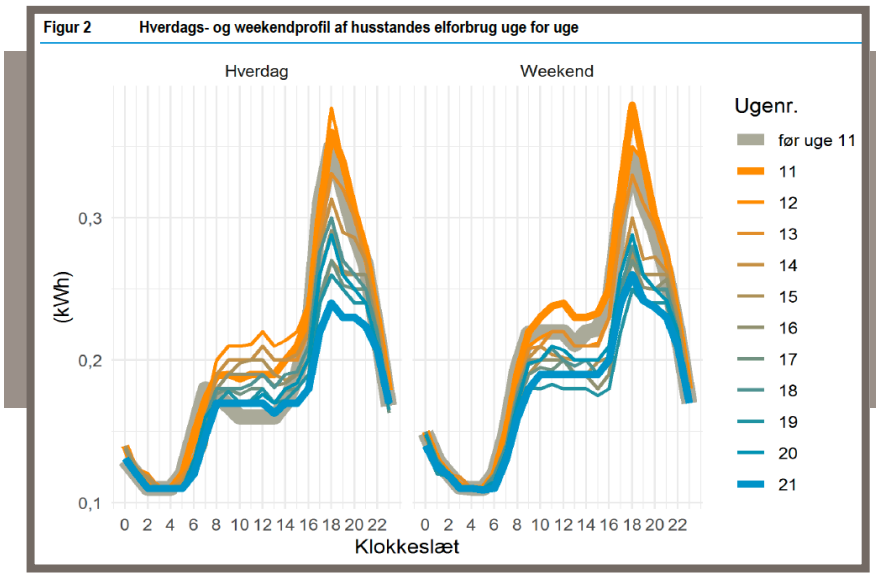
Electricity use at home during Covid-19

In the period of 2019 to 2020 you can see a significant change in the household energy consumption. It is identified by Nielsen, P. Y & Jacobsen J. P., (2020) that it is because a lot of activities is now allocated to the homes. It is identified that the increased use of electricity happens in the daytime in the weekdays. This because most people would be out of their homes to go to work. A experimental statistic performed by DST shows this increase in the daily electricity consumption.

Figur 1 Median af dagligt elforbrug for husstande i 2019 og 2020



Figur 2 Hverdags- og weekendprofil af husstandes elforbrug uge for uge



From the experimental statistic shown on figure 2, you can see that the use of electricity after the closedown of the society is increased mostly in mid-day in the weekdays. Energy consumption has increased, but the significant change is on this pattern, where weekday consumption are closely aligned with pre-Covid-19 weekend consumption. This will most likely result in an incease of energy bills for residental consumers (Chien-fei Chen, et al. 2020).

From workplace energy use to household energy use

What happened when Covid-19 stated a now work-form home practice? Gillingham, et al. (2020) Identified that Covid-19 has in the short run emptied commercial office buildings that has led to reduction of emissions and thus cleaning of the air; "***Use of natural gas in residential and commercial buildings has declined by almost 20%, while overall electricity demand (and demand for coal-fired electricity) has declined by less than 10%.***" (Gillingham, et al., 2020, p. 1338). Although they recognize this declinement, they also recognize an incease in electricity use from residental homes; "***...some of the decline was offset by increased residential electricity demand from people staying at home...***" (Gillingham, et al., 2020, p. 1338). They also state that if shutdowns continue for a longer period of time, and a work-from-home practice becomes popular it would reduce travel but most likely increase building use energy as home energy would increase, whilst commercial buildings would use samewhat the same amount of energy, because the remaineng employees (employees that simply can't perform their jobs from home) whould use the space (Gillingham K, T. et al., 2020). It is estimated that the electricity and energy demand has dropped around 11% in contries in the European Union (Chen, et al. 2020).

Before Covid-19 the normal electricity use in office buildings lay somewhere between 50 to 100 kWh/m^2 (Wittchen, et al., 2011). This project uncovered that it is especially serverrooms that was one of the biggest sinners in the increase of energy use (Wittchen, et al, 2020). Zooming in at the energy use at consulting companies in Denmark most of the energy used is electicity and district heating that together constitue to the energy use by 80% (Dansk Energi Analyse, 2000). Whilst the energy use for residential housing was described as "***... responsible for 44 percent of total energy use and approximately one quarter of household-generated GHG emissions (UNEP 2010).***" (Cohen, 2018)

Source(s): Nielsen, P. Y & Jacobsen J. P., Arbejdspapir: Husstandes elforbrug vidner om ændret aktivitet, DST, 2020
Chen, C., Zarazua de Rubens, G., Xu, X., & Li, J. (2020). Coronavirus comes home? Energy use, home energy management, and the social-psychological factors of COVID-19 (No. 68). Energy Research & Social Science.
Gillingham, K.T, Knittel, C. R, Li, J., Ovaere, M., Reguant, M., (2020). The Short-run and Long-run Effects of Covid-19 on Energy and the Environment, Joule, Volume 4, Issue 7, Pages 1337-1341, ISSN 2542-4351, https://doi.org/10.1016/j.joule.2020.06.010.
Wittchen, K. B., Hansen, E. J. D. P., Radish, N., & Treldal, J. (2011). Energioptimering af kontorbyggeri. (1 udg.) SBI forlag. SBI Bind 2011 Nr. 16 http://www.sbi.dk/miljo-og-energi/energibesparelser/energioptimering-af- kontorbyggeri/energioptimering-af-kontorbyggeri

Appendix 6

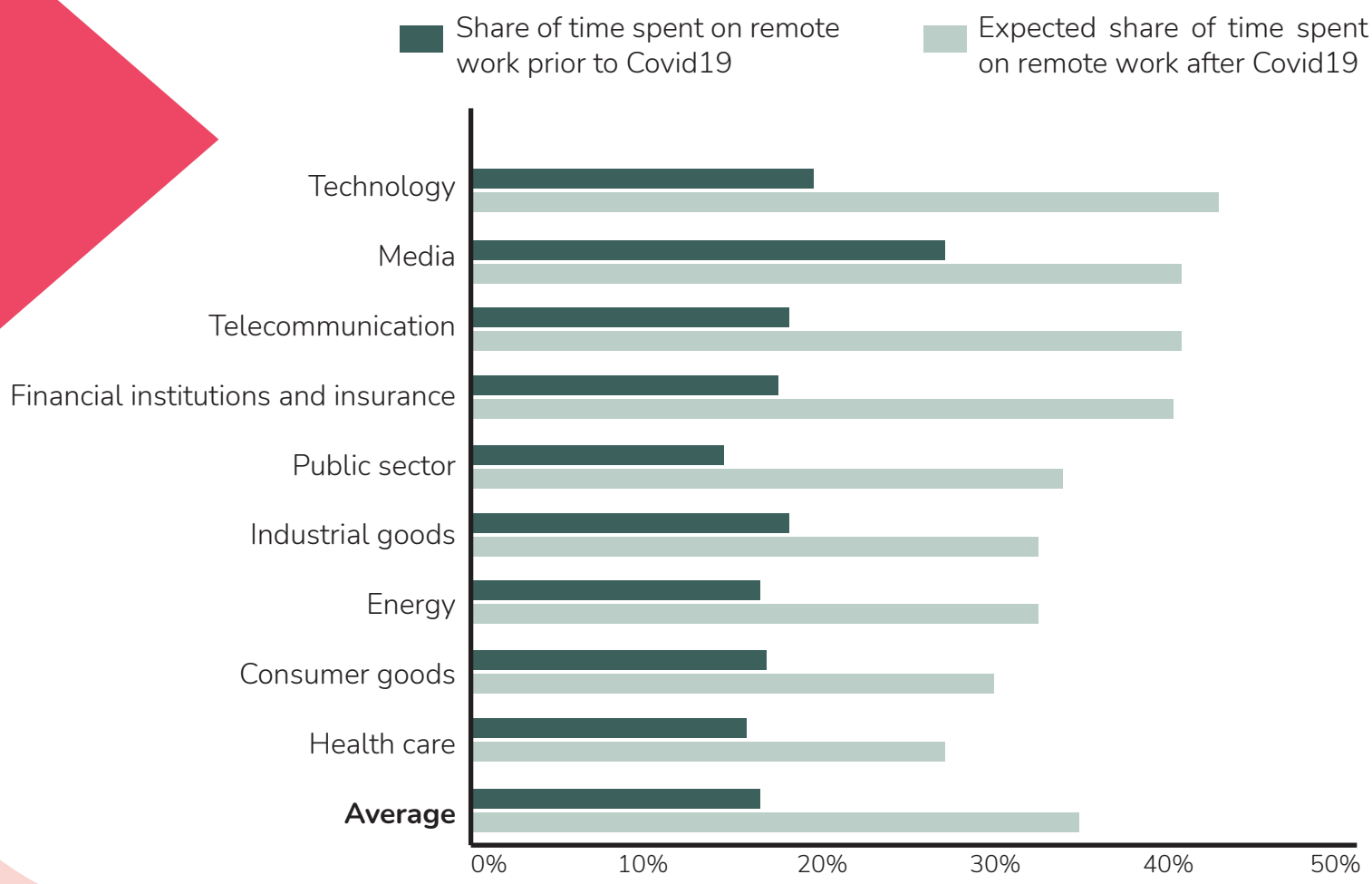
Establishment of Project Collaborator

In the process of finding a suitable project collaborator, we based the choice on statistics and desk-research. According to research commissioned by Microsoft and performed by Boston Consulting Group and KRC research, companies have ambitious remote working plans in every industry.

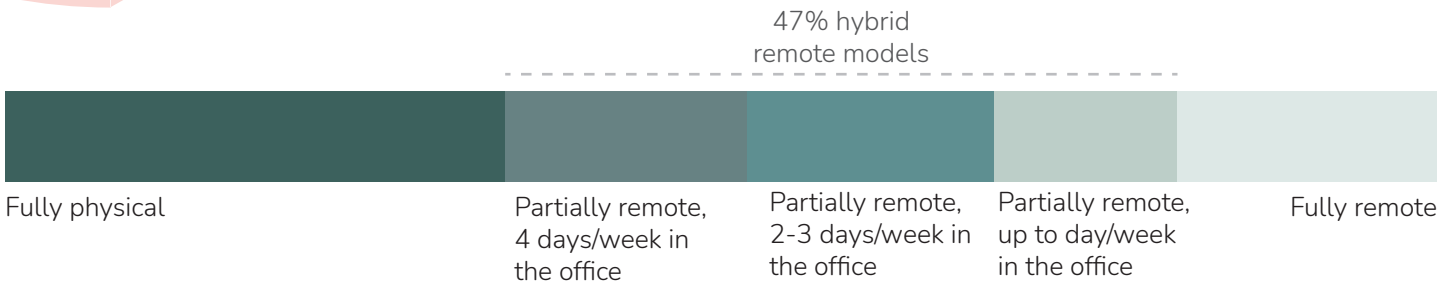
The survey also shows that managers expect that 47% will be working partially from home in the following years, through a hybrid remote work model, where work is performed partly from home and partly from the office.

Furthermore, the survey shows that Denmark is a frontrunner in Europe, in regards to the share of time spent on remotely work.

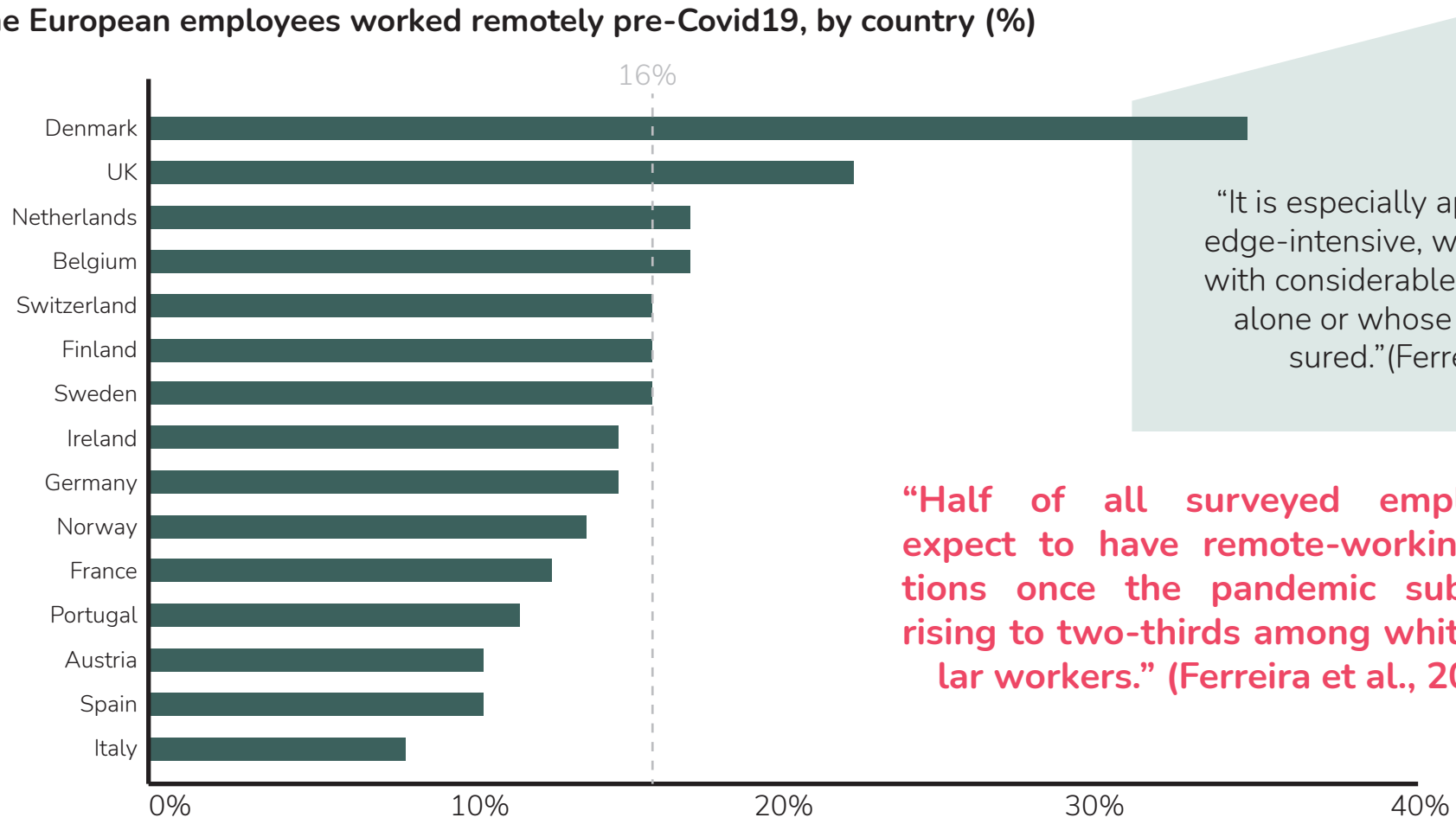
Time managers expect European employees to work remotely, after COVID-19



Managers expect almost half of employees to be working partly from home in the next two to three years.



Time European employees worked remotely pre-Covid19, by country (%)



"It is especially appropriate for knowledge-intensive, white-collar employees with considerable experience who work alone or whose output can be measured."(Ferreira et al., 2020)

"Half of all surveyed employees expect to have remote-working options once the pandemic subsides, rising to two-thirds among white-collar workers." (Ferreira et al., 2020)

Source(s): Ferreira, J., Claver, P., Pereira, P., & Thomaz, S. (2020, October). Remote Working and the Platform of the Future. Boston Consulting Group.

Appendix 7

Work Environment Legislation

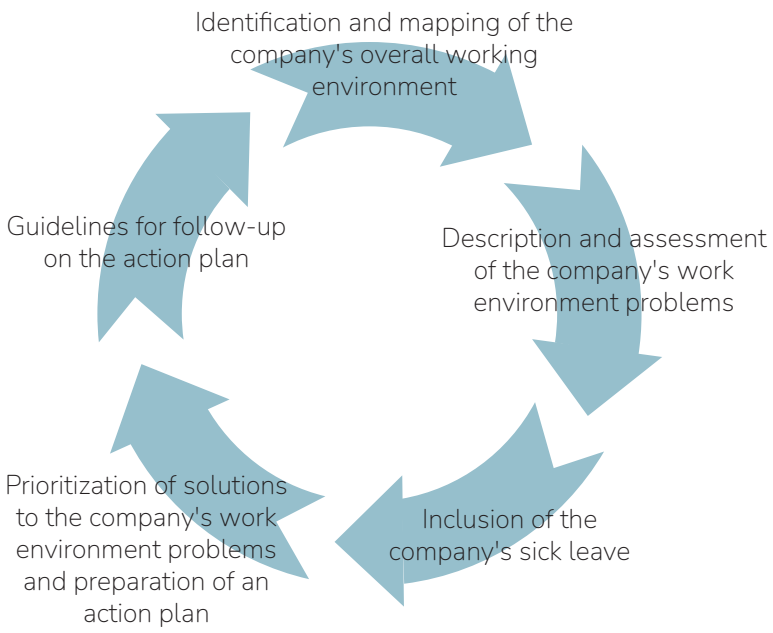
The work-from-home legislations

In order to secure safe and healthy work environments rules and legislations are made. The first legislation on this area was passed in the 1870s and the most recent edition was renewed in 2019. The law is a framework law, which consist of general obligations and principles on the area (See § 1).

> **§ 1. The law strives to create**
> **1.** a safe and healthy physical and mental working environment that is at all times in line with the technical and social developments in society, and
> **2.** basis for the companies themselves to solve safety and health issues with guidance from the labor market organizations and guidance and control from the Danish Working Environment Authority.
>
> **(Arbejdstilsynet, 2020a)**

Work Environment Assessment

Companies are obligated to perform a Work Environment Assessment at least once every 3rd year. The purpose is to evaluate and optimize. The companies can decide what methods they wish to use, but the Work Environment Assessment must include the five elements illustrated in the figure below. The Working Environment Authority (Arbejdstilsynet) supervises that the company carries out this process in accordance with the requirements of the legislation (Arbejdstilsynet, 2016).



(Arbejdstilsynet, 2016)

The work environment legislation continues to apply when the work is carried out from home. However, there are limited rules in the following areas: The physical facilities of the workplace, work in front of a computer, the companies' safety and health work, as well as rest periods and days off. The legislation applies when the work is performed exclusively at home or when the work is regularly performed at home and corresponds to at least one working day per week (Arbejdstilsynet, 2014).

Some general points

- There is no supervision from the National Board of Employment in people's private homes. This can be done by contacting the company.
- The working environment legislation does not regulate the amount of work from home.
- If several employers have work performed at the same workplace, they have a duty to cooperate.

The physical workplace facilities

The legislations regarding physical work facilities still applies when working from home part time or full time. There is a special focus on interior, ligthing, ventilation and rescue equipment, when working from home. However, the last two mentioned does not usually matter when the employee is working from home in front of a computer.
Employees are allowed to use their own equiptment as long as it meets the requirements.

Work in front of computer

Legislation about work in front of a screen at home, applies when the screen work is regularly and corresponds to at least one working day a week or approx. 2 hours or more every day. The legislation include the physical setup, breaks and eye conditions. Employees must have breaks or shift tasks regularly. They have rights to get an examination of their eyes and if this shows that glasses would be necessary, the employer must provide it.

Source(s): (Arbejdstilsynet, 2020a): https://at.dk/regler/love-eu-forordninger/arbejdsmiljoe-674-sam/
(Arbejdstilsynet, 2016): https://at.dk/regler/at-vejledninger/arbejdspladsvurdering-apv-d-1-1/#1-Hvorfor-udarbejde-en-APV?
(Arbejdstilsynet, 2014): https://at.dk/regler/at-vejledninger/hjemmearbejde-d-2-9/#3-Arbejde-ved-en-sk%C3%A6rm
(Arbejdstilsynet, 2020b): https://at.dk/regler/at-vejledninger/skaermarbejde-d-2-3/

Appendix 7

Work Environment Legislation

The work environment system

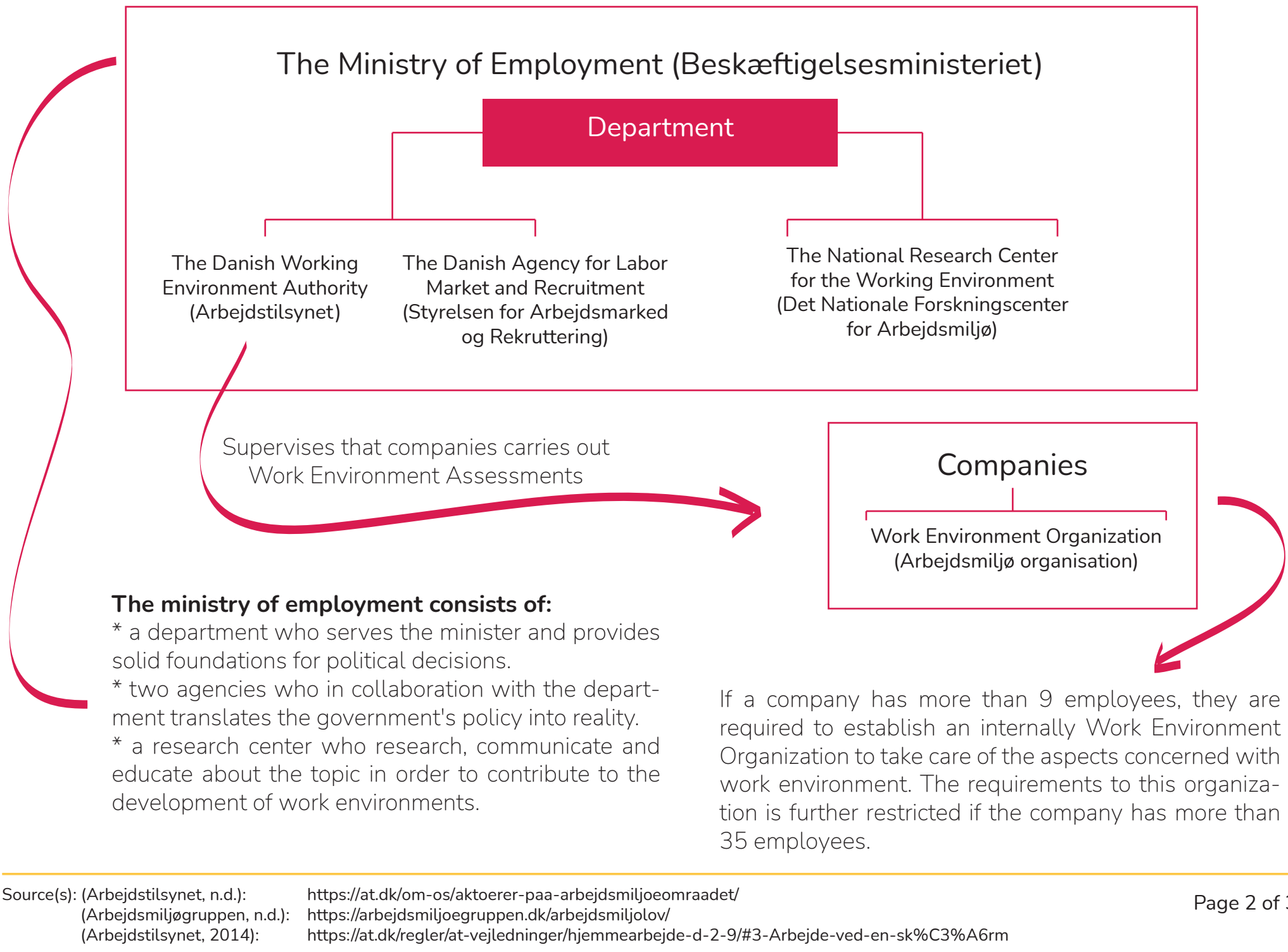
The companies' safety and health work

If a company has more than 9 employees, they must be covered by a Work Environment Organization (Arbejdsmiljø organization). This still applies for employees working exclusively or partly from home. In this case, the organization must be more outreaching to ensure healthy work environments at home as well. However, visits to the employee's home require the consent of the employee.

Rest periods and days off

Employees are required to have a rest period of at least 11 consecutive hours within each 24-hour period, and weekly they must have one day off. Those rules are still applying when the employees work from home, but employees who are free to structure their schedule themselves, are allowed to divide the rest periods into smaller chunks as long as the sum is 11 hours in a 24-hour period.

The law is continuously supplemented with more precise rules and guidelines through executive orders made by the Ministry of Employment (Beskæftigelsesministeriet). In addition, AT-guidelines are made by the Danish Working Environment Authority (Arbejdstilsynet) and describe guidelines for the practical work that a company must do in order to meet the requirements of the law (Arbejdsmiljøgruppen, n.d.). Through executive orders and AT-guidelines it is the employer's responsibility to ensure that the companies' work environment meets the demands.



The ministry of employment consists of:
* a department who serves the minister and provides solid foundations for political decisions.
* two agencies who in collaboration with the department translates the government's policy into reality.
* a research center who research, communicate and educate about the topic in order to contribute to the development of work environments.

If a company has more than 9 employees, they are required to establish an internally Work Environment Organization to take care of the aspects concerned with work environment. The requirements to this organization is further restricted if the company has more than 35 employees.

Source(s): (Arbejdstilsynet, n.d.): https://at.dk/om-os/aktoerer-paa-arbejdsmiljoeomraadet/
(Arbejdsmiljøgruppen, n.d.): https://arbejdsmiljoegruppen.dk/arbejdsmiljolov/
(Arbejdstilsynet, 2014): https://at.dk/regler/at-vejledninger/hjemmearbejde-d-2-9/#3-Arbejde-ved-en-sk%C3%A6rm

Appendix 7

Work Environment Legislation

Specification on special requirements in the screen executive order

The Screen

- The characters on the screen must be clear and large enough.
- Brightness and contrast must be easy to adjust and adjust to external conditions.
- The employee must be able to rotate and tilt the screen according to his needs. It can possibly be used separate base for the screen or adjustable table so that the height can be adjusted to the individual employee.
- Annoying reflections in the screen and glare must be avoided.

Control Equipment

- Control equipment, such as a mouse and keyboard, must be designed so that the employee can use it it with appropriate working postures and movements.
- The keyboard must be separated from the screen so that the employee can use appropriate working positions and movements that do not cause fatigue in the arms and hands.

Work Table

- The work table must have a low-reflecting surface.
- There must be sufficient space on and under the work table for the employee to use appropriately postures and movements. Appropriate working postures and movements require sitting and working height that suits the employee.
- The work table must be wide and deep enough to achieve a flexible display of screen, keyboard, documents and other accessories. The depth of the table must be large enough to accommodate the screen viewing distance (50-70 cm), and so that there is room to rest arms in front of the keyboard.

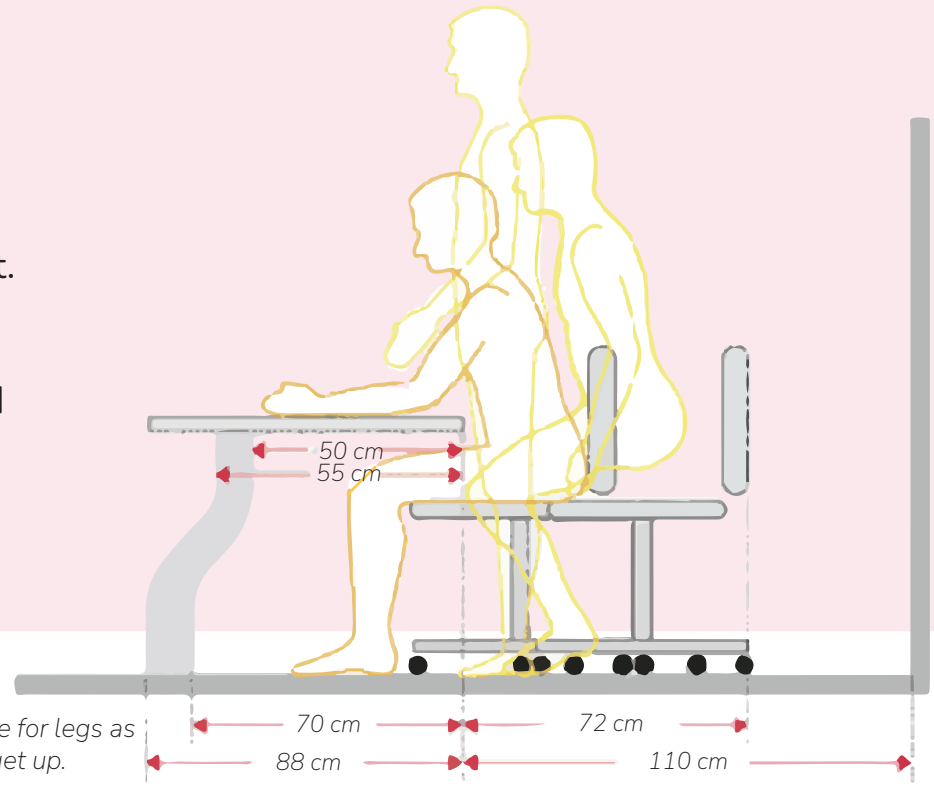
Lighting Conditions

- Light sources must ensure adequate lighting and appropriate contrast between screen and environment.
- Annoying glare and reflections on the screen must be avoided by coordinating the location of the light sources in relation to the premises.
- Windows must be fitted with an appropriate, adjustable screen that can dim the daylight that falls into the screen workplace.

Work Chair

- The work chair must be stable and must ensure the employee's freedom of movement and an appropriate working position.
- It must be possible to adjust the height of the chair seat. The chair back must be adjustable in height and must be adjustable obliquely.
- A good chair allows you to vary the seat inclination and seat depth as well as adjust the seat and backrest independent of each other.

(Arbejdstilsynet, 2020b)

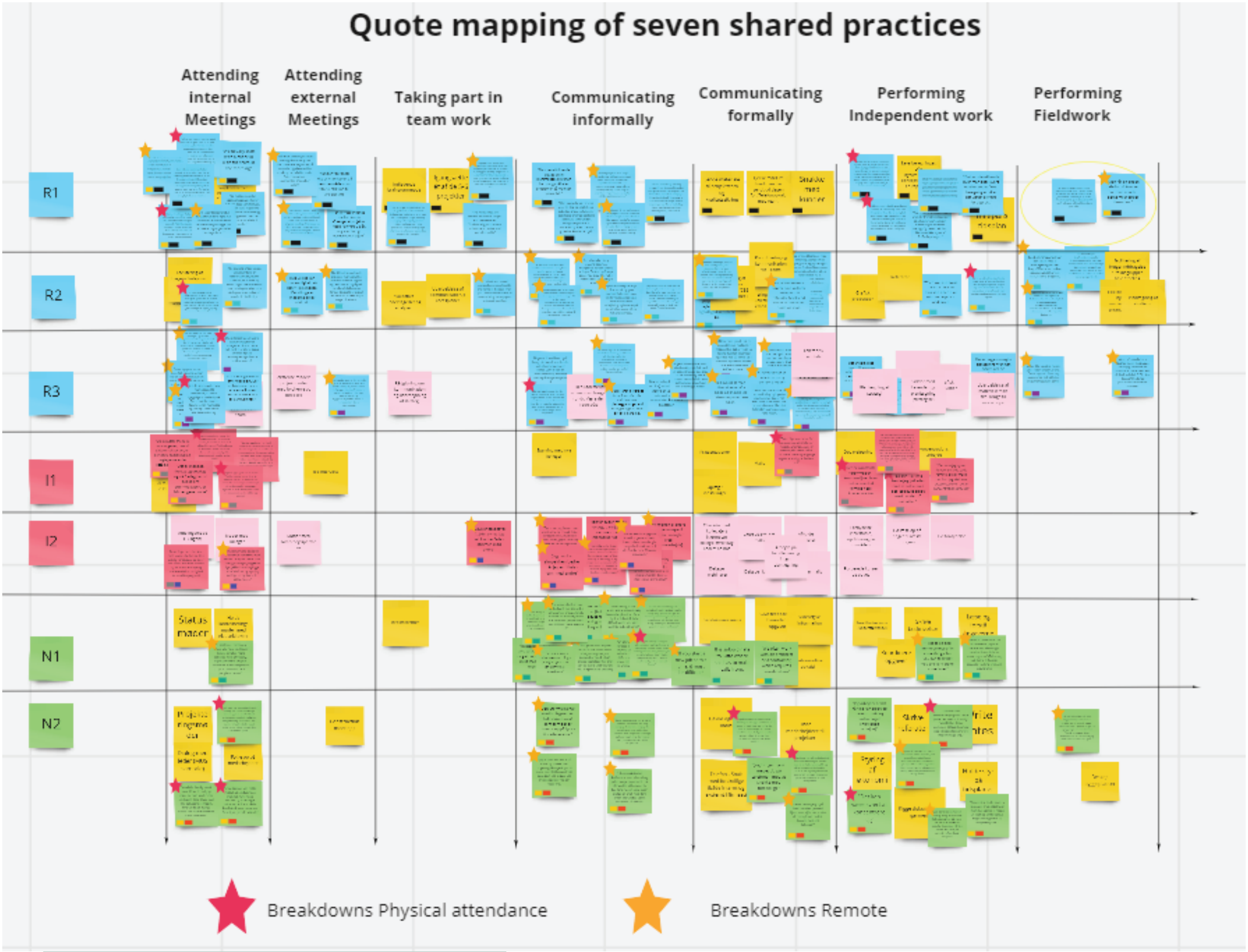


Mnimal and optimal space for legs as well as space behind to get up. (Arbejdstilsynet, 2008)

Source(s): (Arbejdstilsynet, 2020b): https://at.dk/regler/at-vejledninger/skaermarbejde-d-2-3/
(Arbejdstilsynet, 2008): https://at.dk/regler/at-vejledninger/arbejdspladsens-indretning-inventar-a-1-15/

Appendix
8

Quote mapping



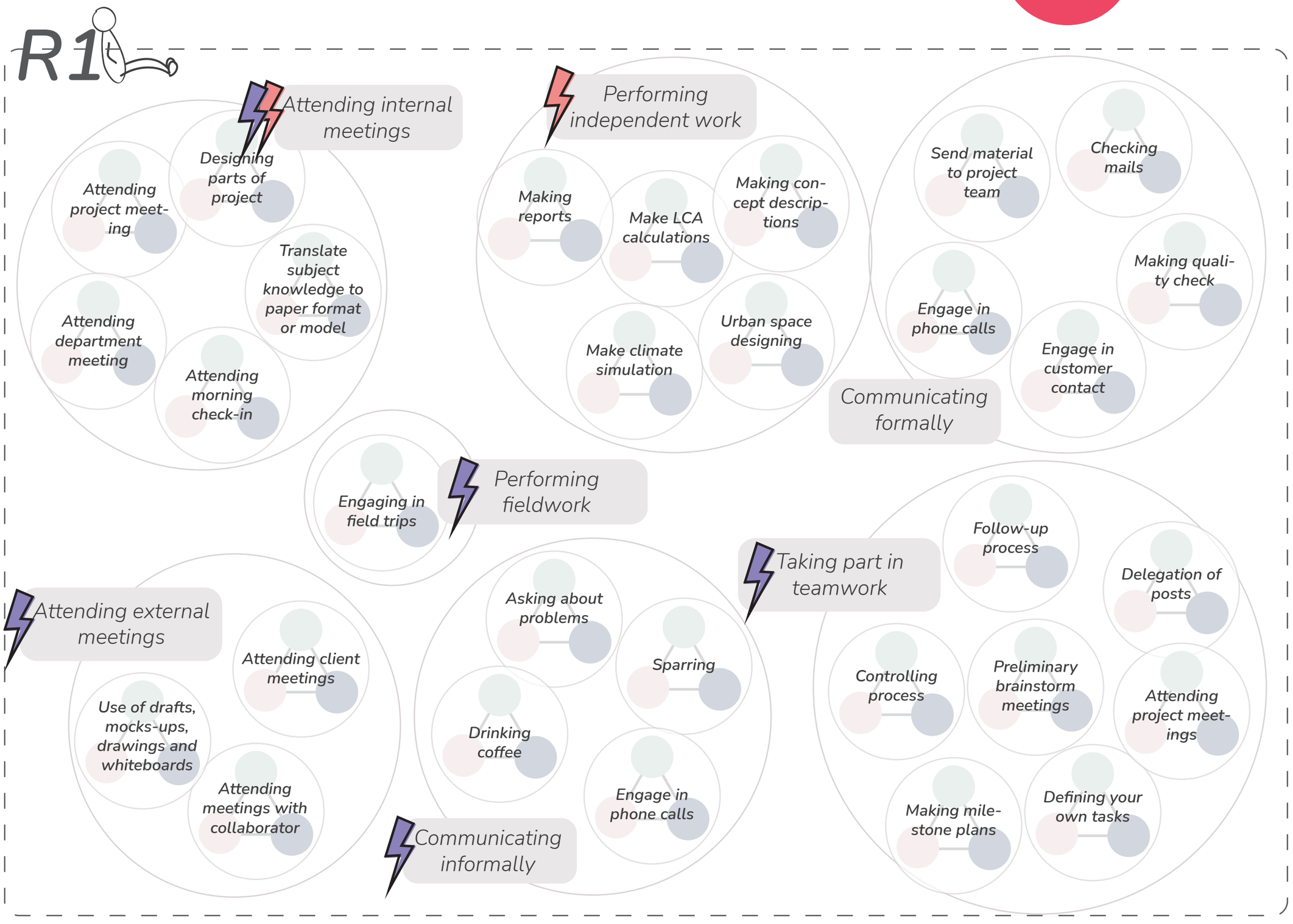
The above scheme is information gathered from pratitioners participating an our online workshops. Quotes were abstracted from the intervews and arranged in accordance to the seven shared practices.

Based on statements by each practitioner, we were able to map out brekdowns regaring remote and physical work sites.

Source(s): (R1, online workshop, March 17, 2021), (R2, online workshop, April 6, 2021), (R3, online workshop, April 6, 2021)
(I1, online workshop, March 18, 2021), (I2, online workshop, March 18, 2021)
(N1, online workshop, March 25, 2021), (N2, online workshop, March 29, 2021)

Appendix 9

Individual practice mapping



— — Work practices of advising engineers Shared practices Individual practices

Appendix 9

Individual practice mapping

R2

Attending internal meetings
- Take part in phone conversations
- Planning meeting
- Facilitation of building committee meetings
- Sparring

Communicating informally
- Sparring
- Take part in phone conversations
- Sharing inspiration
- Sharing knowledge
- Attending social interactions

Taking part in teamwork
- Development of communication/process plan
- Performing qualitative investigations and analysis
- Drawing

Communicating formally
- Engage in email correspondance
- Sparring
- Getting help performing tasks
- Facilitating academic collaborations
- Take part in phone conversations
- Dissemination of information
- Provide guidance

Performing fieldwork
- Planning of study trip
- Facilitating go-home meetings
- Attending workshop meetings
- Facilitating phone interviews
- Facilitating user involvement processes
- Attending in focus group meetings
- Attending building committee meetings
- Attending information meetings
- Facilitating debate events

Attending external meetings
- Attending resident meetings

Performing independent work
- Writing notes
- Graphic production
- Make summary in word, excel or in-design
- Performing desk-research

— — Work practices of advising engineers Shared practices Individual practices

Appendix 9

Individual practice mapping

R3

Attending external meetings

Attending project meet-ings

Engaging in meetings with builder

Facilitating resident meetings

Attending internal meetings

Attending department meetings

Taking part in collaboration with Aarhus department

Attending team meet-ings

Attending drawing room meetings

Attending organization-al meetings

Attending company meetings

Taking part in teamwork

Making strategies

Facilitating processes

Attending field trips

Performing fieldwork

Writing notes

Planning of strategies

Graphic production

Making work-shop material

Using flex-rooms

Performing independent work

Communicating informally

Engage in sparring

Take part in phone conver-sations

Engage in social inter-actions

Drinking coffee

Maintaining social hierarchies

Communicating formally

Checking and answering emails

Graphic production

Take part in phone conver-sations

Engage in sparring

— — Work practices of advising engineers

Shared practices

Individual practices

Appendix 9

Individual practice mapping

I1

— — Work practices of advising engineers Shared practices Individual practices

Source(s): (I1, online workshop, March 18, 2021)

Appendix 9

Individual practice mapping

12

Attending meetings with collaborators

Attending external meetings

Make space for newly employ-eed and stu-dents to ask questions

Attending internal meetings

Attending department meetings

Attending meetings with colleagues

Performing independent work

Work on action plan and inter-nal planning

Preparing presentations

Preparing courses

Immersion in self-studies

Communicating informally

Attending Miro involvements

Ideation

Taking part in relations with others

Affiliation with new workplace

Participate in webinar

Check-in with colleagues

Communicating formally

Checking and answering emails

Participate in courses

Hosting webinars

Taking part in teamwork

Perform devel-opment work

— — Work practices of advising engineers

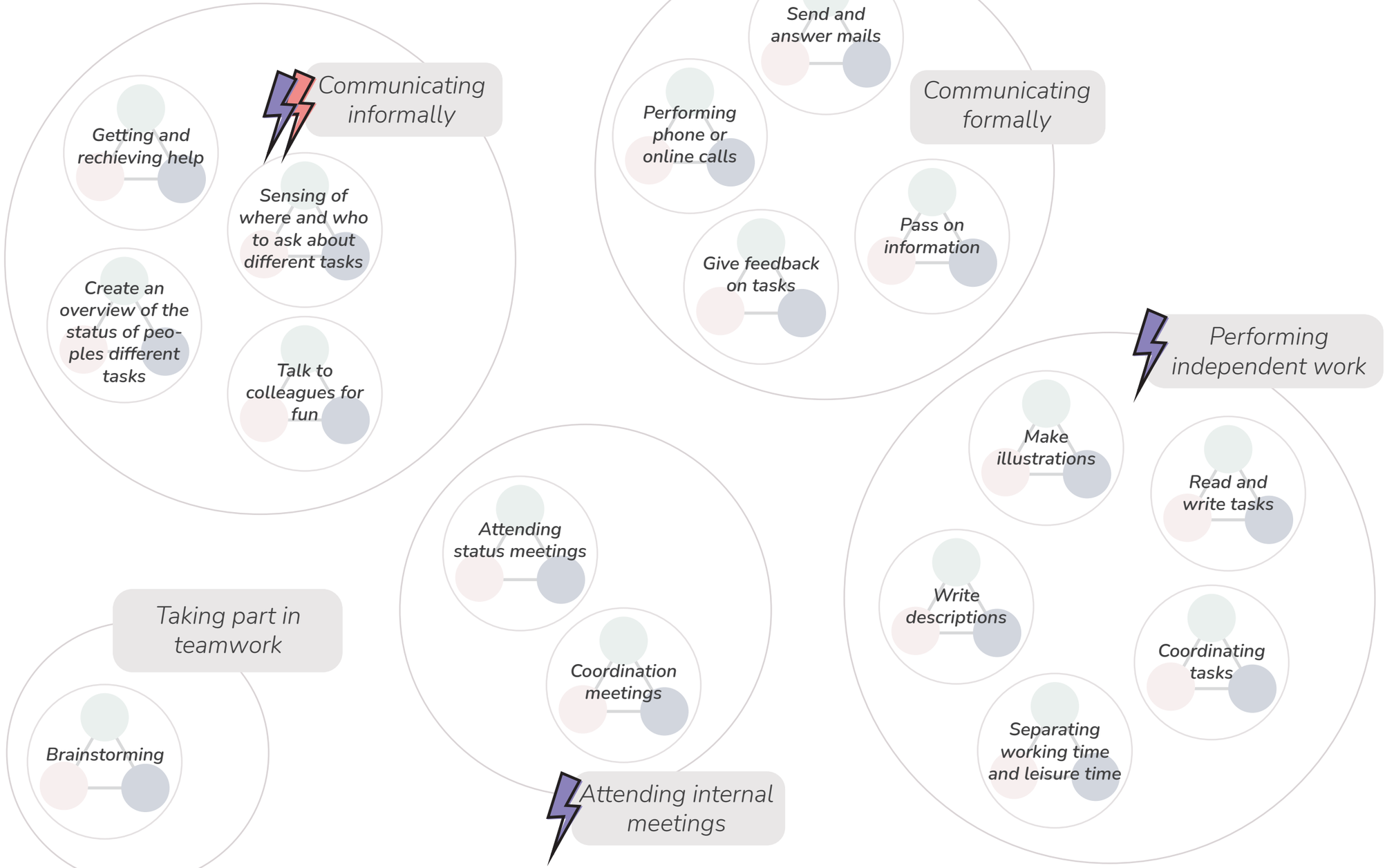
Shared practices

Individual practices

Appendix 9

Individual practice mapping

N1



— — Work practices of advising engineers Shared practices Individual practices

Source(s): (N1, online workshop, March 25, 2021)

Appendix 9

Individual practice mapping

Attending construction meetings

Attending external meetings

Drink coffee

Communicating informally

Printing copies

Take part in social interactions

Check and answer mails

Communicating formally

Take part in phone conversations

Attending internal meetings

Attending dialouge with leader

Using notes and documents

Follow up on employees

Attending project meetings

Write notes

Write summaries

Management of time

Management of finances

Looking through documents

Performing independent work

Visiting building sites

Performing fieldwork

— — Work practices of advising engineers

Shared practices

Individual practices

Source(s): (N2, online workshop, March 29, 2021)

Appendix 10

Work site preferences

	Physical practices	Open for both	Remote practices
Attending internal meetings			
Attending external meetings			
Taking part in teamwork			
Communicating informally			
Communicating formally			
Performing independent work			
Performing fieldwork			

R1 R2 R3 I1 I2 N1 N2

Attending external meetings, Taking part in teamwork, Communicating informally and performing fieldwork are (based on the majority) practices currently suitable for Physical work sites.

Performing indenpendet work is opposite currently suitable for remote work sites.

Source(s): (R1, online workshop, March 17, 2021), (R2, online workshop, April 6, 2021), (R3, online workshop, April 6, 2021)
(I1, online workshop, March 18, 2021), (I2, online workshop, March 18, 2021)
(N1, online workshop, March 25, 2021) (N2, online workshop, March 29, 2021)

Appendix 11

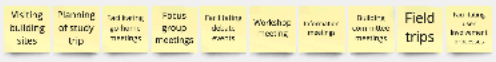
Design Solutions

This appendix show out 112 design solutions (the pink post-its). and how they are related to the shared practice, their breakdowns and if they are in the category of being Radically Different og Incremental Change

Performing Fieldwork

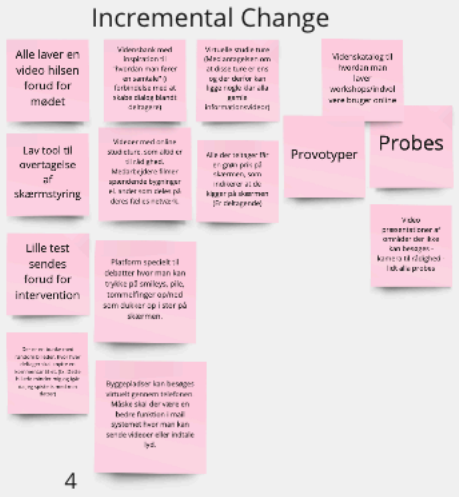
- Difficult to predict a target groups' level of knowledge about online tools
- Difficult to get the right relationship with the customer when not present in their environment
- It is difficult to involve users because it is difficult to teach someone something at a distance (difficult to get inputs)
- Results in less interventions

Individual Practices



Radically Different

Incremental Change

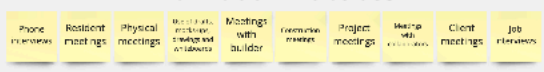


4

Attending External Meetings

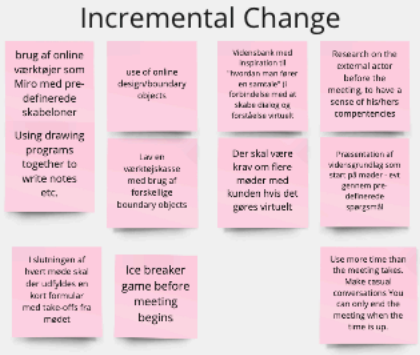
- Lack of customer relationship
- Signal value in showing you are dedicated to the project (The customer may feel you do not take time for them)
- Difficult to communicate due to lack of communication objects
- Competence barrier for relationship with customers / users
- Difficult to read body language and mimicry
- Difficult to create a common understanding

Individual Practices



Radically Different

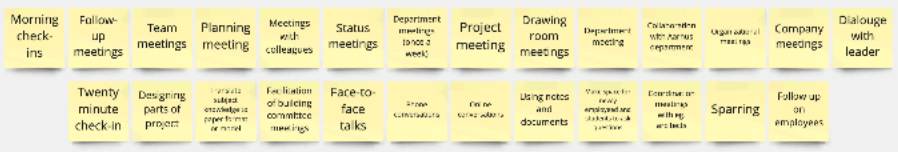
Incremental Change



Attending Internal Meetings

- Can seem distant
- It's harder to be inspired by each other's energy
- Difficult to be 10 people on teams who all have to discuss something
- There is no space to zone out and go to the toilet
- The transfer of knowledge can be difficult across departments, as terms can mean different things (Misunderstandings)
- Lack of concentration (other tasks are performed meanwhile)

Individual Practices



Radically Different

Incremental Change

Source(s):

Appendix 11

Design Solutions

This appendix show out 112 design solutions (the pink post-its). and how they are related to the shared practice, their breakdowns and if they are in the category of being Radically Different og Incremental Change

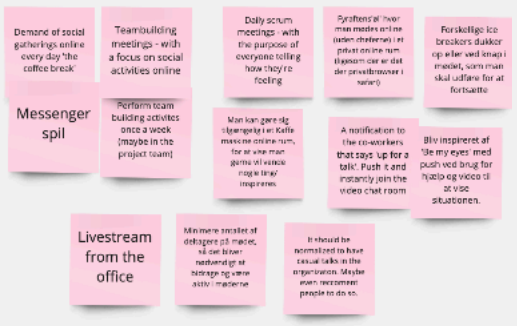
Communicating Informally

- Lack of informal talk / knowledge sharing (Too effective)
- Lack of informal talk at coffee machine
- Lack of social / colleague contact (maintaining relationships)
- Hard to be newly employeed (unboarding phase)
- Lack of spontaneous social gatherings
- Creates a feeling of uncertainty about social / work things that happens in the office
- Inability to read the mood of the room
- Difficult to be inspired and motivated by each others' energy
- Less sense of togetherness
- Hard to know who to ask for help when you do not have the informal talks

Individual Practices

Radically Different

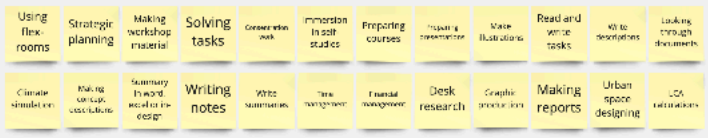
Incremental Change



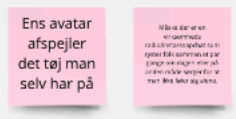
Performing Independent Work

- Hard to concentrate if external factors interfere (such as scaffolding, noisy neighbors, etc.)
- It can be demotivating not to wear clothes (do something for yourself)
-It can be draining to sit and talk into a computer all day (Screen time makes one tired)
- Hard to manage time
- Difficult to distinguish between work and leisure (it merges)
- Can feel disconnected and alone

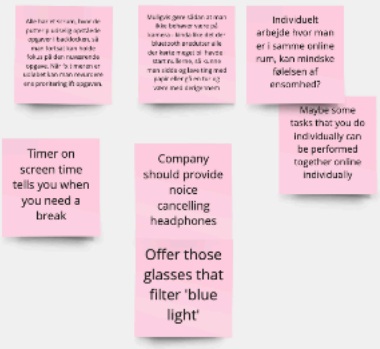
Individual Practices



Radically Different



Incremental Change



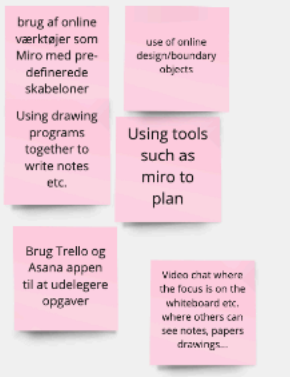
Taking Part in Teamwork

- Difficult to have teamwork written
- Designing a project can be difficult when you can not sit with a team
- Lost tranfering of knowledge with no oppertunities for drawing and make models

Individual Practices

Radically Different

Incremental Change



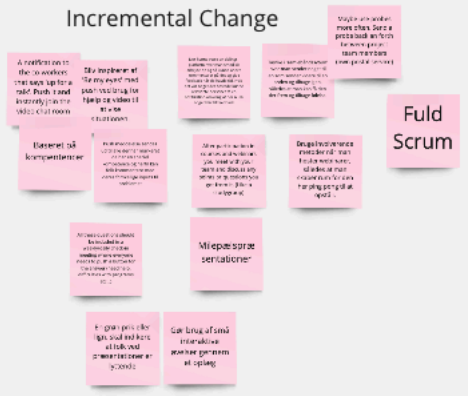
Communicating Formally

- Lack of ping pong
- Hard to sense if you are disturbing your colleagues
- Hard to sense if colleagues need help
- Hard to ask for help
- Help with programs can be difficult when distant
- Hard to get help quickly for short little questions

Individual Practices

Radically Different

Incremental Change



Source(s):

En bæredygtig arbejdspraksis

En fortælling om Gertruds arbejdsdag, præsenteret i 3 dele

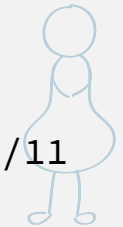
Sustainable Design - Aalborg Universitet

Del 1 - Gertruds Start på Dagen

Gertruds dag starter med interne møder med hendes team, hvor hun i fællesskab med de andre skal planlægge et kommende projekt. Senere skal hun deltage i et webinar. Under Corona har Gertrud oplevet, at det har været svært at have online møder med mange personer på en gang, da det kan være svært at blive inspireret af hinanden, når fællesopgaver foregår på skrift, samt at det også kan være svært at koncentrere sig.

Hun har oplevet at hun nemt zoner ud under længere møder, hvor hun ikke selv aktivt deltager og hun oplever derfor en følelse af distancering mellem hende og hendes kolleger. Gertrud har også haft en oplevelse af at den naturlige 'ping-pong', hun er vant til at have med hendes kollegaer, er forsvundet. Hun føler også, det kan være svært at vide om hendes kollegaer har brug for hjælp, eller selv spørge om hjælp hvis hun har brug for det.

- Det skal være nemt at diskutere i sit team og blive inspireret af hinanden
- Der skal skabes rum for ping-pong og fællesskabsfølelse
- Det skal gøres nemt at sparre med sine kollegaer og vide hvornår dette kan lade sig gøre



Del 1
I Nutiden

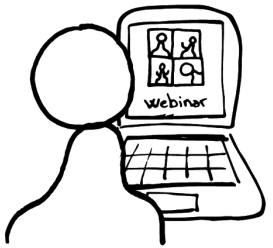
Før mødet med afdelingen har Gertrud modtaget en agenda for mødet som hende chef har fremsendt gennem et online planlægningsværktøj. Da mødet begynder er alle opdateret på hvad der skal ske.

Da mødet begynder, sætter chefen en timer på 40 min, som indikerer en indlagt pause i mødet. Mødet starter med en afslappet samtale blandt deltagerne hvor de fortæller om hvordan deres weekend har været.

Gertrud kan se at chefen står op foran et whiteboard.

Hvis hun skal på toilettet under mødet kan hun trykke på et ikon, der indikerer at hun kort tid er væk.

Afrundingen foregår ved en diskussion i grupper hvor alle kan snakke om dagens møde. Under diskussionen bruger gruppen online værktøjer til at tage noter og tegne sammen. Senere på dagen skal Gertrud deltage i et webinar, i den forbindelse har hosten sørget for at de deltagende er aktivt med undervejs.



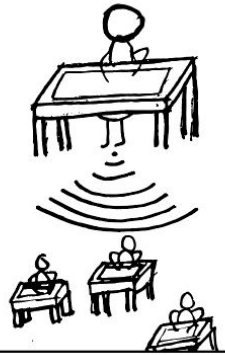
Der er sørget for at Gertrud skal forholde sig til de ting der bliver sagt til webinaret, der er også øvelser hun skal lave i fællesskab med sine kollegaer. Når Webinaret er slut mødes Gertrud med hende kollegaer på teams hvortil de diskuterer pointerne og snakker om potentielle spørgsmål de hver især måtte have.

Del 1
I Fremtiden

1

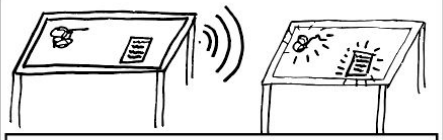
Gertrud sætter sig klar til mødet foran sit interaktive bord, som fungerer som en indbygget tablet.

2



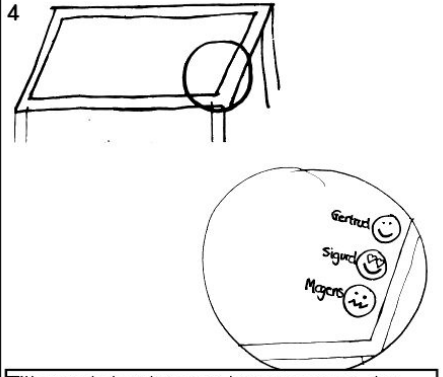
Hendes bord er koblet op til de andre medlemmer af teamets borde.

3



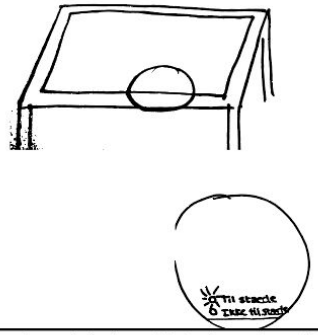
De kan nu se hvad hinanden skriver, tegner og lægger på bordet. Til bordet hører også interaktive klodser, som Gertrud kan bruge til at illustrere sine tanker. Når hun bygger med klodserne på bordet kan hendes kollegaer se dem på deres bord også. De kan nu snakke og afvikle mødet, med mulighed for at skrive eller på anden vis illustrere deres tanker.

4



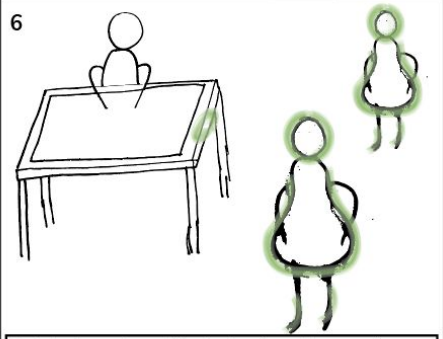
Tilhørende bordet er en humør-sencor, der viser hvordan Getruds kollegaer har det.

5



Og om hvorvidt de er tilstede ved mødet. Er de ikke tilstede (forlader de eksempelvis deres bord), lyser en lille lampe, der indikerer at de har forladt bord-området.

6



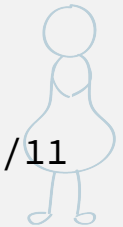
Hvis behovet opstår, for bedre at kunne læse hinandens kropssprog, kan medlemmer slå en hologram funktion til, så de kan se hinandens fulde kropssprog og mimikker.

Del 2 - kommunikation med eksterne

Da Gertrud er færdig med hendes interne møder og webinaret, er det blevet tid til, at hun skal afholde eksterne møder online, hvorefter hun skal holde et debat event med nogle klienter fra et igangværende projekt.

Hun har under Corona oplevet, at det har været svært at opretholde en god relation til klienter og samarbejdspartnere, fordi det ikke har været nemt at læse mimikker og kropsprog. Hertil er det særligt manglen på objekter så som tegninger og modeller, der har gjort kommunikationen til eksterne aktører svær. Derudover har Corona minimeret mængden af felt arbejde, og det har været svært at vide, hvilket kendskab klienter og samarbejdspartnere har til forskellige online værktøjer, hvilket har resulteret i en færre involveringsprocesser.

- Det skal være muligt at aflæse kropssprog og mimiker tydeligt
- Der skal sikres nem adgang til brug af kommunikationsobjekter



Del 2
I nutiden

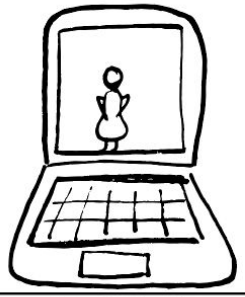
Virksomheden hun arbejder i har sørget for en værktøjskasse med forskellige typer af objekter, der kan bruges mellem forskellige typer af aktører.

Gertrud ved hvilke hun skal vælge fordi hun har lavet research på dem hun skal snakke med inden mødets start og alle har uploadet en videohilsen forud for mødet, som beskriver lidt om hvem der deltager.

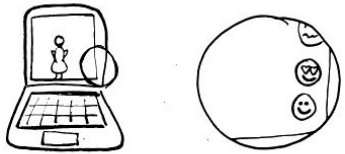
Forud for hendes debat event, har hun læst i et inspirations katalog, tildelt af virksomheden, omkring brugen af probes. Det er hvor man sender fysiske objekter ud til deltagerne i forvejen...

som i Gertruds tilfælde har været fotografiapparater. Det har handlet om at de deltagende har skulle tage billeder af deres problematikker og tage disse med til eventet. Eventet bliver derfor en involverende process, hvor Gerturd kan bruge billederne til at skabe en fællesforståelse mellem alle parter.

Del 2
I Fremtiden



For at sikre muligheden for at klienterne og samarbejdspartnerne kan læse Gertruds kropssprog kan de se hele Gertrud fra deres skærm.

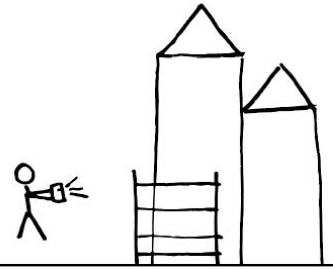


Derudover scannes Gertruds ansigt således at klienterne og samarbejdspartnerne kan se forskellige emojies der indikerer hendes ansigtsudtryk.

Hendes tanker bliver derudover visualiseret gennem software for videndeling, så det bliver muligt at skabe en fællesforståelse for de diskuterede emner.

Derudover bruger Gertrud Virtual reality...

til at få en forståelse for de områder hun, inden corona, ville have besøgt fysisk.



Nu er der mulighed for at hendes eksterne bekendskaber kan filme deres område og Gertrud kan herefter 'træde ind' i en virtuel udgave af stedet, der kan give hende en bedre forståelse for projektet hun skal arbejde med.

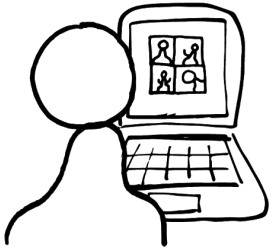
Del 3 - Individuelle arbejdsopgaver

Når Gertruds møder er slut står dagen på individuelle arbejdsopgaver, hvor hun skal løse problematikker, lave grafiske illustrationer, skrive referat af debat eventet samt påbegynde en præsentation til sine kolleger over resultaterne heraf. Under Corona har det været svært for Gertrud at koncentrere sig, fordi hendes bygning har været under renovering, og det har larmet meget.

Gertrud er en person, der arbejder bedst når hun er fysisk sammen med andre. Det gør det derfor svært for hende at klare sine opgaver virtuelt, fordi hun mangler de uformelle snakke og den dialog der opstår i den forbindelse. Hun har også følt sig demotiveret og træt, fordi hun har brugt mange timer foran computeren. Det har derudover også været svært for hende, at styre sine pauser. Gertrud har været vant til at spontane samtaler, som har givet hende en sparring og opløftning hun ikke har følt under Corona. Hun har i den forbindelse også følt sig alene og manglet en følelse af fællesskab. Derudover synes Gertrud at det er svært at skelne mellem arbejdstid og fritid, fordi at hun er hjemme hele tiden.

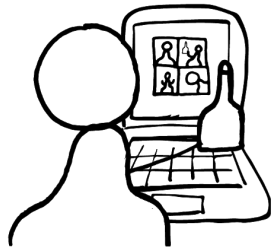
- Det skal være nemt at koncentrere sig
- Der skal skabes rum for formel og spontan dialog
- Det skal gøres nemt at skelne mellem arbejdstid og fritid

Del 3
I Nutiden



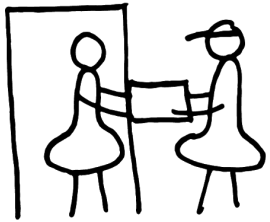
For ikke at føle sig alene arbejder Gertrud online med sine kollegaer (muted) når hun laver individuelle arbejdsopgaver, det giver hende en følelse af at være sammen hver for sig.

Hvis hun ikke bruger sin computer har hun noise cancelling headphones på, så hun nemt kan kommunikere med sine kollegaer, hvis der pludselig opstår spørgsmål eller spontane idéer. Gertrud har også fået udleveret særlige briller, som blokerer det skadelige blå lys hendes computer laver.



Heldigvis for Gertrud har virksomheden arrangeret ugentlige teambuilding events, online kaffe aftaler og fyraftensnakke hvor hun og hendes kollegaer kan mødes online

Gertrud har fri når hendes opgaver er færdige og de er altså ikke tidsbetinget, men hendes ansvarsområder er defineret i arbejdsopgaver.



Gertrud har derudover savnet medarbejder goderne som kantinen, men dette er blevet løst med en leveringordning der sørger for at hun får bragt mad og drikke hjem til sig selv.

Del 3
I Fremtiden

Gertruds virksomhed har oprettet en social gruppe der står for daglige post på virksomhedens sociale medier...

og de har sågar fået deres egen radioudsendelse, hvor der hver dag bliver delt sjove anekdoter, interne jokes og motiverende indslag der sørger for at medarbejderne får en fællesskabsfølelse selvom de ikke sidder sammen.

Gertrud har også fået udleveret et smartwatch, som kan sende og give notifikationer når der opstår et behov for hjælp til en opgave. Har Gertruds kollegaer brug for hjælp til noget, kan man sende en notifikation ud til de kollegaer som har angivet kompetencer inde for det felt man gerne vil have hjælp til. Disse notifikationer kan svares på hurtigt, så Gertrud kan modtage og give hjælp hurtigt.

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I sine pauser er Gertrud begyndt at benytte sig af virksomhedens nye online space, hvor hun har sin egen avatar, der ligner hende og benyttes til at komme i kontakt med de andre medarbejdere.

En kontakt der normalt ville opstå spontant på kontoret, særligt i forbindelse med uformelle møder ved kaffemaskinen. Når hun benytter sin avatar, kan hun samtidig se hvad hendes kollegaer foretager sig og "hvor de befinder sig", eksempelvis hvis de er til møde kan hun se det og hun kan også se hvilke opgaver hendes kollegaer er i gang med.

Tak for alle jeres inputs

sus-design3@plan.aau.dk

En bæredygtig arbejdspraksis

Sustainable Design - Aalborg Universitet

Breakdowns ved remote

Svært at diskutere og blive inspireret af hinanden

Manglende ping-pong og fællesskabsfølelse

Sparring er besværliggjort

Udfordrende at aflæse mimik og kropssprog

Mangel på brug af objekter

Mange forstyrrelser og meget tid på computeren svækker koncentrationen

Mangel på uformel og spontan dialog

Svært at skelne mellem arbejdstid og fritid

Individuelle arbejdsopgaver

En del af Gertruds arbejdsdag indebærer individuelle arbejdsopgaver, hvor hun skal løse problematikker, lave grafiske illustrationer, skrive referater af debat events samt påbegynde en præsentation til sine kolleger over resultaterne heraf. Under Corona har det været svært for Gertrud at koncentrere sig, fordi hendes bygning har været under renovering, og det har larmet meget.

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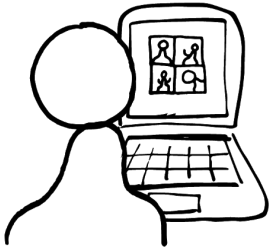

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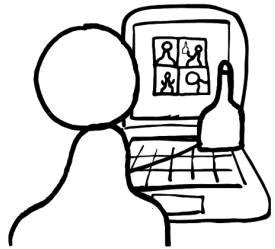

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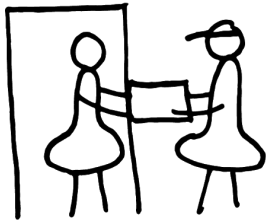

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Præferencer

Fully physical	Partially remote, 4 days a week in the office	Partially remote, 2-3 days a week in the office	Partially remote, 1 day a week in the office	Fully remote
				

Tak for alle dine inputs

sus-design3@plan.aau.dk