Master's Thesis
Environmental Management and Sustainabiliy Sciences

Innovating for Sustainability

Using problem Based Research to Explore a Business Idea

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STUDENTERRAPPORT

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Project:

EMSS Master's Thesis

Period:

February 2020 - June 2020

Project group

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Supervisor:

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Printed editions: 0
Pages: 90
Appendix: 4, plus external files
Finished June 17, 2020

Signatures

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Abstract

This project explores the need for a business idea centered around creating an online platform for companies to collaboratively address and implement sustainability. It frames an entrepreneurial journey through problem based research. This is done through the application of a methodological framework based on design thinking and a theoretical framework of virtual embeddedness and sustainability-oriented innovation on interviews with 23 different stakeholders uncovering real world needs and challenges to be addressed by the online platform.

The research uncovers several challenges tied to sustainability from a company perspective, most prominently resource intensity, lack of overview on information and solutions, and difficulties locating the right collaborators. Current services exist for this purpose, however, they do not address these problems in their entirety and have inherent shortcomings of their own. By combining a set of online features, it seems that the business idea at hand holds potential to alleviate said challenges and several of the shortcomings of current services. Ultimately, there is a need for the business idea at hand. As for the facilitation of sustainability on a societal level, it holds potential to do so by creating a strong foundation for stakeholders to build upon. However, much of what the platform aims to facilitate remains to materialise beyond its confines.

Danish Summary

Dette projekt kombinerer en iværksætter process med et akademisk projekt ved at udforske og udvikle en forretningside via et problembaseret forskningsprojekt. Forretningsideen har til hensigt at facilitere bæredygtig udvikling i virksomheder ved at skabe en online platform, der giver mulighed for samarbejde, informations og vidensdeling samt målrettet match-making og vejledning til de enkelte virksomheder. Projektet initieres med en tydeliggørelse af de samfundsmæssige problemer som danner baggrund for forretningsideens opståen. Dette omhandler analyser, som viser at den globale indsats for bæredygtighed næppe vil være i stand til adressere de verdensopspændende miljø-mæssige problemer tilstækkeligt i sin top-down styrede form. Derfor er det nødvendigt at skabe rammerne for at bæredygtighed implementeres i en mere bottom-up drevet tilgang, der kan supplere den globale indsats. Her bliver firmaer det centrale fokus, eftersom de gennem deres aktiviteter bærer en del af ansvaret i de globale problemstillinger med miljøet, samtidig har de en central rolle i forsyningskæder, hvor der er mulighed for at påvirke både begvedliggende led og kunder. I problemanalysen står det desuden klart, at innovation for bæredygtighed kan tage mange former med forskelligt potentiale, samt at intet firma alene vil kunne løse problemer forbundet med bæredygtighed. Samarbejde og samskabelse er derfor en nøglefaktor for den bæredygtige udvikling. Samtidig viste et litteratur studie både potentiale, for online platforme og deres rolle i facilitering af bæredygtighed. Da forretningsideens potentiale og relation til samfundsmæssige problemer var etableret forekom nu behovet for at afdække samme potentiale i henhold til relevante stakeholders, samt udforske hvordan forretningideen kunne designes således at den er i stand til at adressere problemer og behov udtrykt af førnævnte stakeholders og dermed bibeholde en direkte forbindelse til virkelige problemstillinger og behov.

Dette blev gjort gennem en metodologi med centrum i Design Thinking, som har fokus på stakeholder behovsafdækning og inklusion for bedst muligt at designe løsninger til brug i virkeligheden. Afdækning af stakeholder behov blev foretaget via semi strukturerede interviews, der havde til hensigt danne grundlag for senere workshops og tættere samarbejde med potentielle brugere af platformen. COVID-19 omstændighederne resulterede dog i, at kun interviews var mulige. Emperien blev efter sin bearbejdning via bricolage metoden analyseret gennem en teoretisk analyseramme bestående af virtual embeddedness og sutainabiliy oriented innovation. Analysen viste at en online platform har potentiale til at afhjælpe både udfordringer forbundet med implementering af bæredygtighed i virksomheder samt nogle af de mangler og udfordringer, som forskellige stakeholders forbinder med eksisterende forretningsnetværk. De identificerede udfordringer var blandt andet; manglende overblik og adgang til relevante løsninger og information omkring bæredygtighed, resource forbrug i forbindelse med at blive mere bæredygtig, virksomhedens modenhed i henhold til bæredygtig udvikling, samt udfordringer med at finde de rigtige samarbejdspartnere til at opnå mere bæredygtig udvikling. Derudover viste analysen at fysiske forretningsnetværk stadig havde stor betydning og værdi, men deltagelsen i disse netværk krævede mange ressourcer, tidslig og geografisk flexibilitet, besvær med at aktivere medlemmer, begrænset fokus på samarbejde, sam at fordelene ved disse netværk afhænger af den enkelte

deltagers evne til at "netværke." Gennem den teoretiske ramme og med inspiration fra andre platformstyper viste sig potentiale for at en online platform tilbydende online community, match making, såkaldt open call, samt information og vejledning af virksomheder, i bæredugtigheds regi udviste potentiale forhold til at reducere de førnævnte udfordringer. Samtidig tydeliggjorde analysen en række udfordringer forbundet med online platformen i form af; formodede problemer med tillidsopbygning, digital modenhed hos virksomheder, afhængighed af bruger genereret indhold og certificering af medlemmer. Dette førte til yderligere overvejelser omkring platformens udforming med henblik på mindskelse af disse udfordringer, hvor blandt andet et samarbejde med fysiske forretningsnetværk såsom NBE viste sig fordelagtigt. Med hensyn til platformens potentiale for at facilitere bæredygtig udvikling, kunne det konkluderes at platformen har potentiale til at skabe et stærkere udgangspunkt for inter-organisatorisk samarbejde, gennem videns og erfaringsudveksling, aktivt at skabe forbindelse mellem potentielle samarbejdspartnere og kontinuerlig vejledning. Dermed kan platformen bidrage til et bedre udgangspunkt for systemiske innovationer inden for bæredygtig udvikling. Imidlertid skal det nævnes at potentialet kun delvist realiseres gennem platform eftersom realisering af bæredygtig udvikling, i og mellem virksomheder, vil tage form uden for online platformen.

I henhold til hvorledes problembaseret forskning har bidraget til udviklingen af forretningsideen kan det konkluderes, at flere synergier mellem iværksætter processen og den akademiske fremgangsmåde i projektet er opstået. Den metodiske fremgangsmåde har givet en struktur og form til forretningsideen, deruover har brugen af en teoretisk analyseramme fremhævet ellers uopdagede aspekter og overvejelser. Slutteligt har projektet i sin helhed bidraget til en kritisk anskuelse af forretingsideen og bundet den til virkelige problemer og behov i en grad, der synes usandsynlig ved en udlukkende iværksætter præget tilgang. I kontrast til disse bidrag står til tider svært forenelige aspekter af iværksætteri og akademisk fremgangsmåde. Iværksætter processen synes at sættes ned i hastighed, hvor den normalt er eksperimentel og fleksibel af natur, bindes den i stedet til en argumenterende, langsomere process med validering og underbyggelse. Dette har gjort, at udbyttet af denne første del af iværksætter processen er blevet velfunderet og velovervejet, men til tider også til en grad, hvor det har bremset iværksætter processen.

List of Abbreviations

CSR - Corporate Social Responsibility

DT - Design thinking

ICSD - Inter-organisational collaboration for sustainable development

NBE - Netværk for Bæredygtig Ehvervsudvikling Nord Danmark

NDC - National Determined Contributions

OP - Online platform

PBI - Proposed business idea

RGO - Rådet for Grøn Omstilling

SET - Socially embedded ties

SD - Sustainable development

SDG - Sustainable Development Goals

SOI - Sustainability-oriented innovation

VE - Virtual embeddedness

VET - Virtually embedded ties

Contents

1 Introduction

This master's thesis concludes the master's studies of Environmental Management and Sustainability Science at the University of Aalborg, Denmark. In their previous projects, the authors of the following report have had the opportunity to examine sustainable development from an organisational as well as a societal perspective. Throughout these examinations, it became more and more apparent how much companies struggle to become truly sustainable. It appeared that the collaborating parties oftentimes had a comparatively narrow understanding of sustainability, what it entails, and how it could be put into practice. On the other hand, there is the very apparent need to actively promote, push, and accelerate this process if this planet is to be saved.

There is an incalculable amount of ideas, scientifically based methods, and opinions on how this should be done. This master's thesis is the authors' attempt to establish their own idea, which emerged from their individual experiences with the topic of sustainability and all that they have learned through the course of this master's program, to examine this idea through a scientific lens, and to develop and improve on it by applying problem based research principles.

Problem Analysis 2

This process is initiated by an introduction to global anthropogenic climatic and environmental problems that call for accelerated action for sustainable development. This is proceeded by a description of the role and potential that companies posses in this regard, and how they might innovate for sustainable development. To facilitate such a process, a conceptual business idea is outlined and subjected to examination through a literature review elucidating its potential and giving direction to further inquiry.

2.1 Need for environmental action

There are a multitude of anthropogenic environmental problems calling for a global societal change, most prominent of which is arguably global warming. According to United Nations (2019), the global society is facing a climate crisis, declaring a 1,5°C increase in global temperature as the safe limit for the end of this century. To stay within this limit demands radical and ambitious actions; the establishment of the Paris Agreement and the emergence of the sustainable development goals (SDG) can be considered an example for this. The Paris Agreement calls for the establishment and pursuit of national goals for the reduction of greenhouse gas emissions in the form of National Determined Contributions (NDC). These entail the development of targets, policies and actions to mitigate climate change (Bodle et al. 2016). However, whether the goals of the Paris Agreement will be achieved remains to be scrutinised due to a number of reasons: its reliance on voluntarism, lacking ambitions regarding NDC from significantly emitting countries, and vaguely defined targets and timetables (Bodle et al. 2016).

The Sustainable Development Goals Report (2019) provides insight into the state of other anthropogenic environmental problems, related but not limited to climate change. According to the report, advances are being made in mitigating not only anthropogenic climate change, but also in material consumption and protection of ecosystems and their inherent services needed by the global society. Yet, progress is not sufficient to meet the current SDG targets in several areas such as water and material consumption, renewable energy, protection of marine environments, protection and restoration of terrestrial ecosystems, and changing consumption patterns towards sustainability. This is mainly caused by land-use change, material consumption and production, but also various pollutants such as manufacturing, sanitation, and plastic. All these aspects are leaving the natural environment in a state of accelerated deterioration and call for expedited action on the various interconnected environmental problems.

Related to the scrutiny of the goals in the Paris Agreement and the need for accelerated action regarding the various environmental problems, Welch & Southerton (2019) argue that radical

changes in global production and consumption are needed to address the global challenges. A different understanding of consumption should be the foundation for global policies, if the midterm goals for 2030, set by the Paris Agreement, are to be achieved. Global sustainability policy has thus far mainly regarded technological innovation as the main solution, and where consumption is included, it is often framed as a matter of individual choices on the economic market. Scientific research suggests though, that consumption should be regarded as something that is embedded in societal systems constituted by social, economic, cultural, technical, and material components. Therefore, the social organisation of consumption should be key to global policies for sustainable consumption, focusing on the path of co-evolution for technical systems and social practice (Welch & Southerton 2019).

To sum up, the environmental challenges that the global community face call for accelerated action and a proposed solution is a redirection of the focus of current global policy to take on a socio-technical nature, exceeding the current, more technical perspectives. The policy approaches can be regarded as a top-down solution, as they focus on global policy altering the patterns of consumption. The inefficiencies of current global policy such as the vagueness of NDC's in the Paris Agreement, caused by global negotiation and lacking capacity of participants (Bodle et al. 2016), raise the question of the effectiveness of policies as means of addressing the global challenge. Even with an altered understanding of consumption, will policies suffice in addressing the global environmental challenges?

Furthermore, policies such as the Paris Agreement have been developing for years, displaying the hardship and time consuming process of mobilising and negotiating on a global level. Keeping in mind the shortcomings of global policy making and its top-down nature, it can be argued that in addition to this, bottom-up initiatives are required in order to reach the goals of the Paris Agreement and achieve sustainable consumption and production in general. Such bottom-up initiatives must, by all means, maintain socio-technical system thinking approaches as outlined by Welch & Southerton (2019).

2.2 Moving towards sustainability from a business perspective

In this discussion of how to move towards a more sustainable future, the role and responsibilities of business organisations have increasingly become point of discussion and research (see for example Graham & Bertels (2008), Grayson & Kjelleren (2015), Morioka et al. (2017)). How this should be achieved however, is not quite as clear, and there are many different theories, ideas, and approaches. Generally speaking, Schaltegger et al. (2016) note that...

"[...] the usual approaches to sustainable development of philanthropy, corporate social responsibility, and technological process and product innovation are insufficient to create the necessary radical transformation of organizations, industries, and societies toward genuine, substantive sustainable development."

In other words, the actions currently taken by companies do not suffice to achieve a true sustainable development which can manage the global climate crisis. As Schaltegger et al. (2016) imply, there are more or less radical degrees of sustainable transformation in an organisation.

Adams et al. (2012) reviewed 100 scientific papers and 27 pieces of grey literature, based on which they constructed figure 2.1, which was taken and further developed into figure 2.2, which is frequently used to visualise the stages of innovation for sustainability also to non-academic actors, with a specific aim to communicate to business managers.

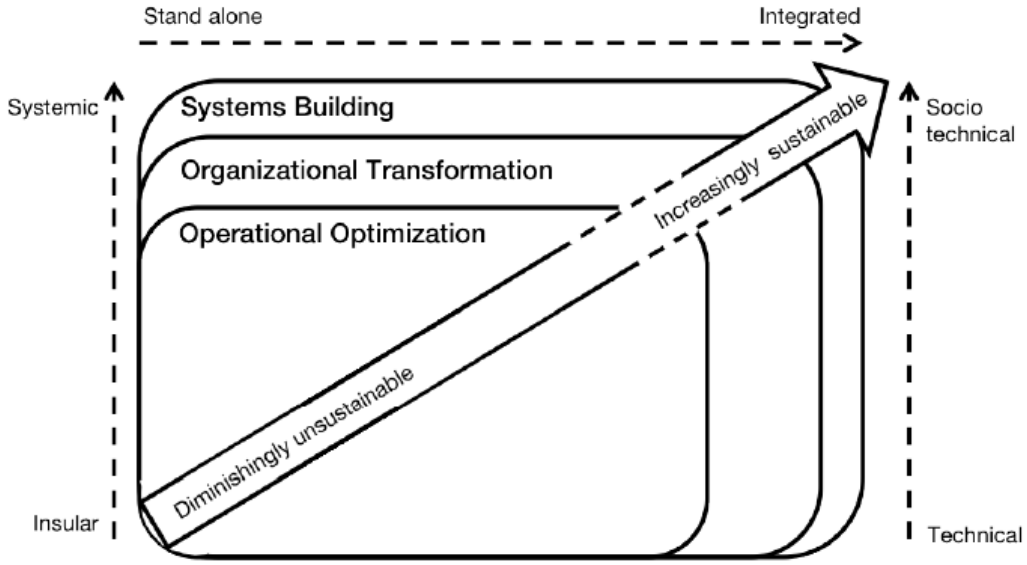

Figure 2.1: Three contexts of sustainability oriented innovation by Adams et al. (2012)

Figure 2.1 shows how an organisation moves through the three contexts of insular/systemic, standalone/integrated, and technical/socio-technical innovation. For each improvement in each of the contexts, the organisation becomes increasingly sustainable. To make this process better communicable, figure 2.2 was created. This visual includes demonstrative examples and a choice of words that is understandable without having to be familiar with the scientific jargon typically used.

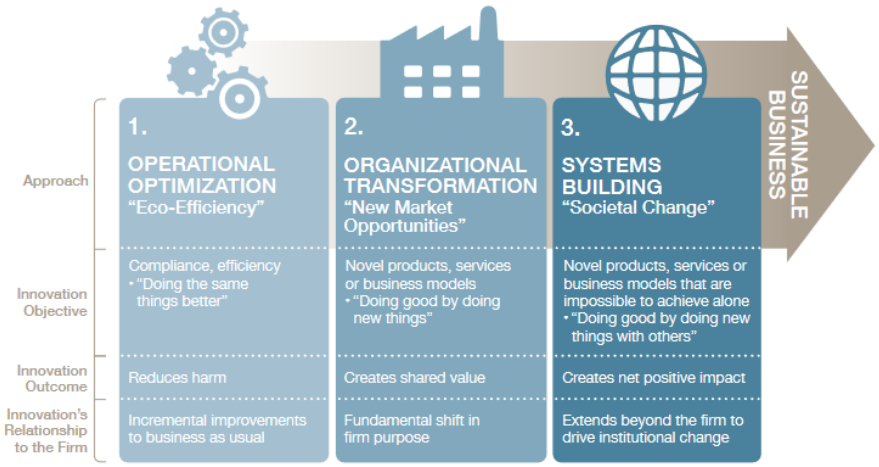

Figure 2.2: 3-Stage framework for innovating by *Innovating for sustainability: A guide for executives* (2012)

The first level includes practices that aim to improve on existing products or processes, thus the term 'eco-efficiency'. The general outcome of this is that some harm that results from the company's proceedings is reduced, and the negative impacts on the environment are lessened. That being said, efficiency does not equal effectiveness, and reducing harm means that some remains. Therefore, moving to the next level means rethinking and redoing things, and thus not only diminishing, but avoiding negative effects and ideally facilitating positive impacts. The third level expands on this by extending the organisation to view itself within a network aiming at societal change. By forming networks and collaborations, sustainability challenges that previously were too big to handle become manageable, and even bigger positive impacts can be achieved.

Konietzko et al. (2020) visualised a similar thought about innovation for circular economy. Figure 2.3 shows that for high impact innovations, it is not sufficient to improve only in the inner circle that depicts product and service innovation, which would be equivalent to the first level above. Better, but still not enough, is a Business Model innovation, which correlates with level two. Ultimately, it is the whole ecosystem that needs to be considered, as the authors argue that like level three, radical and truly powerful changes for sustainability can only be achieved through collaboration between multiple stakeholders. In addition to this, however, it should be noted that with each level towards more radical transformation, the complexity increases accordingly. The figure 2.3 exemplifies this, as the eye has to take in more as each of the circles encompasses more aspects. Especially the system building/ecosystem perspective becomes intangible and obscure, as it includes a whole network of actors that interact with each other and directly and indirectly impact and influence one another. In practice this means that actors will have to move from working as individuals in a network, towards understanding themselves as part of a system in which they co-create and collaboratively innovate.

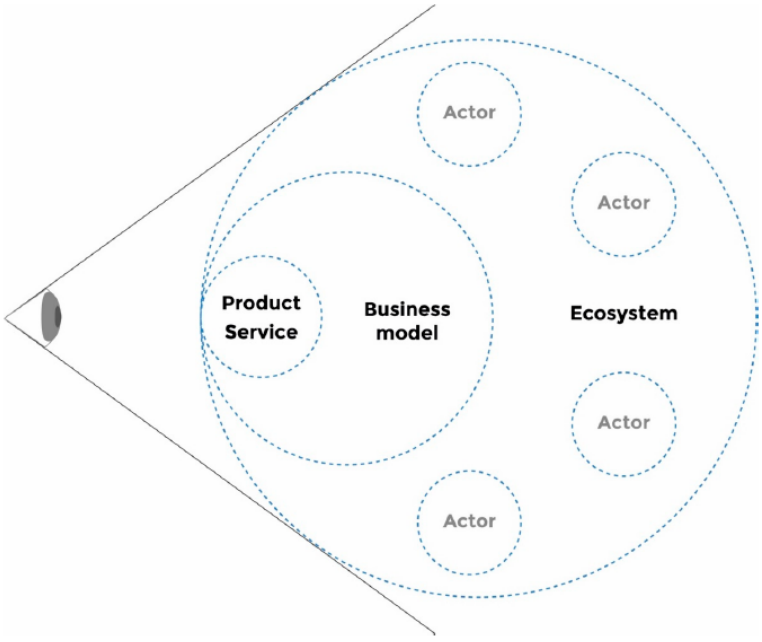

Figure 2.3: An ecosystem perspective on innovation in circular economy by Konietzko et al. (2020)

In conclusion, the literature clearly shows that companies can and should change to become more sustainable. There is extensive material that describes how innovation can take place, how this should ideally be done, and why this is necessary. However, this information needs to be translated into reality and reach those that are intended to work with this. Therefore, the authors of this project propose a business idea that could aid in facilitating exactly that.

2.3 Business idea

Essentially, the business idea is intended to facilitate innovation for sustainable development in organisations, especially companies, providing a bottom-up initiative to supplement the top-down nature of global policy and legislation. As described in section 2.2, inter-organisational collaboration across industries is a key element of addressing and innovating for sustainable development. Therefore, an online platform is proposed, where organisations can explore opportunities across industries for more sustainable practices by being paired with other organisations willing to collaborate for mutual innovation for sustainable development, while also gaining access to existing sustainable products and solutions. Ideally, this will allow companies to capitalise on the untapped potentials inherent to unexplored partnerships, and make the process of identifying and implementing sustainable practices less time and money consuming, as well as providing a window displaying the different opportunities available. This would allow companies to explore new pathways with little investment. Figure 2.4 provides an illustration on the conceptual business idea.

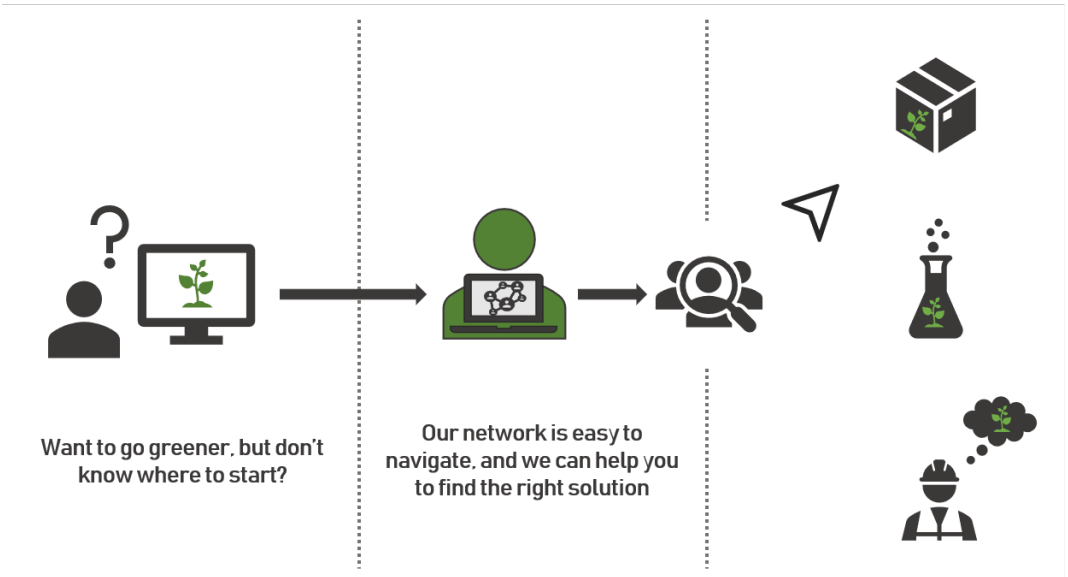

Figure 2.4: Preliminary business idea visualisation

At this stage, the idea itself is very conceptual and vague. Before diving into developing and elaborating the idea, the following section will examine the current field of research related to online platforms and their role in facilitating sustainable development, thereby giving direction to the business idea and project at hand, while situating it amongst current research.

2.4 Literature review

In order to better understand the landscape which the business idea is intended to enter, and to further investigate the potential of online platforms in relations to facilitating sustainable development, a literature review was conducted. For the review, 12 relevant papers were identified, which revolve around online platforms, online means of collaboration and sustainable development. Some of the papers do not entail a direct relation to sustainability, but instead a focus on business performance, which has been deemed relevant since the subject matter of this project is a potential business idea.

The literature review uncovered only two examinations of online platforms aimed at inter-organisational collaboration for sustainability. In both cases, Petri et al. (2014) and Ling et al. (2014), the platforms were designed as an approach to overcome the specific empirically based challenges hindering sustainability. This shows that online collaboration in the form of knowledge sharing and creation helped to identify potential strategies for sustainability, and reduce the resources needed to do so. However, these platforms remain industry specific to construction, and focus on supply chains that were in a sense connected already.

On a more general level, the review indicated the large untapped potential that online networks and online means of collaborating hold for innovation to address the wicked cross-industry nature of sustainability (Maher et al. 2018, Petzel et al. 2010). It is highlighted how the easily accessible and resource effective nature of online networks and online means of communication allows for new and increased collaboration across organisations, fields and geographic location. Additionally, both Petzel et al. (2010) and Maher et al. (2018) stress the need for developing common frameworks and understandings of sustainability, as the ability for online networks to address relevant problems heavily relies on it.

One of the challenges that is arguably tied to inter-organisational collaboration is the issue of competitiveness, which has been examined by both Ziegler & Hamker (2011) and Moritz et al. (2016) in the case of online competitions aimed at co-creation to solve sustainability challenges and design solutions. Both found that even in these highly competitive settings, co-creation and collaboration materialised through commenting and communication features on the websites. Although these competitions involve participants in the form of individuals and not companies, they somewhat indicate that in the face of competitiveness, a common goal of sustainability provides a foundation for collaboration, and that an online interface can be the facilitator for this. Additionally, the online nature of the competition and its content provide a global visibility for the problems the competition is meant to tackle.

Since the literature pertaining to online collaboration and online platforms related to sustainability did not prove to be extensive, literature on how sustainability is communicated through online platforms has been included as well. Fieseler et al. (2010) and Dovleac (2015) examine how online platform types such as the social web are becoming an increasingly popular tool for companies to communicate and interact with costumers, especially in the wake of increasing costumer demands with regards to sustainability and CSR. Dovleac (2015) argues that the most important part of these digital platforms is their potential to share knowledge, and underlines that their visibility potential has meant that costumers are setting new demands to the sustainability of companies via these platforms in a more public space, while simultaneously

allowing for new interaction between companies and their customers. This becomes interesting in relation to the proposed platform, as it entails companies becoming customers in a certain sense, looking for services, products and collaboration with other companies pursuing sustainability.

Not related to sustainability, but still relevant to the proposed business idea, Farzan et al. (2016) and Yang et al. (2019) focus on how to stimulate collaboration and activity in online platforms such as online communities. Yang et al. (2019) focus on online communities and underline their potential for knowledge creation and collaboration, and their inherently high failure rates, stating that continuously updating and adapting both institutionally and technologically means to support users. On the other hand, Farzan et al. (2016) bring to attention so called hybrid platforms, where online activity is aimed at facilitating offline activity, and that synergies between the two arise for mutual stimulation of both offline and online activity, resulting in trust, familiarity and understanding amongst members. This provides an interesting consideration for the online platform proposed in this project, as it could potentially benefit from an offline aspect to stimulate online activity and vice versa.

In summation, there is little literature covering platforms specifically designed to address sustainability, and those identified remain industry specific, contrary to the platform proposed in this project. However, both studies provide indication of online platforms holding potential to address various stakeholders' needs, and facilitate sustainable development. In the more general literature on online communication and networks and sustainable development, it appears that large untapped potential remains in exploring how online networks and communication may provide solutions to the cross industry nature of sustainability, thus supporting an exploration of the business idea at hand. Additionally, the use of online platforms in the social web nature is becoming increasingly popular and provides new means for companies to interact with costumers. This does, however, also entail that companies are facing increasing demands in terms of CSR and sustainability. Finally, it was shown that contact with users to ensure institutional and technological measures are in place to address their needs. The so-called hybrid platforms combining online and offline network activity, provide an interesting consideration for the business idea to address.

2.5 Justification for further work

The following considerations address the aspects uncovered in the problem analysis which were deemed to have primary importance for the direction of this research project.

Even though the literature review in general has helped to cement the novelty of the business idea from a research perspective, the limitations in the literature indicate a need to identify similar concepts and their workings in order to not only situate the project amongst current research, but also to situate the business idea at hand amongst potential competitors or collaborators. Moreover, since much of the literature on online collaboration and networks refers to knowledge sharing and creation, it seems beneficial to somehow include this as part of the inter-organisational collaboration intended by the proposed platform. However, this is only part of what this type of collaboration would entail to address sustainability, and collaborations for actual collective innovation in a business model and ecosystem perspective remain vital to facilitate sustainable development. As evident from Petri et al. (2014) and Ling et al. (2014),

the platforms designed to address sustainability through collaboration were empirically founded in stakeholder needs and challenges, which constitutes part of their success. Therefore, and since the literature is lacking to guide and explore different aspects of the proposed business idea, it appears to be appropriate to examine and develop the business idea with strong roots in stakeholder inclusion. Embarking on the exploration and development of a business idea is arguably something that is typically undertaken in an entrepreneurial process rather than an academic project. However, since the authors of this project lack entrepreneurial experience, it is deemed appropriate to engage with this process through a research based approach allowing for the exploration of potential synergies between the two. Finally, although Petri et al. (2014) and Ling et al. (2014) showed potential for stakeholder centered online platforms to facilitate sustainable development within a certain industry, the influence of facilitating sustainable development on a societal scale remains questionable. It appears vital to include this aspect, as the origins of the business idea stem from a call for accelerated societal action for sustainable development.

Based on this, a two folded research question is proposed: Firstly, exploring and developing the business idea through stakeholder inclusion by using problem based research, and secondly, examining its potential to contribute to sustainable development on a societal level.

Research Question 3

Employing problem based research and drawing on stakeholder experience, how could the online platform be designed to facilitate inter-organisational collaboration and thus contribute to sustainable development on a societal level?

1. How do similar networks and platforms work and how does the business idea at hand differ from these?
2. What aspects should the business idea entail in order to satisfy the needs and challenges as expressed by stakeholders, thus creating additional value?
3. What potential does the stakeholder centered business idea hold for sustainable development on a societal level?
4. How does the application of problem based research influence the development of the business idea at hand?

3.1 Research design

The present project has been developed and executed as a thesis project at Aalborg University in the Environmental Management and Sustainability Sciences master. One of the defining characteristics of projects in this environment is the problem based research approach. More specifically, this means that the research takes point of departure within a real life problem, applying a scientific approach to examining and solving it while remaining critical in doing so. Moreover, this approach shapes the research design used to engage with said problem. While the preceding chapter has described the problem, the following chapter will discuss the research design. Illustration 3.1 gives an overview of the research design's structure, as well as at which stage each of the four sub-research questions will be answered.

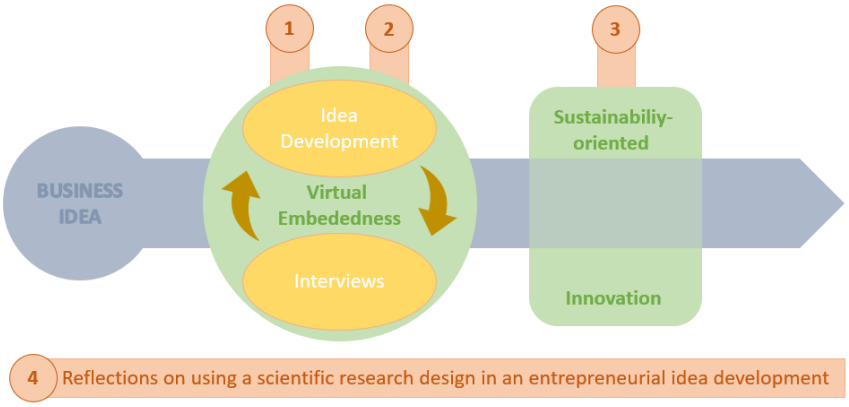

Figure 3.1: Research design with sub-research questions

The research takes point of departure in exploring the potential business idea, which was framed in the context of real world problems through the problem analysis. Since this means applying a research based approach to a traditionally entrepreneurial process, it renders this project as a synthesis between research and entrepreneurship. Empirical data will be collected with the aim of gaining insight into the validity of the idea through the consultation of potential stakeholders. This will also provide insight into the stakeholders needs, challenges and other inputs to the business idea, thereby keeping it rooted in real world problems and needs. For this reason the business idea will remain at a conceptual state when this research is initiated, so that the empirical data can continuously be integrated into and shape the idea as it is processed and examined through the analytical framework.

3.2 Research boundaries

Within the confines of this report it is not possible, nor the intention to address all aspects that are entailed by the research question and its sub-research questions to the same extent. This section serves as a delimitation of the project scope in terms of predefined limitations.

Firstly, the sub-research questions center around developing a business idea, which arguably could lead to the formulation of a business model which would entail several financial and practical considerations. However, before the business idea can be transferred into the form of a business model, its potential to address stakeholders must first be cemented, and therefore this process becomes center of attention. In this process, financial considerations are nit yet relevant, which leads to the second limitation: feasibility of the business idea. When realising a business idea, its feasibility both in financial and practical terms becomes increasingly important. However, the scope of this project is not the realisation of the idea itself, but uncovering its potential and designing it to address real world problems. In line with the design thinking approach of this inquiry, feasibility is recognised as important, but is left to be addressed after the idea development process.

Finally, for practical reasons, the entrepreneurial aspects of the research question are addressed to a lesser degree than intended, since the COVID-19 pandemic hindered the participation on entrepreneurial courses and guidance meetings which were intended to work as a foundation for engaging with this aspect of the research question.

Methodology 4

The premise of answering the proposed research question is to explore the development of a business idea through problem based research. This means it is on the one hand rooted in theoretical findings and discussions, and on the other hand developed by looking at experts' experiences and stakeholder needs. This is not a linear process but rather an iterative one, which develops and is challenged constantly, ideally ultimately resulting in a theory-based, practice-validated business idea.

4.1 Methodological framework

Having already established the research design, the next step will describe the methodological framework used to conduct the research. Based on the discussions in the problem analysis, it was deemed that a method focused on entrepreneurial action appears to be fitting. Mansoori & Lackéus (2019) provide a comparison of six methods within this field, namely effectuation, discovery-driven planning, prescriptive entrepreneurship, business planning, lean start-up, and design thinking.

Each of these methods differ in their origins, being rooted in either academics (effectuation, discovery-driven planning, prescriptive entrepreneurship) or practice (lean start-up, design thinking, business planning). Either of these entail advantages and disadvantages, with the main finding in this regard being that the scholarly based methods tend to lack on the level of tactics, and the practitioner based ones come short in regard to providing a theoretical background (Mansoori & Lackéus 2019). However, the authors discuss not only these aspects, but nine dimensions in total. A quantified rating that summarises this discussion can be seen in figure 4.1. Overall, effectuation, lean start-up, and design thinking are the most comprehensive in regard to the nine dimensions.

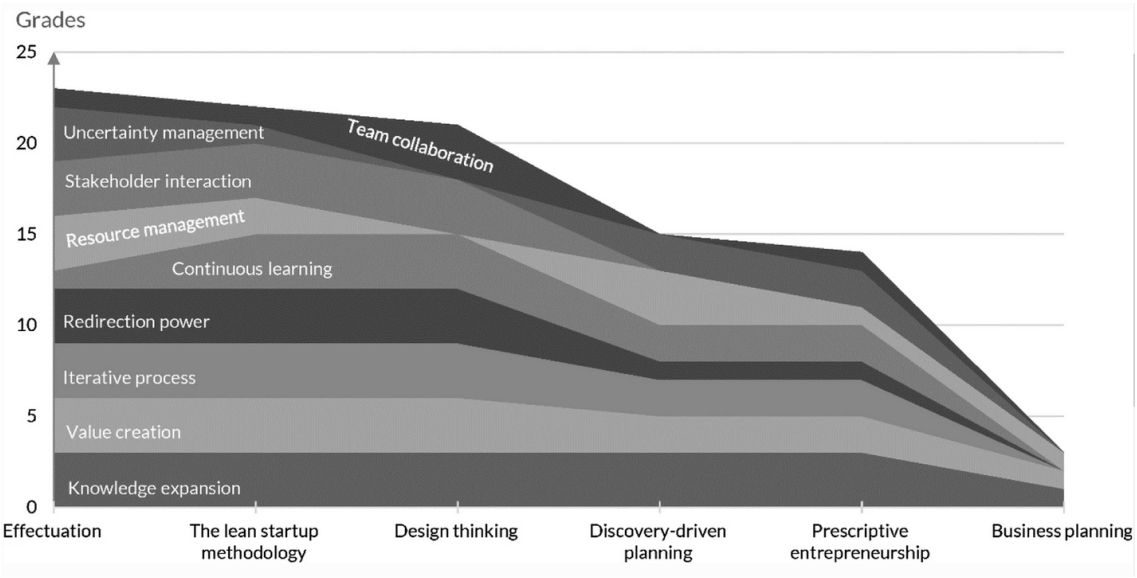

Figure 4.1: Analytical comparison of six entrepreneurial methods across nine conceptual dimensions (Mansoori & Lackéus 2019)

Based on these comparisons, the authors conclude that the different methods each have strengths that can be applied in different phases of the startup venture, these being the idea phase, pre-startup phase, startup-phase, and post startup phase (Clarysse & Moray 2004). In general, it can be said that with increasing maturity, the venture craves more strategic approaches and is less permissive of reorientation and experimentation, as more resources have already been invested (Mansoori & Lackéus 2019). The authors propose to use effectuation in the idea and pre-startup phase, moving on to design thinking or lean startup methodology in the pre-startup and startup phase, and eventually to discovery driven planning and business planning in the startup and post-startup phase. Figure 4.2 shows the different venture phases and how the entrepreneurial methods could be positioned according to Mansoori & Lackéus (2019).

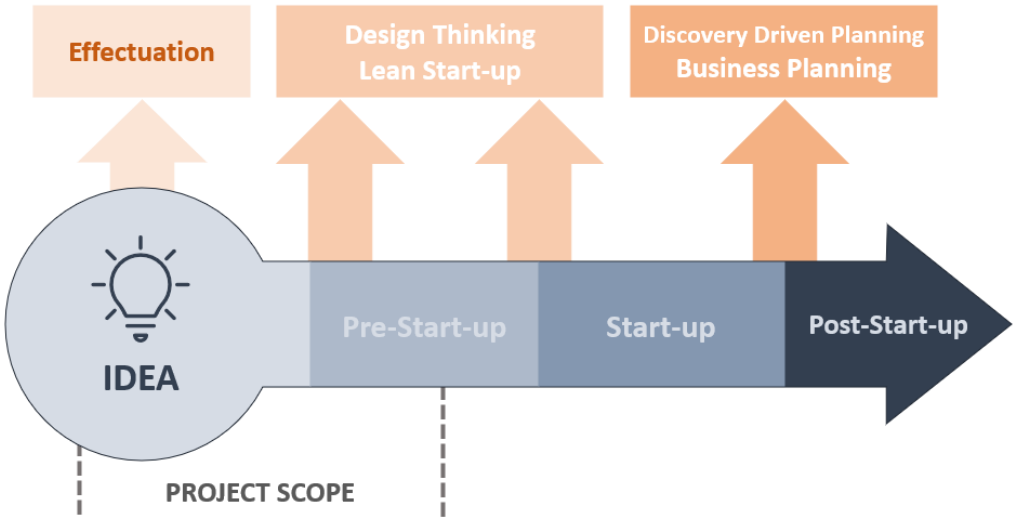

Figure 4.2: Venture phases and the respective entrepreneurial method

Applying the venture phases to the present project allows to determine an appropriate method: The research project itself poses the idea and pre-startup phase, in which the idea is shaped and directed by every stakeholder and co-creation is the core principle. The research conducted throughout the project focuses on validating the idea through stakeholder engagement, which requires a somewhat more structured method such as design thinking. Ultimately, Fiet & Patel (2008) propose to adopt an integrated approach in which different methods are combined to fit the context. This would also arguably alleviate the two major points of critique in Mansoori and Lackéus' work, namely the risk of assuming that entrepreneurship is a linear process (Levie & Lichtenstein 2010), and that methods tend to provide ready-made templates, thereby failing to inspire entrepreneurs to discover new ways of venturing (Mansoori & Lackéus 2019), which arguably contradicts the purpose of creative methods such as design thinking.

Considering the venture phase in which the present project is, it was deemed appropriate that influences of effectuation should provide the base; this will be supplemented by design thinking as the phase progresses. Effectuation has been introduced by Sarasvathy (2001) and describes a method of entrepreneurial creation. The ultimate outcome of the business idea development in effectuation is not clear, instead, bad ideas are dismissed and new ones developed as the innovator continues to learn on their entrepreneurial journey. In this process, relatively few resources need to be invested, and as the venture proceeds, more resources tend to become available. In short, effectuation is characterised by low resource demand and a very high degree of flexibility.

Sarasvathy (2001) advises that effectuation can be an efficient tool when the innovator does not have a clear business goal in mind, but rather a general aspiration to build a business, especially if the access to resources is limited; therefore, it seemed to be appropriate for the project at hand. However, a more structured method was found to be beneficial for two reasons. Firstly, in order to acutely incorporate needs and challenges of different stakeholders and secondly, the initial idea has already been partly validated through the problem analysis, but needs further exploration. This resulted in using design thinking as the main method.

Liedtka (2018) describes seven aspects of design thinking, which in turn are divided into three groups, as visualised in figure 4.3.

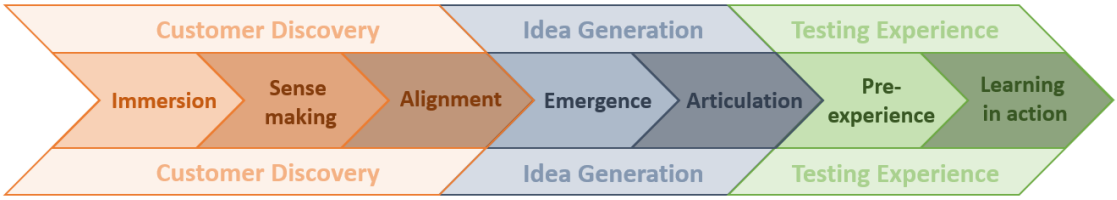

Figure 4.3: Aspects of Design Thinking, based on Liedtka (2018)

Customer Discovery is concerned with making the innovation a *"meaningful customer journey"* (Liedtka 2018) and rooting it in the actual purpose it needs to fulfil, thus focusing on the underlying needs. In this, *immersion* describes how innovators can discover these hidden needs by trying to experience a situation from the customer's perspective. Following this, *sense making* is the step in which the collected data is sorted and processed. Several techniques for this exist, essential is that the innovator remains unbiased and open to new, unexpected, and

even unwanted insights. As a last step in the discovery stage, *alignment* is used to explore ideas and ideal solutions, usually in workshops. Here, focus is on the opportunities and what a best-case scenario would look like, rather than criticising and planning 'realistically', allowing for more radical ideas which would otherwise have been dismissed.

In the *Idea Generation*, the ideas and solutions are sighted and narrowed down to fit the identified needs. The first step of this is *emergence*; ideas are shared and build up upon, thus developing them further instead of compromising. The authors note that in this step, participants should be carefully selected, as they have a significant impact on the outcome of the idea development. Following this, in *articulation* the innovators question and challenge their own assumptions. The aim of this is to break free from individual understandings of the world, and instead discuss what would need to be true about this world for this idea to work.

Lastly, there is the *Testing Experience*. In the *pre-experience*, low-cost prototypes are used to assess the innovation's value. The prototypes help to stimulate the test person's imagination, while it remains easy to adapt and alter. It further invites for interaction, as the prototype remains incomplete at this stage. Following this, *learning in action* is the last step: experimentation in a real world context. While this helps to assess how the innovation can work, it also eases the resistance to change, usually exhibited by the various stakeholders, as it decreases the perceived risk and allows for 'sampling' of the innovation.

4.2 Application

The extent to which design thinking has actually been applied has been restricted by the COVID-19 pandemic. The intention of this project was to use interviews as first steps in *Customer Discovery*: *immersion* and *sense making*, by gathering information from potential users and other stakeholders. These were intended be the foundation for later workshops with case companies and other stakeholders. The workshops and other creative ways of collectively engaging with the business idea were intended to serve as the *Idea Generation* phase: *emergence* and *articulation*. In the interviews, several companies were open to further collaboration on the idea, but the COVID-19 pandemic rendered this practically impossible. In practice this means that the project authors' role as innovators are increased in a sense that does not completely adhere to the actual intent, nor the principles of design thinking. Hence, the project adheres to design thinking covering the *Customer Discovery* through the interviews, while stakeholder inclusion is lacking in the *Idea Generation* phase. The last phase of design thinking (*testing experience*) lies outside the scope of the project, and is intended as the next steps taken in this project, in which the focus is developing and solidifying the business idea through co-creation with different stakeholders.

4.2.1 Semi structured interviews

The data collection of this project takes the form of interviews exploring potential user demands, as well as relevant experiences in regards to developing a business model. Furthermore, interviews were used to gain insight into the experiences and needs of different stakeholders for which the business idea is intended. Thereby, the needs and challenges of potential users are

uncovered and influence the development of the business idea, maintaining the principles of design thinking. In doing so, a total of 23 interviews has been conducted with three different types of stakeholders:

1. Stakeholders from business networks and sustainability related networks

These are people who are working or have worked in organisations concerned with business networks or with a base idea and mindset similar to the business idea at hand - online platforms working towards spreading sustainable practices. This stakeholder type therefore includes traditional business networks, sustainability oriented networks, both private and municipal, and online platforms with different characteristics.

There are two main arguments for including these interviewees. First, understanding existing networks aids in positioning the present business idea in the context of what already exists in terms of establishing partnerships. It can thereby be gauged what kind of relationship between the existing networks and the business idea are possible. Second, they provide valuable insight and experiences in the operation of networks centered around sustainability, giving indications onto both the kind of challenges and potentials relating to companies trying to adapt more sustainable practices, creating inter-organisational collaboration.

2. Stakeholders intended to utilise the online platform

These interviewees represent the potential users of the business idea, therefore the main focus lies with assessing the perceived needs and challenges in regards to an online platform focused on collaboration and sustainable development. They further help to elucidate what kind of challenges companies are currently facing when working with sustainability, to ensure that the online platform will address said challenges, thus staying rooted in actual real world problems. In addition to this, some interviewees are able to add a user perspective to the existing networks, providing insights into potential challenges and existing gaps the business idea could fill in that regard.

3. Experts from academia and business development

While the perspectives of existing networks as well as potential users are covered, an additional point of view was deemed beneficial. Seeing as the present project stems from an academic background, interviewees experienced in the fields of business development and sustainability were included to provide a critical point of view on the business idea, give inputs to it, and provide information and guidance on the entrepreneurial side of business development. Interviewees related to business development were found through the AAU Incubator program and partaking in seminars related to bringing research from academia into the business world - shedding light on the synthesis that is sought through this project.

Interviewees in all categories were mainly found through internet research and referral from other interviewees employing a snowballing approach, by scanning the member lists of the existing networks, and partaking in a physical network meeting. Potential interviewees were contacted via email in which a brief description of the project was given. This description purposefully contained limited and conceptual information on the business idea itself in order keep the interest and not overwhelm potential interviewees with information. Ideally, the interviews would have been conducted in person in order to make use of the full potential of

design thinking, taking on discussions, providing visual aids and having participants creatively engage with expressing and incorporating their experiences, needs, challenges, and ideas into the business idea. However, due to unforeseen external circumstances this was only possible for the first four interviews. All other interviews were conducted through phone or video calls when possible.

The interviews took on a semi-structured form with open-ended questions, allowing interviewees to express their thoughts and idea while giving the interviewer the possibility to steer the conversation in certain directions to purpose relevant information (Kvale & Brinkmann 2015). This also provided an opportunity to efficiently gather relevant information and enabled the conservation to uncover information not expected before. The latter remained crucial, as we, due to the covid-19 pandemic, remain unable to work in close collaboration with potential clients, in manners such as case studies, as typically done in design thinking. All interview audio files can be found in the external Annex B.

Interview guide

The interview guide (as found in Annex A) has three parts with different foci, based on the three types of interviewees. The development of the interview questions has it roots in design thinking, and has the goal of gaining insight into current practices, challenges, and needs as experienced by each type of interviewee. Additionally, in line with design thinking it was important to receive inputs and ideas on the business idea from each interviewee. As such, these were the initial conditions for the questions developed. As the interviews were carried out, the guide was modified to encompass the new or more specific areas of interest uncovered. This means that the empirical data was used as a tool to continuously shape and improve the used data collection. Remaining in the nature of semi-structured interviews and considering the three different types of stakeholders, it is important to mention that the interview guide remains broad and should not be considered an exact fit for each interviewee as new merits emerge in each interview, merits that remain specific to the individual interviewee. This means that the questions in the guideline are neither all encompassing, nor are they intended to be.

4.2.2 Interview processing

The 23 interviews conducted were processed using the eclectically founded interview analysis technique *bricolage* as prescribed by Kvale & Brinkmann (2015). *Bricolage* entails a combination of interview analysis techniques, which in the case of this methodology consist of *Meaning condensation* and *Thematisation*. Meaning condensation is the process of reducing or summarising larger pieces of information to a smaller and more comprehensible format, whereas thematisation involves a process of categorising and organising information with reference to certain criteria. Both of these methods were applied to organise the collected data (approximately 20 hours of semi-structured interviews), creating a better overview and making it more easily extractable for analysis purposes.

In practice, each of the recorded interviews was subjected to this process by a group member listening to the audio files. Every time a point was made by an interviewee, or the matter of subject changed, this fraction of the interview was transferred to an excel sheet, marked with a time reference and condensed into a headline, single sentence, or a few words expressing

its content. These condensations were made inductively, which means that no headlines or sentences were made beforehand, but they arose during the processing, allowing the data itself to influence its process of condensation. The amount of data was still large enough that looking for similarities and differences amongst the different stakeholders and types of stakeholders while maintaining a comprehensive overview remained difficult. Therefore, further processing was needed to ensure that the obtained data was eligible for analysis purposes, which was done through the aforementioned thematisation.

After having written down each condensed point, the statements were colour coded to sort them into five categories. These categories were inductively created throughout the colour coding process, and allowed for a further separation into topic groups. Each of the statements was then sorted and transferred into a respective table (see external Annex C). Within this table, there was another sorting regarding the type of interviewee, namely network, business, and university related. The five topic groups that were created entailed:

(1) Statements related to the business idea development. This includes any statements that give advice or ideas on how the business model could be constructed. These statements are both based on customer needs and wishes, as well as on experiences the interviewees have previously made.

(2) Information on how already existing networks operate. While these resulted mainly from those interviewees, who were in the group 'networks', some of the information was also generated from experiences of interviewees from the business sector, adding their perspective on how sustainability networks function and what uses they have.

(3) Personal opinions, pieces of advice, and verbal agreements. This section includes general expressions of opinions on the business idea, which have no substantive backup. In addition to this, it entails any reactions to the proposal to further collaboration and contact, and any pieces of advise that were given without further context.

(4) Challenges that had been experienced or were envisioned by the interviewees. These are challenges regarding starting and operating a network as well as facilitating sustainable actions and behaviour in general and specific contexts.

(5) Miscellaneous information. Any statement that was deemed of interest for further investigation or could not outright be dismissed, but did not fit into any of the categories above and did not warrant its own category was collected here.

In accordance with design thinking, a more stakeholder based method would have been preferable for the *data sensemaking*, such as a Gallery walk. This would have further decreased the researchers' bias, however, such methods rely on physical attendance, which was not possible given the circumstances. Therefore, thematisation was chosen.

4.2.3 Literature review

A literature review was carried out as the main constituent of the *State of the Art* within the subject field of this project. The project at hand revolves around a business idea, taking the form of an online platform intended to facilitate inter-organisational collaboration for sustainable

development (ICSD), while simultaneously creating an overview of sustainable activities and actors. Therefore, a literature review aimed at disclosing current research and experiences with facilitating sustainability through online platforms was carried out. At the same time, the literature review also provided indications on the novelty of this business idea, and factors to consider and implement into the idea as it develops.

Structuring of literature review

The search for relevant literature was done utilising several scientific data bases such as J-store, Web of science, Research gate, Francis and Taylor and Google scholar. The databases were used to process a set of keywords developed specifically for the purpose of this research. This included the word 'online' followed by either 'platform', 'collaboration', 'innovation' or 'network', which was followed by 'sustainab*' or 'environmental'. In the screening process, only peer reviewed material has been deemed relevant.

4.2.4 Brainstorming

Brainstorming has been applied iteratively throughout this project as a means of developing and modifying the business idea. In practice, this means that when new challenges, needs or ideas were expressed, brainstorming was used to explore potential ways in which the intended online platform could accommodate them. As the project progressed, the content of the brainstorms could then be examined through the theoretical framework in order to determine what was eligible for further work. An example of this is the so-called building blocks for the platform which are partly constituted by direct input from interviewees, and partly a result of inputs from interviewees being processed through brainstorming and theory. Brainstorming was chosen as the appropriate method to do so for two reasons; one is that it is easily done with few resources and time, and can be done via web based communication tools. In addition to this, it adheres to design thinking, as the brainstorming process is intended to be broad, creative and focuses more on idea development than feasibility. Thereby, brainstorming aided in not limiting the idea development process, and allowed the authors to become an active part of the design process capitalising on previous experience and as stakeholders in possession of accumulated data from every other stakeholder.

4.2.5 Triangulation

In order to diminish potential bias arising from the conducted interviews, this methodological approach has employed triangulation as principle for the inquiry. This means when uncovering the needs and challenges of potential customers and other stakeholders, diversity was important to ensure multiple perspectives and verify the obtained information. This was primarily done through the consultation of three main types of stakeholders as displayed in figure 4.4. With in each stakeholder category, further triangulation methods were also applied in the form of different types of business networks and business, as well as an environmental consultant. By using this approach, multiple inputs were gained on both the interaction perspectives, different industries, short comings of current business networks and a diversified insight into the challenges of changing for sustainability on a general level.

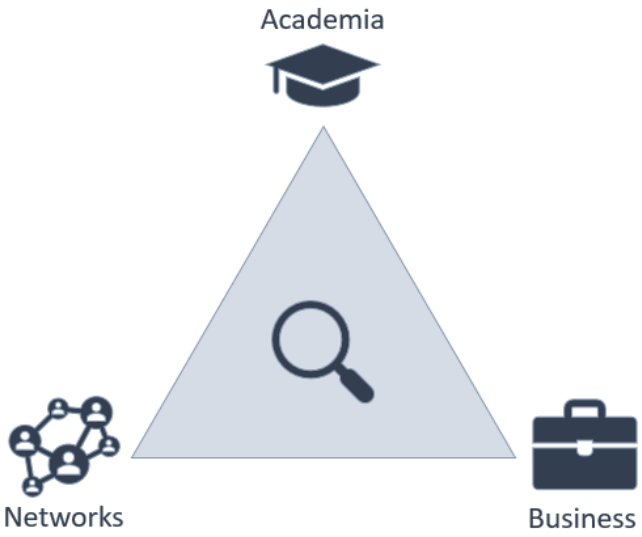

Figure 4.4: Means of triangulation to uncover needs, challenges and ideas held by different types of stakeholders

4.2.6 Business network meeting

The attendance of a physical network meeting was also part of the data collection and idea development process of this project. It was included for two reason. Firstly, to directly experience the current primary means of networking employed by the interviewees, and gain the important "user perspective" advocated by design thinking, an integral part of *immersion*. Secondly, it was intended as a way of trying to establish connections with potential interviewees. The event was called "Breakfast and networking" by Ehversnetværk 9220 in connection with the AAU Carrier Fair 2019.

Theoretical Framework 5

The following chapter presents the theoretical framework applied to answer the proposed research question. The theories used in the present project have two purposes. First, they help to shape the business idea and aid in the development of it, therefore being closely related to and embedded within the methodology, and second, they help to examine the empirical data through a certain lens, revealing new information and understanding of the problem under inquiry. The following chapter will introduce the theories in general terms in order to enhance transparency while they are being applied.

5.1 Critical realism

The ontological and epistemological foundation of this project is rooted in critical realism. Critical realism is constituted by acknowledging the existence of a real intransitive world, coupled with the recognition of a non-reducible transitive world that is subjectively and individually experienced. The understanding of reality and examination of it, undertaken by critical realism, is established thought the assumption that facts are dependent on theory, but not determined by it. Simply put: only knowledge changes, while the world remains unchanged (Danermark et al. 2002).

In addition to operating with the understanding of reality as the existence of both a transitive and intransitive world, critical realism further divides the world into three so called domains, each distinct from the other; *The Empirical* which concerns experiences and observations, *The Actual* regarding events and phenomena disregarded of experience, and lastly *The Real* pertaining to social and societal structures and generative mechanisms. *Generative mechanism* is a central term in critical realism, and describes why something happens in a given context.

To understand the notion of generative mechanisms, further elaboration on the understanding of reality in the context of critical realism is needed. In addition to the distinction of reality as domains, critical realism assumes reality to be hierarchically stratified - a layered reality, where each layer or strata constitutes a level of perception. Being hierarchical in nature, each strata is dependent on, however not reducible to, one another. In short, the existence of higher strata is dependent on the foundation provided by lower strata. However, it is important to note that strata still have inherent qualities of their own, as new things emerge with each ascending strata. As an example of a hierarchical stratified reality, the world could be divided into four distinctive layers: physical, chemical, biological and social, which can be seen in figure 5.1. Here, physics is the lowest strata, rendering it the foundation upon which the other strata emerge, with social as the highest strata. This means that chemical processes are occurring within a world of physics, but they also have qualities that can not be explained by physics

alone, in the same way that social phenomenon cannot be explained only through biology. The explanation of movement between and emergence of new merits on strata is what is understood by the term; *generative mechanism*. In other words, generative mechanisms is an examination and elucidation of why something happens, and thus why new strata emerge; which merits can not be reduced to lower strata (Danermark et al. 2002).

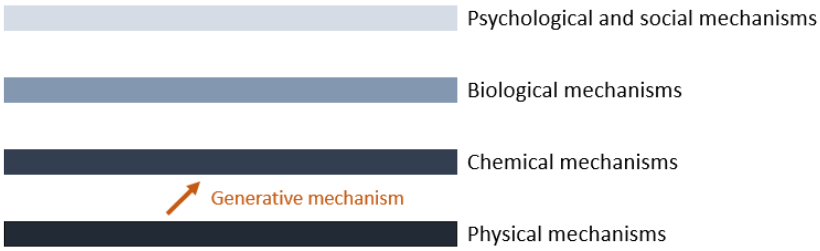

Figure 5.1: Stratified reality and generative mechanism

Within the confines of this project that examines not only the potential of a business idea, but also how a project approach can contribute to this process, the concept of generative mechanisms will serve as a way of reflecting on and examining the interaction and synergies between the development of a business idea, and the problem based research in which it has taken shape. Therefore, the ontology of this project will mainly concern two strata which comprise the reality under examination. One being the business idea itself and the other being the project at hand, thereby rendering the generative mechanisms a means for inquiry of this project in a meta perspective.

The problem analysis showed potential for online platforms, online networks, and online communication to facilitate ICSD, but this calls for further examination of stakeholders' needs and challenges. The framework of virtual embeddedness will be used to examine the empirical data and identify why and where facilitation of inter-organisational collaboration through the online platform would be beneficial. The problem analysis also indicated lacking research in regards to the online platforms' potential for sustainable development on a societal level. For this purpose, the framework of sustainability-oriented innovation will provide the means to gauge and discuss this potential when the idea development process has been finalised.

5.2 Virtual embeddedness

In order to gain insight into potentials held by the business idea to address stakeholder challenges and needs in relation to sustainable development, the frameworks of virtually embeddedness (VE) and liabilities of newness are introduced. This framework was chosen as the business idea revolves around creating an online platform focused on facilitating ICSD. Several online platforms working for sustainability already exist and so do multiple business networks working to facilitate inter-company collaboration (see section 6.1). This framework is intended as a tool to show how the proposed business idea differs from existing platforms in creating relations between companies and how it holds potential to address their needs and challenges through virtually embedded ties (VET). Additionally, the concept of liabilities of newness is used as a

way of examining initiatives for environmental sustainability as new business ventures, and how these could benefit from VE.

To understand VE, an understanding of the term embeddedness is needed. According to Fowler et al. (2004), the framework VE stems from the field of economic sociology, in this context embeddedness refers the extent that economic activity is constrained or enabled by non-economic institutions such as social structures. Social structures is seen as inter origination or actor relations that affect economic activity. Therefore, VE can be expressed as the accumulation of inter-organisational or actor linkages that contextualise economic activity, and are initiated and maintained via electronic communication and information technologies - primarily the internet. The use of these technologies enables VET to overcome exchange related problems in a business context, which would formerly be resolved through formation of socially embedded ties (SET).

The need for VET and SET arises due to the inefficiencies that are inherent to what is referred to as *arm's-length ties*. These are the simplest form of ties between actors and organisations in a business context, and basically entail a purely economic connection. This means that they are essentially non-embedded ties. These are efficient in very simple economic relationships, but become insufficient in the face of exchange problems such as complexity, uncertainty and opportunism. These are inefficiencies for which both SET and VET possess specific, but inherently different means of mitigating (see figure 5.2).

Exchange-Related Problems Ineffectively Addressed by Arm's-length Ties	**Key Components of Socially Embedded Ties**	**Key Components of Virtually Embedded Ties**
Opportunism	Trust	Transparency
Uncertainty	Exchange of fine-grained, proprietary information	Widespread sharing of private and public information
Complexity	Joint problem solving	Community-based problem solving

Figure 5.2: Components of socially and virtually embedded ties that aid in resolving exchange based problems (Fowler et al. 2004)

Fowler et al. (2004) argue that SET come with a set of difficulties or inefficiencies that under certain circumstances could be resolved through VET. As such, one is not generally preferable to the other and VET do not seek to diminish the merits of SET, instead, problems related to one type of embeddedness could be resolved by the other.

The circumstances under which each kind of embedded tie holds an advantage is equally related to their inherent shortcomings. Uzzi (1997) argues that the general weaknesses of SET are:

- Reliance on socially stable networks
- Susceptibility to failure due to rationalisation and institutional change

- Over-embeddedness

Fowler et al. (2004) argue that VET hold potential to mitigate all of the above weaknesses. Considering the weakness of reliance on relatively stable networks, Uzzi (1997) argues that the resources needed to sustain SET could precede resource allocation for the establishment of ties outside the primary network of an organisation. An enduring SET could then become a liability if said tie is for some reason severed, and organisations lack resources needed to establish new ties to sufficiently replace the severed ones. Thereby, firms that focus solely on this kind of organisational ties may risk a competitive disadvantage, especially in an exit of a key actor. This becomes more prominent when an industry is characterised by high organisational turn over: Life spans of companies are relatively short, and new ones are continuously entering. Here VET can be advantageous as they are generally characterised by lesser setup, maintenance and exit costs, because they require little time, often rely on existing digital platforms and do not mean losing the economic and social resources invested.

Regarding the vulnerability of social ties to market rationalisation and institutional change, Fowler et al. (2004), argue that industries operate under a certain degree of stability in terms of technological, political, geographical, environmental or institutional change rendering the resource intensive nature of SET at a disadvantage, as rapid change in the listed circumstances require an equally rapid exchange and replacement of organisational ties. On the other hand, the low resource demanding and flexible nature of virtually embedded ties render them auspicious.

The final weakness of over-embeddedness entails companies being embedded in a network to a degree that it becomes disconnected from other networks and relations. This means they will lack access to novel innovation information, ideas, and changes in market demand, held by other networks. According to Fowler et al. (2004), this disadvantage of SET seems most present in industries characterised by high levels of dynamism and competitiveness resulting in a need for exploration of new information and innovation to maintain competitiveness. Uzzi (1997) identified a main condition for the emergence of over-embeddedness in networks, which is related to the multipelixity that defines SET - they are both social and economic in nature. This, combined with the associated high establishment and exit cost, can result in dense networks in which actors have intensive relations with other network members, while relations outside the network diminish. Contrarily, VET are often single-purposed and narrowly targeted, reducing the often unwieldy flow of information stemming from SET. Furthermore, VET tend to be constellated in sparsely dispersed network structures, lowering the likelihood of over-embeddedness. Additionally, VET by definition allow for a more widespread and easily accessible search for novel ties, information and innovation, since it is not tied to geographic proximity or established physical networks containing such assets. Thereby, VET may prove vital under conditions where organisations operate under high levels of dynamism and competition, rendering a continuous need for new information and relations located in various sourcesFowler et al. (2004).

The figure 5.3 below situates the different kinds of ties within the exchange related problems as well as the discussed industrial circumstances. These conditions will be used to examine the empirical data, to elucidate how sustainability affects these conditions as an increasingly important industry paradigm, and thus which kind of ties are potentially favorable.

		Severity of Exchange Conditions (*Uncertainty: Complexity; Risk of opportunism*)	
		Low	*High*
Industry Dynamism (*Organizational turnover; Frequency of institutional change; Frequency of technological and environmental change*)	*Low*	Arm's-length ties	Socially Embedded Ties
	High	Arm's-length ties	Virtually embedded ties

Figure 5.3: Circumstances in industries and corresponding type of inter-organisational tie associated with better organisational performance

Elaborating on this, the application of VE will be used to identify and categorise the exchange related problems companies, networks and platforms are facing when pursuing sustainable development and where an online platform enabling VET could alleviate these problems or where it may be insufficient. Simultaneously, this framework will be used to determine its degree of dynamism and hence the need for virtually and socially embedded ties respectively, thereby elucidating where an online platform could hold advantages to facilitate ICSD.

5.2.1 Liabilities of newness

The section above outlines several potential implications for organisations relying on arm's-length ties and SET, and outlined a set of circumstances under which these could become more articulated, where VET hold advantages and mitigation measures. Besides being linked to better organisational performance under said circumstances, Morse et al. (2007) argue that this type of inter-organisational tie can be critical to the survival and success of new business ventures. This is due to the fact that new business ventures are particularly vulnerable to the exchange related problems, while oftentimes entering into industries characterised by high levels of dynamism. Concurrently, new ventures also face *liabilities of newness*, in relation to which Morse et al. (2007) argue for mitigation through virtual embeddedness.

New ventures are defined as ventures that have not yet developed to an extent where it can be considered a mature business. This definition is significant for the application of this part of the theoretical framework for two reasons. First, because the subject in this project is one such venture in which information based technology is essential. Second, the process of implementing sustainable practices in companies extends from simple purchasing decisions to changes in business models and systemic innovation, all of which entail facing the liabilities of newness (see section 6.5.4. As such, it can be argued that the increasing complexity of change and innovation towards sustainable practices in companies appropriates their classification as new ventures.

The following section will describe the liabilities of newness, and how new ventures can draw on VE to overcome them. The reason new ventures are especially susceptible to the liabilities of newness is that they are commonly deficient on capabilities and resources acquired by larger mature organisations, which in turn leads to lower survival rates.

According to Morse et al. (2007), the liabilities of newness are as follows:

1. The need to develop internal organisational systems including roles, relationships, and incentives;
2. The precariousness of trust relationships among strangers;
3. The lack of social capital both in terms of a lack of resource endowment and of an appropriate network structure;
4. The lack of economic capital.

To elaborate on this, new ventures are more liable to failure, since the process of establishing inter-organisational systems is often costly in time, uncertain, prone to conflict and temporary inefficiency. New ventures lack extant organisational ties, and must heavily rely on strangers and unsolidified social ties, which renders trust and openness to vulnerability particular problems. Furthermore, new ventures may lack legitimacy in relation to new costumers as a result of absence of trusted relations.

Social capital in this context is understood as the simultaneous element of social structure and ability to facilitate action in said structure. As such, new firms often have difficulties leveraging social capital, and thus lack access to resources critical to growth and survival. Finally, new ventures commonly lack financial resources and ways of obtaining them in light of the above mentioned liabilities. Figure 5.4 shows the way in which these liabilities can be mitigated through VE.

Sources of liabilities of newness	Benefits of virtual embeddedness
Need to create roles and systems	Reduces the need to create new roles and systems by facilitating access to and the acquisition of external skills, services, and systems
Lack of trust-based relationships and legitimacy	Provides a substitute for trust through a widespread dissemination of information regarding the reliability of trading partners
Lack of social capital	Facilitates the creation and management of interorganizational ties
Lack of economic capital	Increases access to a greater range of potential capital providers

Figure 5.4: Mitigation potential of liabilities of newness by virtual embeddedness (Morse et al. 2007)

These mitigation measures can occur through different interfaces like costumer rating, online sales, chat rooms and forums, online search engines, match making services, information sharing platforms, and others. Examples of this will be used in relation to the conducted interviews to exemplify the building blocks to accommodate certain means of VE to corresponding challenges and needs expressed by interviewees. Thereby, they allow the concept of VE to be one of the guiding principles to consider and integrate stakeholder perspectives into the business idea.

It is important to note that VET do not necessarily only provide advantages under the mentioned circumstances or for new ventures specifically, they may also do so under normal conditions,

just as SET will not always perform inadequately under the circumstances described in figure 5.3. The point of these sections is to showcase how VET offer mitigation measures to the mentioned shortcomings of other organisational ties, and that these are especially desirable under certain circumstances.

VE provides a tool to show and examine the potential for the business idea to facilitate ICSD amongst its users. While this remains important, a vital part of this inquiry is also to relate the business idea to its societal impact on sustainability. This will be done by applying the framework of sustainability-oriented innovation (SOI).

5.3 Sustainability-oriented innovation

In relation to the development of sustainability in the economic sector, sustainability-oriented innovation (SOI) has increasingly become a topic of discussion (Adams et al. 2016, Hansen et al. 2009). Buhl et al. (2019) coined it to be a *"key strategic approach for organizations to contribute to sustainable development"*, and Adams et al. (2016) notes that *"the role of innovation in helping businesses transition to sustainability has received considerable interest from academics, managers and policy makers"*.

Hansen & Grosse-Dunker (2013) define SOI as *"the commercial introduction of a new (or improved) product (service), product-service system, or pure service which – based on a traceable (qualitative or quantitative) comparative analysis – leads to environmental and (or) social benefits over the prior version's physical life-cycle"*. Consequently, SOI is able to provide a perspective on an innovation's sustainability impact, which can be related to a societal level, rather than only taking point of departure in an isolated organisation's perspective. The theory provides a qualitative tool that takes into consideration the ecosystems in which the impacts and their interrelations occur. The relevance of this is based on the realisation that small-scale impacts may entail bigger trade-offs or effects, which may ultimately decrease a sustainable development rather than facilitate it. To ensure that the present business idea does not unintentionally fall into such a trap, SOI will be applied to its different components, and thereby aid in analysing the overall sustainable value.

SOI in itself is a conceptual theory which is subject to discussion and development. However, in order to use it as an analysis framework, it is necessary to operationalise it. The Sustainability Innovation Cube (SIC) was developed by Hansen et al. (2009), and provides a generic tool for evaluating SOI. As can be seen in figure 5.5, it consists of three dimensions.

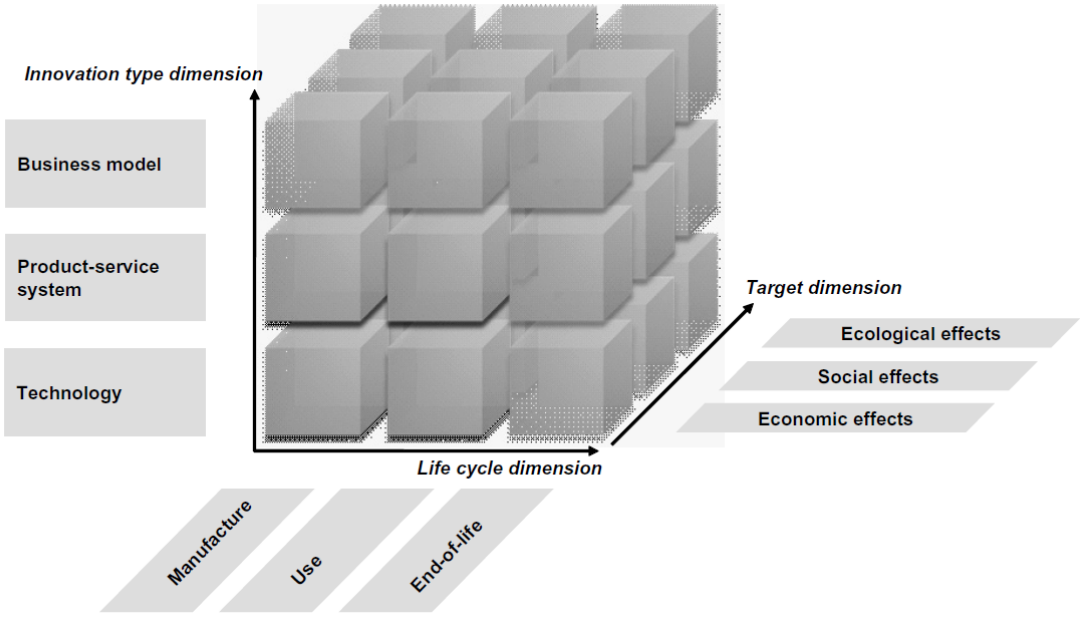

Figure 5.5: Sustainability Innovation Cube (Hansen 2009)

Target dimension

This dimension assesses innovation in regards to the triple bottom line as first coined by Elkington in the mid-1990s (Slaper & Hall 2011). In other words, it examines the effects in the three pillars of economy, ecology, and social. This approach was chosen by Hansen et al. (2009) in order to operationalise sustainability in a way that is tangible and highly communicable among business executives. They further specify that special focus should lie on the social and economic dimension, as innovation typically is connected with economic aspects already. Summarising, the target dimension examines the effects of an innovation in regards to environment, social, and economy.

Life-cycle dimension

The focus of this dimension is on the impacts of an innovation over time, more specifically over its whole life-cycle. This may be economic (eg. life-cycle costing) or non-economic (eg. life-cycle assessment), and includes inter alia manufacturing, use phase, and end-of-life phase. For measuring social impacts, Hansen et al. (2009) mentions organisational-level assessments, which are combined with conversion factors. Altogether, this dimension is heavily based on a technological understanding of innovation, with a strong focus on product innovation.

Innovation type dimension

While Hansen et al. (2009) take point of departure in technological product innovations, in this dimension they acknowledge and stress that there is vast potential for sustainable development through innovations on a cultural level. This stretches over product-service systems to Business Model Innovations. By discussing the function of the innovation, opportunities for system related innovations are created. These have arguably vast potential to positively impact sustainable development by changing people's lifestyles. However, Hansen et al. (2009) discuss

that there is a higher risk and uncertainty involved with these types of innovation.

In addition to the three dimensions described above, Buhl et al. (2019), based on discussions in the literature, propose the addition of a fourth dimension. This dimension is called the *novelty dimension*, others refer to it as "innovativeness" (e.g. Garcia & Calatone (2002)). The aim of this dimension is to evaluate the degree of novelty of an innovation. Hüsig (2014) for example categorises on a scale from incremental innovation to radical innovation, ergo from low to high. Buhl et al. (2019) state that typically, incremental innovations are not sufficient to foster a meaningful development towards sustainability, and that SOI require more radical innovations which challenge the 'business as usual'.

While the Sustainability Innovation Cube provides a systematic framework for evaluating an innovation in regards to its sustainability value, it is not sufficient for the use in the present research. One of the reasons for this is that point of departure is taken in seeing an innovation as technological and product oriented (Hansen et al. 2009), which is for example reflected in the life-cycle dimension. The innovations that the proposed business idea (PBI) aims to facilitate may, however, take various forms, and a product focus seem insufficient. Therefore, the four dimensions presented above will be expanded and edited to satisfy the needs of the present research. Table 5.6 provides an overview over each of the dimensions, what they originally consist of, and how they have been altered to fit the present project.

Dimension	Original Content	Added/adapted content
Target dimension	Assesses innovation in regards to the **triple bottom line**, in other words, it examines the effects in the three groups of economy, ecology, and social. This approach was chosen by Hansen (2009) in order to operationalise sustainability in a way that is tangible and can be communicated also among business executives.	Increase the focus on the integrated nature of sustainability and the three groups.
Life-cycle dimension	The impacts of an innovation over time, more specifically over its whole life-cycle. This may be economic (eg. life-cycle costing) or non-economic (eg. life-cycle assessment), and includes inter alia manufacturing, use phase, and end-of-life phase.	Excluded due to heavy focus on technological innovation.
Innovation type dimension	While Hansen et al. take point of departure in technological product innovations, in this dimension they acknowledge and stress that there is vast potential for sustainable development through innovations on a cultural level. This stretches over product-service systems to Business Model Innovations.	This is supplemented by [the drawing], and no further adjustments were necessary.
Network dimension	n/a	Included instead of the life-cycle dimension. Focuses on the importance of collaboration for innovation with and between stakeholders. The degree of this ranges from insular to systemic (Adams et al. 2016), and can be classified in four modes of collaboration (Barrett et al. 2001).
Novelty dimension (as proposed by Buhl et al. 2018)	Adding a dimension which assesses the degree of novelty: Innovation is categorised on a scale of incremental (low novelty) to radical (high novelty).	Development potential is added instead of evaluating the quality of the innovation based on its novelty degree (eg. can incremental innovations be used as a point of departure and develop into or initiate radical innovations).

Figure 5.6: Alteration of SOI dimensions

Target dimension

While Hansen et al. (2009) themselves note that there is an overlap between the three dimensions of the triple bottom line, and that impacts in one dimension may entail positive or negative impacts in another, for the use of SOI in the present project it was deemed important to especially empathise the integrated nature of these dimensions in sustainability. Gibson (2010) argues that sustainability is an inherently integrative concept. They describe the concept of

sustainability as comprised of interconnectedness and interdependencies, an understanding supported by concepts such as sustainability as wicked problems (Murphy 2012). According Gibson (2010), *"[it] is not about balancing or making trade-offs. It is about integrating and avoiding trade-offs to the extent possible"*. This notion will be the underlying conception for the further discussion of the target dimension.

Life-cycle dimension

In regards to the technical nature of this dimension as described above, it was deemed as unproductive for the present project. As a result, the innovation type dimension becomes the second one, and a new dimension is created in the third space.

Innovation type dimension

Hansen et al. (2009) stress the potential of higher level innovations in regards to their positive sustainability impact. Considering this, the innovation type dimension fits the present context. In this dimension, the function to be fulfilled provides the base for the innovation. As figure 5.7 shows, this can be divided into three groups. The first section describes any innovation in which an existing process is optimised, and the harm caused by the process reduced. The second section includes innovations that 're-think' processes or products based on the function they fulfill. This allows for new approaches to fulfilling customer needs. The third section describes innovations that are created in a bigger context; they rely on cooperation and the usage of collective knowledge.

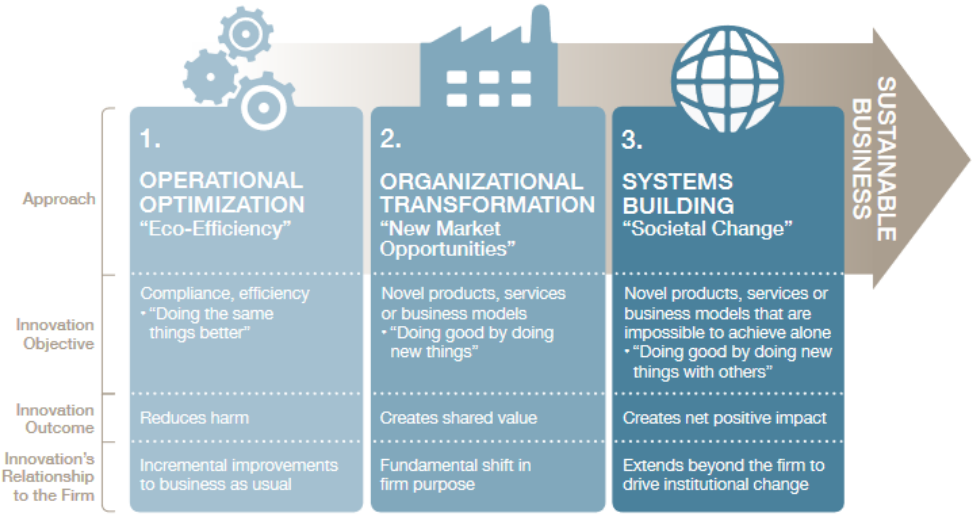

Figure 5.7: 3 stage framework for innovating (*Innovating for sustainability: A guide for executives* 2012)

Network dimension

To supersede the life-cycle dimension, a network dimension is added. The importance of this has already been implied in the section above, in which the third type of innovation is strongly impacted by collaboration and co-creation. Barrett et al. (2011) describe a trend towards collaboration for innovation, which includes firms' customers, suppliers, and in parts competitors.

This development is fostered by globalisation, the intensity of technological change, and a shift towards more cross-border industrial activities (Gassmann 2006), as well as digitalisation (Barrett et al. 2011). This will presumably intensify over time.

Adams et al. (2016) proposes a SOI dimension focused on the *"firm's view of itself in relation to society"*, ranging from insular (focused on itself) to systematic (part of the organisational ecosystem). They argue that more progressive firms (in regards to SOI) look beyond their own boundaries by engaging with diverse actors and forming collaborations with their stakeholders. This enables them to handle bigger sustainability challenges, which could not be solved by a single organisation. The authors refer to this an ultra-firm perspective. Supporting this, Barrett et al. (2011) have classified collaborative models into four types, as shown in figure 5.8.

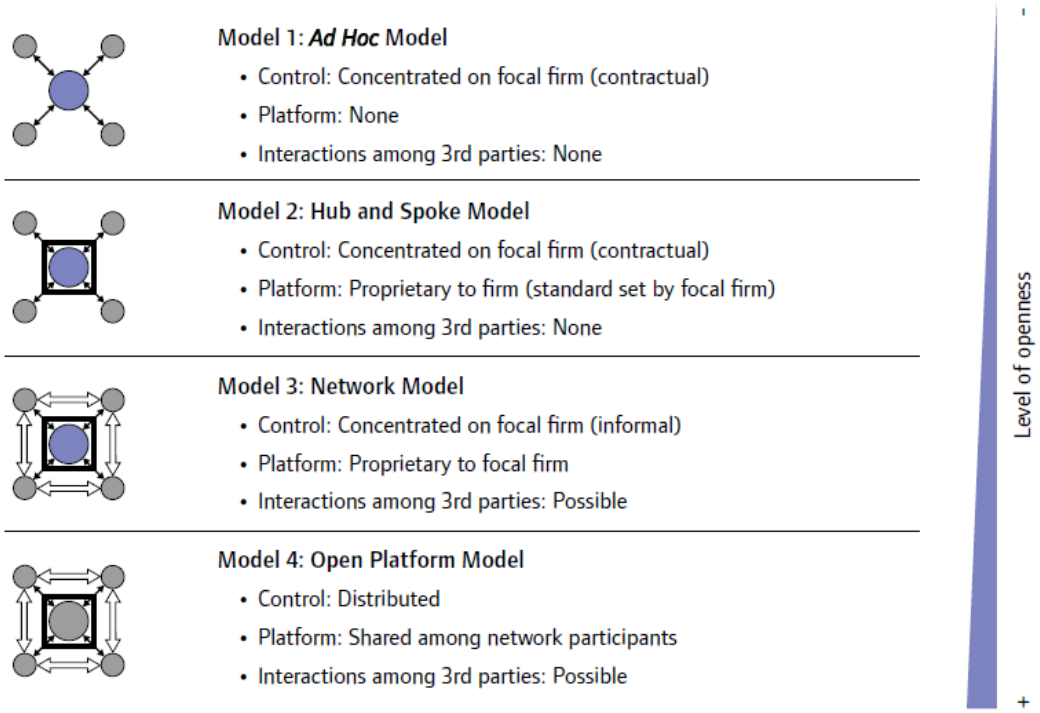

Figure 5.8: Models of Collaboration (Barrett et al. 2011)

Model 1 (Ad Hoc) describes an arrangement in which the organisation forms collaborations on a transaction by transaction basis, meaning that the engagement with partners is informal and occurs as needed.

Model 2 (Hub and Spoke) is a platform in which the organisation interacts with other firms, but no interaction between the external firms occurs.

Model 3 (Network) extends model 2 by enabling the external firms to interact with each other, while still remaining the point of control.

Model 4 (Open Platform) is an open network in which control is evenly distributed and all firms interact with each other within the system.

With an increasing level of openness, i.e. the higher the network level, the opportunities for creating innovations and especially more radical innovations increase accordingly. This in turn

entails increased potentials for innovations for sustainability, as described in the innovation type dimension.

Novelty dimension

Assessing an innovation in regards to its novelty gives insights into its potential effects, and allows to handle the innovation accordingly. While it can arguably be agreed upon that radical innovations are necessary and important for a sustainable development, this project will refrain from judging an innovation as good or bad based on whether it is radical or incremental. Instead, this evaluation will be used to determine how the innovation can be developed best, and how it can be used to foster further development. This approach is based on the principle of persuasion theories, which argues that small commitments provide an entry towards bigger actions (O'Keefe 2016). Therefore, rather than dismissing incremental changes, they should be examined in their potential to become or initiate more radical innovations. Both Buhl et al. (2019) and Hansen & Grosse-Dunker (2013) point out that the term 'oriented' in SOI implies a dynamic process of innovation towards sustainability, rather than a one-time, perfect-fit solution, which further supports this use of the novelty dimension.

In summary, the dimensions of SOI used to evaluate the societal sustainability value are based on the SIC as developed by Hansen et al. (2009), which was adjusted to exclude the life-cycle dimension, include a new network dimension, and expanded based on Buhl et al. (2019) to include a fourth novelty dimension. In practice, these will be applied to the proposed business idea, to show its potential for facilitating sustainable development on a societal level.

Analysis 6

To ensure the ability to address stakeholder needs and challenges and to aid in facilitating sustainable development on a societal level, the business idea under inquiry has purposefully taken on a conceptual form; an online platform focused on facilitating inter-organisational collaboration for sustainable practices and creating an overview of organisations working with or interested in working with sustainable practices. This conceptual form is deemed appropriate as it allows for the exploration of existing platforms and other services in this field and allows these to shape and differentiate the business idea at hand, ensuring the novelty of the idea. Additionally, it ensures the inclusion of a variety of stakeholder perspectives early in the idea development, as prescribed by design thinking, thereby centering the idea development around addressing the real world challenges and needs as expressed by potential users.

The following chapters will initially present the existing platforms and services related to facilitating inter-organisational collaboration for sustainable practices in companies, displaying the novelty or need for modification in the initial business idea. Subsequently, the content of the interviews will be presented through the framework of VE and liabilities of newness to elucidate why and how an online platform could address the needs and challenges expressed by different stakeholders and where other means are necessary.

6.1 Existing platforms and services

Through internet searches and the conducted interviews a set of online platforms and other services, similar to the presented idea or covering part of its intended functions, were identified. This means that while there are a multitude of other platforms and services working to promote sustainable development and ICSD, the ones deemed relevant here hold similarities to the proposed business idea and work for sustainability in the context of companies. The current service providers adhering to these criteria were found to be dispersed over two categories:

- Online platforms focused on sustainability
- Business networks

Each of the categories will be described in terms of the individual initiatives they concern and their functions in comparison to the proposed business idea.

6.2 Online platforms facilitating sustainability

This category comprises a set of online platforms which function as an online intermediary for activities pertaining to sustainability in a business context.

6.2.1 GoGreen Danmark

Gogreen Danmark is a movement and network consisting of more than 170 members in the form of companies, NGOs, municipalities, and other organisations (GoGreen Danmark Last visited: June 2020). The reason for it being included in this category, despite much of their activity taking place in the offline world, is the online platform (website and app) that is focused on linking consumers to companies that provide alternative sustainable products and services. Through the website it is clear that its purpose is focused on private consumers rather than companies, which can also be seen as the products and services offered refer more to consumer goods and services. As such it creates an overview, but has an inherently different focus than the business idea at hand as they target private consumers rather than companies. GoGreen Danmark is built around three core activities:

- Supporting companies that have sustainability integrated into their business model or aim to do so in the future.
- Information and experience sharing about all the advantages that come with sustainability.
- Mapping of sustainable companies in Denmark, so sustainable alternatives are easy to locate.

The last point is done through the website and app, which provide its users with an overview of different industries and the opportunity for them to explore the sustainable companies that are members of GoGreen Danmark. The sustainable companies in each industry must abide certain criteria in order to be featured on the website. The main criterion is that 70 percent of the company's core business must entail a focus on sustainability. This is defined through four main areas covering sustainability in a broad sense (GoGreen Danmark Last visited: June 2020). Licensing of companies in relation to these demands is done through external 3rd party licensing or a mutual trust relationship allowing some members to self-monitor. The member companies are subject to a check on their performance in relation the criteria once a year. All companies working with relation to sustainability are welcome as members in the network, but will not be featured on the website unless they abide the aforementioned criteria (ibid).

The first and second core activities of GoGreen Danmark are also partly done through the website by providing an extra outlet and advertisement platform for the member organisations. Additionally, the webpage contains a blog addressing different difficulties a sustainability minded consumer may face and how to tackle them. The rest of GoGreen's work is related to supporting companies in becoming sustainable. Sharing of information takes place through eight annual physical network meetings. These meetings allow for sparing and sharing of experiences and information across organisations and industries, which in turn can, sometimes, lead to collaborations. However, GoGreen does currently not work with individual companies, nor do they take the role of active facilitator of inter-organisational collaborations for sustainability (interview 14). This is where one of the differences to the proposed online platform materialises.

Collaborations seem to arise as a side effect to the activities in the GoGreen network, and are not directly facilitated by GoGreen; by contrast, the PBI has as its core intention to facilitate inter-organisational collaboration as well as to work with individual companies to alleviate their process of implementing sustainable practices. Additionally, it entails that this takes place via an online platform rather than traditional network meetings. GoGreen however does, to an extent, cover the other function of the platform: to provide an overview of companies providing sustainable products and services. However, this overlap is limited, since this overview is intended for consumers and not for businesses, which is the case for the PBI. Simultaneously, the overview is dictated by the inclusion criteria.

The GoGreen Danmark network has a closed Facebook group for its members, which provides an online channel for the purpose of exchanging knowledge and experiences (GoGreen Danmark Last visited: June 2020). This may provide a space for the creation of ICSD. However, a Facebook group seems arguably too simple and unequipped in nature to singularly address the needs and challenges related to inter-organisational collaboration. Furthermore, this is an external platform employed by the GoGreen network and therefore is not considered part of their online platform directly, showing yet another difference in relation to the PBI. It further remains uncertain whether the activities in the Facebook group are targeted at facilitating collaboration or other purposes, thereby rendering inter-organisational collaboration a byproduct of the group just as in the physical network meetings.

6.2.2 Grønt Overblik

Grønt Overblik is an online portal that performs a search engine function, while also allowing users to post information on the site through something called 'the green bulletin board'. It is run by the Danish organisation Netværk for økologisk folkeoplyning og praksis, in short Øko-net. Øko-net runs Grønt Overblik as a part of its public service function which has the vision of having all resources related to environment and ecology in one place (Grønt Overblik Last visited: June 2020). This is done in pursuit of two core goals:

- Create a better commercial foundation for developing, producing and selling environmentally friendly and organic products in Denmark.
- Make it significantly easier for the citizens to get an overview of, and access to information about organic and environmentally friendly solutions.

Grønt Overblik is one of the tools Økonet employs to achieve these goals (Grønt Overblik Last visited: June 2020). Even though Grønt Overblik functions as a "green" search engine creating an overview of green initiatives, events and information, it has an inherent difference to the proposed idea in its establishment as a public service tool running on donations (interview 8). Even though one of its purposes is to create a better commercial foundation for environmentally friendly products, this is to be facilitated through information sharing and spontaneous debates taking place on the green bulletin board (ibid). This raises the question of the extent to which Grønt Overblik has actually achieved its first goal, because it does not actively take part in the formation of partnerships of projects. Contrarily, the PBI has a commercial focus while working to actively facilitate collaboration for sustainable development. Moreover, the overview created by Grønt Overblik is mainly focused on events, NGO's, and public service organisations, while very few companies are visible on the platform and mostly in the form of private organic

agricultural businesses (ibid). As such, it can be argued that this overview, however important to the citizens, appears insufficient in a business related context focused on creating ICSD.

This is further underlined by Grønt Overblik being intended as a platform for the individual users to search for information to improve their business. This means that members work as individuals on the platform, and networking takes place in Øko-net's meetings and conferences.

The selection of companies and organisations visible on Grønt Overblik is hand picked by the administrator of the site based on common sense about companies' practices and how they fit with the values prescribed by Øko-net (ibid). They do not sign up as members, but are included into the platform by the admins if deemed appropriate, without being informed.

6.2.3 CSR.dk

CSR.dk is an online platform offered by Horisont Gruppen A/S. It is an online forum for sustainable business and is the only business media and community for business driven Corporate Social Responsibility (CSR) (CSR.dk Last visited: June 2020). Members can actively contribute with experiences and information. It gives members access to articles, analyses and company stories related to different topics, while simultaneously allowing them to actively comment and input their own posts. All of this functions from a personal profile, which also gives the opportunity to expand personal networks and gain an overview over the members (CSR.dk Last visited: June 2020). CSR.dk is not part of the interviewed stakeholders, and since a memberships entails payment, insight into the interaction of members was limited. However, its main focus seems to be on the individual user and on dissemination of information and experiences from and between users. As such, CSR.dk focuses on the development of sustainability of individuals or individual organisations in the context of CSR.

In terms of novelty of the PBI, it seems that the key feature of facilitation of collaboration amongst its users is not covered by CSR.dk. CSR.dk gives the opportunity to expand networks through one's own initiative, but does not actively facilitate or encourage it, which is central to the PBI. Furthermore, it seems appropriate to distinguish between the term 'sustainable business' coined by CSR.dk and the term 'sustainable development' employed in this report. Sustainable business is being used in the context of business driven CSR, and arguably renders a more narrow understanding of sustainability as a concept. For the PBI, the goal is to have businesses engage and integrate sustainability into their core business models and collaborate in ecosystems. By contrast, CSR.dk provides a more limited understanding of sustainable business, because CSR is often done as an add-on to business as usual. Therefore, it can be argued that the business idea can be clearly differentiated from CSR.dk and retains novelty in terms of the service it is intended to provide.

6.3 Business networks

Since ICSD is dependent on the creation and maintenance of network relations. Business networks were identified as main facilitators of such a process. Therefore, four different business networks were approached for interviews to gain insight into their activities and their experiences

in connecting organisations and working with sustainability. The interviews also provided insight into their challenges and needs, and how the proposed business idea could function in relation to this. The respective networks will be presented and their characteristics highlighted.

6.3.1 ErhvervsNetværk 9220

ErhversNetwærk 9220 is a business network based in the Eastern part of Aalborg, more specifically the area covered by the postal code 9220. Its goal is to gather all organisations within the area to create an attractive business environment, trade, and collaboration amongst its members. Its members include private companies, public organisations and Aalborg university. Its facilitation of networks and collaboration amongst its members takes place through different events: network meetings, social events, some are organised as "meeting for the sake of meeting" (ErhvervsNetværk 9220 Last visited: June 2020). This is one of the key features defining EhversNetværk 9220, they are closely connected through their geographic proximity, which resembles a neighbourship (interview 21). This means that they are bound by more than just a business tie, and the network focuses on familiarising members across the area. This gives them specific strength in member attendance, and according to ErhversNetwærk 9220, members are more willing to attend when invited to meetings to maintain the 'good neighbourship'.

However, it appears that Erhvervsnetværk 9220's active participation in starting collaborations and connecting members is restricted to initiating network meetings and facilitating the sharing of experiences for the benefit of each individual company (interview 21). ErhvervsNetværk 9220 brings a specific focus on sustainability through the formation of internal network groups. These groups are formed by members based on their interests. One such network group, called Energy and Environment, aims to make business development focus more on sustainability. It does this through monthly meetings with its members and creating attention by communicating existing initiatives with relation to sustainability to inspire others and to share experiences (ibid). They are also currently working on establishing a form of industrial symbiosis and building stronger ties to companies focused on recycling industrial waste and construction material. How and to what extent this internal network group facilitates collaboration between members, or if it remains a platform for sharing of individual experiences, remains to be explored, but at the moment it appears to be limited to communication of existing initiatives and attempts at industrial symbiosis.

6.3.2 Gate21

Gate21 is a non-profit partnership organisation in greater Copenhagen that unifies companies, municipalities, regions, and knowledge-institutions with ambitions towards the *green transition* - A Danish term covering actions to reduce greenhouse gas emissions and mitigate climate change (Gate21 Last visited: June 2020). Thus, an integral part of this network's existence is rooted in environmental sustainability, with a special focus on energy consumption. While Gate21 also supports network formation and helps their members embrace the green transition through traditional network meetings, hosting of workshops, seminars, and conferences, its primary activities take on a different form. Gate21 functions as a project based network,

meaning that its members are connected and collaborate through specific projects started by Gate21. These often take point of departure in goals set in legislation or by regions and municipalities (ibid). The projects are aimed at developing and testing new solutions with roots in the triple helix approach, combining private and public organisations and knowledge institutions to develop the best possible solutions (ibid). Many of Gate21 projects seem to have a system perspective in the sense that they unite the goals of the public sector with private companies, and focus on broad topics such as mobility, smart cities, energy system transition and circular economy, which in comparison to EhversNetværk 9220, IDA's network groups and GoGreen Danmark focus more on the individual companies' benefits from partaking in a network. That being said, Gate21 also has activities that focus on the implementation of sustainable practices in individual companies, which is the context for the interview conducted with Gate21 in this project. The project Gate21 was working on, implementing sustainability into companies, was called Bæredygtig Bundlinje 2.0. It entailed changing the business models of companies to integrate sustainability, and provided this project with valuable insight into the process and challenges in business model changes and general changes for sustainable practices in companies.

Since Gate 21 is focused mainly on the greater Copenhagen area, it also has geographic proximity as one of the common denominators for its members. However, the interviewee did not give the same impression that the geographic proximity has resulted in a close neighborship that defines the workings of EhvervsNetværk 9220 (interviewee 17).

6.3.3 Netværk for Bæredygtig Erhvervsudvikling NordDanmark

Netværk for Bæredygtig Erhvervsudvikling (NBE) is a network organisation based in Northern Jutland with a mission to bring Northern Jutland to the forefront of the green transition. As such, environmental sustainability is a core value for the network and its activities, and geographic proximity, like with the previous networks, partly defines the extent of its activities. NBE connects public institutions with private organisations and knowledge institutions. It offers its members four yearly network meetings that are each centered around a specific topic relevant to sustainable business development (Netværk for Bæredygtig Erhvervsudvikling NordDanmark Last visited: June 2020). These meetings can be traditional network meetings, but also take the form of workshops and debates amongst others. New ventures and collaborations are created between NBE members, therefore the schedule of the meetings ensures that there is time for networking, relation building and maintenance (Netværk for Bæredygtig Erhvervsudvikling NordDanmark Last visited: June 2020).

Besides these activities that serve as source of information and inspiration for the individual members, NBE also actively engages, or offers to, in the sustainable development of each member. This is done in the form of environmental screenings and the subsequent development of a so called 'plan for sustainable business development' that is intended as a strategic tool for the company at hand. This makes NBE special in the sense that it offers the traditional activities of a business network, but centered around sustainability, while also working actively with each individual member to facilitate their journey to more sustainable practices (Netværk for Bæredygtig Erhvervsudvikling NordDanmark Last visited: June 2020). In addition to these activities, NBE also has activities directed at sustainable business development in a systems

perspective, which focus on inter-organisational collaboration. These are called 'external projects' and work mainly with the principals of circular economy, and how municipalities and companies can collaborate for a more circular Northern Jutland. This in turn means that NBE harbours both the traditional and project based activities for their members, while also providing a consultancy service with their screenings and action plans.

6.3.4 IDA Network groups

The Danish Engineers Union (IDA) offers a business network service to its members. The network is different to the others mentioned in this section for several reasons. Firstly, it is not a primary activity of IDA to function as a business network. Secondly, the network it facilitates takes the form of smaller network groups focused on specific topics such as for example sustainability. These groups meet five times a year with meetings structured around a specific topic, and these meetings are planned and facilitated by a so called network consultant from IDA. Thirdly, these meetings have the intention of working as spaces for information and experience sharing. Fourthly, the groups are constructed such that each member resides in the same field, position and profession (Ida Ingeniørforeningen i Danmark Last visited: June 2020). This means that IDA's network groups do not focus on facilitating inter-organisation collaboration, but rather sparring that can benefit the individual members and the companies they represent. Simultaneously, the specificity of members and the focus on their compatibility imply that diversity and partnerships are not their focus.

6.3.5 Situating the business idea

After consulting the different networks, it became clear that all of them include a variety of different stakeholder types, ranging from privately owned companies (both small and large enterprises), municipalities and other public institutions, to knowledge institutions.

Despite their similarities, they each harbour some specific characteristics as networks that make them inherently different. The networks are structured on either a project based level or a more traditional form of network activities, and are connected by different denominators: geography, sustainability, or stakeholder type. Another characteristic is whether there is a primary focus on facilitating collaboration between members, or if this is something that arises as side effect to experience sharing and network meetings. In terms of novelty and situating the PBI amongst these networks, the physical nature of the business networks stands out. Non of the networks above facilitate network activities through an online platform, each of them rely on physical network meetings, while some supplement with webinars, and each have a website stating and advertising their purpose and activities. This means that the current means of networking and facilitating inter-organisational collaboration is build around physical meetings to establish and maintain inter-organisational ties. Thus they currently rely on SET.

The reliance on SET through physical meetings to share information and experiences is not only characteristic of the business networks, but also the online platforms described in the previous section. This in turn means that the PBI differentiates itself from these with its virtually embedded nature and focus on directly facilitating ICSD.

In summary, the examination of the different online platforms and business networks has, besides helping to establish novelty, helped elucidate that geographical proximity can play role in connecting organisations and having them engage with one another in the business networks. It has also given insight into the extent to which sustainability is a core value of the network, or whether it centers on other values such as neighbourship. It has shown that collaboration and sharing of information and experiences is done to different extents by the different networks, some of which concentrate on a inter-industry systemic perspective, while others focus more on the gains for the individual company. Finally, it has displayed how members of a network can be mobilised in different manners: through projects or traditional network activities. This is something that becomes a central consideration for the PBI, because a project approach seems to imply more of a systemic potential for innovation, connecting multiple stakeholders simultaneously, while traditional network events seem to bring companies together as individuals for individual gains.

Even though the novelty of the PBI has been solidified, novelty of an idea in itself does not determine whether it is good or holds potential to facilitate ICSD compared to existing services, nor address stakeholders needs and challenges. Moreover, much of what the platform is intended to do is partly done by the existing business networks, however geographically limited. Therefore, the next section will examine if and how the business idea holds potential to facilitate ICSD, additional to that currently conducted by the business networks.

6.4 Potential benefits from virtual embeddedness

From the previous section it can be summarised that business networks currently mostly rely on physical meetings to facilitate socially embedded inter-organisational ties amongst their members. This is also true for the described online platforms, except in the case of information sharing and creating overviews of green initiatives for their users, which is done virtually. Both Gate21 and NBE appear to be successful in their work for sustainability in the business world, both with individual companies and in a system perspective (interview 11, 17, 24). This brings into question if the PBI is needed, and what potential it holds for additional value creation. When defining additional value, this is not merely related to revenue creation, but is to be understood as potential to improve or expedite the current process of implementing sustainable practices in companies and facilitate inter-organisational collaboration that supports said purpose.

In order to elucidate this potential, the framework of virtual embeddedness is applied (see section 5.2). This framework describes how virtually embedded inter-organisational ties, under certain industrial circumstances, hold advantages over arm's-length ties and socially embedded ties.

Within the confines of this project it is argued that sustainability is, and will increasingly continue to be, a paradigm that encompasses and affects not only one or few particular industries, but all industries. This is supported by several of the interviewees (see for example interviews 8, 9, 11, and 12) in this project saying that sustainability is becoming an increasing measure of competitiveness across industries . Each of them observe this in their respective companies, and concepts like the UN sustainable development goals are increasingly being adapted by

companies. Interviewees from both business networks and organisations such as Rådet for Grøn Omstilling (RGO) have also elaborated that mindsets of companies have and are changing over the last few years (interview 11, 12, and 19). In turn, this means that sustainability is affecting the operating conditions across industries. With sustainability solidified as a cross industry paradigm, the framework of VE will now be applied to examine where the online platform aimed at creating ICSD through VET could hold potential compared to the current physical nature of business networks relying on SET. This is done by examining how sustainability can affect general industrial circumstances, and how this materialises as advantages or disadvantages of the different types of inter-organisational ties.

The industrial circumstances under which VET holds potential are related to the severity of the exchange conditions:

- Uncertainty
- Complexity
- Risk of opportunism

In addition to this, the potentials of VET are also determined by levels of industry dynamism, which includes:

- Institutional change
- Organisational turnover
- Technological and environmental change

Starting with the exchange conditions, more specifically uncertainty, a majority of the interviewed companies have stated that they would like to improve their practices in terms of sustainability, but simultaneously expressed a concern on how to operationalise said practices and an underlying concern about the cost of said practices, as investment is these initiatives do not necessarily provide direct additional revenue or cost saving (see for example interviews 6, 9, 12, 13, 16, 18, and 23). This constitutes two types of uncertainty tied to more sustainable practices: financial issues, and how things will work on paper versus in reality. This is further coupled with challenges related to lacking information and expertise, finding the right partners, and lack of resources to do so, mentioned by different organisations and industries (see section 6.5). All of these add to the uncertainty tied to engaging and investing in sustainable development. Considering the many different aspects that are at play simultaneously, it seems appropriate to argue that sustainability as an industry paradigm can result in a high degree of uncertainty across industries, rendering embedded ties favorable to arm's length ones.

Regarding complexity, Konietzko et al. (2020) and figure 5.7 illustrate how innovation for sustainability ranges from incremental to system and ecosystem innovation. Related to the different innovations are an increasing degree of complexity in their nature, numbers and types of stakeholders involved, technology, institutions, and the imperative need for inter-organisational collaboration. Therefore, the level of complexity depends on the innovation at hand. Incremental changes such as purchasing decisions may not entail a high level of complexity and thus favor an arms-length tie rather than a socially or virtually embedded ones, whereas business model or system innovations would be more complex and favor embedded ties. In this regard, uncertainty can be argued to be affected by complexity; as the complexity of innovation rises, so do the financial and operational uncertainties as expressed by the

interviewees. This means that for innovation types, besides incremental ones, sustainability as an industry paradigm results in a complexity that renders embedded ties advantageous.

Opportunism appears to be prominent in some aspects of sustainability in a business context. This materialises as the interpretation and use of terms such as sustainability, 'environmentally friendly' and the SDGs. For several of the companies contacted in this project, the understanding and application of these terms was found to be narrow and in some cases meant classifying current activities as sustainable or aiding in one or more SDGs. Whether intentional or not, according to interview 7, 8 and 14 the use of the term sustainability can become subject to so called 'green washing', where it is used to highlight certain activities and leave out others and diminish the need to improve, for example only using the term to describe financial sustainability and leave out the social and environmental sustainability. This means that opportunism in this industries materialises as misuse or misunderstanding of what sustainability entails. On the other hand, the interviews have also shown that caution is taken by some interviewees, as it is difficult to determine when something can be categorised as 'sustainable' or 'green'. As such there is both a misuse of sustainability in promoting company activities (Risk of opportunism) and a caution to use these terms, which indicates a knowledge of potential opportunism. Whether opportunism is present to a high degree is difficult to determine, but it is present nonetheless.

Seeing that the high levels of uncertainty and complexity are tied to sustainability as a new industry paradigm with risk of opportunism also uncovered, the exchange conditions favour the use of embedded ties, either socially or virtually, and leave arms-length ties insufficient. While this is general across industries, the need for embedded ties may be increasingly important in industries suffering from high levels of uncertainty, complexity and opportunism for different reasons. This section has shown that the way sustainability affects exchange conditions' complexity, uncertainty, and risk of opportunity, favours embedded ties, however it has yet to be uncovered which type of embedded tie may hold advantages for organisational performance in the light of sustainability. Therefore, the industry dynamism will be examined next.

When examining the industry dynamism, it seems that organisational turnover does not appear to be high in terms of organisations leaving the market due to business failure caused by a lack of sustainability. However, according to interview 2, 7, 9, 12, and 17, sustainability is increasingly seen as an element of competitiveness, which new and small companies seem to adhere more to. Thereby, it can be argued that new ventures are entering the market of sustainable business, indicating a dynamic industry in terms of newcomers to the market and a change in measures of competitiveness that may affect business failure. As mentioned by interviewee 17, companies that do not integrate sustainability will not live long. Ultimately, this means that organisational turnover can be affected by sustainability as a paradigm. Organisational turnover is difficult to classify as high or low, but is likely to increase in the future, as competitiveness becomes increasingly intertwined with sustainability.

The frequency of institutional change is evidently high for several reasons. Firstly, new laws and legislation continuously complicate and change the conditions under which companies operate in terms of sustainability both on a national and a supra-national level, examples of this being the Danish climate goals and climate law and EU directives pertaining to topics such as Eco-design, single use plastics, and waste management. Besides the legislative aspects of institutional change, interviewees from business networks, online platforms, and companies

expressed a change in corporate mindset and an increasing demand on sustainable practices (see interview 2, 7, 9, 12, 14, and 17). The same interviewees also state that they expect this to be an increasing trend. Environmental consultant interviewee 12 also confirmed this in relation to SDGs becoming an increasing part of company culture. In relation to this, demands for environmental or other certification adhering to parts of integrated sustainability are also in increasingly requested by companies. All of this indicates high levels of institutional change that have increased within recent years according to a majority of interviewees, and will continue to do so, as sustainability will only become more important for the competitiveness of businesses. Since this trend seems to be escalating, it is also possible that in the future organisational turnover may increase due to lacking adherence to the demands for sustainability.

Lastly, levels of technological change are arguable high as well. In light of the increasing demands for sustainable performance, products and services, new technologies are constantly being developed in for example reuse and recycling, energy and transport efficiency, and construction. New legalisation on EU level also sets new standards for best available technology, pushing it forward.

In summary, while current levels of organisational turnover are perhaps not definable as high, institutional and technological change are. Combined with potentially high levels of uncertainty, complexity, and to some extent opportunism. In light of this VET seems to hold an advantage on a general level, as opposed to arms-length ties and SET (see figure 5.3). The most important potential advantages of VET on a general level lie in their flexibility and resource efficiency, which is especially desirable under circumstances where the weaknesses of SET become evident (for elaboration see section 5.2.

With regards to the classification of severity of exchange conditions and levels of dynamism as high or low, it is important to note that these are not absolute terms, and the framework does not offer a quantitative scale of measure. Therefore, the degree to which sustainability as a paradigm will result in high levels of both dynamism and exchange conditions is likely to depend on the individual industry and the type of innovations for sustainability taking place. What the preceding section shows is that both dynamism and exchange conditions are and will be, in all likelihood, increasingly affected by the implementation of sustainability into business activities.

What can be cemented, is that institutions and technology related to sustainability are rapidly changing and that innovation for sustainability pertaining to business models and ecosystems will develop to involve higher levels of complexity and uncertainty. Ultimately, this means that the conditions imposed on companies by sustainability will likely take a form that favours VET over SET or arm's-length ties. Thereby, this is giving the overall impression that the integration of sustainability into companies and other organisations could benefit from an online platform that facilitates VET.

Still, both arm's-length ties and socially embedded ties retain importance. This is true especially SET, since they, like VET, offer ways to address the shortcomings of arm's length ties. This is done through imbuing trust, enabling the sharing of otherwise retained information, and the ability to facilitate joint problem solving amongst for example companies and part of their supply chain, whereas VET offer a different set of mechanisms (see figure 5.2) As such, what this section is arguing is not that SET should be replaced by virtual ones, but rather that the

VET seem appropriate under the given circumstances imposed by sustainability across industries. This is especially due to the degree of industry dynamism, which according to Morse et al. (2007) and Fowler et al. (2004) explicates some of the shortcomings tied to SET; their resource intensiveness, high setup and maintenance cost, difficulty of replacing, and overembeddedness. In relation to these, VET offer a set of mechanisms that make them favourable in the presence of inefficiencies of SET. Based on this, the next section will take a more contextualised approach to examine the potentials of VET. This will be done in the context of specific challenges as experienced by different stakeholders in the work with sustainability and current ways of facilitating ICSD.

6.5 Stakeholder perspectives: Needs and challenges

The previous section covered the potential for VET to improve organisational performance when changing for sustainability on a general level. In line with the problem based research, this section will present and examine the needs and challenges experienced by different stakeholders in order to see if and how VET could alleviate said challenges and where other types of ties are needed or inefficient. The challenges and needs are composed of three different areas:

- Challenges experienced by stakeholders regarding companies when working with sustainability.
- Challenges experienced by stakeholders with regards to existing business networks.
- Challenges expressed by stakeholders related to the proposed business idea.

The content of each category will be described and examined through the theoretical framework of VE to elucidate the potential or importance of the different types of ties. Subsequently, different means of providing the appropriate ties will be presented.

6.5.1 Challenges regarding companies working with sustainability

1. Acquiring information and lack of overview

The first challenge indicated in the interviews is related to acquiring the knowledge and expertise needed to design and implement sustainable practices. Both Hustømrerne A/S and Himmerland Boligforening expressed hardship with regards to gaining an overview and understanding of what is out there in terms of sustainable products, services, and potential solutions, and how to take the first step (interviews 13 and 16). RGS Nordic, EhversNetwork 9220, Rådet for grøn omstilling, Colas, and Aalborg municipality confirmed that companies want to change in terms of sustainability, but have difficulties finding the solutions that fit their needs and activities (interviews 15, 21, 7, 9, and 19). Furthermore, there is a perceived lack of resources for this process. Gate21 elaborates that this is especially a challenge for smaller companies since they are already limited in their resources (interview 17).

When relating this to the type of embedded ties that could aid in such a problem, VET seem advantageous to the social ties that the companies currently rely on. This is due to the fact that VET allow for better and quicker access to relevant information, thus mitigating the time and resources needed. At the same time, VET allow for the sharing of widespread private and

public information, whereas SET allow for more fine grained proprietary information Fowler et al. (2004). Therefore, the need to gain an overview, and to identify relevant information and solutions, as well as appropriate partners, arguably adheres more to the information shared through VET. This does not mean that SET cannot provide such a foundation, but socially embedded ties such as those created in business networks demand more resources and continuous face-to-face contact in order to obtain knowledge and experience sharing. The information being shared in terms of seminars is narrowed to a certain subject, and the networking involves a lot of organisation of specific information, as characteristic of SET. An online platform will allow for the inclusion of various topics, targeted experience sharing, and make this available independently from seminars or network meetings.

When synthesising this with the PBI, it means that stakeholders have verified the need for a platform that can create an overview of sustainable solutions, and have stressed the need for a central place for acquiring information related to sustainable solutions, experiences, and taking the first step. Therefore, the platform needs to contain such an element to adhere to the needs and challenges of potential users. This could take the form of simple information sharing, making and sharing of guides to take the first steps, and sharing "good stories" from companies that have already started the journey. It could also take a community based approach allowing for more direct experience exchanging and interactive sharing of information and ideas.

2. Finding the right collaborators and building relations

Several stakeholders mention how difficult it is to find the right collaborators and establish relations (inter-organisational ties) to implement sustainable practices (interviews 2, 7, 9, 15, 17, 19, and 20). This problem is tied to the same lack of resources and the time consuming nature of the process. RT Erhversbyg explains that it is challenging to find partners that have good ideas that are practical and usable. RT Ehvervsbyg and the recycling company RGS Nordic explain that finding, screening, and picking the right partner is a resource intensive process that predominately relies on face-to-face meetings. Danfoss mentions that they cannot afford to form partnerships with unvalidated partners, thus, companies with little reputation are not eligible because it takes time to validate trustworthiness. This indicates that current processes of finding and establishing inter-organisational ties are dependent on SET, where trust is an important element. This applies to both individual companies and business networks. These types of ties are characterised as being more resource intensive than the virtually embedded alternatives (Fowler et al. 2004). RGS Nordic mentioned that the process of finding partners depends not only on their services, but also on their capacity. As an example, they have a project aimed at recycling concrete from demolished constructions. For this project they need partners that can supply a certain amount of this resource in order for it to be a profitable venture. An example of a similar problem from a different perspective is Hustømrerne A/S's collaboration with Råt og Godt, who reuses some of the materials that Hustømrerne removes during renovations. However, Råt og Godt has a capacity limit in terms of how much they can repurpose. As such, Hustømrerne has excess materials that they would like to recycle through collaboration with other businesses, but has not been able to establish such a relation yet. This indicates one of the weaknesses tied to SET and arm's length ties, where reliance on ones' primary network leaves little room for exploring new relations (overembeddedness). It could also reflect that the resource requirements tied to finding and establishing a new tie are overshadowing the gains from said new tie, or that the company simply lacks a method to

locate a potential collaborator.

In addition to this, Hustømrerne A/S showcased another weakness of SET; the difficulties of replacing them. The company was collaborating with a company based in Århus, which they supplied with windows and doors to be refurbished and resold. However this business was acquired by a larger enterprise, which terminated this service. Since the termination, Hustømrerne A/S has not been able to find a replacement, and their initiative of recycling windows has ended (interview 18).

In summary, this challenge calls for a platform where companies working for sustainability can be found by companies wanting to improve their practices. This could be facilitated through a business network and SET, but their resource intensity, risk of overembeddedness, and reliance on stable networks render virtually embedded ones preferable. Moreover, network meetings would only be able to facilitate this a few times a year, and in certain locations requiring geographic flexibility and the ability to wait for the next meeting. An online platform, on the other hand, is accessible from any place with an internet connection, at any time, and can therefore provide its services independently from space and time.

An overview function such as the one discussed above would be beneficial, however, to make the process of finding collaborators even more simple and efficient, a matchmaking service could be introduced as a function. This would bypass the need for the user to navigate the website and manually find potential partners.

3. Cost of becoming sustainable - implementing solutions

Besides the challenge of finding information on and solutions for sustainable practices, some of the interviewed companies refer specifically to the cost of implementing sustainable practices (interviews 23, 6, and 18). Interviewee 12, who works with with environmental and quality certification for companies, also expresses that the financial side of implementing sustainable practices remains a challenge. Interviewee 5, 17, and 7 state that this is specifically challenging for new and smaller companies that generally have access to fewer resources.

This challenge is arguably difficult to solve just through the creation of either socially or virtually embedded ties. However, several interviewees have mentioned that the sharing of 'good stories', examples of successfully implemented solutions from other companies, can help in diminishing the perceived cost and difficulties related to such processes, at least in the initial part of acquiring information and finding partners (see for example interview 19 and 21). Therefore, the potential to share information and experiences through VET could arguably resolve some of the financial concerns. However, it seems difficult for the both virtually and socially embedded ties to solely resolve the financial aspects of implementing sustainable practices in companies.

For the larger enterprises, interviewee 2 also mentions that implementing sustainability is an economic challenge, and there is need for large investments to instigate the sustainable solutions and these investments need to pay themselves of. Even though financial aspects are expressed as a central challenge by some of the interviewees, it could be argued that solving the other challenges may alleviate some of the financial concerns tied to implementing sustainability. Furthermore, interviewee 12 states that investing in more sustainable practices such as energy efficiency creates opportunities for cost savings and good business cases. The same is the case for RGS Nordic and Stena Recycling, who have collaborated with their customers on recycling,

resulting in good business cases (see interviews 15 and 10). Therefore, even though sustainable practices may be hindered by the cost of implementing them, they also provide opportunities for additional value creation and cost savings.

4. Maturity of the company and changing habits

Several interviewees have referred to an additional challenge when operationalising more sustainable practices: changing habits.

Interviewee 19 mentions that one of the central challenges in facilitating sustainable development is convincing companies to do something different. According to interviewee 12, this is related to the maturity of the company. This maturity materialises as the mindset of the company with regards to sustainability. If the degree of maturity is high, the employees of the company are willing to delve into and work with the topic, and positive results are likely to be achieved. Conversely, if the maturity is low, the successful implementation of sustainable processes is unlikely. The two interviewees from interview 24 further support this point by stating that many companies think they do not have the capacity to even think about sustainability, and interviewee 22 elaborates that sometimes companies have a hard time seeing what value comes out of becoming more sustainable.

As practical example, Dansk Køl og Klima have worked with a different solutions to reduce CO2 emissions, but found it challenging as it meant changing the habits of their employees, who had been carrying out the same routines for a long time (see interview 6). This is also experienced by the interviewees from interview 24, who explained that some companies continuously need the involvement of NBE as facilitators to ensure operationalisation of more sustainable practices (interview 24). In relation to this, it could be argued that perceived financial barriers previously discussed may be impacted by a company's maturity.

Interviewee 12 further elaborates that a lower maturity of companies can render the need for assistance, as they often lack the expertise to know precisely where to begin the process becoming more sustainable sustainable. Often, low-hanging fruits can be a convenient place to start, but this lack of expertise means they are often overlooked. Providing assistance is therefore a matter of changing company habits and demonstrating the manageability of sustainable changes (interview 12). Additionally, the interviewee points out that funding for sustainable projects remains an important motivation for many companies to engage in different initiatives for sustainability.

Colas highlights an additional aspect regarding company maturity and the process of changing habits of employees (interview 9). The interviewee pointed out that having an employee responsible for sustainability efforts, who actively seeks to improve the company and effectively communicates this with and to other employees has made a significant change in company mindset and motivation to engage with sustainability initiatives. This indicates that having 'the right people' in an organisation makes a noticeable difference in a company's maturity.

This challenge could be addressed by providing access to information and experiences, showing the good business cases and potential pathways. This is currently offered by business networks, but with reference to the accessibility and resource effectiveness, an online platform could provide a valuable medium for this purpose. However, this challenge also elucidates how something seemingly functional on paper may prove difficult in reality, and less mature companies seem to

need a guiding hand. As described by NBE, who currently offer access to experience sharing, seminars, and workshops, there is a need for a facilitator (interview 24). Therefore, the same standpoint is taken with regards to the online platform; in order to maximise its potential for ICSD, it should offer elements of individualised guidance and be involved in the processes undertaken by its users.

5. Supply chain perspective and legislation

Several interviewees have mentioned that their supply chains or industry circumstances are challenging. Interviewee 15 states that they find it it difficult to establish contacts throughout all parts of the value chain, making ICSD challenging. For example, Dansk Køl og Klima mentioned that the products they offer are the "green" part of their business, and there was nothing they could do to improve on this parameter, as they are just purchased from the manufacturer (interview 6). Similarly, Hustømrerne and RT Erhversbyg both expressed an interest in using more sustainable construction materials and principals, as well as improving recycling, but claimed the potential for doing so was solely dependent on developer and customer demands. They further elaborate that acquiring contracts primarily relies on providing the cheapest solution, which would be complicated by the additional cost that comes with more sustainable construction types and materials (interview 18 and 23). Along the same lines, interviewee 9 points to the challenge that since their company only focuses on asphalt, it is difficult to start a project for sustainability that is more comprehensive, as this would include many actors across the value chain. This is further complicated by the fact that there are strict laws regarding the materials they use, which also need to be satisfied.

In contrast to that, both Hustømrerne and RT Ehvervbyg express the need for legalisation to impose more demands on the construction industry and developers in terms of sustainability, as nothing in legislation seems to push the industry forwards in this regard (interviews 18 and 23). This results in a feeling of powerlessness in parts of the construction industry, but arguably also an abnegation of responsibility towards improving their industry and supply chain, claiming that changes have to happen elsewhere in the supply chain. This is also expressed by NBE, as they witness this abnegation of responsibility and initiatives especially in the construction industry and other industries (interview 24).

Another aspect that becomes evident from this supply chain challenge is also the complexity that comes with imposing the implementation of seemingly simple sustainable practices from the outside. EhversNetwærk 9220 expresses the complexity related to sustainable practices and the supply chain perspective (interview 21). In Aalborg harbour, a collection of different production and manufacturing companies explored the potentials for industrial symbioses amongst them. The concept of using excess material or waste products from one production as input in another seemed fairly straightforward, however, reality showed that many specifications of both production and materials made it rather difficult (interview 21).

When relating this to the business idea, it creates the notion to expand the community element to encompass an industry and supply chain perspective. By doing this, companies could be familiarised with companies in their own industry and find other companies able to circumvent the constrains that the current supply chain poses. Again, it is possible to facilitate this through SET, but the expenses to build such relations would be much higher than through an online platform. Also, for a physical business network to offer such functions, their member base

would have to be very large, and since relations are built and maintained through network meetings only, it seems that this process would become increasingly difficult. Contrary to that, an online platform could easily contain a large number of members, and allow for a more targeted approach to collaboration that does not rely on network meetings.

When considering the aforementioned constrains of the supply chains, it seems that the inter-organisational ties in supply chains take on the form of arm's length ties or to a certain extent SET. This in turn means that little collaboration is likely to take place, and if so, it will entail joint problem solving, which is inherent to SET. As evident from the example with Ehvervsnetværk 9220, joint problem solving requires a lot of resources and can be quite complex. On a more general level, if the PBI was to include a community function, this would open up the possibility of community based problem solving. Here supply chains are circumvented by giving access to an online community that can help to address certain needs and challenges. Current constraints are thus alleviated by sharing experiences, giving advice or providing contact to new supply chain links.

Summary

A need for information sharing, creating an overview, and access to sustainable solutions and partners have been identified as needs of different stakeholders. Other challenges have also been identified, such as financial cost and maturity. Supply chains have been identified as complex, challenging, and constraining to companies with intentions of improving on sustainability. Current business networks offer some of the services to alleviate the identified needs and challenges through SET, but in light of resource availability being a problem described by stakeholders, VET seem to have untapped potential to make these services easily accessible in comparison to physical business networks. When considering the stakeholders' challenges and needs and how these can be addressed by an online platform, this materialises as functions such as simple and non-interactive information and experience sharing, and a community function allowing for more interactive sharing of information, experiences, advice, and the possibility to easily establish new inter-organisational ties. In addition to this, the challenges of finding the right partners may be more directly addresses by a matchmaking function. Finally, it has been found that in order to ensure the full potential of the platform, active engagement with members and their journey as a guiding hand would be beneficial, adding a advisory function to the platform. The findings of this sections can be seen in summary in figure 6.1 below.

Challenge	Mitigation through VET	Proposed Solution
Acquiring information and lack of overview	Easier and quicker access to information	Information and knowledge sharing Provide information and good stories
	Centralised collection of information to provide an overview	Provide space for experience exchange
Finding the right collaborators and building relations	Easier access to new relations / replacements for lost relations	Provide a matchmaking service that aids in finding potential partners
	Less resource intensive	Open call function to address less narrow needs for collaboration
Cost of becoming sustainable - implementing solutions	Inspire cost effective solutions / value creation	Provide time and resource efficient access to solutions
	Encourage willingness to invest	
Maturity of the company - changing habits	Make inspiration and good examples accessible	Provide information, inspiration and good examples, in a cost effective manner.
Supply chain perspective and legislation	Allow for a bigger member base to enhance communication throughout the whole supply chain Allow for communication across supply chains and locate potential replacements to currently constraining parts of supply chains	Provide access to a network that spans through different stages of supply chains and enable communication

Figure 6.1: Summary of challenges related to companies becoming more sustainable

This section has covered how the VET, mediated through an online platform, could aid in solving challenges and needs related to companies' experiences working with sustainability. The next section will uncover some of the inherent challenges with existing business networks and how VET may provide solutions and thus additional value onto existing services.

6.5.2 Challenges with existing business networks

Through the interviews, a set of challenges related to the existing business networks has been identified.

1. Resource intensity

Both Danfoss and Himmerland Boligforening have expressed that attending the different networks' activities such as meetings and workshops requires time and resources, especially when being part of multiple networks (interviews 2 and 16). RT Ehvervsbyg is a members of NBE, but has refrained from being active as they claim to lack the time and resources (interview 23). This is also a personal experience of interviewee 12, who has had to skip meetings because other things are of priority.

Similarly, interviewee 16 adds that their participation in business networks has been limited, as meetings are held less frequently than they would need them. In addition to this, the content of these meetings is only partly relevant to them, which means that ultimately they feel that the resource investment is too high in comparison to what they gain from participating.

Gate 21 furthers this by mentioning that getting members to attend their meetings is hard, as they have to prioritise their time. Adding to this, setting up the physical meetings take up a lot of resources (interview 17). GoGreen has also said that organising their meetings and other activities has led to them lacking resources to help individual companies with implementing sustainability (interview 14). The Ida network groups find it difficult to find topics for their meetings that are of interest to everyone, which has resulted in a challenge to get members to attend their activities (interviews 3 and 4).

When relating this to the online platform, it seems that it could alleviate the resource and time demanding nature of attending network meetings. Instead, access to experience sharing, information, and opportunities to establish new relations would be available at the convenience of the users while requiring few resources. This also relates to the point mentioned about infrequent meetings, and their relevance for each participant. Again, an online platform could make provide the same information and opportunities to establish contacts, and ensure that it is used when relevant and convenient. For the business networks this may also provide advantages. Becoming a more virtually embedded network could mean less resources spent, and sometimes wasted, if the content of a meeting is not interesting enough to encourage participation, and allows for allocation of said resources to other purposes.

2. Attaining and maintaining members

The IDA network groups explain difficulties in finding new members, especially amongst young people, and as mentioned above it has been hard to keep them interested in the network (interview 3). This may also be due to the fact that IDA's networking groups are aimed at individuals and not organisations, and more focused on development of the individuals competences; organisational benefits are more of a side effect to these efforts. GoGreen Danmark also experiences difficulties with getting members to stay in their network and maintain interest (interview 14).

This is closely related to the challenge of resource intensity, as members will not continue to

be part of a network if the resource intensity is too high. An online platform could also help in addressing this challenge. Business networks and their SET require continuous involvement, whereas VET allow for a more ad hoc participation and be utilised when needed. As such, creating and maintaining interest and participation can become a lesser challenge by relying on VET through an online platform.

It has to be mentioned that an online platform will of course also require participation from members, and its content and services need to adhere to their needs and aid in solving them. Otherwise, same challenges are bound to materialise. In the same way, networking and engaging relation building through virtual means demand time and resources. However it is the expedience, availability, and the comparatively less time and resource demanding nature that make VET favorable to socially embedded ones and physical business networks.

3. Difficulties of networking

Interviewee 12 adds to this point, stating that building strong and lasting relations in a network is time demanding, and that networking and promoting the own company is a skill which takes time to develop. This was experienced by the authors themselves when attending a networking and breakfast event held by EhvervsNetværk 9220 (see section 4.2.6). The purpose of this was to gain some first hand experiences with actively using a meeting to network with potential partners, and to find companies interested in partaking in interviews and the prospect of becoming case companies for the development of the online platform. As such, the platform was presented as a startup idea tested through a master thesis. When partaking in the meeting, the time and effort needed to establish contacts and create interest for the business idea quickly became evident. Much time was spent talking to only a few of the participants, which resulted in even fewer established interviews and prospected case companies.

Another matter that became increasingly explicit was the social nature of the networking activities, conversations often covered many subjects unrelated to the intended business relation, before it seemed appropriate or even possible to engage with the topic for which the conversation was started. This also meant that a lot of time was spent before it was possible to gauge weather a person was of interest to this project and whether the interest was mutual regarding the start-up and project. Ultimately, there may have been many participants more fitting for the purpose of this project, but the temporal limit of the network meeting and the time spent on unfruitful conversations meant they were left undiscovered.

An online platform that creates the opportunity for users to quickly and efficiently establish an overview of potential collaborators, or a match making function that would be able to bypass the challenges related to a lacking overview would arguably make the networking process easier and more target oriented, thus saving resources and time.

4. Lack of collaboration

Even though some of the networks examined in section 6.1 actively facilitate ICSD, for other networks it arose as a secondary effect of other activities. According to interviewee 19, many existing networks that aim at collaboration and sharing of experiences in reality often become a space for members to promote themselves.

VET and the PBI does not seem to represent an immediate solution to this, but this challenge

becomes an important aspect to consider in order to ensure that the online platform does not become a victim of the same problem.

Summary

The challenges and shortcomings of business networks and SET seem to be eligible for mitigation trough VET. The SET in business networks have characteristics such as resource intensiveness, need for geographic and temporal flexibility, and lacking relevance, which is in turn mitigated by the expedience, availability, convenience, ad hoc aspects, and less resource demanding nature of the VET. The identified challenges and their potential solutions provided by VET and the online platform is summarised in figure 6.2.

Challenge	Mitigation through VET	Proposed Solution
Resource intensity	Independence of physical meetings	Online community to allow for less resource demanding process of networking
Attaining and maintaining members	Allows for ad hoc participation	Providing online community that is less
Difficulties of networking	More target oriented matchmaking The skills needed to network online are heavily reduced by matchmaking,, open call and participation in online communities	community, matchmaking and open call
Lack of collaboration	n/a	n/a

Figure 6.2: Summary of challenges related to using and operating networks

6.5.3 Challenges related to the proposed business idea

The sections above have showed untapped potential for VET to address some of the challenges experienced by the different stakeholders in relations to sustainability and current means of establishing inter-organisational ties. However, despite its appropriateness, virtual embeddedness and the online platform carry some inherent issues, according to the different stakeholders.

1. Certification

The intended function of creating an overview of existing sustainable services, products, and companies entails a challenge of certification. Several interviewees have stressed this: GoGreen Danmark and Grønt Overblik have mentioned the need to define what can be considered "green" or "sustainable," and that in the face of lacking certification the platform may lead to cases of green washing and loss of trustworthiness (interviews 14 and 8). GoGreen Danmark further stresses that certification must entail a screening process and auditing to ensure compliance

with the certification criteria. GoGreen Danmark does this by using a third party auditor and a set of conditions, whereas Grønt Overblik has employed a different approach: relying on common sense and personally examining and approving organisations to be visible on their website. GoGreen Danmark's approach seems more systematic and validated, whereas Grønt Overblik seems more personalised and sporadic. The risks entailed with either approach are on the one hand to end with a stringent and expensive process, and on the other hand one that seems to hold little validity. Simultaneously, both exclude companies that wish to become greener, but do not qualify as sustainable yet, which is essentially the process that the platform is intended to aid in. NBE references this as one of the reasons they do not work with certification; many organisations would not qualify, and their potential for sustainability will not be developed (interview 24). As an example, Aalborg Portland is mentioned. The company cannot be classified as sustainable, but they wish to improve, and the size of the company means potential improvements will be considerable.

Aalborg municipality adds to the concern on potential green washing, and elaborates that a company's sustainability profile may not be easily determined, since they could offer both conventional products and more sustainable ones (interview 19). NBE also expresses the difficulties of evaluating members in terms of sustainability, and that it would be a resource demanding task, where setting parameter across industries would prove to be very difficult (interview 24).

Instead of offering an overview of sustainable products, services, and companies, it seems favorable to instead create an overview of companies that are working with or wish to work with sustainability. Thus, no company will be left out. It can also be argued that perhaps a company does not have to establish a collaboration with a sustainable one to become more sustainable, instead collaborations between "unsustainable companies" with the right mindset (maturity) may also hold potential. This is also more in line with the ecosystem perspective and inter-organisational collaboration, because in this scenario, both parts will need to evolve and work towards collaborative innovation. There is of course still the challenge of defining when a company can be identified as actually "working with sustainability", but as low hanging fruits are often needed to take the first step to realise larger potential, it seems appropriate to keep definitions vague and refrain from certification. To circumvent certification, but still provide indications for the sustainability efforts of a company a set of indicators for different aspects of sustainability could be applied.

2. Trust and the importance of physical meetings

Despite the shortcomings of existing business networks described above and the inherent weaknesses tied to the SET they rely on, several interviewees have underlined that physical meetings and SET are nevertheless important, especially when establishing trust amongst partners.

For example, RT Erhvervsbyg expressed that they almost solely rely on the personal network built by their owner, which gives a high degree of trustworthiness for both customers and partners along the supply chain (interview 23). Their customers keep returning, and they believe that physical meetings are a big part of that. RT Erhvervsbyg believes that this kind of trust would be difficult to build online. RGS Nordic adds to this point in the context of building new partnerships: trust is a very important aspect of collaboration, and physical meetings

currently play a large part in establishing it and will likely continue to do so (interview 15). They also add that they use customer references to look at previous projects and collaborations.

Combine A/S assumes it to be difficult to maintain inter-organisational relations without physical meetings (interview 20). Interviewee 19 states that companies gain a lot from talking to each other in physical meetings, and that it will not necessarily be possible to obtain the same benefits through an online platform.

According to NBE, meeting in person is very important, and their members are asking for it; it gives the opportunity to maintain relations (interview 11). It is also mentioned that physical meetings are an important tool to maintain relations with the companies they are working with. They elaborate that being present and showing your face is very important in the context of development projects, and under any circumstances, inter-organisational partnerships will require a physical meeting at some point.

GoGreen Danmark attributes much of the organisation's success to physical network meetings. Especially the informal, more social meetings are beneficial for knowledge sharing (interview 14). Similarily, EhvervsNetværk 9220 experiences the culture of meeting physically as the main reason for member participation; the base of wanting to help each other and work with each other is sympathy, and that can only be achieved by meeting in person (interview 21). They further elaborate that meeting through digital media may work if it builds on previous physical meetings. Interviewee 16 underlines that conferences and physical network meetings are one of their major sources of new knowledge.

Overall, this challenge has elucidated that physical meetings aid in the process of trust building amongst companies, as well as between members of business networks. Additionally, physical meeting remain important to establish and maintain relations. It seems that business networks are one of the only places where such activities take place at the moment. However, it can be questioned whether their importance lies in their inherent potential for establishing and maintaining relations through physical meetings, or whether they remain important since they are currently the only way of establishing inter-organisational relations. Subsequently, this brings into question whether the perceived challenges of moving these activities to an online platform rest on the indispensable capabilities of physically and socially embedded ties or whether it stems from an inability to imagine them replaced or supplemented by virtual ones. Regardless of the roots of this challenge, the capabilities of physical meetings and SET remain vital and should evidently not be seen as something that is to be completely replaced by virtually embedded ones. As interviewee 11 mentions, inter-organisational collaboration will demand physical meetings at some point, and arguably more so when the inter-organisational innovation for sustainability moves from incremental towards a business model or systemic nature (interview 24). SET establish trust to overcome the exchange conditions. However, since sustainability holds potential to induce high levels of industry dynamism, the social ties have inefficiencies in their resource intensity and maintenance cost, and are difficult to replace.

One of the mechanisms that VET offers to mitigate exchange conditions as an alternative to trust is transparency. Online environments such as communities can quickly report discrepancies, trust issues, unfairness, and similar issues, as well as positive attributes. As such, they offer a channel to quickly gain or lose a reputation as trustworthy. Examples could be platforms such as yelp, trust pilot, or internet based fora like those in online communities for online

gaming. In a networking perspective, this could be used to quickly gauge whether a potential collaborator is worth pursing. Another way of using transparency to imbue trust is through rating and review systems, like those used by online vendor platforms such as Ebay and Airbnb, which allow users to rate and review their experiences with certain organisations and individuals. Thereby, aspects of trustworthiness can be established without physical meetings.

In physical networks, this type of information will usually be locked in with unconnected individuals, meaning that it will be hard for an organisation to acquire this sort of transparency, as it situated with other organisations surrounding the potential collaborator. This means that the trust of SET often relies on a two-part interaction and what can be perceived through this. With the community approach, it relies on several opinions and interactions. To mitigate the lack of trust building entailed by an online platform, it seems vital to incorporate such features for transparency.

Nevertheless, trust will remain an important part of establishing and cementing the online platform, and since the current means of doing that is through physical and socially embedded relation, these will remain a prerequisite to the success of the online platform. In light of this, and the mentions by interviewees that digital tools may supplement the current physical meetings, it seems appropriate for the platform to take form in collaboration with an existing and well established network with inherent trust relationships to build and expand upon, ultimately supplementing existing SET and offering an alternative when their weaknesses materialise.

3. Comprehensiveness and narrowness

Both interviewees from business networks and companies have touched upon the challenges of the platform being intended to be used by a multitude of industries and different organisations. Interviewee 3 is under the impression that it will be difficult to make the concept broad enough to attain interest from many different kinds of organisations.

NBE elucidates a different aspect of this, stating that the broad nature of the platform with the intention of covering many industries could be detrimental to the functionality of the platform (interview 24). The notion behind this is that the broader a service is, the less specialised it will become, up unto a point where the needs of the customers are no longer adequately addressed.

Interviewee 2 also expresses concerns about an all encompassing platform, saying that it may be difficult to create something that covers all aspects of sustainability in many different industries. At the same time, they express a desire for more diversified networks with members with different backgrounds, showing that there is some sort of disconnect. RGS Nordic points out that no matter how encompassing the platform will be, not all potential partners will be found here, and that companies will also have look elsewhere occasionally (interview 15). Furthermore, they state that perhaps very specific niche companies may difficult to identify and include in the online platform, but they can be very important partners with specialised knowledge or products.

Interviewee 1 from AAU Incubator further adds to this point from an entrepreneurial perspective, saying that covering many industries at once may prove difficult, and that focusing on one specifically may be more appropriate and have a higher change of success. Moreover, they mention that being successful in one industry will make it easier to be successful in the next and allow for sharing of "the good story".

With regards to this challenge, it seems difficult to address it without compromising the PBI, as part of it's core value is to work across industries. Since cross industry collaboration seems inherent to facilitating ecosystem innovations for sustainability, it imposes a difficult compromise to narrow its scope to a certain industry.

4. Digital maturity

Like the maturity of companies with regards to sustainability was perceived as problem, so has the digital maturity of companies been mentioned as a potential challenge. For example, EhversvNetværk 9220 expressed that a lot of the decision makers in companies that will have to be convinced to use the platform, will be of an older generation that is perhaps not as prone to implementing new digital solutions due to lack of a technical understanding (interview 21).

Interviewee 20 also expresses that digital maturity will be important in terms of adopting the PBI, as many companies are at different stages in digitisation. This can hinder the use of the proposed platform, as companies allocate resources for digital solutions differently. Finally, NBE raise special concern with regards to the construction industry, which is where many of the interviewees in this project reside, saying that it is one of the least digitised industries in Denmark. Therefore, it may be especially difficult to introduce the idea in this industry (interview 24). This also raises the concern towards other industries and to what extent digital maturity is sufficient.

Just as Colas provided insight into the importance of having designated personnel in terms of improving on sustainability as a company, so has Combine mentioned the benefits of locating competent IT personnel in order to promote and develop the platform (interviews 9 and 20). This means that specific efforts must be made to identify and involve said personnel. But it remains to be more thoroughly investigated whether digital maturity will be a significant hindrance for the adoption and use of the platform. It does however provide a specific consideration for the development of the online platform. Perhaps digital maturity is something that can be resolved through design for user friendliness, otherwise it provides a condition in the identification of potential case companies and industries. The starting point could be to work with companies struggling with digital maturity to develop the platform to specifically address their needs.

5. Activating users and maintaining interest

Interviewee 19 from Aalborg municipality has stated that there exists an online platform for European municipalities to share "best practices" and thereby inspire each other. However, it has been difficult for municipalities to allocate time and resources to provide inputs to the website. This in turn can result in a declining interest in using the platform. It also comes down to having staff that has the digital know-how to use and provide input for the platform. Similarly, NBE sends out a newsletter covering best practices and experiences, but it has been difficult to activate the members to actively share their experiences. If the inputs to the website are missing, maintaining an interest amongst users will thereby be difficult and could result in even less inputs into the platform.

This becomes a central challenge since the advantages the platform aims to offer rely heavily on user generated content. This means that stimulating user generated content and keeping user interest becomes a vital task to ensure that the platform actually provides advantages that can

facilitate change and ICSD. One way of doing this is to ensure that the platform addresses the challenges and needs expressed by stakeholders, and that it is designed for usability, meaning that creating and submitting content to the platform is easy and its different functions are easy to navigate. This has also been made explicit by several interviewees.

Another way is to ensure the sharing of "good stories" and successful collaborations made through the platform to show its potential and generate interest from users. The authors could also take part in generating content, collecting and organising user inputs to make it more comprehensible, stimulate debate in the community, and continuously update information on the site and seek out the good stories from different users. Internal reward system also provide potential to stimulate user activity. This could be done by rating or highlight certain users for their contribution and service to the platform, e.g the *Superhost* classification used on AirBnb. This could help to encourage user activity and increase their trustworthiness, as the platform will provide a quality stamp in the eyes of other users, or provide them with an extra channel for visibility. However, the specific workings of such a feature would need further investigation and testing. Another way to go is to include certain users as moderators. Since the platform is specifically aimed at facilitating ICSD, the community feature will inevitably need moderation to ensure content adheres to this subject and purpose. In relation to this, social media platforms such as Jodel employ users with "good user history" as moderators of platform content.

6. Small vs. large companies

The need to acquire information and search for partners seems to differ amongst the interviewed companies. Amongst the larger companies such as RGS Nordic, Stena Recycling and Danfoss, the need seemed less pressing, due to the fact that they are well established organisations with large existing networks that they can rely on (interviews 15, 10, and 2). Several interviewees have stated that acquiring larger respected organisations as users could help increase the desirability to become a member and to imbue trustworthiness into the platform (for example interviews 17 and 21). This means that the platform will have to offer something else for its larger customers. One such suggestion was that it may be a place to acquire new customers if the companies offer sustainable solutions.In line with this, both Stena Recycling and RGS Nordic have circular economy as their business model, while some of Danfoss' products are functioning as energy saving alternatives in different industries. RGS Nordic, however, did state that even though they know their own industry well, circumstances are changing and in five years many things may look different. A place to keep an overview of the industry would be beneficial (interview 15).

Even though larger businesses have more well consolidated networks to rely on, this does not mean that they do not see potential in the way an online platform could aid in some of difficulties they experience with maintaining networks in their currently socially embedded form, for example, both Danfoss an RGS Nordic say that physical meetings take time and resources and that business networks have disadvantages in their physical nature (interview 2 and 15). Hence, they perceive themselves as being in well established networks, that need little help to be expanded, but at the same time recognise that these networks have inherent disadvantages. As such, there is arguably still potential for the platform to serve larger organisations in terms of facilitating inter-organisational ties.

Just as with larger companies, a focus on smaller ones also entails both advantages and disadvantages. Firstly, several interviewees mentioned that smaller companies are more flexible, and many of them are more focused on sustainability and have it as a core value (for example interview 10, 12, 15, and 17). Therefore, smaller companies seem an appropriate focus. They often offer potential for identifying low hanging fruits, and through this possibility to quickly and easily improve, they provide the opportunity to share the good story via the online platform. Therefore they seem an appropriate focus group for the PBI. Despite their higher maturity, smaller companies and starts-ups also appear to have a weakness: limited resource availability (interview 5, 7, and 17). Their limited resources arguably makes the online platform more valuable to these companies, as it craves less resource input than socially embedded networks.

In terms of incorporating these considerations into the proposed platform, it does not appear that on size of company should be left out for the preference of the other, but the empirical data indicates that smaller organisations have the most to gain from the platform, and may be more susceptible to change for sustainability due to the fact that their maturity is more extant. Therefore, case companies for further corporation and development of the platform, will aim to engage smaller businesses and startups.

Challenge	Mitigation through VET	Proposed Solution
Certification	Increased transparency	Inclusion of all organisations interested in sustainable development and use of indicators
Trust and the importance of physical meetings	Virtually embedded ties offer transparency as an alternative.	ratings and reviews, indicators, and potential collaboration with physical networks
Comprehensiveness and narrowness	No direct solution, as either would entail a compromise on the inherent goal of the business idea. will have to be examined through further collaboration with case companies	Keeping the platform broad as cross industry inter-organisational collaboration is a core goal of the platform
Digital maturity	No direct solution, will have to be explored through closer collaboration with case companies	No direct solution
Activating users and maintaining interest	Potential weakness of the platform is that it will heavily rely on user generated content	Mitigation could be done through indicators, rewards systems and in general by showcasing the success stories of the site.
Small vs large companies	Small companies may stand to gain more of the resource efficiency of virtual ties and have a higher maturity and flexibility towards sustainability	Small and medium sized companies will be initial target group, but the platform still holds potential for, and could gain from inclusion of larger enterprises.

Figure 6.3: Summary of challenges related to the PBI

6.5.4 Intermediate summary

Previous sections have showed that the PBI holds potential to address the challenges companies face when working with sustainability, as well showing potential to mitigate some of the challenges related to the socially embedded nature of existing networks that offer similar services. The proposed features of the platform are: community building, information and experience sharing, match making, and user reward systems.

Despite its potential, the online platform and the VET it is intended to provide bring forward their own challenges. These involve certification challenges, the importance of trust and

physical meetings, dualities between being too broad or narrow in addressing sustainability, the reliance on user generated content, and servicing both large and small organisations. While some of the challenges have been addressed with the incorporation of different features in the platform, other challenges could not be directly addressed, but instead have provided valuable considerations. The challenge of certification was alleviated through altering the scope of the overview function to not focus on sustainable products, services, and companies, but rather on companies that work with or want to work with sustainability. As such, the platform may contain sustainable products, but it refrains from classifying these, and instead encompasses every company wanting to implement sustainability. The importance of trust and the lacking ability to build this, was proposed to be mitigated through transparency offering some of the same merits through user ratings and reviews. Lastly, the reliance on user generated content and the inevitable need to activate users was addressed through a focus on updating information and services to continuously meet demands, seeking out and publishing the success stories of the platform, motivating users through titles of recognition, and appointing them as moderators or increase their visibility as a result of "good user history" and continuous activity.

The challenges expressed by the interviewees should not be seen as all encompassing, and they take on a somewhat general form. It can be assumed that many smaller or specific challenges are tied to the individual company and their activities and internal processes. The intent was to gain a more in-depth understanding of the companies and their challenges with sustainability in practice by working with several of them as case companies, visiting their sites and seeing their activities first hand, such that challenges that are not explicitly expressed by the interviewees could have been uncovered. This was, however, not possible due to the circumstances surrounding the COVID-19 pandemic.

Experienced challenges and Liabilities of newness

According to the theoretical framework, VE offers a set of mechanisms that make VET favorable to new ventures. The liabilities of newness are

1. the need to develop internal organisational systems including roles, relationships, and incentives,
2. the precariousness of trust relationships among strangers,
3. the lack of social capital, both in terms of a lack of resource endowment and of an appropriate network structure,
4. and the lack of economic capital.

The empirical data has indicated challenges and needs related to working with and changing for sustainability. For example, interviewees have explicitly mentioned that implementing sustainability entails building new habits and routines, and creating different mindsets, and it entails finding new partners to realise the implementation. Which indicates that sustainable innovation i characterised by need to develop new systems and establishing new relations. They have also mentioned supply chains to be challenging and constraining, indicating a lack of social capital and network structure, as well as an overall challenge of resource endowment and financial difficulties. This is present both in small and large enterprises, meaning that the companies themselves cannot be characterised as new ventures, but in each company it seems that implementing sustainability and the changes and investments it entails faces the liabilities of new ventures. As such, it can be argued that sustainability initiatives can be characterised as

new ventures, especially if they entail business model innovations, as this often entails changing the way of value capturing and the value proposition, rendering the whole company in a state of new venture. Therefore, the more radical the innovation for sustainability is, the more they are inclined to suffer from the liabilities of newness. As argued by Morse et al. (2007), VE offers a set of mechanisms that make them especially useful in the face of the liabilities of newness (See figure 5.4. Thereby, it has been indicated both on a general level and empirically that VET holds potential to facilitate ICSD through an online platform.

6.6 Building blocks

The tables in the previous section display the different challenges and the potential platform features to address them. These have been compiled and synthesised into four separate categories or "building blocks" composing the platform and its functions. This has been done in order to move the conceptual idea, which has been expanded, modified, and solidified through the analysis, into a more tangible state. The building blocks that emerge from the content of the analysis are: Community, Information and Knowledge, Guidance, and User activation and motivation, as can be seen in the website mock-up in figure 6.4. Each of these will be described in the following section.

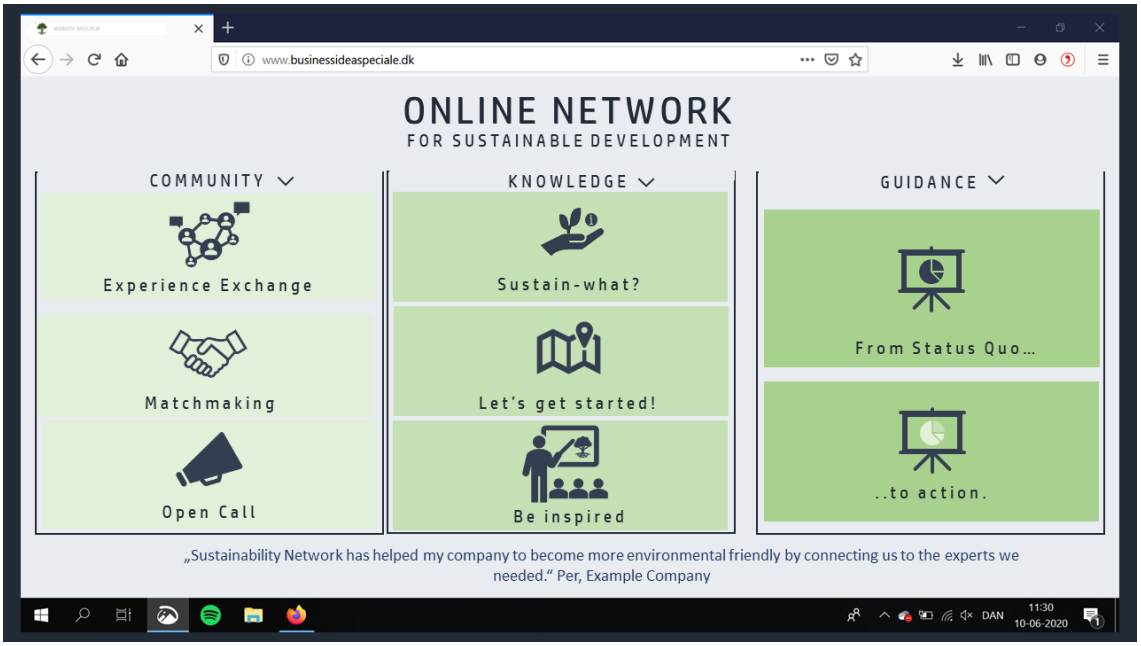

Figure 6.4: Mock-up of a hypothetical website: Building blocks and features

6.6.1 Community

The first building block *Community* includes three features, namely:

- Experience exchange
- Match making
- Open call

Experience exchange

Experience exchange is mostly related to the function that current business networks provide at the moment: providing a space for companies to exchange experiences and discuss challenges. This partly addresses the challenges related to acquiring information on sustainability, and the challenges of resource intensity and lacking relevance tied to physical business networks.

This feature is envisioned as an online forum in which members can actively input and discuss experiences and difficulties they are facing in regard to working with sustainability. This is based on the perceived need of having both the opportunity to talk to people that are 'in the same boat', as interviewee 2 said, and having the opportunity to gain new insights by allowing discussions between members with diverse backgrounds. This feature relies on user generated content, and thus there will be a need for both moderation and initiatives to encourage user activity and willingness to share. To adhere to some of the inputs from the interviewees, such as difficulties regarding supply chains and maintaining an overview over solutions for sustainability, the forum for experience exchange could have threads that are industry specific or for sustainable solutions such as eco-design, business model innovation, energy efficiency or the like, thus ensuring that users can more easily pin point the topics relevant or interesting to their specific needs and locate users within the same industry if needed.

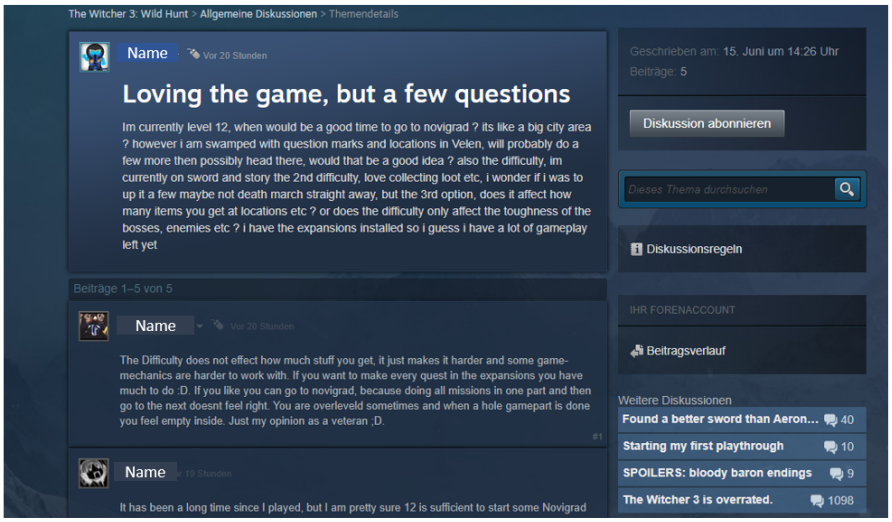

Figure 6.5: Example for experience exchange on STEAM

Match making

Matchmaking was proposed as means to mitigate the difficulties when trying to find the right partners for ICSD, giving an overview of potential partners and partly addressing the difficulties of networking (see section 6.5.2). The feature is envisioned as a service where users look for partners with a set of specific requirements, and the platform works as an intermediary to suggest potentially compatible organisations. An example could be Hustømrerne A/S wanting additional partners that could help to reuse materials from their refurbishing projects. Thus, the user will not have to manually search for a potential provider, but rather state which needs are to be fulfilled, and the platform will suggest, based on algorithms, who potential collaborators could be.

Existing examples of such a features are search engines or dating platforms, as showcased in figure 6.6. Undoubtedly, designing this feature and making it effective will involve its own challenges and process of investigation, while simultaneously presupposing a set of conditions. Matchmaking will entail a set of specific and articulated needs or requirements for a potential collaborator in order to be effective. This means that the use of it requires companies to have a high level of maturity and to further be very clear on which needs and solutions for sustainability they are looking for. This makes the function less usable for those companies, that do not know where to start their sustainable development. This calls for a service that is able to handle the needs of companies unable to benefit from matchmaking.

Figure 6.6: Example for match-making criteria on a dating website

Open Call

Open call is a feature which works as a synthesis of matchmaking and experience sharing. It is intended as an alternative to the narrowness and predefined requirements of the matchmaking feature, and to address the challenges relating to abnegation of responsibility and constraints that some stakeholders pointed out in their supply chains. It is envisioned as an internet forum feature where users can actively input posts, just as in experience sharing, but is directed at identifying and starting potential ICSD. For example, companies could ask more broadly for partners and other members offer their services for potential collaboration. This has elements of matchmaking, but instead of the platform working as an intermediary to propose connections, this relies on different users engaging with each other. The advantage of this is that the offering party has better insight into what they can and what they cannot provide, therefore solutions might be offered that the asking party did not even know about. An example for an open call could be a job offer as posted in LinkedIn, exemplified in figure 6.7.

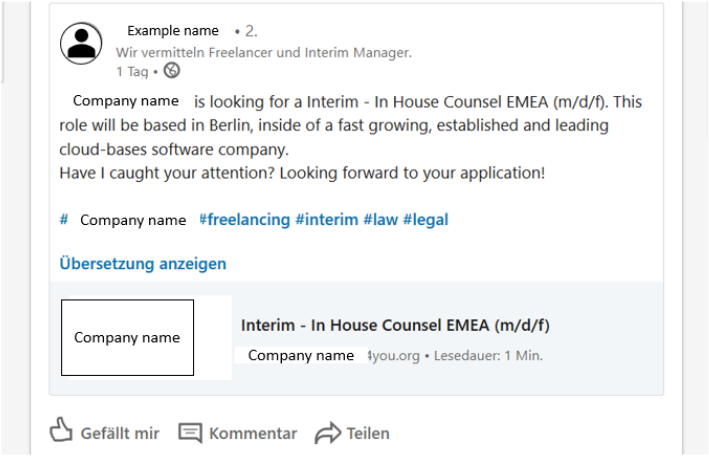

Figure 6.7: Example for an open call for a job offer on LinkedIn

It could also be used in private projects, where for example developers could ask for contractors or carpenters to work on a sustainable construction project, or the other way around that carpenters who wish to engage in more sustainable construction look for developers with a mindset to construct sustainably. Thereby, they could bypass the constraints of current supply chains as expressed in section 6.1.

The open call further adheres to the project based approach of networks, where the platform itself could instigate theme projects such as "sustainable supply chains" or "circular economy", where the platform operators take on the roles of coordinator and facilitator. Users take part in these projects through the platform, and the open call function can simultaneously be used during the project. However, as mentioned before, collaborations will entail meeting physically, and section 6.5.3 shows that social relations remain influential, so projects are unlikely to be solely facilitated and carried out on the online platform. This is where another potential synergy could materialise by joining forces with an existing business network such as NBE or Gate21, who have had years of experience with establishing projects aimed at ICSD. This way, the platform could aid in some of the shortcomings that stakeholders have attributed to physical networks, while the physical networks could mitigate some of the shortcomings inherent to the online platform.

Summarising, the open call differentiates itself from exchange of experiences by focusing not only on the exchange of knowledge and experiences, but on exploring potential collaborations. Simultaneously, it differentiates itself from the match making service by taking a much more broad form, allowing more sustainability-inexperienced companies to explore potential collaborations.

6.6.2 Knowledge and information

A recurring topic in the interviews was a need for more knowledge, and an overview of sustainable solutions and different subjects on sustainability. To address this, the platform could provide a structured database of information and knowledge, which would include a search function. More specifically, it could be categorised in more general information on sustainability principles on the one side, and sustainability in business and operationalisation context on the other side. This would mitigate the challenges of lacking information and overview and the missing ability to get underway with the first step. This resulted in three subcategories of information:

- Get to know sustainability
- Get started
- Be inspired

General information

General information provides an overview over different principles, approaches, and opportunities for a sustainable development, such as circular economy, eco-design, industrial symbiosis, and concepts such as Corporate Social Responsibility. Thus, it adheres to the challenges of gaining an overview of sustainability and having access to relevant information. This function will primarily rely on the platform operators and moderators to locate, input and update information. It could also enable users to input relevant information they encounter in their organisation. By allowing this, a lot of industry specific information could be made available, which is likely

going to be backed up with experiences of using this, which would ensure a high relevance and application potential for other companies, but also require moderation efforts. It should be noted that this requires companies to willingly share information, which could prove difficult in practice.

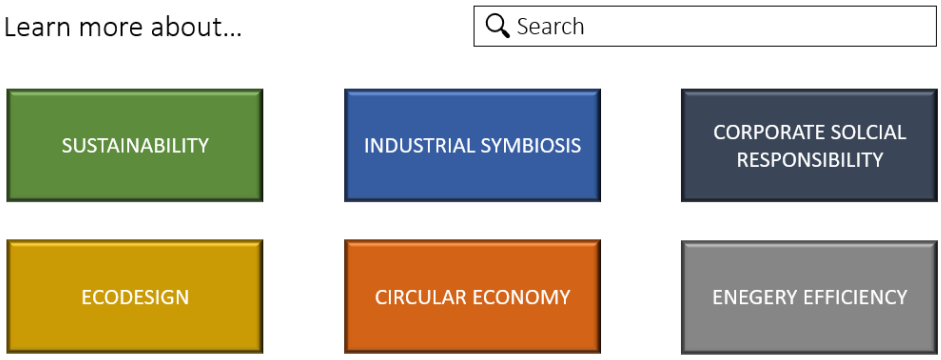

Figure 6.8: Example of an overview over different topics in sustainability

Get started

The *General information* feature entails the users actively navigating the data base to acquire relevant information for their specific needs, and is intended to be relevant for every type of company regardless of how advanced they are with sustainability. *Get started* on the other hand takes the form of a instructions manual targeted at companies that have little or no experiences with sustainability. It would work as compressed and simplified introduction on how to apply some of the principles contained in the *general information* feature, while adding elements of strategic planning such as the plan-do-check-act principle of ISO 14001, allowing users to access simple information and tools to get their journey started. Point of departure is taken in focusing on small, incremental changes that require no or very low resource input, and how to identify them, thus providing a first entry into the topic. Thereby, this function aids in mitigating the challenge of maturity and perceived cost of starting a process to make company practices more sustainable.

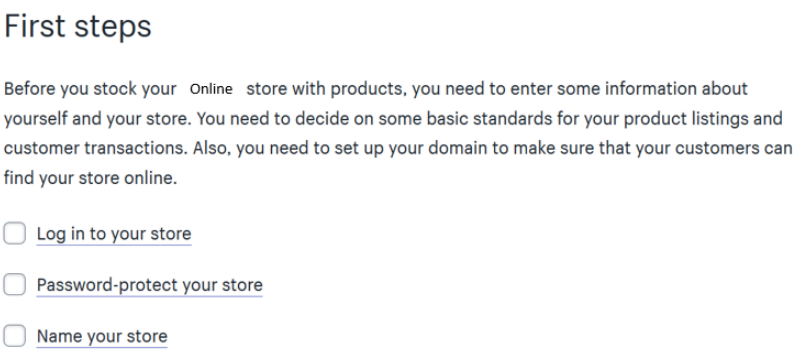

Figure 6.9: Example for a checklist on how to start a web shop from Shopify

Be inspired

The third feature is based on something that has been mentioned by both business networks as well as companies, namely 'telling the good stories'. This is included as a way of mitigating the perceived cost of sustainability and the lacking overview and knowledge of potential solutions. More specifically, it will be used to share stories of companies that have successfully implemented sustainable practices or proven them to be good business cases. This feature will provide concrete examples of how sustainability in a certain form has been operationalised, perhaps boosting the maturity of other users by serving as a source of inspiration. At the same time, the sharing of good stories is something that could help maintain user interest and help to showcase the actions the platform has taken part in facilitating, thus helping to improve its quality impression and desirability. This is once again a feature that relies on user generated input, and thus involves its own challenges in ensuring the users' willingness to share and spend resources on inputting their stories.

6.6.3 Guidance

This building block concerns a set of features that are not digitally or online based, but are included to mitigate the challenges constituted by the maturity of companies; as interviewee 12 stated, some companies need a helping hand. Supporting this, the implementation of sustainable solutions takes continuous involvement as mentioned by NBE (interview 24). The guidance block is envisioned as a type of advisory service that on the one hand will help to ensure that users get as much out of the platform as possible, which cannot necessarily be facilitated merely through information and community functions. On the other hand, it provides an opportunity for the platform operators to actively engage with the companies to facilitate ICSD and help to ensure that the process of becoming more sustainable does not become stagnant. As such, these considerations have resulted in the following functions:

- Screening
- Action plan

Screening

This service entails collaborating with an organisation, mapping out their activities, and determining potential areas of action to improve with regards to their sustainability performance. This process is intended to be broad and superficial as to indicate potential areas of improvement, which then can be taken as point of departure for taking action through ICSD. Keeping the screening somewhat more superficial allows to decrease the amount of resources needed, therefore adhering to many of the interviewees' expressed needs. By beginning with a simple screening that will predominately identify low hanging fruits, a first commitment to becoming more sustainable is made by the company, which can provide motivation to move on to larger actions, for which the PBI's other services would be of increasing potential for ICSD.

Action plan

In order to act on the areas of improvement uncovered through the screening, an action plan can be developed if requested. This could take the shape of a mile stone plan, setting short and long term goals, and defining the steps to get there. The action plan can work as a strategic tool to guide company activities, and as a way of tracking sustainable development in the company. The action plan could provide a more structured approach to using the different services on the platform, such as finding the right information, partaking in targeted forums, and identifying prospective partners to achieve the set goals. These plans could be designed using the aforementioned plan-do-check-act model employed by ISO 14001, which is designed to fit every industry, and simultaneously instigates a process of making organisations eligible for environmental certification.

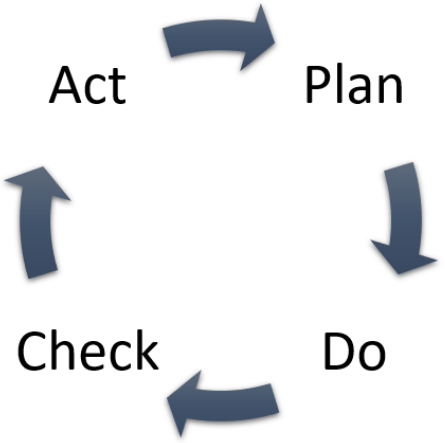

Figure 6.10: Plan - Do - Check - Act Model, based on ISO 14001

As described in section 6.1, organisations such as NBE or some consultants already provide similar services. With the need for this service, another potential synergy arises with the prospect of collaborating with for example NBE or Gate21. These services demand experience and resources to work with users physically, both of which are arguably lacking in a potential start-up company. By combining the physical network and the experiences of existing organisations, and the easy-to-use tools of the online platform, new potentials for facilitating sustainability could arise.

As indicated by NBE, continuous involvement is often needed, and the process of innovating for sustainability can not be achieved through a one time effort. Hence, what this platform is trying to facilitate, or sell, is not a one time product, but a process. As such, the online features hold potential for all types of innovations from incremental to systemic. By virtue, the guidance service should accommodate the same purpose. Therefore, it seems appropriate that the *Guidance* function remains a continuous process, aiding in operationalising sustainable solutions at different stages of the action plan. This could arguably also be conducted through the community building block providing guidance and advice from other members.

6.6.4 User activation and motivation

As mentioned before, the platforms' core services rely on user generated content and activity. Therefore, a vital task is to motivate and activate users to generate content and actively engage with the platform. To address this challenge, several mechanisms have been proposed:

Indicators

To deal not only with user motivation, but also the certification challenge (see section 6.3), the platform would not create an overview of sustainable companies, products and services, but instead compile organisations working or wanting to work with sustainability. As a way of differentiating the sustainability status of members and simultaneously motivating user activity, a indicator system was proposed. This would not be a label determining what is sustainable, instead it would be indicators of certain aspects of sustainability. For example, if a company is working to reduce CO2 emissions, can document this, and is willing to input its experiences or otherwise contribute with content, it will be granted a CO2 reduction symbol/hero/indicator. These indicators provide a visualisation of sustainability efforts and can help imbue trust and transparency with other members, and therefore work as a tool to motivate members to input content. This also helps to mitigate the lacking ability to build trust in relationships by providing tools for transparency amongst members.

Figure 6.11: Example of indicators

Reward systems

Another way to stimulate user activity and content creation is through a reward based approach. Here, user activity such as engaging in community discussions, offering advise, sharing experiences, information, and good stories could be rewarded with highlighting the member organisation on the main page for a certain amount of time, increasing the visibility of a company and its service. Another reward related to the labeling system could be like the "Superhost" used by Airbnb (see section 6.5.3) where users with a good user history get a stamp of trustworthiness by the platform, increasing the credibility of the company to other users.

Figure 6.12: Example of reward system

Ratings and reviews

Both addressing the challenge related to trust by increasing transparency, and the ability to rate and review could work as a user motivator, because a good or bad review will result in doing the same for other users or improving and participating to improve ratings. There is also an option of combining this with the indicators proposed above by letting members reward certain indicators to other members, similar to the function on LinkedIn in which members can vouch for certain abilities of other members.

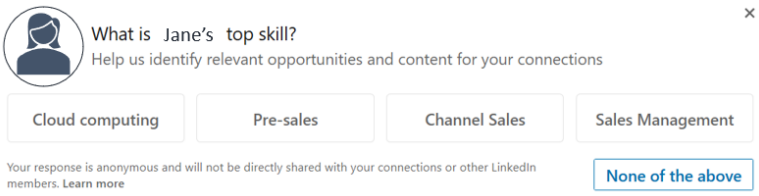

Figure 6.13: Example of ratings on LinkedIn

Moderators

The last proposed feature to encourage user activity is through the granting of moderator privileges, as done by social platforms such as Facebook. Users with good user history and activity will be asked to participate in moderating the content of the community and information section, and aid in approving content for the good stories and information section. This imbues a sense of responsibility and ownership and actively engages users continuously, while also addressing the inherent need for moderation in the user generated content.

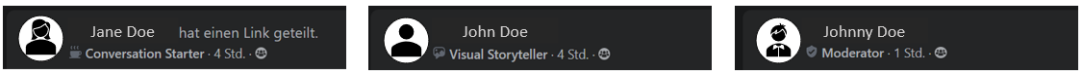

Figure 6.14: Example of moderator functions as used by Facebook

6.6.5 Intermediate summary

The challenges described in section 6.5 and how they relate to the building blocks and functions discussed above are visualised in 6.15.

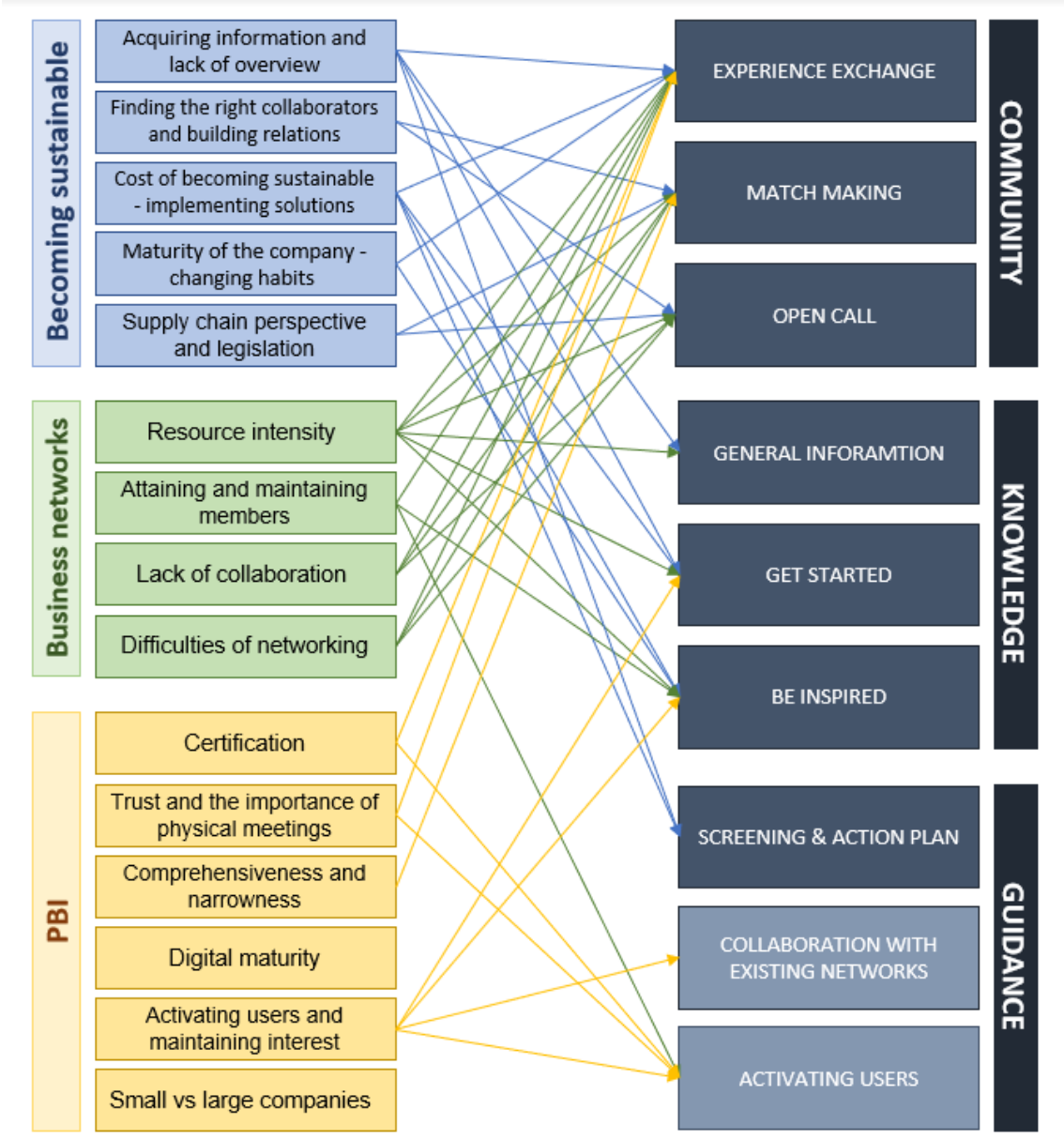

Figure 6.15: Visualisation of the challenges related to their proposed solution functions

6.7 From concept to practice

Even though the inclusion of the above building blocks helps to make the business idea and the services it provides more tangible, most of the features remain broad concepts themselves, and how they will function in practice and what challenges they pose remains to be uncovered. This section will outline some of the practicalities of the features that will need to be examined, considered and specified before they can be realised.

On a general level, the specifics of each feature and how it will adhere to the needs and circumstances of many different companies demands an immersion into user practices, and also working in closer collaboration with case companies and business networks in order to determine how exactly the building blocks will take shape. Additionally, installing the online based features requires knowledge and experience with web development. This project initially intended to uncover some of the challenges that would arise in the prototyping phase. This includes feasibility of algorithms for the match making service, open call, moderation of user generated content, and reward systems. However, due to the COVID-19 circumstances it was not possible to explore this, as the designated interviewee for this became unavailable and a close collaboration with case companies was impossible. Hence, this step will have to take place outside the confines of this project. The advisory section likewise entails experience and knowledge that would need to be acquired elsewhere.

A collaboration with existing physical networks was proposed to mitigate some of the potential shortcomings and challenges related to the PBI. Even though both interviewees from NBE and ErhvervsNetværk 9220 expressed interest in a further collaboration, the specific shape of a collaboration and how this would affect the features of the online platform remains open to question.

Another concern is that many of the services, besides relying on user generated content, depend on a considerably large user-base. For example, a match making service demands a wide selection of companies in order to provide valuable matches amongst potential partners. So does the community in general, as it is intended for many different industries and sustainability related topics. Users with diverse backgrounds will be needed to provide quality discussions, usable experience sharing, and functionality of the open call feature. All of this means that many of the services will need a large user-base to get started and show results that will attract the attention of more potential users through a good reputation. As many interviewees have pointed out, if the platform does not provide results, interest will quickly dwindle (for example interview 12 and 21). This becomes rather paradoxical in the sense that credibility and functionality require a large user base, and getting a large user base requires credibility and functionality. This is again where a collaboration with existing business networks would provide a vital opportunity to supplement and build upon well established, stable networks imbued with trustful relationships and credibility.

Discussion 7

7.1 Fostering sustainable development on a societal level

After having established the building blocks of the PBI, in a next step they will be discussed in regards to their potentials for aiding a sustainable development on a societal level, using the SOI frame established in the theory section.

7.1.1 Innovation type dimension

Community (Experience exchange, Matchmaking, and Open call)

The first part within the community section is the experience exchange. In comparison with existing networks it has to be noted that these provide a physical space for experience exchange; the additional value the PBI brings, is that fewer resources are needed as no physical events have to be organised, and, most notably, that this is accessible independently of time and location. Therefore, it can be argued that this specific innovation aims to make a process easier, or, in other words, 'does the same thing better'. Thus, the experience exchange can be classified as operational optimisation based on figure 5.7. While this means that online experience exchange as an innovation itself is in the very beginning of the process of sustainable business development, it should be noted that it provides a foundation upon which higher level innovations can be created by its users. By encouraging the communication of experiences and ideas between stakeholder groups that do not belong to the same organisation, it opens the path for system building innovation, by inspiring to 'do good by doing new things with others'.

The next function is the open call, a function for members to post a tender for specific products, services, or partnerships they are in search of, to which other companies can make their bids. When comparing this with the other networks discussed in the project, it becomes apparent that such a process does not yet exist in this regard. Typically, 'sustainable' companies offer their services or are advertised for other members to find and contact them. Using an open call to search for a fitting partner gives the opportunity to discover new solutions that aid in becoming more sustainable, without having to spend the time and resources locating them manually. This, and the aim of this building block to facilitate new collaborations, arguably this means that open call could be used as a service for a system building. Compared to existing services (business networks and other platforms), this provides a new way of facilitating system innovations, or at least innovations centered around ICSD, rather than existing services that to a higher degree facilitate the individual gains for its members. However, it cannot be predicted how a member organisation itself is affected by this process, and whether using the open call

will result in a level one, two, or three transformation.

Match making

The last function in the community section is the match making service. This feature can also be characterised as an operations optimisation with reference to figure 5.7, as it reduces the time and resources spent on finding potential partners for ICSD. It provides access to potential collaborations that would otherwise remain unexplored. As with the open call, it holds potential to instigate collaborations that can result in all level one, two, and three innovations. However, if and how these will materialise will depend on the collaborations at hand, and the internal circumstances in companies such as their maturity. As such, it can be concluded that the features within the community building block provide a more targeted, easily accessible and less resource demanding foundation for ICSD, but since these collaborations will take form outside the confines of the online platform, and are subject to the conditions under which each company is operating, their direct potential for facilitating sustainable development remains as a foundation to be built upon.

Knowledge (General Information, Get started, and Be inspired)

Generally speaking, neither the provision of universal information about sustainability and the different approaches to a sustainable development, nor the more specific instructions of how to implement first changes into the own company include any direct relation to collaboration. Indeed, it can be expected that the get started function would include a range of suggestions that would be classified as operational optimisations that focus on for example increasing efficiency. In fact, these suggestions are unlikely to include many aspects that are concerned with collaborations, as this building block focuses much more on companies that are not yet ready to make commitments or invest many resources. The argument for targeting these companies as users for the platform is that these companies must be included in the overall efforts to become more sustainable as well. It should be noted that information and knowledge itself can not be expected to facilitate ICSD alone, as mentioned by interviewee 19: Sustainability will not happen because of text on a website. However, some interviews have shown that many networks centered around sustainability mainly focus on these companies that already exhibit a high level of maturity. This somehow excludes companies that are slower in their progress towards more sustainability. By providing information and knowledge without requiring big commitments and resources, it may be possible to reach exactly those companies that otherwise might be left behind. Therefore, this very incremental step is still included to act as a gateway to using the other functions on the website, and ideally more radical transformations towards sustainability.

Advice (Screening and Action plan)

The screening of a company and the creation of an action plan that is tailored to the respective company holds the most potential for an advisor to directly influence the level of innovation and sustainability within the company. Thus, this service offers a way to mitigate the uncertainty

of how the features of the online will actually result in innovation for sustainable development. First, because the expertise of the advisor allows them to identify opportunities that the company itself may not be aware of, and they can further make suggestions on how to achieve specific goals and what methods would be appropriate for that. Second, it can be expected that companies that are willing to conduct a screening and invest resources into creating an action plan exhibit higher levels of maturity. This in turn would indicate that they are more willing to consider more radical innovations into their business, and as they have already committed themselves to becoming more sustainable by conducting a screening and action plan, they are further more likely to go through with the suggested measures. Therefore, these functions give the possibility to facilitate all operational, organisational, and systematic innovations for sustainability. In terms of innovation level, this service is already offered in similar ways by consultancies and NBE, but it can be argued that through the creation of a centralised platform with services that can aid in the realisation of the action plans, the combination of the features offers an operational optimisation of these existing services.

7.1.2 Network dimension

Community (Experience exchange, Match making, and Open call)

Considering that this part of the business idea is concerned with building a community and using community based services, the degree of networking could be argued to be inherently high. As described in the theory section, Adams et al. (2016) argue that the collaboration of firms enables them to handle more complex challenges of becoming sustainable, and that it creates new, more radical solutions. It has previously been discussed that the platform operators will potentially have to take a facilitating role, for example by moderating content, starting forums and projects, and actively using indicators and reward systems to stimulate user activity, which means that according to Barrett et al. (2011) Models of Collaboration, the community functions would be classified as Model 3: Network. It could also be argued that the experience exchange and open calls could function without the innovators involvement, which would mean that the control is distributed evenly and a Model 4: Open Platform takes place. Due to the nature of the platform this will however likely not be the case, as the main control will lie with those who provide the platform, for example in the shape of moderators that monitor the activities on the platform. Ultimately, it should be the goal to create organisational ecosystems in which collaborations stimulate more radical changes towards sustainable practices, and by providing easy access to a community that revolves around sustainable topics, a step in this direction is taken.

Match making on the other hand works as a Model 3 function as it functions on automated systems to provide potential matches for ICSD between the users. This feature in itself can be considered a booster for network formation with each company, regardless of the network type it is targeted at, specifically expanding the networks of each member, and by doing so also increases the ability to better handle the complex challenges related to sustainable development.

Knowledge (General Information, Get started, and Be inspired)

As has been stated above, the general information and the suggestions of how to begin a journey towards sustainability are targeted at individual organisations, and have no intention of creating networks directly. This is also true for the presentation of example companies, the only difference here being that this might lead to collaborations between the information recipient and the introduced company, or it might inspire collaboration by leading as example. However, this can arguably not be classified as network, and can be described as Model 1: Ad Hoc, if the information recipient only uses this website as they need it, and as Model 2: Hub and Spoke if they actually are a member. Here it should be noted that in both cases, the information recipient is considered the central firm, as opposed to the description above, in which the business idea at hand is regarded as the central business.

Even though the sharing of information does not per se constitute the development of a network, nor is it intended to do so, it does rely on the users to input and generate information on the platform, thus constituting a form of network activity, where users rely on and benefit from each other. Again, considering the holistic nature of the platform, the sharing and use of information could be argued to act as a foundation for the other actual network functions to build upon. In other words, a strong common knowledge base could strengthen the use of the other platform functions aimed at facilitation of ICSD.

Guidance (Screening and Action plan)

The screening itself is a process between the company and the advisor, and could be classified as Model 1: Ad Hoc, however, many interviewees agreed that it would be beneficial to 'sell a process' instead of a one time service, which is especially relevant in regards to the creation of an action plan, and would qualify it as Model 2: Hub and Spoke. Beyond that, creating an action plan gives the advisor the possibility to recommend potential collaboration partners, in fact, this would be largely beneficial in order to inspire system level innovations. Thus, there is a potential to create Model 3 or eventually Model 4 collaboration types, which are more fit to facilitate organisational ecosystems.

7.1.3 Novelty dimension

Community (Experience exchange, Match making, and Open call)

Providing an online space for individuals to exchange experiences is certainly not a new idea, also not for the topic of sustainability. While this combination with the other building blocks does provide novelty, this aspect is arguably the least radical innovation. It may however be interesting to consider that the very low degree of novelty is accompanied with a high degree of familiarity, which means that users will find this function easy to use. As discussed in the theories, this can help ease the entry into the topic in general and the use of other function provided by the online platform in specific.

The open call function on the other hand has not been found in regards to sustainability issues specifically. Similar functions are provided by LinkedIn, where companies can post specific needs

which the community can address. The same is true for match making services, provided in the field of dating sites or job portals pairing up companies with employees. As such, the services themselves provide little novelty. The novelty of these features reside in their joint targeted focus on ICSD. This is accompanied by the holistic nature of the platform, offering services that compliment each other in the pursuit of facilitating inter-organisational collaboration. As such, the individual services do not constitute the novelty of the platform, but their accumulation in a digital medium does, as no other platform including all or some of these functions in one place has been identified through this project.

Knowledge (General Information, Get started, and Be inspired)

The novelty of all three aspects is certainly to be deemed as very incremental, again, the point not being that this has never been done, but rather that all these functions are collected in the same (online) space. It further cannot be argued to inspire very radical innovations, with the exception of the example companies. Those do, in fact, carry potential to inspire more radical innovations, as they do not only showcase good ideas, but also encourage to take chances and prove that higher risk ventures may be rewarded with good business cases. Generally speaking however, these functions remain very incremental both in themselves and in the potential to facilitate innovations. Again, this must be seen under the notion that their aim is to target especially those companies that are not ready to make bigger commitments, and to foster long term successes in regards to achieving sustainable development within firms.

Guidance (Screening and Action plan)

As described before, similar services of providing a company screening and developing action plans are already offered. Despite of its lacking novelty, this type of service is still important to facilitate sustainable development in companies (interview 24). In regards to the potentials it holds, it can be argued that an advisor will likely be able to inspire innovations with low or medium novelty, but as they are influenced by their own experiences, it is unlikely that they are able to create high level innovations for the company. What they can however do, is to recommend collaborations with specific organisations, which might result in more radical innovations; although whether this does happen eventually remains uncertain.

7.1.4 Target dimension

Community (Experience exchange, Match making, and Open call)

In regards to the target dimension, the community building block does not have a direct impact on the environment. However, that is not the intended goal of this. Rather, the goal is to help others to facilitate sustainability. Because there is no direct relation, the discussion of the effects on the three dimensions ecology, economy, and social are somewhat hypothetical. Based on the interviews, most companies aim at becoming more environmentally friendly. By giving them access to means to do so, this could arguably be the most noticeable effect. It has been discussed before that this would not remain isolated, as some measures such as energy saving

would also effect the company's economy. Especially the experience exchange may be beneficial in this regard, as some companies may be able to point out new, more sustainable processes which also carry benefits on a monetary level. Of course, there needs to remain a balance and ideas for e.g. green washing might appear, which would negatively impact a sustainable development. Finally, the building block community carries great potential to impact the social sustainability, as it focuses most on the shaping of relations and ultimately the creation of an organisational ecosystem. To achieve this, the community should include a diverse range of stakeholders, which has not been subject of discussion so far. This project focuses mainly on businesses, however, NGOs, municipalities, knowledge institutions, and other kinds of organisations are also relevant actors in organisational ecosystems. Expanding the scope of the platform to include these provides an interesting direction for its further exploration.

Knowledge (General Information, Get started, and Be inspired)

As before, these functions do not have a direct influence on sustainability, but rather carry potential to create impacts by providing a foundation upon which innovation can thrive. General information for example could very directly affect all three pillars of sustainability and their integrated nature by educating about them. Some interviews have shown that there are still some rather narrow understandings of these matters prevalent in some companies. Interviewees have further stated to be confused by the sheer amount of information on sustainability, which can be overwhelming and thus debilitating. By providing easily accessible, organised, and concise information on sustainability, it may become easier for the companies to apply this and move in a certain direction. This is also applicable to the get started function, perhaps even more so, as it provides very hands-on suggestions. Here, how each of the dimensions can potentially be affected is to some degree dependent on whoever provides the information, which should be considered when these suggestions are devised and worked out. For the example companies, it is very much dependent on the company presented, what kind of sustainable development they inspire. To what degree each dimension will be affected also depends on the company at hand, some may value efforts for social sustainability higher than environmental sustainability, or vice versa.

Guidance (Screening and Action plan)

In general, this building block could have the most direct impact on the three sustainability aspects, as it falls to the advisor and company in question to jointly determine which of the dimensions should be considered to which degree, and which measures can be taken. It is then further up to the advisor to remain conscious of the interdependencies between these dimensions, and how to prevent or alleviate potential trade-offs. Thus, this building block is also the one which can the most easily adhere to the realisation of the integratedness of sustainability. It should however be noted that this is subject to the experience of the advisor, and that it remains impossible to anticipate all effects and avoid all trade-offs.

User motivation and activation

This category of features has not been subjected to the four dimensions of SOI, due to the fact that these are internal instruments aimed at enabling the user generated content that the platform services rely on. Still, some general notions can be outlined on their potential to facilitate sustainable development, seeing as the platform's potential for sustainability depends on user generated content. As such, these instruments to induce user activity hold an indirect influence on sustainability. Furthermore, some of the features aiding in creating transparency arguably create conditions for a more well established network structure with means to ensure trustworthiness.

7.1.5 Intermediate summary

In conclusion, it can be said that the community building block and its functions do not have much direct influence on sustainability, as they aim at facilitating such a development with others. Creating a community and forming relationships has potential to do this, but it is not a necessary outcome. Therefore, it remains the innovators' responsibility that the right steps are taken and the usage of these function does ultimately benefit not only the companies using it, but also the environment and society as a whole.

The knowledge building block covers some very basic requirements, which are unlikely to have major radical impacts or inspire such, possibly with the exception of example companies. Yet, it remains an integral part of the PBI, as its underlying objective is to attract and capture companies with little maturity to create small successes on which further, bigger commitments can be build, thus achieving sustainable developments in the long term.

While the guidance building block can influence and facilitate sustainable development in the most direct and controlled way. On the other hand, it also requires the highest maturity levels in companies, and the knowledge and skills to conduct screenings have to be found externally.

Overall, it can be concluded that several functions within the platform retain little novelty on their own. But by being compiled in a centralised platform, where they compliment each other, and with a focus on ICSD, novelty becomes evident. Several of the services provide a more comprehensive, targeted, easily accessible and less resource demanding alternative to existing services and companies engaging in this process individually. In terms of ICSD, the community section with its inherent functions shows potential to facilitate different elements of network types fit for systemic innovation for sustainability. Despite these potentials, much of their realisation remains to materialise outside of the platform itself. Thus, company circumstances such as maturity will influence the results. Hence, its potential for facilitating sustainability on a societal level is constrained to creating a strong basis upon which innovation can take place, and functioning as a continuous medium for companies to develop their process of sustainable innovation. Comparatively, its advantages to do so, renders this online platform with a presumably additional potential for facilitating sustainable development on a societal level than existing alternatives.

7.2 Using a research perspective on a business venture

In the methodology section it was mentioned that there exist scientifically rooted methods for an entrepreneurial venture, however, there is arguably little empirical backup for this, and approaching the development of a business idea from a scientific perspective remains rather untypical. Therefore, it appears relevant to elaborate and reflect on this process that has lead to the business building blocks above, and how this perspective has shaped the business idea development. Referring back to critical realism, it can be argued that there are two levels of action, or strata, in this case, namely the project level, and emerging from that, the business development level. The topic of reflection in the following section is the interplay between these levels and the generative mechanisms that emerge from this, or in other words, how the project level has affected the business development level and what merits this entails.

The purpose of the problem analysis was to uncover why something is relevant to examine and if there is a specific problem in the selected subject field. It then determined and framed the problem and located it within the bigger context. This includes for example the state of the art, which provides an overview over current practices in the field, which arguably can help to mitigate the lack of experience that inevitably comes with entering a new field. Moreover, the problem analysis worked as the first step of moving the business idea into a specific form. The business idea had to be formulated and take shape in text to properly unfold and enabling it to be examined as a problem. More importantly, the problem analysis allowed for examination and framing of the problems that arise in regards to the business idea and root it in a real world need, thus working as medium for initial validation and market research. The state of the art allowed for the problem field to be uncovered in a structured manner. The academic practices of identifying and examining relevant literature have provided a thorough investigation of contemporary scientific work leaving as few stones unturned as possible. It seems doubtful that without this approach the entrepreneurial process would exhibit such a high degree of structure this early in the idea development, as it would employ a much more practice-oriented process of formulating and validating a business idea. While using reliable, reviewed literature gives these insights more depth, it has the disadvantage that it depicts reality in a somewhat delayed manner, as the process of publishing may take some time, and may fail to illuminate rapidly developing and unspoken (best) practices. So while the problem analysis can arguably mitigate some of the missing expertise and experience in a field, it can certainly not replace it. However, examining the underlying problem to be solved by the research has helped solidify the purpose of the business idea, and to clarify the need for this business idea on a societal level. Therefore it can be argued that it on the one hand acted as market research that justified the need for an innovation, and on the other hand confirmed that there is potential to create value in a larger context.

Part of scientific working is to make explicit how exactly the research was conducted. In this, a range of already developed and reviewed methods may be used. While these methods can never be completely developed and are subject to change and adaption as people continue to use and empirically test them, they do provide a comparatively structured and clear course of action. In the present case this was especially valuable as there is a clear lack of entrepreneurial experience. Being able to resort to Mansoori & Lackéus (2019) work, it was possible to find the appropriate methods based on the business venture stage the project was in. Applying the

chosen methods has given direction and relevant indications of how to proceed. Nevertheless, there is a down site to using existing methods in such a way; there is a risk of locking oneself in these methods and to overlook or miss other, perhaps more suited procedures. There may also be an issue of being confronted with challenges that are not addressed in the chosen method, which then need to be dealt with through different means. The methods have greatly affected the process and amount of stakeholder perspectives that shaped the business idea. It can be said that using explicit methods has helped to compensate for a lack of experience, and given structure to the proceedings, but it is necessary to remain critical and open to other inputs in order to remain flexible and agile.

The analysis in this project was framed by different theories. These theories provide a lens through which the data is examined, which has a major influence on the direction the analysis takes. In the present case, the aim of this was to ensure that value is created not only for potential customers to satisfy their perceived needs, but to be beneficial beyond that, to aid in facilitating a sustainable development on a societal level. Thus, the usage of theories has added an additional meta level of examination. This is a very clear benefit in innovation for sustainability, as it helps to keep the 'bigger goal' in mind, rather than to let the business idea be shaped solely by perceived customer needs. The theories applied in this project have worked as lens through which the empirical data has been examined; each of these theories with a specific aim and understanding of the world has helped to uncover new knowledge and understandings of stakeholder needs and challenges. At the same time, the theories have provided a tool for examining the business idea itself, for example, the framework of VE has helped to point out and understand where an online platform holds potential and include components that specifically address some of the weaknesses existing in the field of businesses it is to enter. Thus, the theories have helped to further validate and situate the business idea and cement its potential. But more importantly it has worked as a tool that has helped frame the stakeholder needs in a way that they can be addressed and incorporated into the business idea, thereby greatly affecting its development,

Additionally, his implies the need to pick the right theory to gain the right findings, which in turn raises the question of what is to be considered 'right'. Furthermore, it has to be said that a theory remains an abstraction and therefore simplification of reality, and therefore it is not possible to seamlessly apply it. Discussions based on theories will remain hypothetical to a degree, and they need to be tested empirically to be validated. Thus, the analysis outcome needs to be tested in real world settings.

The need for applying theories can also be questioned as the empirical data can be understood without a theory, just in a less sufficient, structured, and more superficial way. Practically, this means that part of what is uncovered in the project could have been identified without a theory, but only partly. Ultimately, finding, justifying, and applying a theory is an extensive process that has its rewards, but also seems to diminish the agility of the entrepreneurial journey, and is perhaps not a tool so easily applied in a purely entrepreneurial.

In the beginning stages of the project, the aim was to simultaneously participate in programs aimed at helping innovators to found a business, such as the AAU incubator. This would have provided an entrepreneurial perspective on this business idea development, which doubtlessly would have been very valuable. It would also have enabled a more in-depth comparison of the two perspectives. Under the given COVID-19 pandemic circumstances, a participation in these

programs was no longer possible, and this has caused the entrepreneurial part of the project to decrease significantly and instead let the process almost exclusively take the shape of an academic project.

Since the circumstances of COVID-19 removed the ability to participate in the entrepreneurial program quite far into the project process, an ex-ante decision was made to alleviate this by conducting an interview with a person who holds practical experience in this field. The interviewee wishes to remain anonymous, however, it can be disclaimed that their expertise is founded on 40 years of work experience in the IT field, and they have been part of two start-ups from the beginning, one business to business and one business to consumer, and joined several business ventures at later stages of the development process. In addition to this, they have no background in academia whatsoever, which solidifies their views as being from a purely business perspective. The interview was opened with the request to describe a start-up process in general terms, and it resulted in a list of steps which are paraphrased in the following:

1. Phrase a business idea.
2. Do market research, find out how new the idea is, and determine the unique selling point.
3. Determine what (monetary) resources are needed for a successful venture.
4. Do a cost calculation, do not forget the internal costs.
5. Research and determine funding.
6. Draw out a business plan and management summary. Use these to obtain funding.
7. Determine why customers would spend money on the business idea, and how much. From this, calculate backwards and determine how many customers you need.
8. Define criteria for success and failure. Based on this, determine exit strategies.

Comparing these steps with the proceeding in the project, it can be argued that the beginning steps are similar. Both start out with a conceptual and vague idea; both locate the idea in the bigger market context, determining the novelty of the idea and what exactly it is that differentiates the own idea from others. Here, the project used literature and online research, whereas the interviewee proposed a mix of online research, own experiences in the field, and the usage of the innovator's personal network. They did not have a structured methodology to approach this, and relied heavily on their own experiences, stating that typically, (successful) innovators act within a field they know and have at least some experience with. While the interviewee had not had any contact with entrepreneurial methods such as design thinking, they did describe similar processes, most notably letting potential customers shape and even co-design the innovation.

Based on the list given above, it could be argued that the project has not come beyond point 2., and a major part of the start-up process as described by the interviewee is concerned with feasibility and economic considerations, whereas the project at hand focused on the overall value the idea could generate. However, should the business idea be developed and continue on the venture phase, the steps 3. to 8. undoubtedly need to be conducted as well. Referring back to 4.2, this would lead onto the next stages, where comparatively more strategic methods such as business planning where deemed appropriate by Mansoori & Lackéus (2019). Concluding on the interview, it can be said that following scientifically backed methods has lead into the same direction as the experienced based proceeding of founding a start-up. This can be deemed as positive insofar as that it shows that using these methods has somewhat compensated for the lack of entrepreneurial experience. However, it also has to be said that much time was invested

in in-depth analysis which is not guaranteed to be 'useful' in the sense as that it might not contribute to a successful business venture, and that from a business perspective, this project focuses on specific topics in too much detail and remains rather 'impractical'. The purpose of academic problem based projects is to find and examine a problem critically, and based on this provide potential solutions to it. Though this may overlap in the sense that providing insight into a problem and potential solutions to it can work as a market analysis, business idea validation and development, much of what problem based research encompasses is not aimed at a business perspective, but rather an investigative one, with a goal to pinpoint and propose intervention and solving a proposed problem. Therefore there is an inherent opposing nature in the two approaches or at least point of focus.

In a more practical sense, using the project as a way to investigate and develop the business idea has had a positive effect on the involvement of stakeholders and their participation in interviews, interest in the idea, and openness to collaboration. Being representatives of a knowledge institution seems to have caused the interviewees to be more open and willing to share successes and challenges without concern for loss of competitiveness. They did not seem to regard the business idea as potential competition. Moreover, many of the interviewees have a good relationship with Aalborg University, and it is doubtful that contacting the same organisations and individuals just as a private start-up would have allowed for the same results.

In summary, it can be said that using problem based research and the proceedings this entails has helped to give the business idea development structure and a sense of direction, it has helped to keep the overall aim of ICSD, and it has, to a degree, compensated for the lack of entrepreneurial experience. This proceeding has helped to identify and incorporate stakeholder perspectives into the PBI in a way that would have otherwise been difficult, and it has taken assumed advantages of the idea and validated them in terms of theories and empirical data. An additional benefit was that the scientific perspective has encouraged a critical perspective on the proceedings. On the negative impacts of using problem based research, it has to be said that it has considerably slowed down the venture process as it encouraged deeper examination of specific topics. While it has helped to determine what the PBI should entail, the start-up process itself has not advanced significantly. It will now be necessary to address the more strategic and 'business related' issues such as cost planning, funding, and goals, milestones and exit strategies. Ultimately, it has to be said that the project at hand became more academic than it was initially intended to be, which can partly be explained by the unexpected external circumstances, but certainly also be attributed to the chosen scientific proceeding. Perhaps most importantly, it has to be said that there is no empirical validation of the preceding discussion, and that the considerations remain objective to the authors.

Conclusion 8

The extent of global environmental problems and the insufficiency of top-down efforts to address them call for accelerated action and indicate a need for bottom-up initiatives. Companies take a central role in this, both due to their contribution to the anthropogenic environmental problems, and their potential to positively affect costumers and supply chains. However, companies are not able to adequately engage with sustainable development as isolated individuals. Thus, inter-organisational collaboration becomes essential to ensure sustainable development on a societal level. Based on this, an online platform aimed at ICSD is proposed. There is clear evidence that the inclusion of stakeholder challenges and needs are essential to designing appropriate solutions. The literature indicates potentials for utilising online networks and platforms to foster innovation for sustainability, but the authors lack entrepreneurial experience. To address the limited literature in this field and lack of entrepreneurial experience, the following research question was taken as point of departure for inquiry:

Employing problem based research and drawing on stakeholder experience, how could the online platform be designed to facilitate inter-organisational collaboration and contribute to sustainable development on a societal level?

In order to establish the novelty of the business idea and how it would differ from existing services, similar concepts were examined. This included online platforms focused on sustainability and business networks. While each of these networks differed from one another and had its own distinct characteristics, there were two overall groupings to be observed. One includes those organisations that focus on sharing information and knowledge about sustainability through the means of online based tools such as websites, forums, and Facebook groups. The other entails all those that focus on networking, which takes place through physical meetings, workshops, or conferences. The business idea at hand differs from these groupings in so far, as that it aims to combine the networking aspects with online means to do so.

When examining the empirical data through the lens of virtual embeddedness, it became evident that sustainability as an industry paradigm holds potential to induce high levels of industry dynamism and increase the severity of exchange related challenges. These circumstances indicated the appropriateness of introducing virtually embedded ties to increase organisational performance and mitigate some of the shortcomings that arise from relying on extant socially embedded ties. Thus, it could be concluded that an online platform which provides a space for the establishment of virtually embedded ties holds untapped potential for facilitating ICSD.

As a result of examining the challenges and needs expressed by different stakeholders, three overall sections with several functions each were established. To address the most prominent challenges in regards to networking, namely the dependencies on time and geographical location, the section 'community' was created. This includes an online space to exchange experiences, a

match making service, and a function for so called open calls; the two latter functions aim to foster collaboration for sustainability. Another major challenge was the perceived complexity and lack of clarity of different sustainability subjects. To address this, the section 'knowledge' was created, which includes an overview over information on sustainability, easily implementable suggestions on how to begin becoming more sustainable, and example companies. These example companies have the purpose to 'tell a good story' and inspire other companies, thus potentially increasing their maturity. Lastly, concerns were raised that companies might need individual, ongoing guidance for a successful transition towards sustainability. This resulted in the section 'Guidance', which entails a screening and subsequent action plan tailored to the companies' needs and capacity based on simple principles such as the plan-do-check-act model used in ISO 14001. In summary, the business idea should entail these three aspects of community, knowledge, and guidance in order to satisfy the needs and challenges as expressed by stakeholders.

In regards to the sustainability value the business idea could create on a societal level, the discussion based on the SOI framework has shown that the major potentials for this do not lie in the platform as an innovation itself, but in the result of using it. In other words, the collaborations between organisations has potential to foster incremental as well as radical, systemic innovations that have a positive impact on the sustainable development of the ecosystem they act within, and ultimately society as a whole. In regards to this, it has to be said that the influence the platform has on such collaborations is indirect by providing a space for them to emerge. Nevertheless, there is potential for the business idea to facilitate and encourage sustainable development.

Examining the project through problem based research has influenced the idea to become more rooted in empirically obtained insights on the real world needs and challenges that different stakeholders face. Generally speaking, the methods and theories provided guidance, which to a degree mitigated the lack of experience in regards to entrepreneurial ventures. The application of the theoretical framework also helped to elucidate new insights that might otherwise have remained uncovered. In addition to this, they provided a meta perspective which helped to ensure that the value creation for sustainability did not focus solely on the potential users, but on society as a whole. Having said that, it also has to be noted that the research process has in some ways slowed down the venture process, and that the outcomes remain rather conceptual. Therefore, it can be summarised that the research perspective has given deeper insights into some rather specific aspects of the venture journey.

To answer the research question, by using scientific methods such as design thinking, interviews have revealed the needs of stakeholders in regards to becoming more sustainable to be rather diverse. By covering the three sections and their respective features described above, the online platform has the potential to mitigate some of these challenges. Most important in this is the comparatively high accessibility to information and collaboration opportunities, as opposed to physical networks. Yet, there are some functions that an online platform cannot replace, and ultimately it can be concluded that, in order to facilitate sustainable development that entails society as a whole, a combination of a physical network and the online platform would be beneficial.

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Annex A: Interviewguide

Introduction

We are studying Environmental management and sustainability and want to investigate the challenges and needs of companies working to become more sustainable. This is all in pursuit of developing a business idea focused on inter-organisational collaboration for sustainability. We would like to do an initial interview, which will serve as a foundation for future meetings and workshops to ensure that the needs and challenges experienced by companies will take part in shaping the business idea.

1. Potential user of the platfrom

- How does your company understand sustainability // what do you think sustainability is?
- Is there an environmental department or person of responsibility in your company?
- What experience do you have with sustainability?
- What efforts are you currently making at the moment to become more sustainable?
    - Environmental policy, CSR, sustainable business model etc.?
- Do you have an interest in increasing your efforts in becoming greener?
    - If so, why?
    - If not why?
    - Do you have a plan for how to increase?
- What has been your biggest challenges in becoming more sustainable?
- What do you expect to be the challenges in becoming more sustainable?
- What is the process of implementing something green in your company?
    - Who starts it?
    - What is the motivation?
- If you were to get help to become more sustainable, what type of help would you prefer?
- Are you a member of any type of business network
    - If so does it have a specific focus on green initiatives or sustainability?
    - How does it work?
    - What has been the benefits of your current network?
    - Is there any problems or things that you would like to change in your current network to improve it?
- Are you currently collaborating with other companies to pursue sustainability?’
    - What are the benefits and challenges?
- Introducing the business idea briefly to see how it fits with the company:
    - What kind of benefits do you see from this idea?
    - What complications/limitations does it have with respect to your company?
    - Would you be interested in joining such a network - why/why not?
    - Do you have any additional service that would be interesting to you?

2. Companies engaged with sustainability

- How does your company understand sustainability ?
- What kind of sustainability efforts are you pursuing at the moment?
- What have your experiences and challenges been in this regard?
- What are your current way of reaching out to potential customers?
- What is your biggest challenges in acquiring new customers?
- Are you currently a member of any business network?
    - Why/why not?
    - Do you have an interest in joining a business network?
    - How does it work?
    - Does it have a focus on sustainability and how?
    - What are the benefits of your current network?
    - Is there any problems or things that you would like to change in your current network to improve it?

- Are you currently collaborating with other companies or organisations to pursue sustainability?
    - What are the benefits and challenges?
- How were your current partnerships established?

- If you were to expand your customer basis/partnerships what kind of help would you prefer?
- Introduce our idea briefly to see how it fits with the company
    - What kind of benefits do you see from this idea?
    - What complications/limitations does it have with respect to your company?
    - Would you be interested in joining such a network - why/why not?
    - Do you have any additional service that would be interesting to you?

3. Business networks and similar services working to facilitate sustainability

- How does your organisation understand sustainability
- Can you describe the nature and purpose of your organisation/network?
- Can you describe the process of establishing your current organisation/network?
- What services do you offer to your members?
- What are the challenges in attaining new members/customers?
- What are the challenges your members/customers face when engaging with sustainability?
- Do you ensure the facilitation of collaboration amongst members?

    - How is this done?
    - What are the challenges and strengths tied to collaboration amongst members?
- What are your key challenges as a network/organisation?
    - What are your key successes / strengths?
- What are the challenges in working with sustainability in a business context according to you?
- If you were to expand the network/company what would be your prefered way?
- Are you current using online/digital services in your organisation/network?
- Introduce our idea briefly to see how it fits with the company/network?
    - What kind of benefits do you see from this idea?
    - What complications/limitations does it have with respect to your company?
    - Would you be interested in joining such a network - why/why not?
    - Do you have any additional service that would be interesting to you?
    - Do you have any advice you would like to share?

Annex B

Interviews, Audio Files, external upload

Annex C

Thematisation of Interviews, Excel Files , external upload