

THE ROADMAP TO ECOSYSTEM VALUE CREATION

MASTERS THESIS

STRATEGIC DESIGN AND ENTREPRENEURSHIP

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Abstract

As requirements for sustainability in products are defined by governmental initiatives like the UN SDGs and the danish climate agreement, the accommodation of these are met by adopting a circular business model for organisations working with upcycling. In order to sustainably create value for their customers, organisations need to consider sustainability socially, environmentally and economically. For the organisations in the upcycling food byproducts community value creation for their organisations happen internally, however knowledge is shared and collected through network activities. Network activities are thus a way for these organisations to fill in the gaps when innovating for their customers. As this thesis researches how knowledge creation can be facilitated in collaborations to increase value creation for organisations in the upcycling food byproducts community, the framework for facilitation is the Ecosystem Pie Model created by Talmar et al. (2020). Conducting a multi-case-study approach for this research, a pragmatic stance is taken to illuminate the underdeveloped field of scaling up organisations in a circular economy.

Initially a general understanding of the mechanisms of knowledge creation in the upcycling food byproducts community is established. This was done to be able to consider what effect a facilitated structure of the Ecosystem Pie Model has on value creation when collaborating towards materializing a shared goal or value proposition. Evaluating this facilitation, five overarching parameters were found to have influence on value creation when establishing an *innovation ecosystem*; *ecosystem strategy*, *facilitator*, *customer centrism*, *knowledge diversity* and *knowledge conversion*. Although these parameters were found to have influence on value creation in innovation ecosystems, underlying mechanisms constructed general elements that must be considered chronologically in order to access the value of an innovation ecosystem. These elements are; *circular business model*, *alignment of community purpose*, *the ecosystem value proposition*, *structure* and *risk*. In order to unlock the value creation an ecosystem offers, the Ecosystem Pie Model is a tool for facilitating the process of fulfilling the elements that generate the parameters which contribute to value creation in an innovation ecosystem.

Introduction

Problem definition

The European Union generates around 88 million tonnes of food waste annually, associated with an estimated cost of 143 billion euros. The topic on food waste poses both as an ethical, economic and environmental issue, where limited natural resources are being depleted. The urgency in the reduction of food waste is thus represented in the United Nations' Sustainable Development Goals as goal 12.3 (UNEP, 2021). The production of food contributes to 8% of the Global Greenhouse Gas Emissions in relation to climate change. More so, water as a scarce resource plays a significant role in the food production process, where 40% of annual water use in Europe is related to agricultural production (EEA, 2019). This percentage places emphasis on the need to consider the natural resources encapsulated in food waste. When discussing ethics, the unfathomable amount of food waste can be measured against the battle towards eradicating hunger and ensuring nutritious food for all. Within the European context, data shows that 33 million people cannot afford maintaining a nutritious diet (European Commission, 2021). Thus the concept of food waste presents itself as a dynamic global challenge and the SDGs are set to be met by all actors in the food system.

The motivation behind investigating food waste as a challenge, was informed by a primary interest in mimicking natural cycles within the business sector, as an approach to addressing the challenges at hand. The concept of circularity in business models speaks into establishing a structure to enable the value of a natural resource to be realised beyond its primary intended use, by serving as a raw material for new products of materials (BlackSatino, 2021). This concept can be referenced to natural cycles where in nature, circularity happens naturally in the sense that nature generates no waste (Zero Waste Europe, 2013). Cycles in nature facilitate the use and regeneration of all natural resources which is an essential part of a circular economy. An additional motivation lies within the idea of applying the biological concept of ecosystems as a model for organising a businesses activities. Ecosystems in the realm of business speaks into the

notion that a business forms strategic partnerships, in which they can mutually co-evolve capabilities around realising a focal value proposition (Adner, 2017). This concept draws from ecosystems in nature, where living organisms interact in service of enabling their existence, and maintaining and increasing quality of life. Circular business models and business ecosystems are explored as concepts that can enable the reduction of food waste by playing an interdependent part of a society.

Problem statement

The scope of the thesis research seeks to learn more about the aspects influencing the acceleration of circular business startups in the food industry. The research rests on a hypothesis that the engagement between organisations related to upcycling food byproducts, holds more capacity for value creation than the value created by individual organisations by themselves. The scope adopts the concept of ecosystems as structure for investigating the parameters of joint value creation. More specifically the scope is inspired by the suggestion of areas of further development in the book *Innovation in Food Ecosystems* by De Bernardi and Azucar (2020). From the book, the scope aims to firstly unravel the structural changes necessary within the organisations to enable them to form an innovation ecosystem that accelerates entrepreneurial activity (De Bernardi & Azucar, 2020, p. 83). Secondly the research seeks to understand what subjects hold stake in enabling structural shifts and engagement of institutions and organisations. Additionally, how these subjects determine the degree of empowerment organisations feel in adapting to new institutions and in determining the fertility of a context for an ecosystem (De Bernardi & Azucar 2020, p. 83). Thus the research aims to understand the structural dynamics and subjects at hand in enabling the emergence of an innovation ecosystem within the food sector.

The overarching field of research lies within innovation ecosystems as a vehicle for driving the establishment of an emerging industry and accelerating its value. The investigation focuses on entrepreneurial activity in circular business model innovation (both new -and expanding businesses), as a novel concept that poses multiple challenges and opportunities for development. More so, the structure of circular

business models requires the formation of co-existing partnerships in the process of optimising the circulation of a resource. Thus the innovation ecosystem presents a strategic approach to building multilateral partnerships to facilitate the realisation of complex innovation such as circulating resources. Through investigating ecosystems as a structure, the study seeks to create answers to new questions in an ever-changing market. New questions encompass understanding what innovation companies need to align around to facilitate joint value, as well as the open questions that arise from forming the multilateral partnerships. Thus the scope of the research seeks to investigate the strategic aspects that influence the formation of an ecosystem, to generate joint value creation.

Research question

How does knowledge creation as related to the value chains of companies in the upcycling food byproducts community influence what parameters contribute to value creation in innovation ecosystems?

Subquestion 1: How are network activities used to create knowledge in companies working with upcycling of byproducts?

Subquestion 2: How can an ecosystem be used as a method for strategic innovation?

Subquestion 3: What parameters have an influence on value creation in an ecosystem?

Delimitation

The scope of the research has been limited to the geographical context of Denmark. This means that all the field research that takes place has been conducted within companies that play an active role in realising circular business models that upcycle food byproducts within the Danish market. This decision was made due to the time limit of the research and to ensure an in-depth investigation within this scope. Furthermore, this decision was also based on the predetermined wish to conduct research that would contribute to realising local impact. Additionally, the scope has further been limited to

the food sector, where the study conducted is on launching upcycling food byproducts as a new product category. Investigating food systems stems as a personal choice where both researchers of the thesis hold a personal interest in growing their knowledge within food systems and explore future opportunities for value creation. Within the circularity agenda, Denmark has outlined a strategy to accelerate circularity within the food agenda, where 15 initiatives will work in close collaboration with a focus on the utilization of resources (Food Nation, 2021). Thus the thesis scope is limited to studying companies facilitating the process of upcycling of natural resources and reducing food waste in Denmark.

Concept definitions

The following section aims to define the terms used in the research question and clarify how these terms relate to one another.

Value creation

Seeing individuals as heterogeneous with nested social -and learning aspects, knowledge is created by individuals interacting with other heterogeneous individuals (Felin & Hesterly, 2007, p. 212). Perceiving knowledge as the value creating element Felin & Hesterly (2007) defined individuals as the owner of knowledge and the locus for value creation activities through interaction. Value creation is thus the incorporation of new knowledge acquired through employment or network activities.

Organizational knowledge creation

As well as Felin & Hesterly (2007), Nonaka et al. (2006) acknowledges that knowledge lies with the heterogeneous individual (p. 1181). Knowledge transaction and creation is then embedded in the transmissive actions between individuals. The knowledge layer of the organisation is defined by the corporate vision which alongside organisational culture provides the knowledge base for individuals tacit knowledge to fit into (Nonaka et al., 2006, p. 1183). The creation of new knowledge in an organisation is thus guided by the corporate vision and defined as the transaction of knowledge between individuals, to be incorporated into the organisation's culture.

Value chain

The activities provided by an organisation in the production of a product or a service, are incorporated in Porter's (1985) value chain model. The model incorporates primary activities and supporting activities that together build up the value of a product, which initially accumulates to represent the value a customer wishes to pay for the product. The value chain plays the part of showing what elements/processes contribute value to the consumer.

Byproduct

In conventional production organisations, resources have the purpose to produce a certain product, where the excess of resources are wasted to trash, pollution or emission which lead to many other potential costly impacts (EMF, 2021B). The excess resources not incorporated in the primary product are defined as the byproduct.

Upcycling

As linear productions aim to refine certain resources into a product, byproducts are often wasted (De Bernardi & Azucar, 2020, p. 5). The process of reusing wasted resources is divided into three levels (elaborated below), where quality and functionality is the variable. Increasing the quality and functionality of a wasted resource, is categorised as upcycling.

Ecosystem

Following the definition by Adner (2017), ecosystems in this thesis, are defined as: "the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize" (Adner, 2017, p. 40). This definition incorporates the aspect of alignment and interaction between partners, which was defined earlier by Felin & Hesterly (2007) as the platform for value creation.

Innovation ecosystems

Contributing to innovation, ecosystems are used as the structure for materializing complex innovations that cannot be materialized by one organisation alone. Adner

(2006) defined innovation ecosystems as “ the collaborative arrangements through which firms combine their individual offerings into a coherent, customer-facing solution” (Adner, 2006, p. 98). The purpose of an innovation ecosystem is to generate value for all participants that could not have been achieved single-handed (De Bernardi & Azucar, 2020, p. 75).

Community

The element of community is used to cover the connection of organisations aiming to reach the same goal, and is defined as: “people who are considered as a unit because of their common interests, social group, or nationality” (Cambridge dictionary, 2021)

Upcycling food byproducts community

Based on the previous definitions, the community of organisations working with upcycling byproducts from the food industry, is used as a general term encapsulating all organisations on the dansih market who fall under this category and have circular business models. The purpose of using this term to describe all organisations within this area of interest, is to remind the reader that this thesis aims to contribute with findings that are valid for these organisations, regardless of their representation in the empirical dataset.

Ecosystem Pie Model

The Ecosystem Pie Model (hereafter EPM) was constructed by Talmar et al. (2020) and is used as a key tool to both structure the two workshops conducted in relation to this thesis, and as a benchmark for measuring the process of value creation between organisations. The EPM takes the role as a normative framework aiming to structure interdependent collaboration between actors, and builds on Adner’s (2006+2017) definition of the ecosystem. Using the EPM as a framework throughout this thesis has the purpose of tying together our arguments and increasing the validity of our results. These two elements of purpose will be elaborated further in the methodology -and the theory section.

Ecosystem Value Proposition

A key element of the EPM is the focus of materialization of a value proposition, which was defined in the previous section by Adner (2017). The Ecosystem Value Proposition (hereafter EVP) is defined as “a system-level goal in the form of a coherent customer-oriented solution [...] which represents an overarching offering by the supply-side agents in the ecosystem corresponding to an (assumed) need and/or a desire of the end user” (Talmar et al. 2020, p. 3). The EVP will, throughout this thesis, define that goal a community (or an organisation) wish to materialize.

Table 1: overview of workshop participants

Organisation	Description	Abbreviation
<i>Knowledge platform</i>	A danish entrepreneur who in 2008 started a consultancy company working with incorporating sustainability in PR, communication and project development. In 2020 was a festival about sustainability in the food industry launched. The festival aims to include all stakeholders in the food industry and be a platform for sustainability initiatives related to all aspects of the industry.	KP
<i>Circular Coffee Community, Owner, Coffee Supplier</i>	The largest importer of organic coffee in the European Union and one of the oldest coffee suppliers on the danish market. The company launched a sustainability initiative in 2020 to create a platform for exploiting the possibilities of the waste that the coffee industry creates.	CCC-OCS
<i>Circular Coffee Community, Coffee User</i>	One of the largest art museums in Denmark and a big user of coffee to customers through their café. The museum is a part of Circular Coffee Community.	CCC-CU

Organisation	Description	Abbreviation
<i>Circular Coffee Community, Upcycling - Edible 1</i>	A Copenhagen based initiative to use spend coffee grounds in a production facility of mushrooms. The business collects coffee grounds from large companies and grows mushrooms which are sold to restaurants. The company is part of Circular Coffee Community.	CCC-UE1
<i>Circular Coffee Community, Upcycling - Edible 2</i>	An Århus based initiative to use spend coffee grounds in a production facility of mushrooms. The business collects coffee grounds from large companies and grows mushrooms which are sold to restaurants. The company is part of Circular Coffee Community.	CCC-UE2
<i>Circular Coffee Community, Upcycling - Non Edible 1</i>	The company is exploring the potential of coffee grounds on a broader scale where both edible and non-edible products has been launched on the market. The company is part of Circular Coffee Community.	CCC-UN1
<i>Circular Coffee Community, Upcycling - Non Edible 2</i>	An organisation who has introduced coffee grounds into the technology of 3D printing. The company is part of Circular Coffee Community.	CCC-UN2
<i>Circular Coffee Community, Byproduct user</i>	Exploring the potential of the byproducts in the coffee industry, this company has found that not only coffee grounds are wasted. The company produces alcoholic beverages infused with coffee leaves. The company is part of Circular Coffee Community.	CCC-BPU
<i>Circular Coffee Community, Branding Agency</i>	The company works with Communication Strategy, Concept Development and Content Marketing. The company is part of Circular Coffee Community.	CCC-BA

Organisation	Description	Abbreviation
<i>Circulating Grain, Grain Supplier</i>	A DTU based initiative exploring the possibilities of using all byproducts in their own production of beer.	CG-GS
<i>Circulating Grain, Upcycling - Edible</i>	A Copenhagen based company working with byproducts from beer production, which is upcycled in a variety of products branded as nutritious.	CG-UE

Macro environment

Combining knowledge will turn challenges into opportunities by approaching systemic challenges in collaborating communities, with the emphasis on social -, environmental -and economic impact (De Bernardi & Azucar, 2020, p. ix). The current food system in Denmark is primarily driven by organisations with linear business models, where take-make-dispose is a popular approach for using resources. Reconfiguring the food system into a circular economy approach creates “an opportunity to balance environmental, social, and economic goals while simultaneously guiding human activities to a path toward sustainability” (De Bernardi & Azucar, 2020, p. 15). The perspective of this thesis approaches the opportunities of this reconfiguration, where the organisations of the dataset have individually approached this change themselves. Their incentive for transforming towards a circular economy is for 38,9% of respondents to reduce waste, according to the questionnaire conducted in relation to this thesis (Questionnaire - replies, p. 118). This incentive indicates a perspective of environmental value creation, whilst creating a business case around a societal challenge.

Creating a benchmark for the movement towards sustainability in all varieties of social -, environmental -and economic, the United Nations’ Sustainable Development Goals (hereafter UN SDGs) aim to “promote prosperity while protecting the planet” (De Bernardi & Azucar, 2020, p. 6). The signing of the UN SDGs by 196 countries makes the goals international standards for incorporating sustainability in a broad variety of initiatives to change the general approach towards sustainable actions. Connecting

prosperity with protecting the planet aligns again with the environmental, social, and economic parameters that are incorporated in Elkington's (1994) triple bottom line. The triple bottom line incorporates the aspects of sustainability into the business model and measures the impact the organisation has on societal challenges. Using the UN SDGs as a point of reference in this thesis, relates sustainability initiatives from the organisations working with upcycling of food byproducts to the international aim for incorporating sustainability as a natural aspect of all initiatives in the world of the future.

Introducing a national climate agreement in 2020, the danish government aimed to lower the emission of greenhouse gasses by 70% before 2030, which requires a collaborative incentive from both public and private organisations (KEFM, 2020). Enforcing the global initiatives towards sustainability, the danish government aims to put Denmark on the sustainability map to lead the way towards incorporating both the UN SDGs and the requirements of the Paris Agreement (UNFCCC, 2021). Formalizing steps for what responsibilities public and private organisations carry in reducing greenhouse gasses, danish organisations are presented a framework for how the requirements for future organisations look. As the main focus of this thesis is on organisations working with upcycling, the requirements defined by the danish government are not only met, but new standards for exploiting food wasted resources are made (Initial interview, KP, 00:29). Establishing their business models on circular economy, the organisations in the upcycling food byproducts community aim to create standards in an industry not yet established. Perceiving the governmental requirements as benchmarks the organisations in the empirical dataset aim to actively create a change in line with the societal expectations as well as incorporating a triple bottom line.

Since organisations increasingly are required to not only create value for customers, the requirement for responsible research and innovation is a method for managing boundaries between knowledge and practice to enhance legitimacy in society (De Bernardi & Azucar, 2020, p. 151). Living up to requirements from governmental institutions is a necessity to gain access to a market. Since sustainability aspects are increasingly being added to these requirements, organisations need to adapt to these in order to practice their activities. As customers increasingly demand sustainability to

be incorporated in the businesses they buy from, businesses need to fulfill these demands in order to gain legitimization from their user segment (De Bernardi & Azucar, 2020, p. 151). Organisations can try to gain legitimacy in a variety of ways, however the main concern is whether they live up to what they promise. Decoupling from promises are made towards sustainability initiatives are defined as greenwashing, which will be developed further in the case description. Organisations in the empirical dataset aim to gain legitimization by providing sustainability through launching upcycled products on the market. Introducing a new product category is challenging for all organisations, however collaboration between organisations containing complementary knowledge creates a possibility for increasing relevance into an innovation.

Case description

What is upcycling

Playing a consistent part throughout this thesis, the concept of upcycling describes the process of reusing a resource as well as recycling and down-cycling (Board of innovation, 2021). However, the three concepts are related to the process of circulating resources to lower waste in production and acknowledge the value of non-exploited resources, which are some of the key concepts of circular economy (EMF, 2021A). Relating the definition of what typology to use when defining the process of reusing a resource, Ellen MacArthur Foundation (2013) defined the variable of quality to indicate which term to describe the process: relative to the previous use of a resource, if the quality is lower in a reused context the terminology 'down-cycling' is used. If the quality and function is maintained in the resource, the terminology 'recycling' is used. Lastly, if the quality is higher with increased functionality, the process is defined as 'upcycling' (EMF, 2013, p. 25). Throughout this thesis the empirical data from two workshops has been focusing on the process of upcycling. One workshop focusing on the upcycling processes of coffee grounds, and another focusing on spent grain from beer production.

Putting a focus on the process of upcycling in this thesis, an underlying reference is made to the change from linear business models to circular business models. In line with the key concepts presented by Ellen MacArthur Foundation, circular economy focuses on value creation in a variety of contexts, alongside monetary (EMF, 2021A). Pivoting around value creation, the concept of upcycling relates naturally to this process. As down-cycling and recycling diminishes or preserves quality in a resource, value is added or maintained, however, the process of upcycling focuses deliberately on the process of value creation (De Bernardi & Azucar, 2020, p. 20). Constructing a research around the upcycling process of food byproduct and its value creation, sets a focus on a smaller industry, which primarily exists of relatively young companies and startups and few established organisations. Whether or not these organisations have constructed their business models around circular economy, or they have adapted into it later, the quantity of organisations upcycling is relatively low, which was indicated in an initial talk with an organisation working within the upcycling food byproducts community. Regardless of the size of this industry - or perhaps because of it, a lot of the organisations knew each other either peripherally or were actually collaborating prior to this thesis.

The purpose of networks

Facing challenges and production alone in a modern and globalised society seems impossible, where interplays supporting production, planning, and so on is by far more the rule than the exception. As a concept network is used to describe the social interaction with other people, the use of network activities in relation to businesses, incorporates a possibility for contextualizing the business with its external environment (De Bernardi & Azucar, 2020, p. 9). The use of networks was seen to be an important tool for the organisations in the upcycling of food byproducts community. Using the possibilities of networks for exchanging knowledge, resources and connectivity is an aspect that is increasingly relevant in a society requiring the incorporation of circularity in businesses. To the organisation in the empirical dataset networking was an essential tool to achieve knowledge and resources that were not present in the organisation itself. For KP, networking is the main part of the business model, and connecting organisations

creates a platform for knowledge creation, for the benefit of all involved (initial interview, KP, 00:29).

Applying the network perspectives to the concept of circular economy, is merely a given, however, adopting a circular business model requires interaction with other companies possessing the byproducts for upcycling. Increasing collaboration with stakeholders is a way to achieve alignment in adopting a circular business model which is increasingly necessary due to the growing interdependence between businesses (De Bernardi & Azucar, 2020, p. 16). This approach is an essential part of several organisations' ways of gaining more control and lower risk in collaborating with other organisations (Initial interview, CCC-UE1, 12:01). Besides stakeholder management, the organisations in the dataset often use their networks for business development, finding employees and gathering knowledge for innovating. The organisations in the empirical dataset were thus seen to utilize the possibilities of network mechanisms for their own value creation.

What is Circular Coffee Community

A key stakeholder to this thesis, and an organisation represented throughout the empirical dataset is CCC-OCS. As CCC-OCS chose to exploit the amount of unused resources in the use of their product, they saw the need for incorporating a circular business model to facilitate better conditions for exploiting resources. Reviewing their business CCC-OCS perceived coffee production as wasteless, however the truth was discovered to be different: "In many years, we've been saying that we didn't have any waste. But we have a lot of waste. I mean, 99% of what we have in our hands is waste" (Initial interview, CCC-OCS, 52:05). Since only 1% of the coffee bean is used when brewing coffee, both nutritional benefits and fibers were left to be exploited in the coffee grounds. CCC-OCS saw this as an opportunity: "now we've been making a business for more than 100 years, using less than 1% of what we have in our hands. We saw this as a strong potential for growing a business that would be more profitable to us [and] more profitable to farmers" (Initial interview, CCC-OCS, 06:43).

Creating a community around the exploitation of the 99% of unused resources, CCC-OCS invited organisations working with upcycling of coffee grounds to join their community Circular Coffee Community (Hereafter CCC): “we’re reaching out our hands to kind of invite everybody, who shares our vision of becoming circular [...] we have a feeling also that there are so many stakeholders that share this mission and wants to work with us in it” (Initial interview, CCC-OCS, 06:43). Even though the community only started in august 2020, they have attracted 14 members working only towards exploiting the coffee plant for its full potential (Circular Coffee Community, 2021). Plans for the community were ambitious to increase interactions to facilitate collaboration, however the CoViD-19 Pandemic has challenged this: “we have had one event, I mean, we had plans to do much more, but then we had this pandemic situation. And so in the end, what we managed to do in 2020, was that we had an opening event together with KP” (Initial interview, CCC-OCS, 14:30). The initiative of the community was thus established and planned to become more than it is today, however, ambitions for collaboration between participants are high.

Constructing a second community

The formation of the second workshop emerged from the interaction with KP in the initial data collection process. Aiming to find a group of organisations who centered around the same resource, several organisations worked with upcycling grain. These were both found in the questionnaire and through the network of KP. The initiative for establishing the workshop with a focus on grain was taken by us, and the organisations were invited to participate with the promise of exploring the same structure and an alike EVP as the previous workshop. Initially 6 organisations accepted this invitation, who would play a diverse set of actors in a second workshop. Constructing a group of organisations working with upcycling grain from beer production was established, however, three organisations backed out last minute due to a busy work schedule, which left the second workshop with three participants. Constructing a second workshop around the process of upcycling grain, the organisations were familiar with each other since the field of work was very limited. Two of the organisations, CG-UE and KP, were thought to be involved in each other's initiatives, since CG-UE saw potential in being

represented on KP's platform (Evaluating interview, CG-UE, 01:37). The potential of the second community was thought to incorporate a unit for controlling the elements measured in the first workshop.

Gaining access and conducting a workshop

Initially getting in contact with CCC-OCS through a member of their network, KP, the organisation was approached and used in conducting an initial interview (Initial interview, CCC-OCS). A good connection between the interview person and KP contributed to an access to CCC-OCS and his newly established network (Circular Coffee Community, 2021). Planning a workshop with the access to an established network, or community, contributed with the possibilities of testing a variety of parameters present in an ecosystem: ecosystem strategy, facilitator, customer centricism, knowledge diversity and knowledge conversion. The opportunity of testing all parameters defined as establishing an ecosystem in one workshop, created the possibility of further testing the interaction of these parameters.

For the second workshop, the same five parameters were measured in order to control the findings in the first workshop and check how these played out under different circumstances. The participants of the second workshop were called individually and invited to take part in the workshop for the benefit of the thesis, but also to provide insights into the concept of an ecosystem, for themselves. Several participants said yes, due to the presentation of CG-UE as another participant, however, the aforementioned challenges made some of them cancel eventually. Both workshops were alike in construction and followed the framework of the EPM presented by Talmar et al. (2020). The framework presents the benefits of an ecosystem and the elements it requires for facilitating co-creation in a model for interdependent materialisation of a shared value proposition (or goal) (Talmar et al., 2020, p. 1). As the initial interviews, and a questionnaire supporting the findings, illuminated that a shared goal in the upcycling community is related to the exploitation of a specific resource and its relation to organisations' individual value chains, the EVP took a basis in this.

The structure of the thesis

The structure of this thesis is based on the aforementioned research question, where the setting of the macro environment contextualizes the relevance of this research. To include the reader in the process of the construction of this thesis, the methodological section explains the approaches and decisions made in order to create a relevant result for both stakeholders and academia. In order to support the thesis the dataset represents four initial qualitative interviews, a questionnaire, two workshops and six evaluating interviews (See appendix 2 for research design, p. 5). The theory section describes the application of the literature used to structure and support the thesis and the processing of the dataset. Taking a pragmatic stance in the development of this thesis has been an approach for developing a relevance in the research, since the application of co-creation and circular business models still are underexposed research fields (De Bernardi & Azucar, 2020, p. 83).

To structure the analysis of the thesis, three sub questions had been defined, to each analyse an element leading to answering the research question in full. The purpose of the first sub question is to establish the applied network activities with organisations working with upcycling. The second sub question aims to answer the implications of using the mechanisms of an ecosystem in the context of the two workshops. Lastly, the third sub question aims to investigate the main parameters in an ecosystem and how they each create value when being fulfilled. The analysis is thus divided into three sections, where the first section establishes knowledge creation in general for all organisations working with upcycling. In the second and third sub question, the two workshops are analysed individually to investigate how the setting in each has affected the value creation in relation to the five parameters. Following this, the findings in the analysis in relation to the five parameters are discussed to establish what elements should be in place to create value in an ecosystem. Finally, a conclusion rounds off the thesis and provides an answer to the defined research question.

Analysis

Subquestion 1: How are network activities used to create knowledge in companies working with upcycling of byproducts?

	Circular business models
	Knowledge value
	Knowledge practices
	Knowledge creation

Subquestion 2: How can an ecosystem be used as a method for strategic innovation?

Coffee workshop	Grain workshop	
		Ecosystems in general
		Innovation ecosystem
		Ecosystem Pie Model

Subquestion 3: What parameters have an influence on value creation in an ecosystem?

		Ecosystem Strategy
		Facilitator
		Customer centrisms
		Knowledge diversity
		Knowledge conversion

Figure 1: Visualisation of the analysis

Methodology

Philosophy of science

As this thesis builds on the foundations of the pragmatic stance, the ontological view of the world sits somewhere in between realism and constructivism, which means that the focus will be on viewing practical consequences in specific contexts (Saunders & Thornhill, 2019, p. 150). Using the pragmatist research philosophical position to analyse the previous defined research question, the focus is put on the individual and its actions in certain contexts: it is, in other words, incorporating an individual's experiences and practices (Saunders & Thornhill, 2019, p. 144). Putting the individual in the center and viewing truth as subjective, the ontological position between realism and constructivism perceives truth as "the end of infinite inquiry" (Margolis, 2012, p. 93). This infinite inquiry is the answer to the research question that provides the most useful, likely and trustworthy truth in a given situation, with the information that is available at the specific point in time the results are defined. Using the pragmatic philosophy of science has contributed to an iterative approach towards the research and continuous adaptation of the research scope to increase relevance between the research and the data gathered. The pragmatic stance thus plays an important part in determining which results are being presented in this thesis and how their validity is perceived.

Using the pragmatic stance to perceive the challenges in the field and understand the approaches to collective value creation with upcycling companies, takes a fallibilistic position towards subjective data as a "picture" of the current situation (Margolis, 2012, p. 82). The fallibilist viewpoint of the pragmatic stance takes a critical approach to subjective data, where truths are seen as emerging and dynamic instead of static and final - ergo pictures of a certain situation. This way of using the pragmatic research philosophy's epistemological approach of finding practical meaning in practices is a way of making context specific problem solving (Saunders & Thornhill, 2019, p. 144). Taking a pragmatic stance in this thesis, thus helps to understand the complexities and the underlying flux of practices in an underexposed research field. Using this approach,

results cannot be predicted and are by the end of this thesis, the most relevant truth possible at this specific time.

Research design

To collect data that could help answering the defined research question, a contextualisation of the different aspects that appeared throughout the initial research, was done by continuously measuring the research question against our findings. The initial research was based on secondary data collection and literature research in order to define the scope of the thesis and the field of research and narrowing down from that. Taking an abductive approach to the research design is a key element of the pragmatic paradigm and is defined by its iterative way of defining the scope of the research question by revisiting collected data and literature continuously (Saunders & Thornhill, 2019, p. 155). The abductive approach has been important to narrow down the research field and find the essence of the research scope before defining the final research question.

Researching value creation by knowledge sharing in ecosystems, with a focus on upcycling companies is a relatively new approach to organisational management, which means that little literature is available for the coverage of all aspects of the research. Following the pragmatic stance, a continuous fallibilistic approach was taken towards the research question and the research design in order to integrate the abductive process fully and iterate the research direction to follow the direction of the data. This approach has especially been used in the first stage of the data collection where four exploratory interviews were made with two companies facilitating sustainability in organisations and two upcycling companies. The data collected in this stage created the basis for a quantitative survey distributed through the network that was established in the initial interviews. A qualification of the iterated hypotheses in this early stage, created the foundation for the further data collection for this thesis, which was in line with the fallibilistic approach. To investigate the defined research question, two separate workshops were conducted with two separate explorations of potential ecosystems working with upcycling; one was previously established (coffee workshop), and one was

established in the context of the thesis (grain workshop). Both workshops were evaluated with participants from each in a 20-minute long semi structured interview. However, the mixed method approach was used to validate data, in order to increase quality in data (Silverman, 2014). This will be further developed in the 'Reflections over research design'-section.

Qualitative data

Interviews were used to collect data for further research. Initially, four participants representing companies upcycling food byproducts and food system sustainability were interviewed to establish a general understanding of the upcycling of food byproducts community in Denmark and to gain details of their experience in the operational everyday activities of their business. The initial interviews held were themed around incentives, challenges and knowledge practices behind their business models. The initial interviews lasted between 34 and 58 minutes and aimed to explore the themes; business model, ecosystem and circular economy with the two upcycling companies, and; value proposition, network purpose and network opportunities with the two companies working with communication. As Brinkmann and Kvale (2015) presented interviews as a qualitative research method attempting to understand the world from the subjects' point of view, with the intention of uncovering their lived experience, the interviews were used to understand incentives for collaborating with other companies in different ways. The initial interviews established the first dataset that informed the research on participants' view of upcycling of food byproducts.

The initial interviews and the evaluating interviews later in research were conducted through a semi structured approach. A semi structured approach refers to a method focusing on the subjects' experience, aimed at letting the subject describe as freely as possible, with little presumptions (Brinkmann and Kvale, 2015, p. 29). The initial interviews were set up in the form of a narrative style to capture individuals' meaning and knowledge (Brinkmann and Kvale, 2015, p. 179). In the initial interviews, participants recalled their accounts and made meaning of upcycling of food byproducts, through semi structured questioning. In the evaluation interviews, participants revisited their

experiences from participating in the workshops as well as key takeaways through semi structured questioning too. Conducting semi structured interviews through *narrative* enables the collection of data that not only encompasses facts but captures the underlying motives that are not made explicit. For increasing the exploration about specific opinions elaborating questions were used, and for confirmation viewpoint either repeating answers or challenging questions were asked.

Quantitative data

In order to qualify the hypotheses created from the initial qualitative interviews, in the following empirical data collection, a quantitative method was used in a questionnaire focused on companies upcycling food byproducts (See appendix 12, p. 113 for the full survey). The purpose of the questionnaire was to achieve responses about the upcycling byproduct companies and their challenges at a larger volume. Conducting a questionnaire for the defined group, companies working with upcycling of food byproducts, having minimal knowledge about the group has made it challenging to learn the exact number of companies fitting within this definition in Denmark. Having the 'population,' as Rowley (2014) defines it, estimated at approximately 30-40 companies when talking to entrepreneurs in upcycling companies, indicated that the sample would be less than required when conducting quantitative research (p. 317). A key method to overcome this challenge was to optimize the response rate via non-probability samples, which was an optimal approach since the sample frame was narrow (Rowley, 2014, p. 318). Using the snowball sampling method took advantage of the established network in the initial data collection process, where interviewees were asked to distribute the questionnaire. As a sample of 18 responses was achieved from the estimated 30-40 companies in the population, the response rate of approximately 50% is considered adequate when generalizing from the response sample given the type of questions asked (Rowley, 2014, p. 310).

As a characterization of the population was needed to understand the population better in order to qualify the following empirical data collection, descriptive research about the population was conducted (Rowley, 2014, p. 311). The themes of the research were

based on the four initial qualitative interviews which were analysed in order to redefine the hypotheses of the research following the abductive processes. The three topics were: 1) incentives for starting a circular business, 2) needed skills/knowledge to grow, and 3) potentials of utilizing networks. Defining sub-topics from these three themes, 18 questions were produced, where three of these questions were demographic questions and contact information. The original 15 research relevant questions were constructed to be open ended; however, answering them would have been too time consuming for the respondents, so changes were made. A new set of questions with multiple-choice answers were prototyped with a few companies before distribution to the population (Rowley, 2014, p. 316). Iterating from this piloting process made the questions clearer and the language more approachable for the respondents.

Furthermore, the multiple-choice answers were individually related to previously collected data and supported theory in order to achieve relevance with the responding organisation (Rowley, 2014, p. 314). The questionnaire was distributed via the stakeholder network established in the initial stage of the data collection process. It contained a short private note from the distributor to the receiver about the project accompanied by a short description about the thesis. When opening the questionnaire, the respondent would see another short description about the research and the importance of their contribution. The purpose of the questionnaire was thus to gather data from several organisations besides the ones included in the qualitative parts of the empirical dataset. The respondents in the questionnaire represented a larger group of organisations working in the upcycling of food byproducts community, which allowed us to increase the validity of our findings.

Workshops

Constructing a group of 4-12 participants, depending on the complexity of the topic, the use of a workshop as a research methodology connects people who are related to a given topic to fulfill participants expectations and to achieve results of interest for the research (Ørngreen & Levinsen, 2017, p. 72). The first workshop had 9 participants who had a similar approach to circular business models and upcycling, which was the focus

(See appendix 15 p. 127, for workshop structure). The participants in the workshop were chosen due to their connection to CCC and the accessibility through CCC-OCS. The second workshop had 3 participants who were contacted in order to construct a workshop around a shared topic without the participants having any prior collaboration together. The participants in the second workshop were not connected in other ways than the familiarity of each others' existence, besides some business activities between KP and CG-UE.

Two workshops were formed in the research, one focused around the value chain in the circularity of coffee and the other on the value chain in the circularity of grain. The workshops were facilitated as a discussion and had the activity of filling out the EPM (Talmar et al., 2020). The main agenda of the workshops were for participants to explore a design for an ecosystem, identify potential opportunities and gain knowledge related to the circular value chains. The participants' interactions enabled various viewpoints of the potential of establishing an ecosystem and shifts in perspectives in common understanding. Using the EPM (See description of framework in the theory section) framework of Talmar et al. (2020) as the framework of the workshops, they were structured and timed in order to incorporate all relevant elements (See appendix 15, p. 127 for workshop structure). The moderators' role in both the workshops was to facilitate discussions about specific elements of the EPM, which in relation to the framework, created discussions about value creation in an interdependent context, which created the basis for the analysis section of this thesis.

The use of workshops is seldomly a stand-alone method but is often related to previous research and serves the role of either clarifying, extending or qualifying findings (Ørngreen & Levinsen, 2017, p. 73). Relating the workshops to previously gathered data, the conversation in the workshops is thus anchored to data and the possibility for having a social constructivist perspective on the topic occurs (Ørngreen & Levinsen, 2017, p. 73). Approaching collective sense making in a workshop is directly related to the research question and the matter of 'ecosystems'. Using the initial interviews and the answers from the questionnaire, created a focused scope for the workshops, which is in line with the pragmatic stance, as an iterated approach towards the research question is

used to continuously increase relevance. The use of workshops enables the previous research to be extended in relation to knowledge creation and constructs spaces for both collective sense making and knowledge creation according to the framework applied.

Data collection

As all data was gathered digitally, the need for technological tools was essential. Since data was not gathered face to face, differences in interpretations and misunderstandings between interviewer and interviewee might have occurred. Firstly, some interviews were conducted over the phone. Collecting qualitative data over an audio call can offer advantages like speed, availability and connectivity, however disadvantages involve the lack of facial expressions and non-verbal communication (Saunders & Thornhill, 2019, p. 472). With the risk of having a lower degree of paralinguistic signals in a phone interview, the interviewer experiences more difficulty asking clarifying or elaborating questions (Saunders & Thornhill, 2019, p. 473). As for the data collection related to the thesis, interviews conducted via audio calls have been used mainly to adapt to the interviewees' schedules.

To the extent possible, interviews have been conducted via video calls through Microsoft Teams to avoid the above mentioned areas of potential misunderstandings. According to Saunders & Thornhill (2019), the use of video in qualitative data collection resembles the advantages in a physical setting; however, requirements for clear orchestration of focus groups are needed (p. 472). Following the requirements of a clear communication prior to the video call, the interviewee was secured to have the right technological tools for participating, where participants for example were asked to register to Miro (2021) before joining the workshop. The video call offered resembling conditions as a physical interaction, and appeared to be the next best thing after meeting in real life. As often as it has been possible all interviewees have been offered to participate in a video call, to increase communicational aspects and interaction. Conducting workshops via video call required us as mediators to be clear about who is being addressed, and what approach for interaction is necessary. The use of video calls

offered a best practice for interacting with organisations in relation to the thesis considering the conditions of CoViD-19 and provided an opportunity for incorporating participants from several geographical places in Denmark.

Data analysis

In order to work with the collected empirical data, the recorded interviews and workshops needed to be transcribed for the ease of the following processes. The software application Otter.ai (Otter, 2021) has been used for transcription of all interviews for this research. The software application creates a thorough transcription draft, although it must be proofread. Mistakes were corrected and names anonymised in relation to the abbreviations in the stakeholder overview (Table 1). Transcribing data is necessary for preparing the empirical data collected for analysis (Saunders & Thornhill, 2019, p. 644). All transcriptions are presented in the appendix. In order to make sense of the data, the thematic analysis approach was used and incorporates the use of detecting patterns from a large set of data in order to define relevant themes for further analysis (Saunders & Thornhill, 2019, p. 651). Identifying key themes in the empirical dataset is a starting point for the analysis, which sets focus points in the dataset and aims to minimize distortion (Saunders & Thornhill, 2019, p. 651). Saunders & Thornhill (2019) further highlights the need for being true to the philosophical assumptions in the research approach (p. 652). Thematising the empirical dataset has created a method for creating clusters of relevant aspects in which to dive, and clearly shown discrepancies between the empirical data and theory. Continuing the abductive approach has increased the relevance of the research question by continuously iterating it in relation to the data collected and the detected themes.

Categorising the themes detected in the empirical dataset with codes creates labels on paragraphs and phrases to be used explicitly or implicitly in the thesis. According to Saunders & Thornhill (2019), codes are single words or small phrases which can either be derived from terms used by interviewees, labels based on themes or derived from existing theory (p. 655). In order to increase relevance in relation to the pragmatic stance, a more deductive approach was used to relate specific paragraphs to the

theoretical framework. Topics used for coding of the initial interviews were; incentive, Who could be part of the network, What could be shared and Why is the network important. For the workshops and the evaluating interviews the topics used were; knowledge creation, ecosystems and workshops insights. Other codes have been derived directly from terms used by participants (See appendix 9, p. 102, and appendix 29, p. 297 for coding list). Applying the software application NVivo (Alfasoft, 2021) for coding the empirical dataset has offered an approachable and simple method for coding the large set of data with the same codes and made them visually approachable. An investigation of connections between codes and theory was made in the virtual whiteboard software Miro (Miro, 2021) in order to create an overview and detect connections for analysis.

Use of a multi-case study

According to Flyvbjerg (2006) case studies can be used as a method for learning about, and being an expert in the context, compared to being a novice in context independent relations (p. 221). Flyvbjerg (2006) highlights that learning about how people act cannot be theorised to be covered by one single rule, however using case studies to uncover the specific situations creates depth and relevance (p. 224). By incorporating these perspectives in this thesis, the relevance of the case study is proven to be high in the context and provide high value to the organisations incorporated in the empirical dataset. In this thesis the use of primarily qualitative data aligns with this view, and the contextualisation of organisations through the two workshops exemplifies the depth that these two scholars advocate for. The purpose behind choosing a multi-case study was the aim to test the findings from the first workshop, and increase validity in the data to insure relevance of the research. Generalizing from this multi-case study, is according to Yin (2014) an analytical generalization to either advancing theoretical concepts or building on top of them (p. 41). Ensuring quality in the design of the multi-case study, however, was based on carefully choosing the variables that would be considered in the two workshops which were tied to the structural elements in the EPM: the knowledge creation.

As Yin (2014) illustrated the concreteness of the choice of cases for the case study is crucial to be able to illuminate all relevant aspects that the research question requires (p. 32). To understand what types of data collection was necessary for us to conduct our case study, the abductive approach back and forth between data and literature, provided us with an increasingly relevant research question, which was emphasized by Yin (2014, p. 39). Aligning with the research question in this design process created some challenges in facilitating the grain workshop. We were granted access to CCC to create the coffee workshop, however the grain workshop was built up to fit these variables since no community preexisted. Firstly, the support from KP in putting together a group working around the framework of the one from the first workshop, proved to be challenging due to limited time for the task from KP. Secondly, it proved difficult to put together a group of organisations, who could spare their time and instantly see value in participating. Thirdly, the delayed support from KP evidently collided with the easter holiday, which made it difficult for organisations to plan around. The grain workshop, however, turned out to be an important indicator of how the variables measured in it were important to facilitate in order to establish an ecosystem.

As a variation to the fallibilistic view on truths in the pragmatic perspective, Flyvbjerg (2006) argues that truth in case studies should be reviewed by falsification (p. 228). This refers to the perception of empirical data as being true until they are proven not to be, where observations either must be reevaluated or rejected. In this thesis, the main variable is knowledge creation in companies working with upcycling, and the few cases chosen are the contexts in which they interact: the workshops. To ensure likeness in the two workshops, the same value proposition was chosen as the focus, and knowledge creation in relation to this focus was investigated. Following Yin's (2014) argument for replication, only two workshops were conducted for the research due to the wish for testing our hypothesis several times, and the limitations of time was a factor that could not be neglected. The first aspect however, was according to Yin (2014) a necessity to "determine prevalence or frequency of a particular phenomenon" (Yin, 2014, p. 59). Iterating the theoretical framework and the research question accordingly throughout the research process was an important process to ensure relevance in our findings.

Reflections over research design

Research ethics

When conducting qualitative research, ethical concerns must be addressed. This was done through a transparency towards the purpose of the research, and by informing the interviewee what part they played in it. Throughout the research, participants were given an understanding of the project through a presentation of the scope of the research and how the data would be used. The interviewee was informed that a choice had been made to anonymize their names and businesses, so that the thesis could be constructed without a non-disclosure agreement with the organisations. At the beginning of the interviews and workshop the participants were asked for consent to record the information for later use. Silverman (2014) highlighted that one should never assume that people have understood the scope of the research sufficiently in order to give a truly informed consent (p. 145). During the research, participants were made aware of exercising consent, and this is also reflected in the evaluation interview with CCC-UE1, when he asked a clarifying question of how the data will be used (Evaluation interview, CCC-UE1, 00:50).

Another ethical consideration is working with groups whose views which with one does not necessarily agree (Silverman, 2014, p. 146). Silverman, (2014) suggests this as a way to gain intellectual flexibility and avoid setting up a one sided us-them dichotomy, in light of contributing to progressive social change (Silverman, 2014, p.147). This consideration is raised particularly in the second workshop where participants reveal contradictory views on the idea of collaborating. In the workshop, CG-UE expressed her concern of sharing intimate information, reasoning the workshop as too intimate (Workshop 2 - transcription, CG-UE, 20:13). Whilst CG-GS in the evaluation interview, questioned why CG-UE appears unwilling to explore opportunities for collaboration (Evaluation interview, CG-GS, 03:49). Hosting a second workshop enabled the opportunity to gain more than one perspective in analysing the mechanisms of knowledge creation in the context of ecosystems, which supports the use of a case study as a research method.

Quality in data

One of the most important criteria for ensuring quality in conducting semi structured interviews according to Brinkmann and Kvale (2015) is the interviewer verifying his or her interpretations of the interviewee's answers during the interview (p. 192). This criterion was exercised in the qualitative interviews, for example when the interviewer asked CCC-OCS, "So is that basically what you want? Do you want people to take part in this? Let's say external activity by [censored company name] for example?" (Initial interview, CCC-OCS, 19:32). The nature of this question invites CCC-OCS to verify his statement, probing him to elaborate on the meaning of his statement in a critical way (Initial interview, CCC-OCS, 19:32). In this way, quality in conducting semi-structured interviews was ensured.

The use of semi-structured interviews created a focus on the interviewees who had the opportunity to elaborate on replies and drive the interview in a direction defined by associations related to the question. As the semi-structured interview allows this, it was our role as the interviewers to keep track of the purpose of the interview, and return to the interview guide, when detours were too long. Another one of the important criteria is the interview being self-reported as a self-reliant story that does not need much additional explanation (Brinkmann and Kvale, 2015, p. 192). Brinkmann and Kvale (2015) added that the foundation of the criterion is to present rich texts for further interpretation. This criterion was applied in the interviews, for example, when interviewees were asked to introduce the ideas behind their businesses. The interviewer prompted CCC-BPU to begin telling a story of how his upbringing had shaped the idea of the business (Initial interview, CCC-BPU, 04:10). Asking such questions enabled interviewees to freely share what they felt was the most relevant information in depicting the concept of their business.

As the mixed method design was applied for gathering empirical data for answering the research question, the aim was to increase knowledge about the upcycling food byproducts community in general. Qualifying the themes of the questionnaire on initial qualitative interviews, made the questions asked in the questionnaire more valid for the community, which increased the quality of the knowledge that was acquired. As the

complexity of gathering empirical data increases by adopting a mixed method design, an increasingly more complicated research question can be answered (Yin, 2014, p. 67). As Yin (2014) argues the mixed method design can achieve richer and stronger evidence compared to a single method design (p. 66). The reason for adopting this approach was related to this argument, as it was earlier argued, that very little research has been done in this field. Resembling Yin's (2014) definition of a survey within a case study, the qualitative part of the mixed method design added an element of knowledge depth which initially increased the validity of the data (p. 66).

Validity

When applying the concept of 'validity' on the empirical data, two strands emerge: 1) are the means of the measurements accurate, and 2) is the data measuring what they intended to measure (Winter, 2000, p. 5). Winter (2000) firstly defined internal validity, which is the process of securing data from being influenced during the research by things not accounted for in the process (p. 11). In relation to this thesis, an element influencing the data could be CoViD-19, however, this will be accounted for in the limitations section further down. As internal validity accounts for the interferences the cases studied are exposed to, the EPM itself acted as an element of interference. However this interference was intentional, the EPM challenged the ways participants interacted, which was especially seen in the second workshop, where a participant detected risk in participating (Evaluating interview, CG-UE, 17:47). Yin's (2014) perspectives on internal validity in a case study is that interference is intended, however accounted for (p. 47). The internal validity in this case study is thus seen to be in place.

Secondly, Winter (2000) defined external validity, which considers the generalizability and the applicability of the methodology in other researches (p. 11). Since Yin (2014) accounted for the generalizability of a case study, the external validity is related to the argumentation of the analytical generalization. In the matter of this thesis, external validity is reliant on the research question defined above. Basing the initial research on *how* and *why* questions favours the case study research, where the initial interviews conducted filled an important role investigating the research field. The continuous

alignment with the theoretical framework created a supporting element for this thesis, which has a positive effect on the external validity. Applying validity as an element for securing alignment between data and the research question through a pragmatic research, perspectives shared by people around the same subject, can be used to secure external validity and generalize from this thesis.

Talking about reliability in relation to a case study is according to Flyvbjerg (2006) unnecessary, however Yin (2014) advocates for the reliability of the framework of the research design (p. 48). By documenting the research process, the method used for data collection can be reviewed (See appendix 2, p. 5 for research design). The method for ensuring reliability is according to Yin (2014) to make the steps in the research process operational (p. 49). The operational element in this thesis is manifested in the construction of the appendices, which are orchestrated chronologically with all steps of the research process presented. Following Flyvbjerg's (2006) argument, reliability of a case study is irrelevant to consider, since the research can never be done similarly, however the transparency of the methods behind the research design, can contribute to an aspect of reliability according to Yin (2014).

Limitations

The research is taking place during what has been stated by the World health Organisation, as the Covid 19 global pandemic (WHO, 2021). The virus is transmitted between people through direct contact and in an attempt to reduce the spread, WHO presented a list of preventative measures, which includes social distancing and staying home (WHO, 2021). The preventative measures of the disease have limited the research methodology in a sense that all of the interviews and workshops were held digitally. This affected both the quality and collection of the data, where multiple participants stressed the frustration with interacting on a digital interface. For example, CCC-CU (Workshop 1 - transcription, CCC-CU, 1:12:15) and CG-UE (Workshop 2 - transcription, CCC-UE, 1:13:15), did not manage to complete the workshop tasks due to their lack of competencies in using the digital tool Miro. Hosting the interviews and workshops

physically would have enabled the participants to focus more on engaging in the discussion, and making it easier to harvest data afterwards.

The business sector of upcycling food byproducts in Denmark is upcoming and limited to a small number of companies that are leading the establishment. This is emphasised by CCC-BPU who stated that their biggest challenge was legislation in commercializing their product as it is considered a novel food and the danish food industry has not yet established protocols for commercialising food products made from sidestreams (Initial interview, CCC-BPU, 26:05). CG-UE also adds that there is a need to establish upcycling food byproducts as a business sector, by defining the rules and regulations (Evaluation interview, CG-UE, 30:40). This has placed a predetermined limitation on the scope of study, to the few companies leading the establishment of the sector. Thus if the research took place at a later period, the sector of upcycling food byproducts may be more evolved and more established, which would have created a potentially larger group of organisations to work with and collect data from.

Another limitation connected to the thesis process is the timeframe of the project and in relation to the limited time organisations have to give to a research process. Having six months for producing a thesis can be perceived as a sufficient amount of time, however the data collection process is much dependent on the amount of time given to the project by organisations agreeing to participate in the process. Due to a high interest from key stakeholders like KP and CCC-OCS, data has been collected from them in all categories of data; qualitative, quantitative and workshops: "the two of you really great persons that have great ideas" (Evaluation interview, KP, 07:15). Regardless of the agreement of the scope of the thesis, organisations will inevitably experience time limitations in participating. Planning and arranging interviews and workshops is always reliant on stakeholder participation, which delayed the timeframe of the thesis a bit. If there had been more time for data collection, another workshop could have been relevant to have in order to increase validity further in the dataset and measure knowledge creation from several workshop setups.

Theory section

In the following theory section the three pillars supporting the research question will be investigated. The three pillars are constructed as sub questions aiming to answer three aspects that together aim to answer the research question. The purpose of the first question is to establish the applied network activities with upcycling companies. With the second sub question, the implications of using the mechanisms of an ecosystem are investigated in the context of two separate workshops. Lastly, the third sub question aims to investigate the main parameters that increase the output of being organised in an ecosystem constellation. The three sub questions are treated with equal importance to construct a valid analysis to answer the research question.

As a general element in the analysis, the book 'Innovation in Food Ecosystems' by De Bernardi & Azucar (2020) is incorporated throughout the analysis to create a supporting structure. The book reviews the current conventional, and linear, mentality of the food industry and takes a normative stance on how the incorporation of a sustainable and circular approach can contribute to increased value creation in relation to social -, environmental -and economical considerations (De Bernardi & Azucar, 2020, p. 8). Incorporating the book in this thesis, a framework for a circular transformation of the food systems is presented and used as a backbone in order to create a coherent and clearly communicated structure. Chapter one presents the current challenges of the food system and incorporates the external requirements from intergovernmental -and nongovernmental institutions. Chapter three introduces the ecosystem as a method for organising inter organisational collaboration and a method for value creation. Chapter six presents methods for knowledge sharing and creation in ecosystems. Finally, chapter seven reviews the approaches to incorporating sustainability and circularity in a business model. The incorporation of the book is thus a standing point of this thesis and has been an important source of inspiration in the construction of this thesis.

Subquestion 1: Network activities

To answer the sub question *how are network activities used to create knowledge in companies working with upcycling of byproducts*, a foundation is created with Lewandowski's (2016) definition of circular business models. Supporting this circular framework, the process of value creation is elaborated with the perspectives of Rajala et al. (2018), and supported by Massa & Tucci's (2017) views on business model innovation in relation to sustainability. Hereafter, the views of Felin & Hesterly (2007) is used to investigate the role of the individual in a collective setting. By integrating Dhanaraj & Parkhe's (2006) article, the role of the organisation taking initiative to co-creation is researched. Finally, Nonaka et al.'s (2006) article is included to analyse the processes of creating knowledge in a collective setting.

Circular business models

The book 'Innovation in Food Ecosystems' by De Bernardi & Azucar (2020) takes a broad stance when seeking to transform the food industry by driving sustainability in food ecosystems through innovation and entrepreneurship by incorporating circularity (De Bernardi & Azucar, 2020, p. VI). Relating this perspective to Lewandowski's (2016) article, the concept of circular economy is developed and defined as "an industrial system that is restorative or regenerative by intention and design [... and] becomes a new vision of the treatment of resources, energy, value creation and entrepreneurship" (Lewandowski, 2016, p. 5). Using this definition as a standing point for the analysis, the organisations in the empirical dataset will be measured according to this definition and Lewandowski's five principles in order to define if an organisation incorporates a circular business model: 1) Design for reuse, 2) Build resilience through diversity, 3) Rely on energy from renewable sources, 4) Think in systems, and 5) Waste is food/Think in cascades/Share values (symbiosis) (Lewandowski, 2016, p. 5). By analysing the organisations in the empirical dataset according to these five principles, the qualifications for changing the food industry through upcycling will be related to their ways of designing their business models.

By introducing circularity to the business model canvas, Lewandowski (2016) integrates the aspects of looping of both value, resources and relations to benefit both the organisation and its context. It is essential to highlight that the looping of materials both goes forward (traditional) and backwards when repairing or reusing products according to the concept 'take-back systems' (Lewandowski, 2016, p. 20). This integrates the holistic approaches of circular economy, which are further investigated in Massa & Tucci's (2017) article about business model innovation. Defining business models as: "system level concept, centered on activities and focusing on value" (Massa & Tucci, 2017, p. 423), value creation is a key aspect. Massa & Tucci furthermore introduces their concept of business model innovation and its relation to sustainability integration where value can be created in two ways: Firstly, adopting more sustainable practices and processes can reduce or prevent negative impacts on society and the environment. Secondly, engineering and marketing new technologies should be geared towards solving sustainability challenges (Massa & Tucci, 2017 p. 439). By using Lewandowski (2016) alongside Massa & Tucci (2017), the value creation process of looping resources is investigated and related to innovation and the incentives behind upcycling with the organisations in the dataset.

The last element of Lewandowski's (2016) circular business model canvas, 'adoption factors', incorporates an alignment between the business model itself, and the organisation's capabilities and external requirements. Creating a fit between the internal and external environment will thus increase relevance of the business model, catch market opportunities and introduce boundary spanning activities (Massa & Tucci, 2017, p. 426). Both Massa & Tucci (2017) and Rajala et al. (2018) highlighted the perception of knowledge as a resource that can be collected from outside the organisations through network activities, where missing knowledge can be retrieved by spanning structural holes. Incorporating Rajala et al. (2018) in this part of the analysis contributes with a revitalization of value creation in closed-loop systems and incorporates three aspects for leveraging different closed-loop systems for value creation. These aspects are: 1) platforms for collaboration, 2) management of information resources and objectives, and 3) innovation for sustainable recycling (p. 29). By incorporating Rajala et al. (2018), the definition of the organisations of the empirical dataset is contextualised to their

external environment and the resources and collaborations they have in network platforms.

Knowledge value

Felin & Hesterly (2007) primarily support the concept of equating knowledge to value within the scope of the research question (p. 195). They view knowledge as “the primary resource underlying new value creation, heterogeneity, and competitive advantage” (Felin & Hesterly, 2007, p. 195) and the level at which new value is created. The article criticises the idea that the locus of knowledge is in a collective setting where individuals are seen as homogenous. Instead they argue that knowledge begins with heterogeneous individuals with a core self, that determines learning and knowledge outcomes of the collective (Felin & Hesterly, 2007, p. 214). Thus Felin & Hesterly, (2007) propose viewing individuals as the subject of new value creation and not the social construct as an organisation or network (Felin & Hesterly, 2007, p. 200). The article's definition of knowledge as value establishes what is defined and analysed as value within the organisational context of the upcycling food byproducts community. Moreover, the article sets the premises to analyzing new value primarily at an individual level.

The proposed theoretical concept that individuals are heterogeneous leads the analysis into understanding the nature of heterogeneity amongst the members of the upcycling food byproducts community. Felin & Hesterly (2007) described that an individual consists of a priori knowledge, which they defined as “stimulus, context, and environment determines differential individual- and collective-level outcomes” (Felin & Hesterly, 2007, p. 202). This a priori knowledge is developed and added to external influence and environmental influence. Additionally, they highlighted that heterogeneity by skills and prior knowledge, and organisational culture defined by individuals, influence what jobs people are considered for and assigned to (Felin & Hesterly, 2007, p. 204). The perspective of heterogeneity being the foundation of new value creation supports the analyses of internal and external factors that influence the heterogeneous

nature of the members that form the network or community of upcycling food byproducts.

Furthermore, Felin & Hesterly (2007) develop the point that measuring skills and knowledge within the community of upcycling food byproducts cannot be measured at the community level but can instead be measured at an individual level (p. 206). The article presents all organisational learning taking place inside an individual's head and thus an organisation learns only in two ways: Firstly, by the learning of its members, and secondly, by taking in new members who have knowledge that the organisation did not have before (Felin & Hesterly, 2007, p. 198). The notion that knowledge can be measured at an individual level and the two ways in which an organisation acquires new value can be considered in the analysis when interpreting opportunities for new value creation in organizing the upcycling food byproducts community. Using these perspectives on new value creation in an organisation, adds to the analysis of the mechanisms which the community innately engages in, in new knowledge creation.

Knowledge practice

Dhanaraj & Parkhe's (2006) article analyses the flow of knowledge in loosely coupled systems of autonomous organisations and how value is created in these systems with orchestration by a hub firm. According to their article, the hub firm is defined as "one that possesses prominence and power gained through individual attributes and a central position in the network structure and that uses its prominence and power to perform a leadership role in pulling together the dispersed resources and capabilities of network members" (Dhanaraj & Parkhe, 2006, p. 659). Initiating a network group, a hub firm has the benefit of designing the network in order to define membership, structure and position. Finally, the hub firm can influence the processes by which the network is orchestrated (Dhanaraj & Parkhe, 2006, p. 661). Relating the importance of the hub firm to the possibilities of collective value creation and innovation, the usage of network mechanisms is analysed with the organisations in the empirical dataset.

As knowledge is shared, acquired and deployed in the network, a hub firm has the possibility to facilitate and arrange knowledge mobility in order to increase the chances

for high value gain in the network (Dhanaraj & Parkhe, 2006, p. 662). By understanding knowledge as heterogeneous, network participants will contribute with differentiated knowledge and experience for the benefit of the community (Dhanaraj & Parkhe, 2006, p. 660). Analysing the ease of the flow of knowledge between network actors, the organisations' willingness to share and create knowledge is analysed. However, reaching innovation appropriability, it is essential for organisations in the network to have trust in each other in order to capture the value of an innovation (Dhanaraj & Parkhe, 2006, p. 663). As a third element for high network innovation output, Dhanaraj & Parkhe (2006) mentioned network stability, which plays the role of maintaining the purpose and scope of the network for continuous value creation. Reviewing the interactions and interdependency between organisations and their networks, knowledge mobility and innovation appropriability creates an understanding of how a hub firm can orchestrate collective value creation.

Knowledge creation

Organisational knowledge creation is described as the process of making available and amplifying knowledge created by individuals as well as crystallizing and connecting to an organisation's knowledge system (Nonaka et al., 2006, p. 1179). Nonaka et al. (2006) will firstly be applied to define the concept of knowledge. The article defines knowledge as three things (p. 1180-1182). Firstly, an individual's justification of the truthfulness of their observations is based on unique viewpoints, personal sensibility and experience. Secondly, knowledge is defined as a person's capacity to define a situation and respond accordingly. Thirdly, knowledge comes in two forms: explicit, such as language and documentation, and tacit, such as experience and skills. The definition of knowledge will support the process of identifying forms of present knowledge and opportunities for knowledge creation in the community of companies connected to upcycling food byproducts.

Furthermore, the SECI model will be applied to analyse the process of converting knowledge amongst entities of the upcycling food byproducts community. The model focuses on converting tacit knowledge to explicit knowledge in an organisation (Nonaka

et al., 2006, p. 1182). The model describes 1) Socialization: sharing tacit knowledge among individuals, 2) Externalization: communicating tacit knowledge into explicit concepts, 3) Combination: combining different forms of explicit knowledge and 4) Internalization: taking in explicit knowledge into tacit knowledge. Viewing the data through the phases of the SECI model will enable an understanding of the nature of practices in play that drive knowledge conversion across the upcycling food byproducts community.

Nonaka et al. (2006) propose a contextual characteristic that can be considered as factors enabling knowledge creation to support innovation and learning amongst members of the community (p. 1185). The article highlights that knowledge is context (*ba*) dependent, defined as shared space for emerging relationships. *Ba* can be physical, virtual or mental space and is acquired through individual experiences or reflections on other peoples experiences (Nonaka et al., 2006, p. 1185). Characteristics that are suited for conversion of knowledge include: Originating *ba*, (where knowledge creation begins), Interacting *ba*, (supports externalization), Cyber *ba*, (interaction in the virtual world) and Exercising *ba*, (individuals internalization of explicit knowledge). These characteristics will be applied early in the analysis to identify the contexts that are present in supporting the ability for knowledge to be created between entities that form part of the upcycling food byproducts community.

Lastly, this section will draw upon the overall consideration that in order to have an effective knowledge creation, members of the upcycling food byproducts community need to have empathy amongst themselves (Nonaka et al., 2006, p. 1186). Nonaka et al (2006), raises the point that social justification makes knowledge creation a fragile process needing members to exhibit a high degree of care for one another (p. 1186). Additionally, various types of information systems and information mechanisms have an influence on the learning process and can affect organisational knowledge creation (Nonaka et al., 2006, p. 1186). Thus, the social dynamics and empathy, as well as the role of information systems and mechanics in influencing, will be taken into consideration when analysing aspects enabling knowledge creation amongst members.

Subquestion 2: ecosystems as strategic innovation

To analyse the second sub question *how can an ecosystem be used as a method for strategic innovation*, the article by Adner (2017) is used to create an understanding of how value is created in collaboration. Supporting this perspective, Adner's (2006) article builds on the concepts of the ecosystem and is used to investigate how innovation is done in a collaboration between organisations, and what this collaboration requires in order to be successful. Lastly, Talmar et al. (2020) presents a normative model incorporating the beneficial elements of the ecosystem in their Ecosystem Pie Model, which encapsulates the structural necessities of co-creation and materialization of a shared value proposition. The three articles present different layers of the ecosystem and are used in the analysis to investigate the benefits of organising collaboration in a structured environment.

Ecosystems in general

Using the ecosystems as a structure for alignment and configuration of activities and actors can encourage organisations to join forces in materializing a mutual value proposition (Adner, 2017, p. 43). Adner (2017) defines an ecosystem as "the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize" (Adner, 2017, p. 42). He thereby considers all ecosystem participants as members of a not open-ended community, which relates to its interdependency and shared goal. He further considers the role of the ecosystem organiser, and its purpose in defining the scope of the ecosystem and its value proposition (Adner, 2017, p. 41). Viewing the two workshops as platforms for alignment towards mutual value creation, Adner's (2017) article is used to identify the parameters that should be aligned in order to achieve the benefits of an ecosystem structure.

Adner (2017) characterizes the ecosystem strategy as the game plan for materializing the ecosystem value proposition where the heart of the strategy is to reach an alignment of actor differences (p. 49). He defines ecosystem strategy as "the way in which a focal firm approaches the alignment of partners and secures its role in a competitive ecosystem" (Adner, 2017, p. 47). The ecosystem strategy is thus related to managing the

ecosystem actors and their interests in order to achieve a mutual interest. Approaching the two workshops exploring the concepts of an ecosystem, provides an insight to how an orchestrator may create the foundation for mutual value to be created. Adner characterizes four elements for achieving structure in an ecosystem: activities, actors, positions and links (Adner, 2017, p. 44). Analysing the two workshops individually with these elements, it may be reviewed how much potential the ecosystems have for materializing a shared value proposition.

In order to bring the ecosystem into a context, Adner (2017) presented a variety of alternative approaches to interdependence, which will define different opportunities for organisation collaboration (p. 50). These approaches assimilate the ecosystem as structure but exclude the elements of impact that structure has to approaching the value proposition and thus leaves conceptual gaps. Considering these approaches as equally acknowledgeable, he highlighted the missing consideration of structure that distinguishes them from being an ecosystem (Adner, 2017, p. 50). He exemplifies the alignment of the value proposition with new questions and new directions, which indicates an aspect of innovation in the context of an ecosystem (Adner, 2017, p. 56). Using these alternative approaches of interdependence to review how value is created with individual organisations can thus indicate how the element of structure might increase value creation when organising in an ecosystem.

Innovation Ecosystem

Incorporating the aspect of an innovation strategy is to contextualise the innovation of a collective by incorporating necessary activities in order to make the innovation work (Adner, 2006, p. 98). Adner (2006) presented the potential of the ecosystem as a platform on which value is created that no single company could create alone (p. 100). The interdependency is thus seen as a natural element for creating relevance for an innovation in the external environment. This perspective is used in the analysis to qualify the interdependency that organisations with a circular business model are deemed to adopt. Aligning the goal of the ecosystem with the requirements of the market is, according to Adner (2006), a necessity to reach volume sales, in order to benefit

ecosystem participants (p. 107). The innovation strategy is then used by ecosystem participants to align roles and requirements to create relevance for an innovation.

To increase innovation performance, the collaborating organisations need to overcome three types of risk related to an innovation ecosystem: innovation -, interdependence -and integration risk (Adner, 2006, p. 100-103). Firstly, innovation risk relates to project management and organisation capabilities of the companies like appropriateness of the supply chain and the quality of the project team (Adner, 2006, p. 100). This perspective will be used to analyse how organisations individually organize themselves and use capabilities for collective innovation. Secondly, interdependence risk defines the relatedness and dependency on complementary projects to succeed in order for the innovation to succeed (Adner, 2006, p. 101). Viewing the dependency and the level of connectedness organisations have to each other in the analysis will indicate how reliant the individual organisations are on the success of the ecosystem. Thirdly, integration risk considers the requirements of collaborating entities who play a crucial role in incorporating the innovation in order to launch the product on the market (Adner, 2006, p. 103). The analysis of the integration risk helps mapping the reliance the ecosystem has on stakeholders as gatekeepers to the market. In connection these three parameters of risk show the potential pitfalls of an innovation ecosystem, and how an innovation strategy can overcome these.

Ecosystem Pie Model

The Ecosystem Pie Model (EPM) describes a tool for modelling an ecosystem, which can be applied to map out and analyse the design of an innovation ecosystem within the upcycling food byproducts community (Talmar et al., 2020, p. 1). Talmar et al. (2020), argue that in a world of increasingly specialized organisations, individual firms simply do not hold the necessary capacity in resources to develop and commercialize an entire value proposition (p. 1). Thus, firms need to rely on other actors in their innovation ecosystem to build an Ecosystem wide Value Proposition (EVP). The EVP enables a company to leverage relationships for higher value creation by exploiting synergies and complementarities across actors (Talmar et al., 2020, p. 1). The EPM is applied in the

thesis research as a tool to facilitate a collective process of designing an innovation ecosystem around a shared value proposition, amongst members of the upcycling food byproducts community.

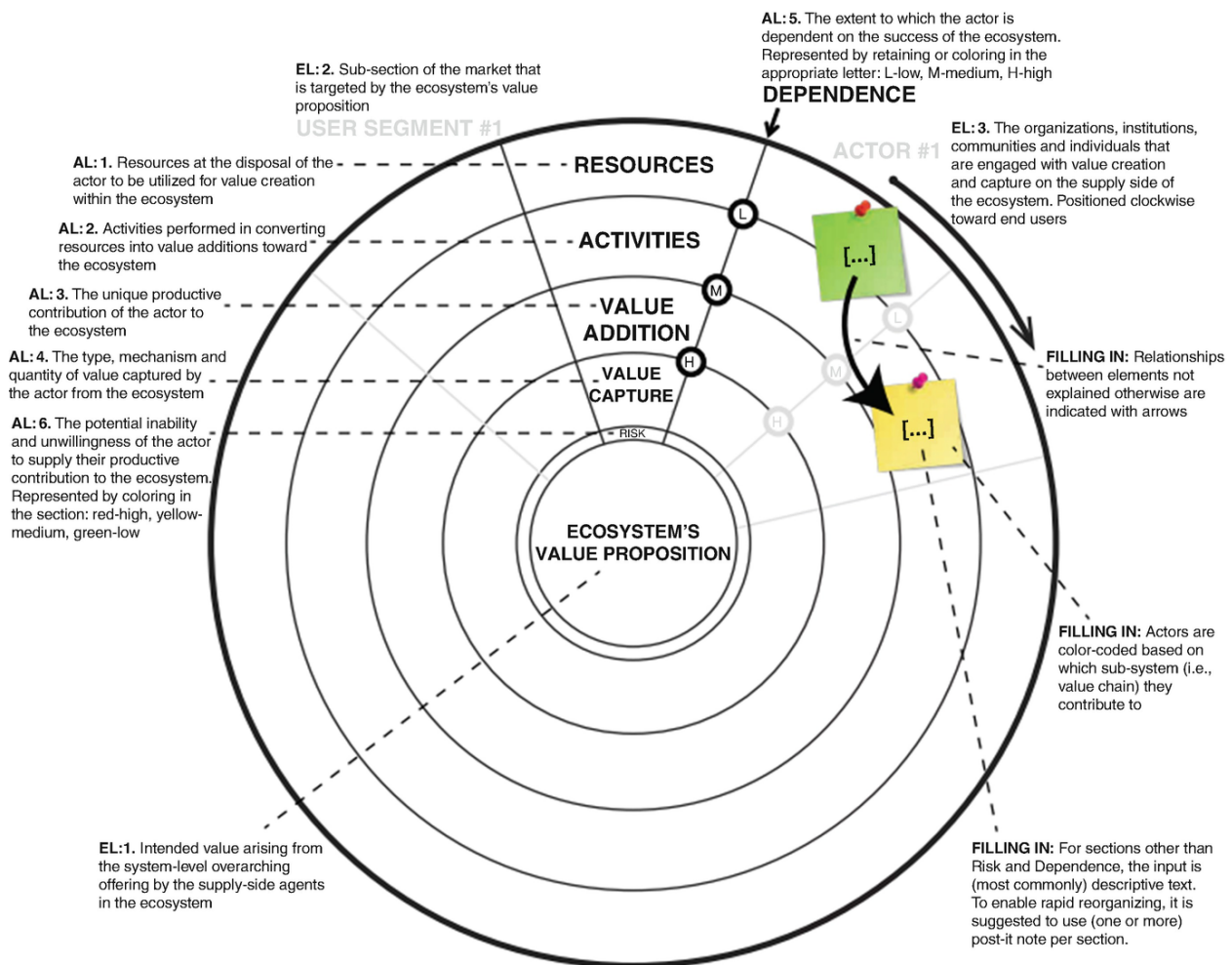


Figure 2: Ecosystem Pie Model, Talmar et al. (2020)

Furthermore, the EPM tool enables users to gain a deeper understanding of the overall design of the ecosystem and specificities within the ecosystem for the innovation (Talmar et al., 2020, p. 2). Stemming from the idea that one can deliberately manipulate an innovation ecosystem, the tool enables users to make informed decisions in regard to the ecosystem strategy. This approach is done through gaining a thorough understanding of the interdependencies of relationships and specificities of the innovation (Talmar et al., 2020, p. 1-2). Collectively mapping out the ecosystem can support members who are connected to upcycling food byproducts to make informed decisions in their participation in forming the ecosystem.

Talmar et al. (2020) presents that implementing an EVP can enable companies related to upcycling in realizing the interfaces of collaborations between parties and the types of complementarities between different actors (p. 2). Mapping out the EPM supports the consideration of particular roles within the value structure and the potential network effects arising from ecosystem constellations. Additionally, users can map out the influence of the different entities involved and the risk and value tradeoffs of having interdependencies across actors (Talmar et al., 2020, p. 2). Within the context of analysis, the process of mapping out the characteristics of the ecosystem using the diagram enables the identification of the dynamics, opportunities and risks that are present in the process of realizing the EVP.

The process of designing an ecosystem using the EPM tool in the upcycling food byproducts community involves entities that form part of realizing the EVP filling their representative activities in qualitative, quantitative or visual information concerning each construct (Talmar et al., 2020, p. 4). The tool is illustrated in circular rings representing each ecosystem construct. The illustration maps 'pie' sections that represent separate ecosystem actors, the **EVP** placed in the centre and a targeted **User Segment** of the EVP. The constructs in a pie section represent: **Activities** that an actor performs, **Resources** used by an actor to perform the activity, **Value Addition** as the outcome of the activity, **Value Capture** each actor receives from actively participating in the realization of the EVP, **Dependence** being the degree in which the success of the actor is dependent on the success of the EVP and lastly **Risk**, describing the degree of unwillingness of an actor to contribute to the EVP (Talmar et al., 2020, p. 3-4). Building an overview of defining aspects that enable members to collectively realize the EVP, supports the process of aligning roles and expectations within the ecosystem formation. Additionally filling in the EPM creates a representative document of analysing explicit information of a design and mechanisms of a potential innovation ecosystem in the upcycling food byproducts community.

Talmar et al., (2020), further presents guidelines that users need to take into consideration when filling in the EPM for the upcycling food byproducts community (p.4). The direct chain of adopters between the team and the 'User Segment' is

represented in each pie slice of the diagram as 'actors'. The exchange between actors can also enable integration value additions into the hands of the user segment. This constitutes a supply chain where some actors are sequenced closer to the user segment and some actors farther away (Talmar et al., 2020, p. 4). Additionally, activities of an actor can also be boundary spanning, deliberately combining activities across actors (Talmar et al., 2020, p. 2). Thus the process of collectively filling out the EPM may more concretely enable entities related to the upcycling food byproducts community to locate opportunities for new value capture through the engagement in activities with other actors.

Finally, the article presents two other factors for users to take into consideration; risk and dependency, which is supported by the notion that the value capture and risk of an individual actor is influenced by the activities, value additions and value capture level of other actors (Talmar et al., 2020, p. 5). The dependencies of actors between one another is represented by using grades L (low), M (medium) and H (high) between the actors. To represent the level of risk arising from the willingness and ability to contribute, the estimated risk level is translated into generic codes that resemble high risk, medium risk and low risk of each actor in the ecosystem (Talmar et al., 2020, p. 6). In completion of the EPM, its users draw arrows showing distinct relationships (eg. resource combinations or value capturing opportunities) between actors. The arrows predominantly reflect how certain assumptions made by actors are potentially reinforced by other actors in the ecosystem (Talmar et al., 2020, p. 6). Predominantly these factors may help create transparency and an understanding amongst entities of the upcycling food byproducts communities, in terms of their willingness to participate and form an ecosystem.

Subquestion 3: parameters for value creation

The last pillar supporting the research question at hand investigates what elements an ecosystem requires in order to succeed, and is defined in the last sub question as: "What parameters have an influence on value creation in an ecosystem?". With the use of three theoretical perspectives five parameters have been defined to analyse the chances for value creation in an ecosystem. By using Williamson & De Meyer (2012) as

the overarching theoretical element, the benefits of orchestrating a successful ecosystem defines the benchmarks in the analysis of the two workshops. Contributing to this analysis, Nonaka et al (2006) is incorporated as an element for understanding the platforms on which knowledge is created. Lastly, Dahanraj & Parkhe's (2006) article is used to integrate the mechanics of orchestrating and increasing the output of an innovation network. The five parameters have been defined deductively from the aspects presented in the three above mentioned articles.

Ecosystem strategy

An ecosystem facilitates multiple bilateral alliances with the benefits of gaining complementarities and achieving not only economies of scale but also economies of scope through the structure of an ecosystem strategy (Williamson & De Meyer, 2012, p. 25). This refers to the notion that ecosystem strategy can enable companies to gather the competencies to better meet the volatile and complex needs of customers (Williamson & De Meyer, 2012, p. 26). Williamson & De Meyer (2012) highlighted that through interacting in an ecosystem, diversity of tacit knowledge is mobilized and members co-evolve their capabilities and align their investments to create additional value and improve processes (p. 25). When analysing the overall outcome of the workshop Williamson & De Meyer's (2012) perspectives on mobilizing tacit knowledge and co-evolving capabilities are taken into consideration (p. 25). The intention of using the article will be to analyse how participants might achieve value in bringing their competencies together.

Proceedingly Williamson & De Meyer (2012) described the necessity for an ecosystem strategy in order to achieve value creation for all participants (p. 27). Using the ecosystem strategy as a method for activating alliances between participants a hub firm must design an architecture which engages participants to share knowledge in a secure environment (Williamson & De Meyer, 2012, p. 27). A result of a successful ecosystem strategy is, according to Williamson & De Meyer (2012), the advantage of higher relevance in products through co-creation, which leads to the ability to pinpoint the added value in participating in an ecosystem (p. 33). The activity of reducing risk related

to ecosystem participation is dependent on the perceived risk about participating in the ecosystem. Using the ecosystem strategy as a tool for increasing relevance, lowers perceived risk of the interdependency, and possibilities for value creation are higher. These views enable the analysis to elaborate on the potential in structuring through an ecosystem strategy.

The facilitator

In order to gain the potential of being part of an ecosystem an important element is the role of a lead firm to facilitate a direction for the shared value proposition. Williamson & De Meyer (2012) present the possibilities of the lead firm as being able to stimulate the development of an ecosystem and enjoy access to a broader variety of knowledge (p. 28). By using this argument to analyse how the initiator of a network group can create value for itself and participants, it can further be exposed how an facilitator might increase value creation. Adding to this analysis, the incorporation of Dhanaraj & Parkhe's (2006) perspectives of ecosystem innovation can incorporate the parameters that a lead firm can orchestrate to increase value creation (p. 661). Contributing to the analysis of the potential of leadership in an ecosystem, Nonaka et al. (2006) added that the responsibility of the leader is to enable knowledge creation in what they call the project system layer (p. 1191). They define this as the business level where innovation takes place. The role of the lead firm is thus seen in three perspectives, who all agree on the necessity of a defined purpose and an orchestration of the ecosystem that facilitates knowledge creation.

By continuously aligning the corporate visions of the participants to the ecosystem purpose and its relation to the external environment, an iterative approach creates a continuous relevans of the ecosystem output. As Nonaka et al. (2006) argue the knowledge layer is embedded in the corporate vision and relates to business development and innovation (p. 1183). This argument is agreed upon by Williamson & De Meyer, who add: "By taking a strategic approach that actively promotes and guides the development of its business ecosystem, the lead firm enhances its own competitive advantage and ability to capture value" (Williamson & De Meyer, 2012, p. 25). The

facilitator has furthermore the responsibility to close knowledge gaps in the ecosystem, in order to increase the broadness of knowledge (Williamson & De Meyer, 2012, p. 36). Viewing the approach to adaptation towards a changing external environment, the theoretical framework is used to analyse how the lead firm may increase the potential of the ecosystem and by that the value creation.

Customer centrisism

Williamson & De Meyer (2012) suggested that the firm leading the catalyzation of an innovation ecosystem can capture more value for this community, like it is the case with the upcycling food byproducts community (p. 25). Amongst the strengths of having an ecosystem, includes allowing participants to be able to better meet the customer demand for complex integrated solutions by mobilizing rich diversity of complementary activities whilst its own activity remains the focus (Williamson & De Meyer, 2012, p. 26). Ecosystem can allow the lead firm to orchestrate around risks through the capabilities of the partners. Participants can then benefit from the stimulus of innovation that comes from partners abilities, diverse geographical backgrounds and market contexts, and unique corporate culture. Thus the presented strengths of having an ecosystem will support the analysis of the mechanisms present in value capture for all participants as a result of an alignment between the internal -and the external environment. Customer centrisism sits at the heart of an ecosystem strategy (Williamson & De Meyer, 2012, p. 24). Williamson & De Meyer (2012) presented that in order to reliably capture value, participants need to contribute an activity or component on which the overall value of the ecosystem to the customer depends on. The focus on customer centrisism supports an analytical perspective of understanding how the ecosystem as a strategy makes it possible for participants to capture value through its customers offering.

Knowledge diversity

Viewing the variety of knowledge participants bring to the ecosystem as heterogeneous individuals, increases the speed of learning in an ecosystem accordingly with the inclusion of differentiated actors. Differentiation in ecosystem groups contributes to a

broad variety of knowledge and can be used as an active tool for creating brokerage through recruitment of specific knowledge (Dhanaraj & Parkhe, 2006, p. 661). Williamson & De Meyer (2012) relates this brokerage approach to the ecosystem strategy and the responsibility of the lead firm, due to its potential for increased relevance of the innovation and avoiding pitfalls (p. 28). Analysing the heterogeneous roles of the ecosystem participants may contribute with knowledge about what roles and knowledge the ecosystem needs in order to achieve the value proposition. Actively using the structure of the differentiated partner roles can contribute to the ecosystem development by securing an increased relevance with the user, and thus increase the value creation for participants.

The potential of the participants in an ecosystem is related to how they span structural holes and incorporate network knowledge into the ecosystem, and may be increased by having a knowledge activist represented. The role of knowledge activism is, according to Nonaka et al. (2006), to "catalyse and coordinate knowledge creation and transfer, and communicate future prospects." (Nonaka et al., 2006, p. 1187). Having a knowledge activist in an ecosystem helps creating knowledge by disrupting groupthink and routine behaviour. Filling the role of spanning boundaries the knowledge activist contributes with external knowledge to the group, which increases the level of interaction between participants for the benefit of the ecosystem as a whole (Nonaka et al., 2006, p. 1187). Analysing the data with the concept of knowledge activism, thus helps to locate activities for ecosystem disruption and development towards increased value creation. Knowledge activism can be viewed as a key player in achieving an increased relevance for the ecosystem.

Knowledge conversion

Williamson and De Meyer (2012), presented the importance of the promotion of transparency in enabling joint value creation and preventing the concept of *free-riding* (p.40). Free-riding presents describes the concept of a company gaining resources from other companies inputs without having contributed value. The notion of promoting transparency in enabling knowledge conversion can also be connected to Nonaka et al's

(2006) concept of social justification (p. 1182). In social justification, the presence of individuals having a degree of care for one another is deemed important in enabling them to share knowledge towards a common goal (Nonaka et al., 2006, p. 1182). Thus the two concepts of transparency and care can be viewed as foundational variables when assessing the willingness of knowledge sharing between individuals towards a common goal.

Nonaka et al (2006), proposed the SECI model as a conceptual framework for demonstrating the process of knowledge conversion in an organisation (p. 1182). The framework demonstrates different faces of reconfiguring knowledge from tacit to explicit (Nonaka et al, 2006, p. 1182). When placing conversion within the structure of the ecosystem, Williamson and De Meyer, (2012), refer to the significance of flexibility in the formation and governance of interactions between companies to avoid restricting the process of joint learning (p. 39). They further elaborate that experimentation and working together on joint activities cultivates quality interactions that realise learning and increase in joint value. Both the structure of the SECI model and the nature of flexibility in interaction between potential ecosystem members during the workshop, can be considered in the analysis of the structural process of facilitating conversion for joint value. Particularly in understanding which structural elements could be deemed responsible for the outcome of the nature of knowledge converted.

Analysis

Network activities

To lay the groundwork of the analysis, the first subquestion aims to establish the network activities performed by the companies working with upcycling of byproducts. In order to understand the organisations' approaches to doing business, they are firstly analysed with the use of Lewandowski's (2016) five principles for defining the incorporation of a circular business model. By incorporating Rajala et al. (2018) and Massa & Tucci (2017) the organisations in the empirical dataset are being analysed to better understand the mechanisms that support their approaches to knowledge creation. Following up this definition, Felin & Hesterly's (2007) article is used to establish the value of knowledge, and how new knowledge is acquired and created in organisations. Furthermore, in order to analyse the first subquestion Dhanaraj & Parkhe's (2006) article is included to localize the role of facilitating the level of output organisations can create by participating in an innovation network. Finally, Nonaka et al.'s (2006) article is incorporated to analyze how platforms are used for knowledge to travel between individuals and their organisations. The subquestion for the first section is: *How are network activities used to create knowledge in companies working with upcycling of byproducts?*

Circular business models

By upcycling wasted resources, the activities of creating loops around the flows of resources is a key element of a circular economy. Lewandowski's (2016) key concept of circularity in relation to the business models, is the intended value creating, restorative or regenerative act, of looping resources (p. 5). He presented five main principles to define an organisation as incorporating a circular business model: 1) Design for reuse, 2) Build resilience through diversity, 3) Rely on energy from renewable sources, 4) Think in systems, and 5) Waste is food/Think in cascades/Share values (symbiosis) (Lewandowski, 2016, p. 5). Relating to these principles, companies upcycling uses the waste of today as the resources of tomorrow for doing business (Initial interview, CCC-UE1, 27:10). Following this, the mechanisms of upcycling are seen to fall under

Lewandowski's (2016) definition of 'designing for reuse' and 'waste is food'. The adoption of a circular business model is thus presumed to be a necessary approach when upcycling - this will be further analyzed in this section.

The organisations from the qualitative empirical dataset of the thesis, can be broken down into two categories: 'upcycling related organisations' and 'communication related organisations' (see Table 1). The upcycling related organisations can be perceived as having circular business models, since they actively treat byproducts as resources and a potential for further business development (Questionnaire - replies, p. 125). As for the two remaining companies, KP and CCC-BA, the communication related businesses, the incentive for both their business models is to increase the importance of social -and environmental parameters, which KP defined as "Food System Disruption" (Initial interview, KP, 00:29). Due to their close collaboration with both networks and entire industries turning towards better sustainability incorporation, the community related businesses can be seen to fulfil the second principle by Lewandowski (2016): 'Build resilience through diversity'.

Continuing the definition of organisations upcycling as having circular business models, Lewandowski's (2016) incorporation of the '*take-back system*' as a fundamental concept of looping resources, supports the definition (p. 20). He emphasized the requirement for profitability of the sustainable business case in his Circular Business Model Canvas, and echoed the Triple Bottom Line with the emphasis on environmental -, social -and economical measurements of performance (Lewandowski, 2016, p. 12). Supporting this argument further, 88,9% of the respondents in the questionnaire choose 'responsible consumption and production' as one of the three most important SDGs to their businesses (Questionnaire - replies, p. 119). Incorporating upcycling in their business models the companies in the empirical dataset aim to disrupt the status quo and create a new standard by engaging in sustainability networks (Initial interview, CCC-OCS, 00:15). This is in line with Lewandowski's (2016) principles of 'thinking in systems' and 'in cascades'.

According to Massa & Tucci (2017) the business model is a vehicle for innovation, and BMI is either designed (Eg. born circular like most of the upcycling businesses) or

reconfigured as circular (like CCC-OCS)(p. 425). Relating sustainability to innovation, Massa & Tucci (2017) integrated a disruptive attitude towards changing business standards, and making profits while benefiting the environment (p. 430). An example of this is CCC-OCS's comment on upcycling businesses: "they're also not hiding that they're in it for the money. But their overall vision is to do a change in society." (Initial interview, CCC-OCS, 39:57). Being an older company and the leading importer of organic coffee beans in Europe, the societal expectation for transitioning towards sustainability in the business model was clear to CCC-OCS (Initial interview, CCC-OCS, 06:43). Transforming their business models was then a strategic choice to include upcycling as a method for regaining legitimization.

Besides legitimization, the consequences of a linear business approach have contributed to other issues. The need for incorporating sustainability aspects in the business model is vivid to CCC-OCS for another reason too: "there is a risk that up to about 50% of the global land, which is now being used for growing coffee, is going to be gone in, let's say, 10, 15, 20 years." (Initial interview, CCC-OCS, 00:15). The requirements from society, and the consequences of continuing a linear business approach, can thus be related to the macro parameters Lewandowsky (2016) suggested incorporating in his Circular Business Model Canvas (p. 20). He defined the macro requirements as '*adoption factors*' and highlighted the need for a fit between them and the capabilities of the organisation (2016, p. 14). By fitting external factors with internal capabilities, when incorporating UN SDGs in the business models of the organisations, can be perceived as moving towards incorporating a circular business model.

The concept of merging sustainability aspects with business is further developed by Rajala et al. (2018) who also emphasised the fit between the micro -, meso -and macro environment (Eg. internal and external)(p. 32). Aligning the value proposition and the customer segment, as Lewandowski (2016) too emphasised, puts a focus on providing value to customers (p. 22). This downstream value creation is thus related to a conventional business model, however, the looping of resources introduces the reversed supply chain where value is created for suppliers as well as customers (Lewandowski, 2016, p. 6). Following this model, this argument was agreed upon by

44,4% of respondents in the questionnaire who claim that they provide value for suppliers through their business models (Questionnaire - replies, p. 120). 50% of respondents, furthermore, answer in the questionnaire, that customers are provided with 'a sustainable product choice' (Questionnaire - replies, p. 120). This aligns with Lewandowski's (2016) argument for a fit between the cost structure and the revenue stream (p. 22). The fit between the internal and external environment is thus seen as an alignment of the organisations' business models and the customer demand they each detect.

Another principle defined by Lewandowski (2016) is the 'shared value', which is an essential part of creating a circular business model. Rajala et al.'s (2018) article presented three aspects for leveraging closed-loop systems for value creation. Firstly, 'platforms for collaboration' is the basis for collective value creation, where network effects are the mechanisms through which innovation is created (Rajala et al., 2018, p. 30). The openness of a platform indicates the broadness of its membership organisation, which in CCC-OCS's network was including and open to all organisations working, with some aspect of the coffee plant in a circular way: "we reach[ed] out our hands to kind of invite everybody who shares our vision of becoming circular." (Initial interview, CCC-OCS, 11:00). Rajala et al. (2018) emphasised the information about the resources between actors in the supply chain, which require an inclusion of representants throughout the lifespan of the resource - defined as the ecosystem of the resource, and its value (p. 23). The aspect of shared value and value creation is a normative way of using knowledge in relation to BMI, which should create an increased relevance for the organisations on the market due to an iterated fit between internal and external factors as mentioned earlier.

Incorporating a collective approach to solving organisational challenges is an argument supported by several of the scholars in this section: "Synergetic merging of knowledge, or knowledge sharing, rather than a destructive clashing of progressive ideas from various industries and disciplines" (De Bernardi & Azucar, 2020, p. 8). The synergetic approach and the interdependency is again related to Rajala et al.'s (2018) definition of the openness of the system, where inner circles collaborate in circulating a resource

between them, and the decentralized systems rely more on co-development of new innovative approaches to value creation. The open system relies in this stage more on advising the network about decisions surrounding the shared value proposition (Rajala et al., 2018, p. 31). For CCC-OCS the mentality towards increasing the use of their previous wasted resource; coffee grounds (Initial interview, CCC-OCS, 14:30), indicates that their network holds aspects of both the inner circle and the decentralised system. KP as a communication related organisation, aims to create value for her network through information sharing and sustainability guidance (Initial interview, KP, 00:29).

As mentioned, Massa & Tucci (2017) used the term boundary spanning about incorporating actors providing specific knowledge required by the platform to increase the pool of knowledge (p. 426). This aspect was similarly incorporated by Rajala et al. (2018) in relation to innovation by bridging structural holes of lacking information in the closed-loop ecosystem (p. 32). This approach was used by CCC-BPU when establishing the foundation for the company, where profiles and their experiences and knowledge profiles were a key factor for the collaboration (Initial interview, CCC-BPU, 10:20). As KP exemplified, the need for diversity in changing the food industry: "I think that's a main foundation to the change agenda" (Initial interview, CCC-BPU, 31:28). The companies in the empirical dataset are then seen to incorporate 'shared value' in their business models.

Finally, the principle of 'relying on renewable resources for production' can be questioned since the empirical data is not covering this aspect. This aspect especially is seen to differentiate between the organisations in the dataset where CCC-UE1 collects coffee grounds via bike (Initial interview, CCC-UE1, 12:57), and CCC-BPU saw itself as forced to transport coffee leaves by airplane to avoid contamination of the product at this early stage of development of the production (Initial interview, CCC-UE1, 43:21). This last example is a risky element related to all initiatives working with sustainability, called 'greenwashing', which is a decoupling from the approaches used internally and the profile communicated externally (Corcione, 2020). Greenwashing is an element which is sometimes hard to detect, and relies solely on the discrepancies discovered in

the organisations' way of performing sustainability. The risk of greenwashing being present in the organisations in the empirical dataset cannot be excluded from this thesis.

However, following the incentives of the businesses and the five principles of Lewandowski's (2016) article alongside Massa & Tucci (2017) and Rajala et al. (2018), both the upcycling -and the communication related business can be defined as having circular business models. This definition clarifies the purpose of the organisations investigated in this thesis, and categorizes them as businesses approaching the requirements of the external environment. Clarifying the organisations' incentives in the realm of circular economy provides a legitimization of them and provides a relevance in the world that they act in. Building on this contextualization, the organisations working with upcycling of food byproducts takes on an important role to disrupt linear thinking, and create new standards. However, this transaction was seen to be approached somewhat singlehanded by the organisations but with the use of network activities to gain momentum. To further understand their methods for creating value in this process a further analysis is needed to define what knowledge practices they employ.

Knowledge value

Felin & Hesterly (2007) presented the concept of viewing knowledge as the primary resource underlying new value creation. The article presented that individuals consist of prior knowledge as a result of environmental stimulus and learning. The variants in environment stimulus, determines the heterogeneity in prior individual knowledge of the people that form the organisations and the outcomes of the community of upcycling food byproducts (Felin & Hesterly, 2007, p. 202). In the qualitative interviews CCC-BPU, stated that his father was a gardener, which set the premise to his interest in waste as a resource. Being raised in a home engaged in everyday gardening practices for sustenance, suggests that he holds informed knowledge of self sustaining practices (Initial interview, CCC-BPU, 04:10). KP has a teaching background in public relations and communications. The gap between farmers and consumers became apparent to KP whilst teaching public food producers and farmers which created the idea for bridging the knowledge gap between actors in the food industry (Initial interview, KP, 37:08).

CCC-UE1 was fundamentally inspired by a global leader in the upcycling industry and went on to co-work with an upcycling business before officially launching an upcycling business (Initial interview, CCC-UE1, 06:34). Thus individuals within the upcycling byproducts community represent a diverse value set based on their heterogeneous knowledge.

Felin & Hesterly (2007) further presented that an organization learns through individual participants' learning and by ingesting new participants with new knowledge (Felin & Hesterly, 2007, p. 198). The desire to acquire new knowledge from outside into the organization is suggested in the questionnaire, when 25% of individuals voted that more collaboration in the supply chain could support overcoming business development challenges (Questionnaire - evaluation, p. 120). Furthermore, the theory presented that variants in knowledge can be accredited to individual level characteristics, which are more heterogeneous than the collective environment (Felin & Hesterly, 2006, p. 214). They continued their argument by focusing knowledge-based work in collectives on individuals' contributions and skillsets, which makes individuals the foundation of new value creation (Felin & Hesterly, 2006, p. 214). CCC-OCS's view on network resembles this perspective, highlighting the value in knowledge diversity: "knowledge sharing and the context, the interactions between various companies [...] that's the strongest part right now." (Initial interview, CCC-OCS, 39:12). KP agreed to this vision on diversity and states: "We not only see it as a strength between different segments, like the value chain - we will have a place where they [participants] can meet and exchange ideas" (Initial interview, KP, 27:25). Diversity of heterogeneous individuals in a diverse group is thus seen by members of the community as a contributing factor to the collective creation of new value.

Individuals' underlying capabilities (ability to learn and create knowledge), who form part of the organization, need to receive consideration as it is antecedent of the overall collective outcome (Felin & Hesterly, 2006, p. 204). This can be referenced to the initial qualitative interviews, where CCC-OCS shared a consideration to create a diverse and inclusive network that combines an international network of farmers in agriculture, manufacturing, universities, and end users (Initial interview, CCC-OCS, 35:23).

Additionally, according to Felin & Hesterly (2006), viewing the network on the individual level rather than higher collective, suggested an easability in the possibility of measuring new value (p. 206). This suggests that CCC-OCS views the community by an individual level, which sets a feasible premise for measuring the value creation in the outcome of the community.

The article also presented that people who are attracted to a particular setting, are selected by and remain in that setting, thus determining the outcome of the setting (Felin & Hesterly, 2007, p. 204). The people who remain in the setting create new value through sharing knowledge in collaborative organisational processes (Felin & Hesterly, 2007, p. 212). In the initial interview, CCC-OCS suggested an awareness of the influence of individuals on the collective, by sharing the idea of attracting partners through two way communication of visions and each party does (Initial interview, CCC-OCS, 18:03). CCC-BPU also shared an awareness of selecting business associates based on prior knowledge (knowledge on farmers and entrepreneurship), adding that it would have not been possible without their participation (Initial interview, CCC-BPU, 09:47). Moreso CCC-BPU formed a collaboration with CCC-OCS, through a supply chain and sales partnership. Through the collaboration CCC-BPU suggested gaining knowledge of the challenges and expenses of working with distribution in food and beverage (Initial interview, CCC-BPU, 35:58). The process of collecting knowledge is an activity used by all organisations in the empirical dataset which indicates networks play an important role in business development.

Knowledge practices

Turning towards the facilitation of knowledge creation, Dhanaraj & Parkhe's (2006) article presented three orchestration processes: 1) knowledge mobility, 2) innovation appropriability, and 3) network stability - all managed by a hub firm to increase the innovation output of a network (p. 661). Through the process of orchestration, an innovation network creates access to resources that enable a network output for all participants (Dhanaraj & Parkhe, 2006, p. 665). CCC-OCS suggests engaging the activity relating to facilitating a network to gain resources: "there are a lot of companies, people,

organisations and so on that have seen this [network] potential. And if we could support this development [towards sustainability] we see this as an opportunity again to grow our business, but also to grow the society, our customers' businesses and so on" (Initial interview, CCC-OCS, 06:43). This view resonates with, firstly Adner's (2017) definition of the ecosystem leader and the shaper of an ecosystem strategy (Which will be developed later), and secondly with De Bernardi & Azucar's (2020) argument for creating a competitive advantage for the lead firm as well as the participating organisations.

As the hub firm acts as the orchestrator of the network, the power of organising participants and the purpose of the community lies with it (Dhanaraj & Parkhe, 2006, p. 661). However, the perceptions of the purpose of CCC-OCS's network were mixed: CCC-UE1 did not know the purpose even after joining their first meeting (Initial interview, CCC-UE1, 18:09). Others were positive: "their zero Waste vision and how they want to work with the coffee [...] I really sort of tried to grill them. But after a while, I figured out that they were actually committed to it [upcycling]" (Initial interview, CCC-BPU, 33:29). KP, however, expected a network to have a clear communication about the network goal: "there needs to be a person who can [...] facilitate. And also you should be really clear about what people [customers] want" (Initial interview, KP, 38:42). The role of the orchestrating firm, however, is initially to design the network before orchestrating it, which the article by Dhanaraj & Parkhe (2006) did not cover further (p. 666). Since the aim in this section is to analyse the elements of orchestration which the hub firm is responsible for in the network, the design of the network will be excluded for now, but developed under subquestion two. Thus managing the scope of the network to enable knowledge mobility in realizing a community purpose requires the establishment of clear communication from the initiator of the network, in this case CCC-OCS.

A necessary establishment to make in order to dive into knowledge mobility is the requirement for heterogeneous knowledge between participants in the network, which was elaborated on in the previous section. The establishment of the network was achieved by CCC-OCS, which suggests the need to engage in the activity of managing knowledge mobility between network participants (Dhanaraj & Parkhe, 2006, p. 662).

Ease in mobility of knowledge between actors creates the opportunity to synergistically lead to enhanced innovation (Dhanaraj & Parkhe, 2006, p. 662). This opportunity was exemplified by CCC-OCS: "If we do good business, [...] and it kind of helps society grow. [...] So in that sense, we're also role models in changing things. [...] We want to be an open minded player of society. [...] Because we believe that makes the biggest impact, that would make the biggest development." (Initial interview, CCC-OCS, 32:17). Exactly the opportunities of high knowledge mobility in innovation creates a learning capability at the organisations' boundaries and could potentially be a method for reaching monopolistic advantages as a community (Dhanaraj & Parkhe, 2006, p. 662). CCC-UE1 confirmed the mentality of high knowledge mobility: "we do want to share stuff. It's just a matter of figuring out how to do it in the best way" (Initial interview, CCC-UE1, 18:22).

Exactly the "how to" that CCC-UE1 spoke of, may be related to the expectation of achieving value creation by participating in the network. As Dhanaraj & Parkhe (2006) highlighted in their article, the innovation appropriability requires a shared purpose and high mobility of knowledge in the network to promote value creation (p. 662). Appropriability is defined as "an environmental property that governs an innovator's ability to capture the profits generated by an innovation" (Dhanaraj & Parkhe, 2006, p. 660). Achieving appropriability will thus be seen to generate a higher level of innovation output in the network. Value, however, will then be increased, and distributed via "trust, procedural justice, and joint asset ownership" (Dhanaraj & Parkhe, 2006, p. 662). The role of trust in enabling a community is demonstrated by CCC-OCS: "So I think that transparency goes to [make] you trust [...] the founding partners - to trust their vision" (Initial interview, CCC-OCS, 22:31). Returning to the scepticism about the purpose of their network from CCC-UE1, the element of innovation appropriability seems to be highly dependent on trust in CCC-OCS, which seems to be fairly low at this early point in its existence.

Finally, if the knowledge mobility and innovation appropriability is achieved, the survival of the network is dependent on the stability of the network (Dhanaraj & Parkhe, 2006, p. 663). Network stability should not decrease the level of agility in the loosely coupled

network, although network instability is not preferred, since it may harm the innovative output. Returning to the lack of definition of the network, CCC-OCS would need to increase the robustness of the relations between the participating organisations through multiplexity, which is the relationship between two or more organisations (Dhanaraj & Parkhe, 2006, p. 664). The opportunities of promoting multiplexity is the increased scope of the network, which can be related back to both the heterogeneity of individuals (Felin & Hesterly, 2007) and bridging structural holes of necessary knowledge (Rajala et al., 2020). Simply it all goes back to a shared foundation for defining a value proposition, and the orchestration of a scope of the community: "knowledge sharing is facilitated when stakeholders perceive that a personal or communal benefit will arise from the interaction" (De Bernardi & Azucar, 2020, p. 166). Creating a high innovation output from engaging in innovation networks, is for CCC-OCS's network reliant on the engagement from him as an initiator, and how he manages to better orchestrate the purpose of it.

Knowledge creation

As analysed in the previous two sections, knowledge in the organisations in the dataset is seen to be acquired through network activities, where heterogeneity in individuals is perceived as a method for gathering specific knowledge. The SECI model is incorporated to identify the process of knowledge conversion across companies related to the upcycling food byproducts community. *Socialization* is the first phase of conversion in the SECI model, which describes sharing tacit knowledge among individuals (Nonaka et al., 2006, p. 1182). The practise of socialization is suggested through gaining knowledge from suppliers, technical university, word of mouth (Questionnaire - replies, p. 121), other startups (Initial interview, CCC-BPU, 31:07) and well established companies (Initial interview, CCC-BPU, 35:58). The practise of socialization suggested the presence of Originating *ba*, in the form that experiences and mental models are being shared face to face amongst individuals and organisations that are connected to the community (Nonaka et al., 2006, p. 1185). The network activities performed by the organisations in the empirical dataset are found to be practicing

knowledge sharing, which is an essential part of how organisations create new knowledge.

The second phase of conversion is *externalization*, which describes the process of community members converting tacit knowledge into explicit (Nonaka et al., 2006, p. 1182). The practise of externalization is suggested through companies giving courses, sharing learning material (Initial interview, CCC-UE1, 17:10) and publishing media articles on sustainability practices in the food system (Initial interview, KP, 00:29). This affirms the availability of explicit knowledge in the upcycling food byproducts community. Interacting *ba*, as the supporting pillar of externalization of converts knowing amongst participants (Nonaka et al., 2006, p. 1185). The publishing of media articles, podcast and teaching courses, can be references to the supporting characteristic of Interacting *ba*. Interacting *ba* supports externalisation in the sense that it suggested the presence of the sharing of mental models, common terms and concepts across the upcycling food community emerge.

The analysis has also touched upon the point that ease in mobility of diverse knowledge amongst community members increases the activity of creating collective value (Dhanaraj and Parkhe, 2006, p. 662). The phases of *combination* and *internalization* from acquiring diverse knowledge can be seen in the collaboration between two organisations where CCC-UE1 supported CCC-UE2 with explicit knowledge in establishing a similar business model describing the combining of different forms of explicit knowledge. CCC-UE2, was thus able to combine the knowledge, skillsets and experiences of CCC-UE1 to acquire value through increasing his own ability to establish and develop a new circular business model (Initial interview, CCC-UE1, 17:10). Organisations who use externally acquired knowledge as a resource for innovation as several organisations in the empirical dataset do, indicates that an internalization process is performed. This demonstrates that a given entity within the upcycling food byproducts community internalizes explicit knowledge through network activities.

The mobility of knowledge between CCC-UE1 and CCC-UE2 also ties to variables of trust between community members in enabling the process of knowledge creation. Nonaka et al. (2006) supports the significance of trust by elaborating that members

need to demonstrate a high degree of care for one another as a condition for supporting the process of social justification (Nonaka et al., 2006, p. 1186). CCC-UE1 and CCC-UE2 demonstrate having trust for one another as they seemingly operate the same business, in which traditionally they could be viewed as competitors. More so, social justification supports the increase of value through knowledge creation. CCC-BPU suggested his experience in value increase through elaborating on the significance of their collaboration with CCC-OCS, where both members share knowledge through shared business activities within supply chain and sales (Initial interview, CCC-BPU, 35:58). The qualitative data from the initial interviews suggests members engaging in knowledge creation having an adequate degree of trust for one another and in turn realising joint value creation.

Section conclusion

Analyzing the organisation in the empirical dataset with the use of Lewandowski's (2016) five principles has helped align the activities of upcycling with the incorporation of a circular business model. By establishing their approaches for doing business, the organisations were found to use collaboration in resource looping as a method for acquiring knowledge about internal projects (Rajala et al., 2018). Designing and iterating their business models as circular, the organisations are thus seen to use their BM's as a vehicle for driving their upcycling activities in a sustainable way in all aspects of the triple bottom line (Massa & Tucci, 2017). Incorporating Felin & Hesterly's (2007) views on individuals as heterogeneity, the organisations in the upcycling food byproducts community are seen to actively use their networks to acquire new knowledge. As knowledge was argued as emerging from individuals the organisations collected knowledge in specific settings for specific purposes to benefit their businesses. Dhanaraj & Parkhe's (2006) article contributed to the understanding of how the outputs of network innovation could be increased through increasing the role of the facilitator such as CCC-OCS and KP in their network. Finally, the interactions between organisations in the empirical dataset were analysed with the use of Nonaka et al.

(2006), which showed how new knowledge is created through their network activities by performing socialization, externalization, combination and internalization.

Ecosystems as strategic innovation

The facilitation of the two workshops conducted in relation to this thesis, is focused on the concept of the ecosystem. To fully understand the potential of an ecosystem, Adner's (2017) article is used to analyze the ways an ecosystem can be structured and strategically used to materialize a value proposition. As an element of the subquestion, innovation is incorporated to underline the developmental approach an ecosystem has, which is embedded in the process of materializing. Applying Adner's (2006) article about innovation ecosystems, the two workshops are analyzed as platforms for co-creation and the facilitation and risk that interdependence implies. Connecting these elements to Talmar et al.'s (2020) Ecosystem Pie Model, the two workshops are analyzed for the facilitating role of the EPM, and how it provides a structure for knowledge creation, which results in value creation if requirements are met. This analytical framework is firstly applied to the coffee workshop, and then to the grain workshop. The second subquestion is as follows: *How can an ecosystem be used as a method for strategic innovation?*

Coffee workshop

Ecosystems in general

Using 'ecosystem as structure' as an approach for considering interdependent value creation, offers a mapping of the actors needed to materialize a shared value proposition (Adner, 2017, p. 42). As Adner (2017) defined ecosystem as structure, he underlined the alignment of a diverse group of collaborating actors who work towards materializing a shared value proposition (p. 42). The activity-centric approach towards ecosystems that Adner (2017) had, was further emphasised by De Bernardi & Azucar (2020) in their argument for an holistic and inclusive approach for co-creation (p. 73). Like CCC-UE1 emphasised in the workshop, the requirements for collaboration were:

“transparency amongst each other, and a need [...] to be honest about what we are, what we are working on, and possibly also what we intend to do in the future.” (Workshop 1 - transcription, CCC-UE1, 1:14:33). Equally, CCC-OCS saw the participants bringing skills together to benefit the entire community: “in their own working field [the participants] are kind of front runners. And here we put ourselves together.” (Workshop 1 - transcription, CCC-OCS, 1:27:01). The participants in the workshop thus saw a potential for defining a common ground for co-creation. However the structural part of an ecosystem is still to be defined in order to be able to materialize a value proposition.

Mutual value creation pivots around a shared value proposition in the ecosystem and not one of a focal firm, in order to create a lens for solving ‘new questions’ that arise in the ecosystem perspective (Adner, 2017, p. 55). Considering firstly the ‘new question’ of the community, which is exemplified as: “we are working towards the same goal, which is basically changing the perception of coffee grounds.” (Workshop 1 - transcription, CCC-UN1, 37:07). It is thus seen that the potential for a shared value proposition is in place in the community. Adner (2017) characterized four requirements for structuring a shared value proposition: activities, actors, positions and links (p. 43). Following the previous example of a common ground, the community can thus be seen to agree on the ‘activities’ that need to be undertaken in order to materialize a shared value proposition. Solving the requirements of the external environment, or the ‘new question’, the community will though need to fulfill the three remaining requirements for structure, in order to define an ecosystem strategy for materializing a shared value proposition.

Securing an alignment of ecosystem actors, the role of the ecosystem strategy is an important tool for the lead firm to emphasise partnership and secure positions in the ecosystem (Adner, 2017, p. 47). The ecosystem actors are the entities that undertake the activities for changing the perception of coffee grounds, in this case. The representation of actors was seen to be diverse in the coffee industry: “it can be [...] complicated, bringing things to life. But I think here [...] we also have a quite broad variety of partners doing different things in this grit [community]” (Workshop 1 - transcription, CCC-OCS, 1:29:39). Although perceiving the community as diverse via a suiting variety of actors,

does not fulfil the remaining elements for structure in order to be characterised as an ecosystem strategy. The alignment of 'partners', which is essential for an ecosystem strategy, is thus still reliant on the elements 'position' and 'links' (Adner, 2017, p. 47). The task of incorporating these two elements, lies with a lead firm who needs to orchestrate a partnership and value creation.

The possibilities in adopting an ecosystem structure can increase value creation for organisations in alternative approaches for interdependencies (Adner, 2017, p. 49). By not qualifying as an ecosystem, the use of network in alternative interdependent collaborations (like the organisations were seen to employ earlier), the organisations of the workshop wish to achieve even more benefits from co-creating. One example was the wish for achieving a competitive advantage with an international scope: "there's currently a global competition, to who establishes it first [the ecosystem of coffee grounds]. So if we want to position ourselves as the leaders in these needs, we need to make it work in Denmark" (Workshop 1 - transcription, CCC-UN1, 1:34:47). Mentioning the possibilities and challenges in the same sentence, CCC-UN1 underlined the need for structure on a local scale, in order to achieve a larger scope in an ecosystem. Otherwise the collaboration might be defined as an alternative approach for network structuring, which does not materialize a joint value proposition as an ecosystem facilitates.

Innovation Ecosystem

Diving further into the fit between the internal and external environment, an innovation strategy is used to contextualise the ecosystem and secure customer centrism in order to create relevance in innovations (Adner, 2006, p. 98). The necessity to align with the external environment is the way to innovate with the focus on a defined market and its structure (Adner, 2006, p. 106). Supporting this, De Bernardi & Azucar's (2020) presentation of co-creation possibilities in an ecosystem, was also argued to create more value than what an organisation can create alone (p. 85). This is exemplified in the view that CCC-OCS had on the possibilities of the community: "we're using what is now considered [...] as byproducts. And we're going to use that for improving conditions for

everyone and the environment as well." (Workshop 1 - transcription, CCC-OCS, 37:57). He continued by pointing out how value was created in the ecosystem: "we get access to a very strong network of dedicated partners, we get the opportunity to develop our brand and profile and for sure, products and services related to our circular transition." (Workshop 1 - transcription, CCC-OCS, 1:11:33). Relating the innovation strategy to what the external environment requires, incorporates a relevance of the innovation, which is noticed by CCC-OCS, however the succesfactor of this strategy is though related to how well the ecosystem manages risk.

Relating the potential of a community's growth to how successful the ecosystem assesses its risk, Adner (2006) proposed a systematic approach to structuring the three levels of risk in order to "create value that no single firm could create alone" (Adner, 2006, p. 100). Firstly, taking the initiative to create the ecosystem is connected to the capabilities of orchestrating the co-creation with the lead firm, which Adner (2006) defined as initiative risk (p. 100). This is exemplified by CCC-OCS "we want to be in this 100%. And if I look, let's say 5-10 years ahead I think this is a very, very big part. I mean, not just this system, but generally working in ecosystems." (Workshop 1 - transcription, CCC-OCS, 1:38:16). Secondly, collaborating is defined by interdependence, which involves a risk since several actors contain codependency in their collaborations (Adner, 2006, p. 101). As KP noted, the stage for interdependence should be facilitated by "connecting people that have the same values and creating a stage for them." (Workshop 1 - transcription, KP, 1:09:50). Lastly, the pitfalls of integration creates a risk for barriers for launching an innovation on a market (Adner, 2006, p. 103). CCC-UN1 highlighted the need for change towards the perception of upcycled products as being a barrier for customers (Workshop 1 - transcription, CCC-UN1, 1:30:21). By structuring the ecosystem around the minimization of these three levels of risk, the ecosystem has an increased chance of materializing its value proposition.

Ecosystem Pie Model

Talmar et al. (2020) presented ecosystem formation as a strategy, enabling companies to build specialized organisations to meet the demands of realizing complex value

propositions (p. 1). They further related the user segment to a firm and ecosystem level, encompassing the ability to serve specific groups of users within the boundaries of the EVP and enabling the ecosystem to gain a competitive advantage as a whole (Talmar et al., 2020, p. 3). KP contributed to the description of the user segment by suggesting going to KP's festival as an activity (Workshop 1 - transcription, KP, 22:10). CCC-UN1, added that the segment includes users of alternative products derived from coffee byproducts, and as a form of value capture for users to perceive upcycled products as healthy (Workshop 1 - transcription, CCC-UN1, 30:51). The participants of CCC established a common understanding of the ecosystem user segment, defining the segment as users valuing sustainability and health in their product choice (Workshop 1 - transcription - ecosystem pie model, p. 189).

As described by Talmar et al. (2020) the EVP is a system level goal, where the value of the innovation should correspond to the need of the end user (p. 3). CCC-UN1 defined a requirement in the EVP to incorporate changing the perception of coffee grounds from waste to a byproduct (Workshop 1 - transcription, CCC-UN1, 37:07). Whilst CCC-OCS shared that "instead of talking about reducing, why not talk about improving [conditions for upcycling]" (Workshop 1 - transcription - CCC-OCS, 37:57). CCC-BA drew an additional perspective that "it is not just about coffee grounds [...] but the entire plant" (Workshop 1 - transcription - CCC-BA, 39:15). The EVP was formulated by the participants as *Maximizing the potential of Coffee throughout the Value Chain* (Workshop 1 - ecosystem pie model, p. 189). The participants of CCC suggested the proposition as shifting the perception of coffee as a resource amongst users and exploiting its full potential as a plant. The agreement of the EVP is thus an alignment between participants which creates a shared platform for all actors to stand on and see relevance in participating in the ecosystem. The participants functioned as the main actors, engaging in 'value additions' and 'value capture' in the ecosystem, through performing distinct 'activities' that are complementary to realizing the EVP via their separate 'resources' available (Talmar et al., 2020, p. 3).

According to Talmar et al. (2020) participants having complementary subsystems can be categorized to represent one actor (p. 6). This was done accordingly in the workshop

with CCC (Workshop 1 - presentation, p. 140). As a host of a political festival on food systems who works with public relations and communication, KP represented a knowledge platform (Workshop 1 - transcription, KP, 03:36). CCC-OCS represented an established international coffee supplier and a leading role as the vision holder of the ecosystem (Workshop 1 - transcription, CCC-OCS, 05:18). CCC-CU represented an actor buying and using coffee in the ecosystem who offers coffee as a beverage to customers and packs the coffee grounds to give to customers to take home as a service (Workshop 1 - transcription, CCC-CU, 01:00). CCC-UE1 and CCC-UE2 with their likeness of business concepts, together represented an actor upcycling coffee byproducts to create edible products, in the ecosystem (Stakeholder overview, p. 2). CCC-UN1 and CCC-UN2 formed part of actors categorized as upcycling coffee byproducts to create non edible products. CCC-BA represented an actor performing branding and communication to support the realization of the EVP (Workshop 1 - presentation, p. 140). According to this perspective, the actors' contribution to the ecosystem is seen to represent different roles in the life cycle of coffee.

The resources that the actor uses for generating value, draws from the individuals' heterogeneity and is influenced by prior knowledge, which drives value creation by being diverse (Talmar et al., 2020, p. 2). The resources that KP contributed with are defined by her knowledge of food systems as a resource (Workshop 1 - ecosystem pie model, p. 189). CCC-OCS had resources that include knowledge about coffee value chain infrastructure. As for CCC-CU, her resources available to the ecosystem were coffee grounds and a channel of communication. CCC-UE1 and CCC-UE2 mentioned that they are developing new kinds of production techniques about how to use coffee grounds in edible products and that they would be willing to contribute that knowledge as a resource into the ecosystem (Workshop 1 - transcription, CCC-UE1, 1:14:33). CCC-UN1 and CCC-UN2 presented the thought of contributing by sharing their knowledge and know-hows on unlocking the full potential of coffee to produce everyday products and involves measuring environmental improvements (Workshop 1 - transcription - CCC-UN1, 1:16:56). CCC-BA's contributing resources were influenced by his experience in establishing branding in other industries. Both the actors' backgrounds and their

realized contributing resources are seen as diverse, which creates a fertile foundation supplementing resources.

Talmar et al. (2020) described 'activities' as the mechanisms that actors do for creating value, by converting firm resources into value additions (p. 3). By spreading the message about sustainability in food systems, KP's activities were related to communicating about the work towards industry change (Workshop 1 - ecosystem pie model, p. 189). For CCC-OCS analytical activities about impact of sustainability and its relation to a circular business model was noted as activities relevant for value creation. Activities for CCC-CU were supplying coffee grounds to CCC-UE2 (Workshop 1 - transcription, CCC-CU, 01:00). For CCC-UE1 and CCC-UE2 storytelling and the aim for scaling up sales of revenue-creating products were essential activities for value creation (Workshop 1 - ecosystem pie model, p. 189). Important activities for CCC-UN1 and CCC-UN2 were partnerships and securing the business case in their products as well as lobbying for a broader acknowledgement of upcycled products. CCC-BA's contributing activities resemble a boundary spanning nature by participating in the facilitation of the combination of actors' activities and bringing in relevant knowledge. As indicated by the activities presented by the actors, the diversity of skills can be perceived as complementary.

Using the resources available to the actors in their activities, generates a value addition which indicates what value is contributed to the ecosystem (Talmar et al., 2020, p. 2). KP saw their value addition as enabling better conversations and facilitating knowledge sharing between companies and consumers by communicating complex messages simply (Workshop 1 - ecosystem pie model, p. 189). CCC-OCS shared some of their value additions as being a sustainable supplier of coffee and having resources of logistics and infrastructure in the entire value chain from coffee farmer to coffee consumer (Workshop 1 - ecosystem pie model, p. 189). CCC-OCS described CCC-CU's value addition as having a very strong platform for communicating and showcasing solutions (Evaluating interview, CCC-OCS, 06:39). CCC-UE1 and CCC-UE2 suggested that they could share knowledge on the health benefits of mushrooms and on improvements of product developments (Workshop 1 - ecosystems value proposition, p. 189). CCC-

UN1 and CCC-UN2 presented their contribution of sharing their know-how on unlocking the full potential of coffee to produce everyday products and measuring environmental impact of production (Workshop 1 - transcription - CCC-UN1, 1:16:56). CCC-BA saw his addition as bringing insights on mobilizing and engaging collaborators within the community, as well as supporting the process of setting the direction of the community (Workshop 1 - transcription - CCC-BA, 1:18:34). The analysis of value addition in the ecosystem can also be referenced to Felin & Hesterly (2017) who proposed that value in an organization lies within the heterogeneity of each individual (p. 202). The value added to the ecosystem from activities and resources from the actors are thus seen as diverse and contributes to a large pool of knowledge for materializing the EVP in the coffee workshop.

Talmar et al. (2020) further presented that complementarity can be identified when actors share resources to enhance their abilities to create value both individually and for the sake of the ecosystem (p. 3). In the initial interviews, CCC-UE1 suggested that they have shared resources with CCC-UE2 to support their development, like it was analyzed earlier (Initial interview - CCC-UE1, 17:10). Additionally, the two companies shared that they earlier had worked on bettering production techniques and that this knowledge was available as a resource to the ecosystem for further use (Workshop 1 - transcription, CCC-UE1, 1:14:33). During the workshop, CCC-CU also stated that she had already done activities with CCC-OCS and CCC-UE2 (Workshop 1 - transcription, CCC-CU, 1:12:55). In particular CCC-CU shared that she provides her excess coffee grounds to CCC-UE2, which CCC-CU related to her fulfilling the social requirements of incorporating the SDGs in her business model (Workshop 1 - transcription, CCC-CU, 1:12:55). The complementarity between the actors' value additions and integration of these value additions acts as a contribution to the ecosystem, which is rewarded with value capture for all actors.

In order to secure value capture for all participants, the lead firm needs to contribute and engineer value capturing mechanisms that are unique to the ecosystem's value creation towards the customer (Talmar et al., 2020, p. 3). CCC-OCS, as the initiative taker, shared that their value capture was innovation, branding, products and services

(Workshop 1 - ecosystem pie model, p. 18). However, uncertainty about the output of the ecosystem is demonstrated when KP shared that she hoped that the community will not end up becoming another “[...] certification that could be put on [product] labels.” (Evaluating interview, KP, 16:25). CCC-UN1 raised the same question stating that their main agenda is understanding how CCC can be valuable for both them and CCC-OCS (Evaluating interview, CCC-UN1, p. 224). Though participants suggested ways of capturing value from the ecosystem, CCC-OCS was not explicit about concrete mechanisms to monitor the individual organisations’ contributions.

Talmar et al. (2020) presented that, given the modular nature of the ecosystem, actors can combine their value additions in different ways, as complementarities, to capture value and materialize the EVP (p. 4). To begin with, CCC-BA identified a variety of complementarities in the workshop by pinpointing and combining value additions from different actors (Workshop 1 - transcription, CCC-BA, 1:18:34). CCC-UE1 further highlighted this immediate value capture in having spent time with CCC-UE2 and that potential value capture lies in gaining new customers and new business opportunities (Workshop 1 - transcription, CCC-OCS, 1:14:33). The availability of explicit knowledge in production techniques can be referenced to Nonaka et al.'s (2006) knowledge conversion phase of externalization, where tacit knowledge is converted into explicit (p. 1182). Furthermore, CCC-BPU mentioned prior to the workshop that CCC-OCS, “[...] pretty much opened up their supply chain and their sales team for our products which is a huge help” (Initial interview - CCC-BPU, 35:58). The complementarities between companies are thus seen to enhance the companies’ value capture, which indicates matches between value additions for the sake of materializing the EVP in collaboration.

Talmar et al. (2020) highlighted risk as a construct in the ecosystem, by relating it to dependence and value capture (p. 4). In order for the EVP to materialize, actors need to achieve a level of agreement, alignment and commitment to their individual contributions (Talmar et al., 2020, p. 4). In the workshop CCC-OCS shared a thought related to the risk of organising in an ecosystem. CCC-OCS highlighted that it is just the beginning of the formation of the ecosystem and that “we want to be in this 100%[...] everybody here seems pretty open towards ecosystems [...] but of course, we are not

destabilizing our business for a start" (Workshop 1 - transcription, CCC-OCS, 1:38:16). These elements of risks are related to the interdependence risk that were Adner (2006) presented. CCC-OCS statements suggest that at the current stage, the ecosystem has great potential, but needs to be developed in order to gain a larger impact. This statement is supported by CCC-UN1: " [...] everything is connected [...] we could add value in some way to some other company and similar company for us. So I think just having this circle [EPM] is perfect" (Workshop transcription, CCC-UN1, 1:29:14). Relating the perceived risk of the ecosystem to its immaturity thus brings a focus on developing the ecosystem to reach its full potential, which is seen by several participants.

Section conclusion: coffee workshop

The analysis of the coffee workshop demonstrates that participants perceive the community as bringing a diverse set of skillets together in a potential ecosystem working towards a shared value proposition. Referencing Adner's (2017) defined potential of an ecosystem, the participants are seen to establish themselves as working towards a shared goal of changing the perception of coffee through actively exploring possibilities for higher value creation through joint collaborations. More so, Adner's (2006) concept of innovation ecosystems reveals that risk in the workshop was perceived relatively low, however a risk for integration of upcycled products to the market was found. The EPM by Talmar et al. (2020) showed participants identifying a common user segment, and the potential in further developing the EVP to maximize the potential of coffee throughout the value chains. The structural nature of the model demonstrates that participants willingly engage in the realisation of the EVP through sharing knowledge of their unique contributions based on their individual prior knowledge and resources although the structure for materializing the EVP was missing. Furthermore the potential areas of value creation were surfaced by participants making their complementarities explicit. The structure of the EPM enabled participants to create knowledge around a common EVP, though also revealing critical needs for structure and orchestration of the ecosystem in order to fully establish one.

Grain workshop

Ecosystems in general

Using an ecosystem to organize and align interdependent collaboration between organisations is, according to Adner (2017), a method for materialization of a shared value proposition (p. 40). Building yet again on Adner's (2017) definition of the ecosystem, the requirements for organising in an ecosystem relate to the multilateral cooperation of partners wanting to achieve a shared value proposition. In the second workshop participants were not previously related to each other in co-creating besides a few specific tasks between KP and CG-UE and the familiarity participants had with each other's businesses (Workshop 2 - transcription, KP, 03:28). Organizing in an ecosystem required the participants in the workshop to be aligned on a shared value proposition, which was the aim in the workshop (Workshop 2 - adaptations, p. 237). However the perspective of it was different: "we're working to maximize the value of the grain throughout the value chain. That's, I mean, the nature of our business, but the *'why we do it'* can be different." (Workshop 2 - transcription, CG-UE, 41:24). It is thus seen that a value proposition was tried to be agreed upon, however, the direction towards one, and the scope of the materialization, was different.

Applying a structural element to the benefits of an ecosystem can contribute to a larger achievement of value creation between organisations, by organising its activities around an ecosystem strategy (Adner, 2017, p. 55). The ecosystem strategy incorporates a structural element in the ecosystem that approaches an alignment of partners in order to achieve the shared value proposition (Adner, 2017, p. 47). To reach the element of structure Adner (2017) mentioned four principles: activities, actors, positions and links (p. 43). The activities which needed to be undertaken for the value proposition to materialize were perceived differently by the workshop participants: "[the focus of] upcycling has to be on multiple side streams in order to gain some relevance in the market." (Workshop 2 - transcription, CG-UE, 1:14:10). Shifting the focus to the actor principle of an ecosystem, CG-UE advocated for a broader scope and the potential of network connections, that assimilates the ecosystem as affiliation "which sees

ecosystems as communities of associated actors defined by their networks and platform affiliations” (Adner, 2017, p. 40). The ‘ecosystem as affiliation’ contributes with an approach to value creation, however, the perspective of interdependence is related to increasing the number of network actors in order to achieve collaboration.

To achieve the full benefits of co-creation by organising in an ecosystem as a structure, Adner (2017) highlighted the importance of the leader role, and the direction a lead firm can contribute with (p. 47). Being a leader in an ecosystem encapsulates the requirements of aligning actors’ value propositions in order to move towards a shared one (Adner, 2017, p. 48). The leader also acts as the facilitator of a vision of structure in the ecosystem. In the workshop KP took initiative to facilitate a stage for actors to undertake activities in achieving the value proposition (Workshop 2 - transcription, KP, p. 03:28). Diverting from this view, CG-UE argued for the need of a broader scope of change in relation to the dreams of an ecosystem as a lobby group: “I think the discussion needs to be broadened out [from upcycling grain]” (Workshop 2 - transcription, CG-UE, 29:08). The discrepancy between the actors in achieving the shared value proposition indicates the lack of a leader in the constellation, which is why the structural elements are missing in the alignment.

As alternatives to the ecosystem, several approaches for interdependent collaboration exist, and create possibilities for an organisation to create value (Adner, 2017, p. 52). As previously mentioned the structural element in an ecosystem is essential to align and interdependently materialize a value proposition (Adner, 2017, p. 52). Viewing the misalignment between the workshop participants the requirements for co-creations are different with the three organisations: CG-GS is connected to Danish Technical University and benefits from their support (See Table 1), CG-UE tried to create a network for startups working with upcycling (Workshop 2 - transcription, CG-UE, 1:19:56) and KP works to facilitate a knowledge platform for sustainable businesses to knowledge share (Workshop 2 - transcription, KP, 03:28). The approaches for interdependent collaboration for both CG-GS and CG-UE resembles alternative presented approaches (Adner, 2017, p. 51-52). KP however, works towards structuring a materialization of a value proposition alone, which has aspects of an ‘ecosystem as structure’ on its own.

Perceiving the 'ecosystem as structure' as the better approach for collaboration between organisations is misleading, if the requirements in the organisation are not to materialize a shared value creation (Adner, 2017, p. 53). Adner (2017) argued that the multilateral relationships must work towards the materialization of the same value proposition in order to create value (p. 53). Seeing the clear discrepancy between the actors in the workshop, the overarching value proposition might be agreed upon, however the scoping and the approach to co-creation is different. CG-UE often works in networks in their business, although it is with a cautious approach (Workshop 2 - transcription, CG-UE, 1:19:56), which resembles the 'ecosystem as affiliation' approach. On the other hand, the more open approach towards ecosystems in KP and CG-GS indicates a more positive mindset towards working with 'ecosystems as structure'.

Approaching 'new questions and directions' and gaining a competitive advantage on the future market, can be achieved by applying the ecosystem as a structure (Adner, 2017, p. 56). Applying the strategic element of structuring an ecosystem, is, according to Adner (2017), an approach to answering 'new questions and new directions' and a way to incorporate a larger variety of resources into achieving a shared value proposition (p. 56). For the participants in the grain workshop, the views on the new directions with upcycling in the food industry were shared by agreeing on a shared scope (Workshop 2 - adaptations, p. 237). The element creating a chasm between the participants can thus be assumed to be related to risk. For CG-UE there is a clear perception of high risk in the workshop, which is why they hesitate to share knowledge (Workshop 2 - transcription, CG-UE, 29:08). Using the element of organisations voluntarily aligning in collaboration indicates to be the best approach to establishing an ecosystem as structure, in order to materialize a shared value proposition.

Innovation Ecosystem

Aligning the innovation strategy to the external environment creates a contextualisation of the innovation, which for ecosystem participants creates an opportunity for benefiting from co-creation (Adner, 2006, p. 98). Emphasizing the alignment from the innovation strategy to the innovation ecosystem, takes contextualisation to the aspect of alignment

between organisations (Adner, 2006, p. 106). CG-UE saw collaboration as a possibility to create a shared voice and a certificate for upcycled products for the benefit of the entire industry: "if the ecosystem could function as a as an interest group, or as a lobby group, and it could put strong pressure on the government" (Workshop 2 - transcription, CG-UE, 1:14:10). Relating the needs for legitimization of their products, CG-UE saw an opportunity to generate momentum by creating a larger group for changemaking. However, the need for a shared voice cannot be defined as innovation, but instead as a support activity which might be more related to the risks of innovating upcycled products.

The lead firm's efforts to manage risk in an ecosystem is related to the benefits of an innovation that the firm sees, which indicates the potential of collaboration the lead firm detects (Adner, 2006, p. 100). As Adner (2006) continued, the minimization of risks in an ecosystem increases the chances of success, which are related to how ecosystem participants saw the opportunity for co-creation (p. 100). Neglecting 'upcycling' as a unique selling point (hereafter USP), CG-UE focused on fitting their product line into existing product categories: "There's a general agreement that upcycled food is not yet a USP on the European market." (Workshop 2 - transcription, CG-UE, 29:08). This view indicates a doubt or detection of innovation risk of the innovation, where customers' perception and governmental legitimization act as integration risk of upcycled products (Adner, 2006, p. 103). The mentality of using an ecosystem strategy for materializing a value proposition related to upcycling thus seems unlikely according to CG-UE's views.

However, using co-creation as a method for securing customer centricism, requires participants to contribute with skills and knowledge for the benefit of the ecosystem (Adner, 2006, p. 100). Considering the market requirements, and the strategy to approach these markets by, depends on the perception of the market size and its preferences (Adner, 2006, p. 105). Compared to CG-UE, CG-GS saw an opportunity and a demand for upcycled products: "I will say around 20% also buy into the upcycling today" (Workshop 2 - transcription, CG-GS, 34:22). Collaborating in an ecosystem requires the actors to work towards materializing the same value proposition, which the two actors indicate to not be. A recognition of the value proposition in the workshop

was thus achieved, and defined as “Maximizing the potential of grain throughout the value chain” (Workshop 2 - adaptations, p. 237). This shows that the potential for the actors to find common grounds is present. Aligning their value propositions thus establishes the potential for co-creation, in order to gain benefits from shared knowledge and value creation.

To detect the chances of success of the innovation strategy in an ecosystem, the risk of interdependency characterises the reliance on collaboration the ecosystem parties have (Adner, 2006, p. 101). Assessing an ecosystem risk in a group requires more resources than doing this task alone, however, the opportunities of defining the risk profile of the ecosystem in plenum increases the relevance of the innovation strategy (Adner 2006, p. 107). Collaborating in innovation processes was seen to be present with both CG-UE and CG-GS, however the approaches were different. CG-UE approached co-creation as “we work a lot with our network [...] but we're also a business and we have to be careful of the networks and alliances that we involve our business in” (Workshop 2 - transcription, CG-UE, 1:19:56). CG-GS talked about collaboration a bit differently: “I have a very large group of known people, you can say I trust and I use them” (Workshop 2 - transcription, CG-GS, 1:21:22). The risk profiles of the two organisations, when considering interdependencies, are thus very different. Where CG-UE assesses risk internally, CG-GS indicates that trust allows them to assess risk in collaboration. Relating this argument to the organisations’ likeliness of participating in ecosystems indicates different risk profiles which each define their approaches to co-creation.

Ecosystem Pie Model

The second workshop was centered around the circulation of grain where participants began by defining the user segment, in specifying a target market for the value created in the ecosystem (Workshop 2 - Ecosystem Pie Model, p. 238). KP shared that when considering the user segment taste should be a distinct part of the products and that users could gain knowledge on the potential of byproducts as being a vehicle for sustainability (Workshop 2 - transcription, KP, 25:27). CG-UE supported KP’s statement on taste by further adding that there is a general agreement that upcycling food is not

yet a USP in the European market, thus other aspects need to come into focus when presenting the product to users such as flavor, nutritional benefit, price, packaging etc. (Workshop 2 - transcription, CG-UE, 29:08). Additionally, CG-GS suggested that the users segment is health conscious with a mindset that products are in fact a resource for your body (Workshop 2 - transcription, CG-GS, 26:39). CG-GS also further challenged CG-UE's statement, by pointing out that users buy into the upcycling concept (Workshop 2 - transcription, CG-GS, 34:22). Thus the user segment of a potential ecosystem in the upcycling of grain is suggested to be defined by having an acquired taste and a health conscious awareness.

Talmar et al.'s (2020) description of the EVP encompasses an overarching offering from the ecosystem in correspondence with a defined need/desire of an end user (p. 3). As a point of discussion for aligning the system level goal, the participants were presented with the EVP "Maximizing the potential of Grain throughout the Value Chain" (Workshop 2 - ecosystem pie model, p. 238). CG-UE added that including more businesses with different side streams would create a more robust and strong ecosystem (Workshop 2 - transcription, CG-UE, 20:13). CG-UE further pointed out that the focus should lie in upcycling in a broad sense, such as the creation of a common definition and a shared understanding across the food industry of upcycling, instead of focusing on the value chain of grain (Workshop 2 - ecosystem pie model, CG-UE, p. 253). CG-GS did not oppose the proposition (Workshop 2 - transcription, CG-CG, 41:00). KP further shared her perspective, adding that the ecosystem focus should be driven by a collective alignment on what can be improved or changed within the sustainability agenda (Workshop 2 - transcription, KP, 39:59). KP's point brought CG-UE to agree that the proposed EVP is deemed relevant, however not at highest importance to CG-UE (Workshop 2 - transcription, CG-UE, 41:24). Thus the participants concluded that the proposed EVP is relevant, though CG-UE argued the need for more diversity in the selected actors in the workshop.

According to Talmar et al. (2020), the value added to an ecosystem is created by the resources existing in an organisation combined with the activities done by it (p. 3). The resources available to the participants in the grain workshop did not variate much due

to the observed likeness of businesses. CG-UE challenged forming an ecosystem around the proposed EVP, stating that she saw a problem “[...] by trying to make different companies that are so close to each other in what they do work as an ecosystem.” (Workshop 2 - transcription, CG-UE, 20:13). Regardless, CG-UE as the CEO and co-founder of a company upcycling spent grain, contributed with resources such as knowledge about production into new foods to the workshop (Workshop 2 - transcription, CG-UE, 00:57). CG-GS makes and sells beer and upcycles the side-streams they refer to as spent grain, to make their own products. CG-GS also makes their own machinery (Evaluating interview, CG-GS, 05:57). The resources added by CG-GS are both knowledge -and machinery related. Lastly, KP’s resources lie in knowledge about connecting people and facilitating better conversation (Workshop 2 - transcription, KP, 03:28). Although the resources potentially available in an ecosystem are different, the overlapping elements are perceived as eclipsing the potential of materializing the EVP according to CG-UE.

The activities performed by the ecosystem participants are those initiatives done to perform the value creating processes of the resources available to an organization (Talmar et al., 2020, p. 3). For CG-UE, working with bringing a new category of upcycling to the market, as well as knowledge on working with the food administration on integrating side-streams into the food industry, illustrates her activities (Workshop 2 - transcription, CG-UE, 1:14:10). CG-GS on the other hand, suggested his value addition activity as upcycling spent grain and accumulating knowledge on how to exploit byproducts as a food product (Workshop 2 - transcription, CG-GS, 1:11:10). KP suggested her contribution as facilitating a platform for sustainable change in the food system through enabling transparency and generosity in sharing ideas across food system players (Workshop 2 - transcription, 03:28). The activities performed by the actors in the workshop are thus related to different foci, which indicates that the organisations’ are more differentiated than firstly assumed.

According to Talmar et al. (2020), the value addition element of their EPM is the value that the individual actors are bringing into the ecosystem, which all are playing their own role in the collective materialization of the EVP (p. 6). For CG-UE their value addition was

based on prior resources and activities as well as experience about food administration and their go to market strategy (Workshop 2 - transcription, CG-UE, 1:14:10). According to CG-CS, having vast knowledge in processes and managing spent grain as a resource alongside his skills in developing machinery for grain processing was perceived as a potential value addition to an ecosystem (Workshop 2 - transcription, CG-GS, 41:00). KP brings her skillset and prior knowledge of facilitating conversations and making knowledge explicit as her value addition in an ecosystem (Workshop 2 - transcription, KP, 1:09:40). By combining individual actors' resources with their activities, the value addition in an ecosystem working with upcycling grain can be perceived as varied, however the broadness of it is limited due to the low number of participants.

In collaborating towards materializing a shared EVP, actors will potentially benefit from capturing value from the ecosystem, which could not have been achieved alone (Talmar et al., 2020, p. 3). KP defined value capture in participating in an ecosystem as gaining knowledge of the challenges at hand in producing more sustainably (Workshop 2 - transcription, KP, 01:09:38). Furthermore, CG-GS suggested his value capture as gaining new ideas, within upcycling grain, for products in relation to what consumers need. He added that this could include equipment and methods of transportation (Workshop 2 - transcription, CG-CG, 1:12:42). Individually the participants saw potential in network activities, however, the value proposition defined in the workshop seemed to be increasingly irrelevant for them.

In Talmar et al. (2020), the notion of complementary value creation is presented, stressing the relationships between actors and the combination of value additions in different ways to realize the EVP (p. 4). CG-GS suggested in the evaluation of the workshop, an interest in working directly with CG-UE, sharing that "[...] it would be nice if we could find a way to work together instead of working in different directions." (Evaluating interview, CG-GS, 03:49). He presented potential areas of complementarity as methods of transportation and equipment. CG-UE, in the evaluation, shared that they have tested CG-GS's machinery for upcycling grain, but chose not to use them as they had better methods and technology (Workshop 2 - transcription, CG-UE, 13:39). KP's recognition of CG-UE's communication strategy,

suggests a complementarity in combining value additions based on KP's skills in communication. Furthermore, CG-UE revealed that they had been working with KP already and that they have a very good position in what they are doing (Evaluating interview, CG-UE, 01:37). Complementarities are though seen to be present, but they do not build on the value proposition recognized in the workshop. However, potential collaboration between the actors was seen, although indications suggest that this would be in relation to another value proposition.

Talmar et al. (2020) listed potential sources of risk that may influence an actor's terms of agreement, alignment and commitment to their contribution to the ecosystem (p. 4). CG-UE suggested a risk in associating companies that are so close in what they do, presenting that it "[...] becomes a little too intimate, to be honest." (Workshop 2 - transcription, CG-UE, p. 20:13). In response to a question asked by KP, CG-UE replied "I'm not super comfortable sharing this." (Workshop 2 - transcription, CG-UE, 29:08). She continued "[...] as a startup or any other business we need to protect our business." (Evaluating interview, CG-UE, 00:22). CG-UE proposed that it is safe to talk to someone who is upcycling a different side-stream compared to one doing the same (Evaluating interview, CG-UE, 02:29). Agreeing to this argument CG-GS perceived CG-UE as a competitor too, however, collaboration was an option for him (Evaluating interview, CG-GS, 02:24). He further shared that the concept of the EVP was a good idea when focusing on a broader value proposition, and not on the main business because of competition (Evaluating interview, CG-GS, 09:48). The participants' comments indicate that a competitive element between participants can limit the possibilities for collaboration, but both CG-GS and CG-UE could be willing to materialize another EVP focusing on lobbying with the right structure supporting the collaboration.

Section conclusion: grain workshop

In the grain workshop, participants experienced a misalignment on the premise in which a shared value proposition for forming an ecosystem is presented. By failing in aligning on a shared EVP, the participants of the grain workshop were seen to perceive risks of participating in the workshop. As the perceived risk made collaboration around the

suggested EVP impossible, instead participants had individual ideas of different goals a network could contribute to. The facilitation of the workshop using the EPM detected differences in the participants activities despite their own perceived likeness. As the low number of participants did not bring much diversity, the value addition available for a potential ecosystem were overlapping, and limited by the unwillingness to share knowledge by CG-UE. As the element of the EVP was not established between the participants, the potential of collaboration was seen to fall under alternative categories for interdependent innovation. The perception of risk from CG-UE overshadowed the possibilities of materializing the same EVP, however redefining the EVP with a broader scope was seen as a possibility for the participants to collaborate, if the required structure would be in place.

Parameters for value creation

In order to answer the last subquestion, a framework for which parameters should be measured were constructed. The approach to this construction took its basis in the ones encapsulated in the EPM structure, which was elaborated further by Williamson & De Meyer's (2012) article. Their article uses the ecosystem perspectives to establish which advantages it brings and how they are achieved (Williamson & De Meyer, 2012). To support this analysis relevant elements from Dhanaraj & Parkhe (2006) and Nonaka et al. (2006) are contributed to illuminate the aspects of ecosystem orchestration and knowledge creation in an ecosystem. These three articles were used to deductively construct five parameters for measuring value creation in an ecosystem, which are: 1) Ecosystem Strategy, 2) Facilitator, 3) Customer centricism, 4) Knowledge diversity, and 5) Knowledge conversion. As it was the approach in the second subquestion, firstly the data from the coffee workshop and its following four evaluating interviews will be analyzed followed by the grain workshop and its two evaluating interviews. The third subquestion is: *What parameters have an influence on value creation in an ecosystem?*

Coffee workshop

Ecosystem strategy

An ecosystem strategy is an architectural tool for orchestrating collaboration and the contribution of resources and activities from all participants to materialize a shared goal; the value proposition (Williamson & De Meyer, 2012, p. 27). The definition of an ecosystem strategy is based on the activities “that actively promotes and guides the development of its business ecosystem” (Williamson & De Meyer, 2012, p. 25). This definition resembles the definition presented by Adner (2017) and emphasizes the structural aspects of an ecosystem by promoting the possibilities of defining a strategy. As the initiative taker reasoned: “In some ways, you have to figure out what it is that you want to create? [...] we probably have to find a broader purpose” (Evaluating interview, CCC-OCS, 03:13). The lack of a clear ecosystem vision blocks the development of an ecosystem strategy, which is noted by a participant: “exactly how we will use it is still blurry. [...] But I have no doubt that I will try to do whatever I can from here to help to make it into something that we can all benefit from” (Evaluating interview, CCC-UE1, 17:13). The lacking element of a clear ecosystem vision, and by that an ecosystem strategy, decreases the chances for value creation in the ecosystem, however participant engagement for co-creation is seen to be high.

A key element for creating value from an ecosystem is to ensure an alignment between the ecosystem value proposition and the requirements of the user segment in the ecosystem strategy (Williamson & De Meyer, 2012, p. 26). Like it was emphasized in the circular business model section earlier, the need for relevance in the ecosystem outcome and incorporation of demands by customers were too defined by Williamson & De Meyer (2012, p. 31). As further suggested by them, more organisations work towards specialisation, which minimizes the ability for adapting to changing customer requirements singlehanded (Williamson & De Meyer, 2012, p. 31). Reflecting on the benefits of being interdependent versus alone in innovating, one participant said: “I mean being part of an ecosystem is beneficial, we can see value from being part of [it]” (Evaluating interview, CCC-UN1, p. 225). He added his perspectives on customers’

perceptions on upcycled products: "We would like to use it to [...] build consumer awareness. [...] for there not to be skepticism around the products (Evaluating interview, CCC-UN1, p. 225). As it is exemplified, the customers' awareness of upcycled products is still low, which is a challenge for the participant. He further sees the possibilities of value creation in collaboration with skillful collaborators.

Securing an alignment to customers recognition of incremental value in the products from the ecosystem, increases the added value that ecosystem participants gain (Williamson & De Meyer, 2020, p. 34). Emphasizing the focus on value creation for the customer proves the importance of an ecosystem strategy as a structural tool, which can be referenced back to Adner (2017). A strategy built on customer requirements thus increases the value creation for participants, which was seen to be perceived by participants in the workshop with CCC: "as for my experience, this was so far the most intimate and therefore also revealing, and therefore also productive session in that has been done within the circular coffee community" (Evaluating interview, CCC-UE1, 01:30). Furthermore, the structure of the EPM helped participants to see what roles were necessary to obtain in order to materialize the value proposition: "I like that way of organizing it, that you kind of get to understand what is the role I can play here? And also, I see what are the benefits that I could get out of it" (Evaluating interview, CCC-OCS, 06:39). Basing their orchestration on the defined user segment in the EPM, participants realised what roles were necessary to fill, in order to create value for customers, to gain value themselves.

The level of contributed activities and resources from the participants is reliant on the trust of the business case behind the ecosystem, which should be considered via risk management in the ecosystem strategy (Williamson & De Meyer, 2020, p. 37). Engaging in an ecosystem requires the participants to willingly buy into the EVP and identify an ecosystem strategy for materializing it. Williamson & De Meyer (2012) suggested that stimulating the level of engagement of participants through alignment contributes to investments (monetary and resource based)(p. 37). The initiator of the community defined the output for participants, by highlighting that: "[...] it's actually coming back to all those who kind of put into the system will also be able to get out the gains from the

system.” (Workshop 1 - transcription, CCC-OCS, 14:10). However, the necessary information for structuring an ecosystem strategy for moving towards this output was questioned by CCC-UE1 (Evaluating interview, CCC-UE1, 04:27). This critical view was shared by CCC-UN1 (Evaluating interview, CCC-UN1, p. 224). The requirement from participants is thus for the initiator, CCC-OCS, to lead and contribute with more information and be more open towards how, and which, contributions should be made to lower barriers for participating.

In order to gain optimal value from collaborating in an ecosystem, participants need to encounter a strategically defined platform for sharing tacit and explicit knowledge in order to materialize the value proposition (Nonaka et al., 2006, p. 1182). For value to be created, the ecosystem strategy must facilitate a platform with no, or none, perceived risk, for participants to be willing to share knowledge (Williamson & De Meyer, 2020, p. 28). A participant stated that the way of organising the collaboration internally is important to learn what complementary skills could do specific tasks (Evaluating interview, KP, 13:42). Proceedingly, CCC-UE1 saw potential value capture from the contributions in the workshop, and acknowledged CCC-UN1 as a good provider of knowledge (Evaluating interview, CCC-UE1, 04:17). Furthermore, CCC-OCS highlighted the openness towards sharing knowledge between participants: “secrets are not really bringing us anywhere” (Evaluating interview, CCC-OCS, 15:55). Detecting an open approach towards knowledge sharing between participants in the workshop, showed that there was a high willingness to share, which indicates the possibilities for an ecosystem for knowledge creation to materialize.

Facilitator

The article by Williamson & De Meyer (2012) presented the role of the lead firm as establishing the overall architecture of the ecosystem in which participants can materialize a shared value proposition (p. 27). This includes structuring key interfaces and incentives and forming a small co-opt group of strategic partners (Williamson & De Meyer, 2012, p. 27). The concept of a lead firm is also mentioned by Dhanaraj & Parkhe (2006), who defined the tasks of the hub firm to orchestrate three parameters for

increasing innovation output (p. 660). As CCC-OCS is the initiator of CCC, he might be perceived as the lead firm of the circular coffee community. He stated that he bears most responsibility for the improvements of the meet ups (Evaluating interview, CCC-OCS, 02:08). The experience of the workshop also probed CCC-OCS in a sense that he recognized the need for setting more structure (Workshop 1 - transcription, CCC-OCS, 1:26:59). The lack of structure proposed a threat to the level of engagement in the community, as CCC-UN1 shared that his engagement in the ecosystem depends on CCC-OCS defining the purpose of the community (Evaluating interview, CCC-UN1, p. 225). The increase of participants' engagement in the community is dependent on CCC-OCS, taking action in setting up the necessary structures and taking on the role as the lead firm.

Nonaka et al. (2006) emphasised the presence and influence of corporate vision in the orchestration of an organisation's knowledge system (p. 1183). The article stated that corporate vision outlines the fields of development and organisational culture that directs individuals' choices, mindsets and actions (Nonaka et al., 2006, p. 1183). In the beginning of the workshop CCC-OCS outlined their vision of the community as being 100% circular by 2030 and beyond (Workshop 1 - transcription, CCC-OCS, 05:18). Though this corporate vision has informed the primary concept of the circular coffee community, participants in the workshop perceive that it is not yet explicit enough to inform areas of development and direct participants actions. This is exemplified by KP, when she added that CCC-OCS needs to put out the vision into a framework that is comprehensible (Evaluating interview, KP, 18:29). Thus CCC-OCS's corporate vision needs to be implemented as a guiding principle in orchestrating a knowledge system within the architecture of the ecosystem.

The role of the lead firm is to catalyze the emergence and development of an ecosystem by taking a strategic approach that actively promotes and guides the development of the ecosystem, which overall enhances competitive advantage and ability to capture value (Williamson & De Meyer, 2012, p. 25). This consideration is used by CCC-UN1 when he added a comment directed to CCC-OCS, explicifying that the ecosystem could have a global objective by focusing on optimizing current circulation of coffee grounds

in Denmark, in order to gain a global competitive advantage (Workshop 1 - transcription, CCC-UN1, 1:35:41). Furthermore, the role of the lead firm also involves maintaining the dynamic composition of the ecosystem through actively managing the requirements for partners to join the ecosystem (Williamson & De Meyer, 2012, p. 41). CCC-UE1 pointed out that there was no new information from CCC-OCS in the workshop, adding that it is still a community without a promise (Evaluating interview, CCC-UE, 17:13). This demonstrates that as the lead firm, CCC-OCS has not yet defined the scope of the ecosystem in which it realises competitive advantage for the ecosystem as a whole.

Williamson & De Meyer (2012) further added that closing the knowledge gaps within the community is under the responsibility of the ecosystem facilitator (p. 36). Thus the lead firm needs to close these gaps by finding ways to integrate actors who represent the knowledge gaps existing in the community. CCC-OCS recognised the values of using the EPM as making the potential roles and responsibilities explicit. This enabled the process of understanding what roles were needed and how new partners entering the ecosystem can contribute (Evaluating interview, CCC-OCS, 06:39). This demonstrated his awareness of his responsibility to have an overview of resources within the ecosystem, exemplified by his realisation of a need to include more big industrial players in the ecosystem (Evaluating interview, CCC-OCS, 11:23). CCC-OCS recognises the EPM as a tool for supporting his ability to respond to gaps within the ecosystem and realising different approaches for engaging participants in the ecosystem to define a structure for organising.

Customer centrism

A central element of the Ecosystem Pie Model is the focus on customers and their demands. Customer centrism is a necessary perspective in order to secure relevance in innovation (Williamson & De Meyer, 2012, p. 26). As organisations increasingly become more and more specialized, collaborating in innovations provides organisations to contribute with specialized skills and meet increasingly complex demands from customers (Williamson & De Meyer, 2012, p. 27). As defined in the construction of the

EPM, the participants saw an important aspect in collaborating on reaching customers: "there's so much chaos out there. So there's really no reason why not to collaborate [around customer demands]" (Workshop 1 - transcription, CCC-UE1, 36:26). Another participant further clearly saw an opportunity in collaborating: "we could play each other's strengths for the common good" (Workshop 1 - transcription, CCC-UN1, 1:30:21). Emphasizing the value capture that increases by collaborating in reaching customer demands, Williamson & De Meyer (2012) illustrated how a result of co-creating with a customer centric perspective creates increased value for all participants (p. 43).

In their article, Williamson & De Meyer (2012) presented the central concept of ecosystems being able to facilitate co-creation in order to create *economies of scope*, which describes bringing specialized capabilities, scattered across diverse organisations, to work together for their joint benefit (p. 26). In considering customer centricism, both CCC-UN1 and CCC-UN2, highlighted the importance of the design of ecosystem innovation, enabling customers to gain a deeper awareness of the coffee industry and the potential of upcycled coffee grounds (Workshop 1 - transcription, CCC-UN1, p. 1:16:56). CCC-UN1 suggested that benefits particularly relate to the health benefits of the resource (Workshop 1 - transcription, CCC-UN1, 30:51). The value of facilitating collaboration is an important aspect of *economies of scope*. CCC-UE1 highlighted that he hoped participating in the ecosystem would result in bringing everyone more customers (Workshop 1 transcription, CCC-UE1, 1:14:33). A collaboration between a broad variety of participants thus brings a differentiated pool of skills to be combined in meeting complex demands from customers.

Knowledge diversity

A high degree of diversity contributes to a large pool of knowledge to benefit the development of the ecosystem when constructing an ecosystem from participants having heterogeneous knowledge profiles (Williamson & De Meyer, 2020, p. 28). In order to effectively create and extract value from an ecosystem, Dhanaraj & Parkhe (2006) described the main currency for increasing value creation in innovation

ecosystems to be knowledge (p. 660). Even though CCC-OCS saw great diversity in the workshop, he pinpointed an interest in gaining momentum by incorporating larger players in the ecosystem: "We need industrial players to take part as well. Yeah. And it would be very strong to have a company like McDonald's [or] Arla or something like that. I mean, some with some kind of outreach and power" (Evaluating interview, CCC-OCS, 11:23). Another participant in the workshop described an additional perspective on diversity: "It's also risky because on one hand bringing in more people could bring solutions or they could see it as a business opportunity and try to do it themselves" (Evaluating interview, CCC-UN1, p. 226). Seeing both opportunities and risk related to diversity in an ecosystem is a natural part, however managing activities and players via an ecosystem strategy maximizes value creation, and direct control over variability and uncertainty lowers risk (Williamson & De Meyer, 2020, p. 28). So inevitably the success of the ecosystem goes back to the role of the facilitator.

Allocating roles to specific participants in line with their knowledge fields is aligned with Adner's (2017) definition of structure, which is the basis for applying an ecosystem strategy for materializing a value proposition (Williamson & De Meyer, 2020, p. 35). By establishing the ecosystem focus on the requirement of the user segment, the lead firm should aim to facilitate and combine special niches that fulfill specific needs of the user segment in order to create alignment with the ecosystem output (Williamson & De Meyer, 2020, p. 35). KP reflected on this view, by evaluating the skills available in the workshop: "how can we contribute to a more sustainable food system with our knowledge?" (Workshop 1 - transcription, KP, 1:08:37). Another participant highlighted his perception of the session, as a place to meet each others and establish which qualifications were available in CCC: "the purpose of this whole session [is], that we can meet each other and just and talk amongst each [actor] category" (Workshop 1 - transcription, CCC-UE1, 1:14:33). In order to allocate roles in an ecosystem, a clear perception of knowledge available is crucial. The workshop can thus be perceived as a platform for facilitating this process.

Using boundary spanning for accumulating knowledge through participants' networks, is a method for incorporating missing knowledge into the ecosystem (Nonaka et al.,

2006, p. 1187). Contributing to this argument, Dhanaraj & Parkhe (2006) described brokerage activities as a method for designing an ecosystem to possess all qualifications needed for materializing a value proposition (p. 661). Contextualizing the discussions of the workshop was mentioned during the workshop, and argued as being relevant for both the community itself and others as well: "I'm actually looking way beyond coffee on this as well. [...] I think that's a good, good opportunity to actually be able to help, maybe evolve and to set standards for other industries as well" (Workshop 1 - transcription, CCC-BA, 1:25:43). Seeing the community in a context like this creates a relevance of the value proposition which increases interest, and even engagement, in the potential ecosystem. Contextualizing an ecosystem will thus both create relevance and contribute with a mapping of what value proposition to materialize and where to find the missing knowledge for this process.

A knowledge activist can play the role of breaking groupthink and routines in an ecosystem (Nonaka et al., 2006, p. 1187). Knowledge activism is, according to Nonaka et al. (2006), a disruptive approach to groupthink and routines in an ecosystem and catalyzes knowledge creation through contributing external knowledge and combining skills in a new way internally (p. 1187). A knowledge activist can thus take on the role as the creator of new opportunities both internally and by internalizing new skills. As CCC-BA contributed with the element of contextualisation, he furthermore disrupted linear thinking among the circular organisations: "I mean, we are trying to change our own and everybody else's mindsets, from linear to circular. So talking about a chain does not make any sense anymore. And it certainly doesn't make sense within a community like this. I mean, this is not a chain, this is the value grid" (Workshop 1 - transcription, CCC-BA, 1:28:25). Disruption of groupthink contributes to a localisation of opportunities, where skills in an ecosystem can be combined in new and even more relevant ways with support from boundary spanning objectives.

Knowledge conversion

Williamson & De Meyer's (2012) article emphasised the importance of the lead firm's promotion of transparency in interactions between partners, in order to avoid

participants *free-riding* in an ecosystem (p. 40). CCC-BA suggested an awareness of the significance of transparency in the ecosystem, when he bluntly stated his incentivement for participating: “we really need to be honest, and be vocal about the fact that this may all evolve around circular thinking, but it also revolves around doing business” (Workshop 1 - transcription, CCC-BA, 1:31:30). CCC-BA's promotion of transparency towards the incentives behind the community, also affected participants' perception on the environment: “[...] everyone was so keen on collaborating and sharing [...] it was a super secure environment” (Evaluating interview, KP, 00:17). CCC-UN1, also affirmed KP's experience by adding that he too felt willing to share knowledge (Evaluation interview, CCC-UN1, p. 224), though he raised a concern which can be referenced to Williamson & De Meyer's (2012) concept of *free-riding*, in that he saw a potential risk of people stealing others solutions (Evaluation interview, CCC-UN1, p. 224). Promoting transparency in the workshop created an environment for participants to feel safe and willing to share knowledge, however, the ever present risk of participants to free-ride on the community benefits, were detected regardless.

More so, Dhanaraj & Parkhe (2006) defined that knowledge creating resources have greater value when they remain independent entities that come together across organisational boundaries to enhance innovation, rather than in existing hierarchies (p. 662). Nonaka et al. (2006) defined how tacit knowledge in their *socialization* state of their SECI model is shared among individuals and *Externalized* into explicit concepts (p. 1182). CCC-OCS, as the lead firm, recognised the significance of mutual value capture amongst participants, by emphasising that value comes to all those individuals who put knowledge into the system (Workshop 1 - transcription, CCC-OCS, 14:10). Several participants saw useful skills with other participants: “I think that CCC-UN1 did a really good job, sharing really good insights” (Evaluating interview, CCC-UE1, 04:17). Knowledge was made explicit in the form of an EPM, due to the ease in mobility of tacit knowledge that was shared among participants.

Furthermore, Dhanaraj & Parkhe (2006) presented the idea of establishing equitable distribution of value and mitigating *free-riding* by focusing on establishing trust, procedural justice and joint asset ownership (p. 663). They added that this is reliant on

social interactions, rich information sharing and joint problem solving (Dhanaraj & Parkhe, 2006, p. 663). A presence of trust is suggested when KP recognised that regardless of CCC-BA performing similar business activities, he is not seen as a competitor but a colleague (Evaluating interviews, KP, 05:31). This was also observed in the workshop when CCC-UE1 and CCC-UE2 expressed their desire to share explicit knowledge of their innovations in production methods within the ecosystem. Both these examples suggest that trust among participants is present for the ecosystem and an interest in establishing joint asset ownership in an ecosystem emerges. In the evaluation CCC-UN1 raised the point that he does not feel dependent on the community since it is at a very early stage, though he hoped that it might bring new business opportunities (Evaluating interview, CCC-UN1, p. 224). This also suggests an interest in joint asset ownership in an ecosystem. Participants in the workshop demonstrated a degree of trust for one another and a desire to engage in collective value creation besides the perception of potential risk elements being present.

Williamson & De Meyer (2012) presented quality of interactions as occurring through experimenting and working together on joint activities (p. 39). CCC-UE1 noted that: "this was by far the most, say, intimate and therefore also revealing, and therefore also productive [workshop]" (Evaluating interview, CCC-UE1, 01:30). A sense of momentum is demonstrated by CCC-UE1, who shared a desire to spend more time preparing when attending future workshops (Evaluating interview, CCC-UE1, 08:07). He further also shared the idea of initiating shared projects but recognised that this might be premature, due to a lack of structure (Evaluating interview, CCC-UE1, 15:39). Additionally, CCC-UN1 stated that the next workshop should be about planning concrete actions that can be done as a community (Evaluating interview, p. 224). Thus through socialisation and shared joint activity of structuring the EPM in a workshop, quality interactions were cultivated and created further momentum for engagement in value creation in the community.

Section conclusion: coffee workshop

As the five parameters for value creation in an ecosystem were analyzed in the coffee workshop, firstly ecosystem strategy was seen to be an important matter to the participants to create value. Establishing an EVP, the participants in the coffee workshop aligned themselves towards materializing a shared goal and showed willingness to share knowledge for this materialization to happen. Regardless of their engagement, the participants required a clear vision for how an ecosystem could be orchestrated, which relied on the facilitator CCC-OCS. Although the facilitator had a clear corporate vision, the scope for CCC was a critical point for participants in order to create value for customers and themselves. The facilitators role is thus seen to be an essential parameter for being able to create value in an ecosystem. The combination of skills however, were seen as a useful way to approach customer demands better, and increase relevance of their products. Ensuring diversity in CCC was perceived as a highly important parameter for value creation, due to the amount of knowledge available to the community for materializing the EVP. The perception of risk of participating in an ecosystem was thus present, however transparency between participants increased the wish for collaboration regardless. Including the structural elements in an ecosystem led by the facilitator thus indicated the possibilities for value creation in the coffee workshop.

Grain workshop

Ecosystem strategy

Organising an ecosystem by incorporating a strategy to materialize a value proposition is a method for aligning participants and creating value for them (Williamson & De Meyer, 2012, p. 25). The orchestration of co-creation in an ecosystem is, according to Adner (2006) a method for reaching a higher level of value creation, than the individual organisation has the ability to (p. 100). Furthermore, the incorporation of a circular business model not only creates value for the user segment and the organization, but benefits society and environment alongside - this perspective is covered by the concept economies of scope (Williamson & De Meyer, 2012, p. 26). The perspective of driving

economy of scope instead of scale, is a perception shared by all participants in their recognition of the value proposition in the second workshop, however the approach towards materialization of the value proposition was disagreed upon: "I think a network within upcycling is super relevant. But I think it needs to be broader than just looking at one side stream [grain]" (Evaluation interview, CG-UE, 00:22). This perspective indicates that CG-UE acknowledges the value proposition, but prioritates a broader perspective in order to facilitate change-making.

For an ecosystem strategy to contribute with value to the participants of an ecosystem, the organisations must be engaged and perceive low (of none) risk of participating (Williamson & De Meyer, 2012, p. 37). One participant saw high risk of participating in a community where no non-disclosure agreement had been made beforehand: "I would never ever disclose anything that is secret on my business with anyone without having a written agreement that they cannot disclose it to anyone" (Evaluation interview, CG-UE, 09:45). Perceiving high risk when participating in the workshop without having the required agreements in place, CG-UE did not feel comfortable sharing details about their business. Oppositely CG-GS saw potential in collaborating in an ecosystem, where knowledge about equipment and production could be shared (Evaluating interview, CG-GS, 03:49). The discrepancies of the experiences of participating in the workshop indicates that especially CG-UE and CG-GS are not after all prioritizing to materialize the same value proposition, which makes an ecosystem strategy irrelevant in this context.

Facilitator

Both the articles by Williamson & De Meyer (2012) and Dhanaraj & Parkhe (2006), outline the concept of having a firm leading the establishment of a network and ecosystem. Williamson & De Meyer (2012) presented the responsibility of the lead firm lying within establishing the overall structure in which participants collaborate (p. 27), whilst Dhanaraj & Parkhe (2006), highlighted the role encompassing the orchestration of parameters resulting in an increased innovation output (p. 660). The role of the lead firm was not made explicit in the process of engaging participants in exploring the potential of forming an ecosystem. Though, KP suggested embodiment of this role, by sharing

that they've identified a lack of facilitation of knowledge sharing between small and medium sized companies (Workshop 2 - transcription, KP, 1:18:40). The absence of an explicit lead firm showed how participants recognised the shared value proposition, however implicitly CG-UE was seen to focus on another one.

In relation to the role of the lead firm encompassing easing the mobility of knowledge (Dhanaraj & Parkhe, 2006, p. 660), Nonaka et al. (2006) raised the consideration of knowledge conversion as being dependent on knowledge management systems that are based on corporate vision and organisational culture (p. 1183). CG-UE raised that their knowledge flow is dependent on strict and clear agreements: "I would never engage with someone without having a clear agreement - a written NDA" (Evaluating interview, CG-UE, 09:45). This suggested the need for a lead firm to define both the value of the ecosystem and the architecture for interactions between participants, in which these terms would have to encompass a strict knowledge management system if CG-UE were to engage. Furthermore, CG-GS shared that the establishment of knowledge mobility was dependent on making corporate values explicit which participants can align on (Evaluating interview, CG-GS, 10:48). Thus the resistance in knowledge mobility can be connected to the absence of the role of the lead firm in establishing a common corporate vision and systems of interaction.

Customer centrisism

The article by Williamson & De Meyer (2012) presented the importance of a lead firm constructing value to the customer in the process of securing the ecosystem's value capture mechanisms (p. 43). Though the design of the ecosystem around the circulation of grain does not explicitly incorporate a lead firm, participants share potential mechanisms of value that are distinct to securing value for the customer. In the workshop CG-UE raised the point that upcycling was not yet considered a USP and customer engagement was currently dependent on other factors: "[...] you need to focus on other aspects of the product. It can be flavour, it can be nutritional benefits." (Workshop 2 - transcription, CG-UE, 29:08). CG-UE's proposal suggests potential strategic areas of focus in generating customer centric value in an ecosystem.

GS on the other hand, noted that a focus on customers was always important in his product development process (workshop 2 - transcription, CG.GS, 1:12:42). CG-GS saw the potential of an ecosystem as being a place for identifying further customer needs and developing new products to meet those needs (Workshop 2 - transcription, CG-GS, 1:12:42). Both CG-UE and CG-GS saw the ecosystem as a strategic tool for further evolving the quality of their products to better meet customer needs, however structural elements were lacking for this to happen in the grain workshop.

Knowledge diversity

Reviewing the aspect of diversity in an ecosystem relies on the approach towards interdependency, which indicates how collaborations are made in an organisation. As Williamson & De Meyer (2012) defined diversity as a method for contributing a variety of aspects into an ecosystem to materialize a shared value proposition, a misalignment between the organisations' scopes of the value proposition makes diversity irrelevant (p. 27). As CG-UE saw a higher need for like minded organisations to perform networking activities, more focus was put on internal challenges: "I really think, to incorporate everyone working with upcycling would be the most relevant and efficient network. Because there's so many things that we can learn from each other and from each other's ways of dealing with issues" (Evaluating interview, CG-UE, 02:29). Having a clear view on ecosystem collaboration as a risky activity, CG-UE saw more potential in performing network activities instead, with companies that are far away from their own business model.

Perceiving risk as high in participating in an ecosystem neglects the opportunities arising from co-creation and increased relevance in innovation. Creating a pool of knowledge by providing a diverse and broad group of skills into an ecosystem creates a potential for co-creation that one single organisation cannot achieve alone (Williamson & De Meyer, 2012, p. 27). From the perspective of CG-UE the potential of a broad network were described as useful: "I also mentioned the Upcycling Food Association, in the last meeting, which is a US organization or network or whatever you want to call it, focusing on exactly the potential of upcycling, and they have a very broad participant

base. And I think this is basically the model that is the right model" (Evaluating interview, CG-UE, 07:30). Creating a focus on lobbying for the benefit of the entire upcycling industry shifts the focus to a value proposition, which lies closer to what CG-UE requires. A high diversity in a potential ecosystem organising around this value proposition instead, is thus seen as more relevant for materialising that, according to CG-UE's arguments.

Elaborating on the roles of participants in an ecosystem, the specific organisations contribute with specialised skill sets, which can create opportunities by complementing each others' skills. However, by not achieving a level of trust between participants, these opportunities did not arise from the workshop: "it's handing my recipe on a silver plate to a competitor" (Evaluating interview, CG-UE, 12:24). Diversity was not perceived to be broad enough by CG-UE, although CG-GS saw a variety of complementary elements to be achieved: "it would be nice if you know we could find out working together instead of working each direction in many ways" (Evaluating interview, CG-GS, 03:49). A perceived low degree of diversity though created a high perception of risk, although knowledge was seen to be achieved from each other. This challenge created a chasm between the participants, and the possibilities for materializing a shared value proposition are seen to be non-existent.

Knowledge conversion

Williamson & De Meyer (2012) mentioned that the business ecosystem is driven by the concept of businesses specialising core activities and expanding their periphery, to meet investment demands and avoid increased costs of complex innovation (p. 30). By doing so, the incorporation of network activities in businesses is increasingly relevant. CG-UE shared that they tried to start a network for sustainable food startups but "[...] it's too much work to be the facilitator" (Workshop 2 - transcription, CG-UE, 1:19:56). This suggested that low value was created for CG-UE in the attempt to form a network group. However, CG-UE acknowledged that value can be found in knowledge creation and collaborative problem solving through forming network partnerships within the upcycling of food byproducts (Workshop 2 - transcription, CG-UE, 02:29). It can be

argued that CG-UE has a traditional hierarchical approach in engaging in network activities based on her view of her business as a “standard operating business” (Evaluation transcription, CG-UE, 09:08), with tightly knit contracted agreements (Workshop 2 - transcription, CG-UE, 09:45). Thus CG-UE’s traditional business approach in expanding their periphery, their approach to using network activities suggests a cautious approach in engaging in complex mutually dependent partnerships.

Furthermore, Williamson & De Meyer (2012) presented that ecosystems are maintained through flexible agreements in the governance of partner interactions, avoiding strict limitations and excessive details (p. 39). Flexibility in the design of partnership agreements gives opportunities for partners to experiment together and learn from each other (Williamson & De Meyer, 2012, p. 39). The notion of an ecosystem enabling a shared learning experience is suggested by CG-UE, who stated that the ecosystem can: “function as an interest group, or as a lobby group [...]” (Workshop 2 transcription, CG-UE, 1:16:01). This view is seen as a way to increase capability pressuring the government to incorporate necessary regulations. CG-UE also stated that she was not open to flexible agreements in the governance of partnerships, evident in her discomfort with sharing knowledge with KP and CG-GS during the workshop (Workshop 2 - transcription, CG:UE, 29:08). She emphasised her need for strict limitations in her requirement for working in non-disclosure agreements that set clear boundaries of the grounds of partnership interaction (Workshop 2 transcription, CG-UE, 13:34). Though CG-GS acknowledges the value of collaborative problem solving, she is not open to flexible interactions suggested in the governance of ecosystem partnerships.

Williamson & De Meyer (2012) presented the importance of the promotion of transparency amongst ecosystem members in order to avoid the concept of *free-riding* (p. 40). CG-UE mentioned repeatedly during the workshop that she was not comfortable sharing information (Workshop 2 - transcription, CG-UE, 29:08). She later revealed the cause as viewing CG-GS as a competitor (Evaluating interview, CG, 06:30). This was also respecified by CG-GS stating that: “[...] you have found out the competitor [...]” (Evaluating interviews, CG-GS, 02:24). The fact that the participants view one

another as competitors demonstrates the lack of willingness for them to create common knowledge and be transparent as they both suggest fearing the risk of *free-riding*: "[...] it's handing my recipe on a silver plate to a competitor?" (Workshop 2 - evaluating interview, CG-UE, 12:24). CG-UE, thus demonstrated a resistance to engage in a social justification process of knowledge creation towards a proposed common goal (Nonaka et al., 2006, p. 1186). The lack of trust and transparency between the participants' focus, due to a risk of free-riding, hinders their engagement in joint knowledge creation.

Section conclusion: grain workshop

The participants of the grain workshop were presented with an EVP which they recognised as an important goal, however a full agreement of the EVP was not achieved. Due to a perception of risk, the EVP was, according to CG-UE, too intimate and would force them to disclose business secrets. By not agreeing on a shared EVP the ecosystem strategy was seen to be irrelevant since no common ground was found. Affecting this missing common ground was the role of a facilitator, which role was not filled, however elements of an initiative towards alignment was taken by KP in order to find a platform for creating value. A customer centric approach was detected by participants, although the demands of customers were perceived very differently, which confirmed the different perceptions of the EVP. The representation of different roles in the workshop further challenged the collaboration between participants, since two of them saw each other as competitors regardless of some detected differences. According to CG-UE the matter of competition in an ecosystem could be overlooked if the EVP was defined broader. Finally, the knowledge conversion was minimal in the grain workshop, due to the missing alignment between the participants. The key parameter for value creation was seen to rely on an alignment and a clear definition of a shared EVP.

Discussion

The discussion section seeks to formulate empirical parameters enabling ecosystem based value creation in the upcycling food byproducts community. The structure of the discussion applies the theoretically defined parameters shaping value creation in an ecosystem as a benchmark against the analytical findings. More so, the discussion seeks to understand the specific elements within each parameter that are significant for value creation. The theoretical parameters are defined as ecosystem strategy in relation to shared incentive and EVP; the role of a facilitator referring to orchestration and structure; customer centricism concerning user focused value creation; knowledge diversity in relation to the defined roles forming the ecosystem; and knowledge conversion referring to the active engagement in knowledge creation amongst participants. To comprehend the outcome of value creation, the discussion identifies elements determining the role of the parameter before the workshop, in its implementation during the workshop and finally in the outcome after the workshop. Through establishing the interconnectedness of elements found in the parameters, the discussion aims to formulate empirical parameters that are significant in establishing ecosystem based value creation in the upcycling food byproducts community.

Ecosystem strategy

Aligning the business models of modern organisations is a requirement for achieving relevance for products on the market, which is increasingly relevant for organisations working with circular business models. As defined by Lewandowski (2016) the requirement for aligning the macro, meso and micro levels is a necessity for gaining relevance on a market. For the organisations in the empirical dataset, the alignment of the internal and external environment is both related to legitimization aspects (social and environmental) and economical. Exemplifying this, KP highlighted the need for being perceived as relevant by customers by providing sustainable products and continuing the positive impact by sustaining the business. This aspect was shared by 88,9% of respondents in the questionnaire who valued 'Responsible consumption and production' as one of their three most important SDGs (Questionnaire - Evaluation, p.

125). Achieving the perception of being sustainable in several ways was seen by participants in both workshops to be possible through collaboration. The approach towards achieving legitimization via collaboration is thus seen to be a predetermined element in the organisations having a circular business model.

Changing the status quo of the food industry is difficult to do as a single organisation, but joining forces around a shared goal, the community of several organisations can achieve momentum. As Adner (2006) argued, the innovation output of collaborating organisations can be greater if co-creation is manifested in an aligned ecosystem working towards the same goal. Organisations in the two workshops were seen to share a variety of similar qualities due to their circular approach, however the scope of changing the food industry was approached differently in the two workshops. For the coffee workshop the participants had gathered around a vision to increase exploitation of the coffee plant. For the grain workshop, participants were invited to take part to discuss the process of upcycling grain. The voluntary approach for constructing a community was seen to have a natural facilitation of a shared scope, where the grain workshop merely saw risk before possibilities.

Approaching co-creation through the use of an ecosystem requires a clear definition of the EVP that should be materialized. Based on the incentives for using network approaches, the organisations in the dataset were seen to exploit their networks for accessing information. The use of network activities were primarily to gather information supporting the roles not filled internally. Like CG-UE illustrated in the workshop: “we are seven people. So of course, we cannot do everything. No, we work a lot with our network” (Workshop 2 - transcription, CG-UE, 1:19:56). However, network use in this sense is defined by CG-UE’s internal requirements, which takes the perspectives of only their organisation. Applying the EPM in the two workshops brings the element of interdependence, which is embedded in the alignment through a shared goal. Finding a common ground in the coffee workshop happened through a constructive discussion about the formulation of what was already a shared scope of the community. Oppositely, the grain workshop participants did recognize an EVP, however it was seen to be decoupled from by CG-UE who found another EVP more relevant; one with a

broader scope. Lifting the value creation for an organisation to a higher level, thus requires an alignment between collaborators through an EVP to achieve an accumulated value.

Aligning on the materialization of an EVP in an ecosystem requires a clear vision for what to be materialized and how. As some organisations prior to the participation in the two workshops have collaborated in either network activities or business relations, the previously established connection was seen to add aspects of trust. Regardless of their competitive business models CCC-UE1 had assisted CCC-UE2 to establish their business and together developed methods for production in collaboration. In the grain workshop KP informed that they had collaborated with CG-UE for a longer period, however the collaboration was clearly formalized, which was in line with what requirements CG-UE had for their collaborations (Evaluating interview, CG-UE, 01:37). The level of collaboration acted in the respective workshops worked as an element of trust which led to more constructive approaches. For the coffee workshop, the prior collaborations between participants turned the discussion towards how the community can achieve a higher purpose in their EVP. In the grain workshop on the other hand, the connection between KP and CG-UE led to CG-UE hesitatingly continuing the workshop after detecting high risk in participating alongside a competitor. Trust between organisations is found to be an important factor for creating value.

Collaboration between organisations is a network activity that organisations in the dataset all have used, however approaching the value creating mechanisms of an ecosystem requires the incorporation of structure. To achieve structure in an ecosystem and from that define a strategy for materializing an EVP relies on orchestration. The elements of structure Adner (2017) defined is a necessity for defining an ecosystem strategy. As the alignment of scope and EVP in the coffee workshop, participants required a clear vision for an ecosystem to emerge, which is an essential step for defining an ecosystem strategy for the process of materialization. In the grain workshop, participants' differentiated scopes and deviation from the workshop EVP, the structural elements required in an ecosystem are not present. As mentioned, the collaboration between KP and CG-UE allowed KP to act as a mediator between the other participants

to continue the workshop as it was planned, although with an iterated focus on general benefits from collaborating. Structure in an ecosystem can thus only be applied if participants share scope, EVP and vision. A fulfilled structural element can then be the last step before defining an ecosystem strategy.

Facilitating collaboration between organisations can in the matter of an ecosystem orchestration lead to elements of risk, which should be overcome in order to achieve the benefits of the ecosystem. Adner's (2006) perception of risk in innovation ecosystems can be maintained by structural elements orchestrated facilitation. The aspect of risk is a natural occurring element when organisations move beyond their area of control. However, in organisations with circular business models, the area of control is somewhat larger since requirements for closer collaboration are necessary in the supply chain (Lewandowski, 2016, p. 15). As discussed throughout this section, the elements of risk are present at various levels, but the assessment of risk to increase innovation output is only relevant if an ecosystem is established. Like it was seen with the grain workshop, risk was detected in relation to the EVP and the competing participants, which indicates that attempting to materialize the defined EVP in the workshop is irrelevant. In the coffee workshop, the risk detected was related to the fear of a participant free riding, which according to Dhanaraj & Parkhe (2006) can be orchestrated by adding elements of structure by the facilitator.

Facilitator

In the first phase of the research, the questionnaire showed that most of the participants shared a common mentality in the focus of their businesses. For example 44,4% saw high value in collaboration within the supply chain (Questionnaire - replies, p. 120). CCC-OCS saw this as a commercial opportunity in forming a strategic network around circularity of coffee to reconfigure their business model into a circular business model (Workshop 1 - transcription, CCC-OCS, 06:43). Making a network into an ecosystem involves designing the structural architecture and orchestration of activities between partners (Williamson & De Meyer, 2012, p. 36). CCC-OCS had already engaged in the role of a facilitator by reaching out his hand to gather a diverse network of farmers,

manufacturers etc. who shared their vision of becoming circular (Initial interview, CCC-OCS, 11:00). KP was also identified as a potential facilitator. She described her activities as facilitating a diverse network of participants across different segments around sharing knowledge and sustainability guidance (Initial interview, KP, 27:25). CCC-OCS and KP were the two participants in the initial phase of research who suggested value creation in facilitating a network.

The EPM enables a facilitator to realise their corporate vision and strategy through identifying relevant actors to engage in structuring and aligning their activities to the EVP. In the coffee workshop CCC-OCS, as the ecosystem facilitator, explored the structural architecture of using an ecosystem as a strategy, in enabling their vision of becoming 100% circular by 2030 (Initial interview, CCC-OCS, 00:15). CCC-OCS was also able to make his activities explicit although they were not directly related to creating mechanisms of orchestrating the ecosystem as a facilitator (Workshop 1 - ecosystem pie model, p. 189). In the grain workshop, the role of a facilitator was primarily vacant, where KP can be suggested stepping into this role a few times. For example when she contributed with her corporate vision in focusing on the collective alignment on what can be improved or changed within the sustainability agenda, in an attempt to align workshop participants on a common EVP (Workshop 2 - transcription, KP, 39:59). Thus the EPM in the coffee workshop realized a potential structure for an ecosystem though it did not reveal mechanisms of orchestration from CCC-OCS. More so, the lack of an explicit facilitator in the grain workshop probed KP to explore the possibility of orchestration, laying in her interest enabling transparency and generosity in sharing ideas across food system players (Workshop 2 - transcription, 03:28).

Implementing the EPM as a tool to orchestrate the emergence of an ecosystem, realised different outcomes in the responsibilities of orchestration between the two workshops. The results of the coffee workshop showed that participants were engaged in the corporate vision proposed by CCC-OCS, though it also emphasised that participants were demanding a clearer scope to validate their commitment and clarify the value of engaging in the ecosystem (Evaluating interview, CCC-UN1, p. 224). The experience of the workshop also made CCC-OCS aware of this, as he affirmed in the evaluation

interview that he bore a responsibility of orchestrating the ecosystem (Workshop 1 - transcription, CCC-OCS, 1:26:59). In the grain workshop, the responsibility of orchestration was laid in defining the corporate vision informing the ecosystem, which participants still needed to buy into. Hence KP's attempt to align participants, in the process of negotiating the existential value of an ecosystem and premise of orchestration, by presenting her vision as relevant and inclusive (Workshop 2 - transcription, KP, 39:59). Thus through the workshop CCC-OCS realised the significance of exercising orchestration as this was connected to the level of engagement participants had in the ecosystem. Whereas in the grain workshop, KP was seen to take on orchestrating activities in the absence of an explicit role of a facilitator, suggesting potentiality in this role.

The nature of the EPM enables a facilitator to identify the significant roles in filling the knowledge gaps relevant to include in realizing the EVP (Williamson & De Meyer, 2012, p. 36). Filling in the EPM during the coffee workshop, gave CCC-OCS an overview of participants' potential contributing activity to the ecosystem, defined by their prior knowledge and access to resources. For example CCC-CU, as a commercial buyer of coffee, saw her activity providing coffee grounds as a resource and engaging customers in the concept of circulating coffee (Workshop 1 - transcription, CCC-CU, 01:00). The discussion in the grain workshop was also rooted in unraveling significant roles in the ecosystem formation. Even though there was no explicit receiver of the knowledge generated, the model facilitated the negotiation space of what roles were deemed valuable in forming an ecosystem. CG-UE proposed that if the scope were to be more broad then ecosystems were to include participants from other side streams, adding that this would create a more robust and strong ecosystem (Workshop 2 - transcription, CG-UE, 20:13). In the coffee workshop the EPM enables a facilitator to orchestrate roles which allows them to make a better informed decision of the skillsets of actors required when realising the EVP.

The outcome of mapping the structure resulted in an overview of roles contributing to the formation of an ecosystem and realisation of an EVP. In the coffee workshop, participants recognised the value of the structuring roles within the ecosystem, where

KP added that it helped her become more concrete in understanding how she can contribute to the ecosystem (Evaluating interview, KP, 08:39). As the ecosystem facilitator of the coffee workshop, CCC-OCS saw value in that he realised that participants who filled in the model were mainly start-ups, identifying a knowledge gap in engaging more industrial players (Evaluating interview, CCC-OCS, 11:23). In the grain workshop an attempt to structure the roles within the ecosystem made evident that the participants wanted to form part of a largely diverse ecosystem. Unlike in the coffee workshop, where participants saw value in engaging with actors performing similar activities, participants in the grain workshop seemed to negotiate their value in being similar businesses. The lack of an anchored vision brought in by an ecosystem facilitator, compromised the proposed value proposition in circulating grain which made CG-UE feel insecure (Evaluating interview, CG-UE, 09:45). Instead participants saw potential value in including actors performing alternative activities related to upcycling food byproducts.

Customer centrisms

As a result of the increasing demand from customers for sustainability in products, the requirement has started several movements towards sustainability, which organisations aim to satisfy. As a natural focus, the organisations working with upcycling have put a focus on customer demand to innovate products that have a higher relevance on this market. As De Bernardi & Azucar (2020) highlighted, an increasing relevance of products is based on their sustainability aspects due to a demand for approaching a variety of societal causes manifested in the UN SDGs. 50% of organisations in the quantitative dataset saw an essential necessity for incorporating sustainability aspects in products to the market. Perceiving this aspect as a requirement from the external environment, the participants in both the workshops saw that changing the food industry towards sustainability as a main focus. It was clear that the participants in the grain workshop approached this in separate ways. As the coffee workshop participants approached the same EVP through collaboration, the grain workshop participants

implicitly had different EVP's to fulfill. Approaching increased relevance in innovation is thus related to aligned goals of ecosystem participants, which lead to value creation.

Sustainability as a single parameter for purchase is not strong enough, but needs to be supported by other parameters such as health and taste. As both workshops showed, customers require sustainable aspects in products, however, they should be accompanied by other parameters like flavour, nutritional, beneficial, or fair prices. According to CG-UE the sustainable perspectives of upcycled products are simply not enough. The perspective from CCC-UN1 in the coffee workshop was somewhat similar to this. They both argued that the USP of the upcycled products could not be on sustainability alone. However, as the requirements for sustainable products are increasing, the potential for using sustainability as a method for legitimization of products, other USP's are, according to CG-UE and CCC-UN1, necessary for making the products relevant for customers. Creating relevance in innovation is according to Adner (2006) more likely to happen through collaboration between specialists. This approach was seen fulfilled in the coffee workshop due to the alignment of their EVP.

Launching products based on resources upcycled from other productions can be challenging for organisations to brand. Materializing an EVP requires collaboration between organisations playing complementary roles. Seeing a necessity in producing sustainable products and changing the perception of the upcycled products, both workshops approached the challenges of customers' perception of upcycled products. For the grain workshop CG-UE saw that customers were not ready to buy into upcycling as a USP, however CG-GS saw that already 20% of their customers saw upcycling as a key USP. Perceiving this change of customers' perception as a task for the organisations themselves, CG-UE suggested that ecosystems could be used as lobby units for both governmental and customer perceptions. In the coffee workshop, however, the strategy for branding upcycled products was more focused on changing customers' perception. As the different scopes of the approach to a branding strategy is related to the EVP, again the alignment of organisations' goals is a crucial element.

The aim for legitimization in making products defined as sustainable, requires transparency throughout the organisation to avoid being accused of greenwashing. The

decoupling from what is communicated by an organisation, when related to sustainability, is defined as greenwashing. The risk of having organisations represented in the empirical dataset who are greenwashing was mentioned in the circular business model section. The production of sustainable products, however, is a discipline interpreted as a 'do-good' approach, which in the coffee workshop was somewhat agreed upon, but it should also be economically sustainable to last (Initial interview, CCC-OCS, 39:57). The element of greenwashing was also feared amongst the participants of the coffee workshop, however the transparency of the incentives for participating in the workshop resulted in mutual trust. Greenwashing is thus an element of risk, which can be managed through orchestration. Achieving legitimization is thus a crucial element for value creation in both organisations and ecosystems.

Knowledge diversity

Constructing a diversified ecosystem of specialists is seen to contribute to a larger pool of knowledge, benefitting all participants to increase their knowledge to some extent. As for CCC-OCS, it was already important prior to the workshop to include a broad group of participants in a community to contribute with diversified knowledge. For the organisations working with upcycling in general, the questionnaire showed that an interest for broad inclusion in a network is important. Respondents thought it necessary to include; Customers (56.25%), Market leaders (43.75%), and Supermarkets + Farmers (37.5%) (Questionnaire - Replies, p. 123). Participants in both workshops saw a diversified group of specialized organisations as a possibility for interaction, which is aligned with what Williamson & De Meyer (2012) argued in their article. The output of the workshops however, showed that the use of the diversified knowledge is different. Outputs deviated by contributing with knowledge sharing in the grain workshop, which came across as network activities. In the coffee workshop however, the possibilities for co-creation were detected by defining the diversity as an opportunity for knowledge creation between specialists. For knowledge creation to occur in a diverse ecosystem the purpose of an EVP is thus a crucial element for alignment in order to create value.

In a heterogeneous group of participants the detection of differences indicates which actors possess specific knowledge based on their business models. Following Felin & Hesterly's (2007) perspective on individuals as heterogeneous, workshop participants represented their organisations and their respective backgrounds and experiences manifested in resources and activities in the EPM. For both workshops participants saw the opportunity to detect which skills were attractive in other participants and potential for future exploitation. As Adner (2017) defined several perspectives for orchestration interdependence, the consequencing output of them relies on their degree of structure (p. 40). As the coffee workshop was perceived as moving towards the same EVP, which was defined in the workshop, the grain workshop deviated from the proposed EVP and eventually drifted towards different scopes. This resulted in detecting possibilities of network characteristics. The heterogeneous contribution of participants is thus reliant on an aligned EVP for creating knowledge.

The degree of openness of an ecosystem allows potential participants to buy into the value proposition at hand and contribute to materializing it. For CCC-OCS the scope of his community was to gather organisations working towards exploiting the coffee plant, where all interested organisations were welcomed. Facilitating exchange and creation of knowledge, KP's platform was constructed to act as a database for all aspects of the circular economy. Allowing all interested parties to collaborate on materializing a defined value proposition can thus be detected in CCC-OCS's initiative and KP's work. Adner (2017) emphasized the importance of EVP alignment, and buying into a defined one secures a natural interest between ecosystem actors (p. 55). As this was the case with the coffee workshop, a broad representation of knowledge was represented in the actors moving towards materializing the same EVP. Oppositely, the workshop focusing on grain was not orchestrated through a natural interest in an EVP but via an invitation to participate in the workshop. The misalignment in the grain workshop resulted in a differentiated perception on necessary scope in a potential ecosystem, which indicates that openness towards interested organisations can contribute to a natural alignment between participants in an ecosystem.

The representation of actors proposes how the available resources might be contributing to materializing the EVP. As several respondents in the questionnaire affirm, integration of both upstream and downstream collaborators in an ecosystem contributes to a broadness and a relevance of knowledge. Building on the argument in the previous paragraph, CCC-OCS's openness was seen to contribute to an inclusion of network organisations. As Rajala et al. (2018) pointed out, the degree of openness creates a differentiated perspective of the ecosystem which also depends on the defined EVP (p. 24). Related to the exploitation of an underlying, and more relevant, EVP for CG-UE, the broadness of the grain workshop did not contribute with the resources needed to materialize it. In order to materialize her differentiated EVP, CG-UE proposed that a broadness creates robustness and increased relevance for her organisation. The roles of the actors and their contributed knowledge is thus an important aspect to consider when designing an ecosystem.

The use of network activities by individual actors contributes to a contextualization of skills and knowledge that an ecosystem can benefit from in materializing an EVP. To secure representation of specific skills required in an ecosystem, boundary spanning activities can be incorporated to internalize these. As boundary spanning is both exemplified by Rajala et al. (2018) and Massa & Tucci (2017), the concept can be a helpful tool for using networks to gather specific knowledge filling specific roles required by an ecosystem. As Adner (2017) further defined the requirements for activities, actors, positions and links to be considered in order to create structure, the element of roles is essential to define complementarities in an ecosystem. For the coffee workshop both alignment of skills and knowledge were seen as methods for collaboration, where participants saw specific opportunities in collaborating even after the workshop (Workshop 1 - transcription, CCC-OCS, 1:14:33). In the grain workshop participants detected overlapping skill sets which limited CG-UE's view on possible collaboration. A lot of her concerns were results of low trust towards CG-GS who she saw as a competitor. For organisations to play specific roles in materializing a shared EVP, mutual trust between actors is a crucial element that indicates what degree of willingness organisations have to share knowledge.

Knowledge conversion

Referencing Felin & Hesterly (2007) the thesis research equates knowledge to value, where the value of an organisation is seen to be located within the heterogeneous knowledge held by its participants (pp. 196+198). Prior to the workshop the empirical data suggested that participants of the upcycling food byproducts community recognized knowledge as a value. CCC-BPU explicitly states selecting business associates based on prior knowledge (initial interview, CCC-BPU, p.7). Furthermore, KP's business concept lay in recognizing value as gathering diverse sets of knowledge across different segments within the food system to engage in collective problem solving (Initial interview, KP, p.6). The recognition of knowledge as value was also exemplified in both workshops, wherein participants formulate their unique value additions based on their prior knowledge that they bring into the organisation of the ecosystem. In the grain workshop knowledge was emphasised differently, where CCC-UE chose to hold back knowledge due to seeing CG-GS as a competitor and advocating for a broader scope that incorporates a more diverse set of knowledge (Workshop 1 - transcription, CCC-UE1). Thus the notion of knowledge as value is seen present both in the community and in the workshops, the difference in the two workshops was the willingness of the participants to share knowledge in the proposed frames of the EPM.

The degree of willingness for participants to share knowledge during a workshop is dependent on the establishment of trust and a shared common ground between the participants (Nonaka et al., 2006, p. 1186). Before the workshop the empirical data showed that participants were engaging in knowledge exchange via network activities (Questionnaire - replies, p. 121). The willingness to share knowledge amongst participants in the coffee workshop can be connected to the fact that they had already established a common ground of activating a community around the circular value chain of coffee prior to the workshop (Workshop 1 - transcription, CCC-UN1, 1:14:33). Where during the workshop participants placed focus on establishing trust. Participants in the grain workshop, prior to the workshop, had not engaged in establishing a common ground apart from CG-UE and KP having worked on a project (Evaluating interview, CG-UE, 01:37). Hence the second workshop circumnavigated around negotiating the

process of scoping a common ground. The absence of common ground in the grain workshop compromised the participants willingness to negotiate trust and share knowledge targeted towards the proposed EVP.

When analysing the outcomes of the workshop, the process of enabling organisational knowledge creation is dependent on the presence of social justification (Nonaka et al., 2006, p. 1186). This means that individuals need to engage in recognition of one another and justifying knowledge put out into the organisation as the truth. The outcome of the coffee workshop demonstrated that participants engaged in a justification process as participants shared tacit knowledge, in the form of ideas and opinions, which were affirmed by other participants which in turn contributed to an alignment of the EVP (Workshop 1 - transcription, CCC-UN1, 37:07). In the grain workshop social justification occurred, but it was not directed towards increasing the value in realizing the proposed EVP. This is demonstrated by CG-UE when she explicitly mentioned that she did not want to share knowledge within the proposed scope of the EVP, adding that it was too intimate (Workshop 2 - transcription, CG-UE, 29:08). Instead CG-GS was willing to engage in the justification of knowledge that was directed to her proposed broader scope of an EVP (Workshop 2 - transcription, CG-UE, 29:08). Thus in the coffee workshop social justification of knowledge was targeted towards increasing knowledge in scope of the EVP, whereas in the grain workshop the justification process was intentionally targeted towards an alternative proposition.

Prior to the workshop, the empirical data presented different formats in which participants were individually generating knowledge. Increasing knowledge in an organisation is dependent on social justification between the existing individuals in the organisations or between new participants brought into the organisation, who have knowledge the organisation previously did not have (Felin & Herstely, 2007, p. 198). More so, this expansion of organisational knowledge occurs through four stages of conversion, presented as the SECI model (Nonaka et al., 2006, p. 1182). The questionnaire showed that participants within the upcycling food byproducts community were creating new knowledge through: *socialization*, with technical universities and other startups (Questionnaire - replies, p. 121), *externalization* of

knowledge through publishing articles and learning materials (Initial interview, CCC-UE1, 17:10, *combination* and *internalisation* through sharing knowledge on the establishment of common business models (Initial Interview, CCC-UE1, 17:10). Though participants are seen to engage in creating new knowledge amongst themselves and with new participants from outside the community, the focus of knowledge expansion remains within the individual participants themselves and not so much based on increasing value in the community as a whole.

The collective use of the EPM facilitates knowledge conversion, targeted at realizing the EVP, where participants explore forming complimentary partnerships through making tacit knowledge explicit, in individual value additions and potential value captures within the ecosystem. During the coffee workshop, the EPM facilitated *socialization* between different participants where for example CCC-UE1 and CCC-UE2 suggested a complimentary between them after having exchanged tacit knowledge. They then made their shared knowledge explicit through *externalizing* their value addition and value capture as providing knowledge on production techniques to the ecosystem and gaining new customers (Workshop 1 - transcription, CCC-UE1, 1:14:33). The use of the EPM in facilitating knowledge conversion in the grain workshop was different in a sense that the expansion of knowledge was not targeted at releasing a common EVP. The little *socialisation* that occurred, for example when CG-UE and KP exchanged tacit knowledge on the USP of upcycling food byproducts, was targeted at the broader scope suggested by CG-UE (Workshop 2 - transcription, CG-UE, 29:08, p.26). More so CG-UE held the perception that the conversion process held little value as there was not enough heterogeneous knowledge to combine (Workshop 2 - transcription, CG-UE, 20:13, p.27). Thus the knowledge that was externalized, was deemed not valuable by participants in the grain workshop, although externalization in the coffee workshop facilitated knowledge sharing within a common ground.

The outcome of the knowledge shared and externalised in the EPM, was further analysed through evaluation interviews, for further processing into the organisation through combination and internalisation (Nonaka et al., 2006, p. 1182). Furthermore internalisation realises new tacit knowledge that suggests potential value created by the

model. To begin with the CCC-UE1 mentioned that the workshop was by far the most productive though he added that it was too short for him to gain new knowledge based on the explicit knowledge on the EPM. The data showed otherwise, as CCC-UE1 presented areas of new tacit knowledge in recognising the richness of CCC-UN1's insights and by formulating the possibilities of starting a project as a community (Evaluating interview, CCC-UE1, 04:17). In the grain workshop, both CG-UE and CG-GS did not engage in common knowledge creation for realising the proposed EVP, although they created new knowledge in relation to the value of an ecosystem as a strategy for driving regulatory changes related to establishing competitive advantage for side stream products (Workshop 2 - transcription, CG-UE, 1:16:01). CG-UE suggested new knowledge in the possibility of utilising an ecosystem to form an interest group in enabling new knowledge creation on upcycling food byproducts with the food administration. Thus the use of the EPM in the workshops facilitated the creation of accumulated value, by building on the potential of created knowledge in formalising engaged partnerships.

Discussion reflections

The deductive approach to defining the five parameters used in both the third subquestion of the analysis and this discussion, has been used as a framework for detecting how elements of these parameters influence value creation in an innovation ecosystem. The discussion aims to detect how these parameters have influenced value creation in organisations within the upcycling food byproducts community, by applying the EPM and the supporting theoretical framework. As illustrated in figure 3 the discussion shows a high interconnectedness of the parameters influencing value creation in an ecosystem in the upcycling food byproducts community. Firstly, the individual organisations carry the responsibility of determining their internal strategies which encapsulates the business model. Furthermore, the approach towards change making should be established in this parameter, in order to define the values which the organisation meets the world with. As the line illustrates, the division between internal responsibilities and collective responsibilities is necessary to define. An important

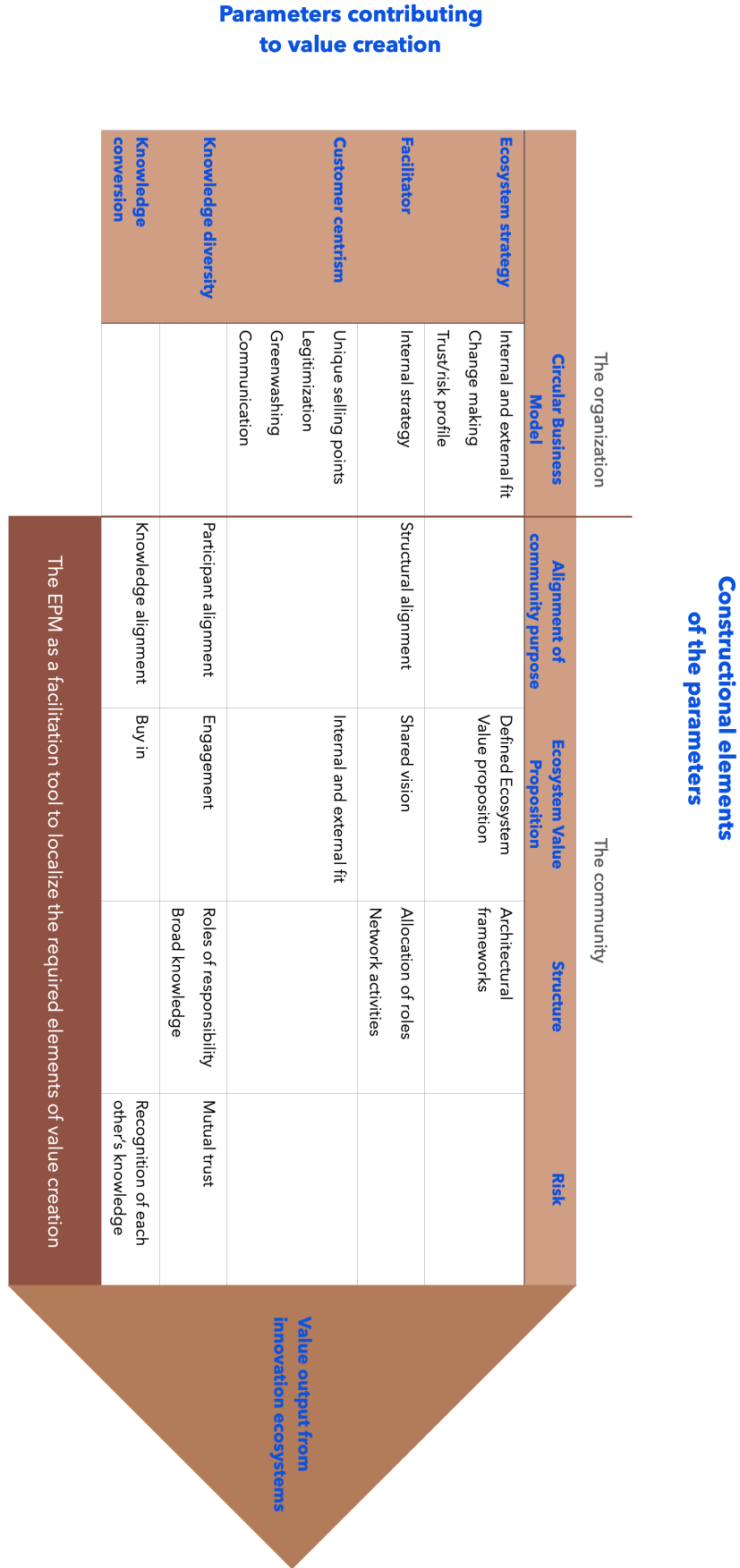


Figure 3: Overview over constructional elements of the parameters

parameter shown in the discussion is thus the approach and the mentality of the individual organisation in order to create value in an ecosystem in the upcycling food byproducts community.

The parameters covering the collective responsibilities shown in the discussion, are connected in four ways which are aspects that should be facilitated to achieve the value an ecosystem offers. The four parameters are: *alignment of community purpose*, *EVP*, *structure* and *risk*. Firstly, alignment of community purpose is represented in the parameters of the facilitator, knowledge diversity and knowledge creation, and encapsulates how participants in a community need to find a common ground, in order to facilitate an ecosystem. Secondly, the EVP is constructed by elements of all parameters, which indicate the importance of aligning on a shared goal for materialization in order to gain value from an ecosystem. Thirdly, structure defines elements of the ecosystem strategy, the facilitator and knowledge diversity and establishes the road towards materialization of the EVP. Lastly, elements of risk are rooted in the knowledge parameters (- diversity and- conversion) and breaks down the remaining barriers within the previously established structure. These organizational -and communal responsibilities for facilitating these elements define the gates for accessing the value an ecosystem can offer, and the roadmap towards it is the facilitation of the EPM.

Conclusion

The overall thesis investigation sets out to gain an understanding of how innovation ecosystems can enable increased value creation for the organisations in the upcycling food byproducts community. The investigation rests on the hypothesis that the interaction between the organisations creates more value than the organisations single handedly. The design of the research process takes on a pragmatic approach where firstly initial data is drawn through literature readings and interviews with several organisations in the community, drawing insights on business model activities within upcycling. This was followed by a questionnaire designed to quantify the insights and test their validity in the representation of the larger upcycling food byproducts community. The data from the initial insights and questionnaire went on to inform the scope of two workshops, one on upcycling coffee and the other on upcycling grain. In the workshops the EPM was implemented as a facilitation tool and structure in engaging participants in an active exploration of common value creation in the structure of an ecosystem. Furthermore to validate and elaborate on the insights in the outcome of the workshop, evaluation interviews were conducted on several participants in both workshops. The initial interviews, the EPM workshops and the evaluating interviews generated a set of empirical data that set the foundation for interpreting how ecosystems enable value creation.

All the organisations incorporated in the research are characterised and defined by Lewandowski's (2016) five principles of circular business models by their activities of upcycling. The organisations are seen to engage in collaborative network activities to enable the looping of resources in realising the sustainability agenda and value creation in all aspects of the triple bottom line (Massa & Tucci, 2017). More so organisations within the up-cycling byproducts community are seen identifying knowledge as value by drawing heterogeneous knowledge into their organisation from individuals outside as an approach to increasing organisational value creation (Felin & Hesterly, 2007). Prior to the workshop, participants like CCC-OSC and KP are also seen in embodying the role of a network facilitators, embedded in their desire to drive activities that increase network innovation output (Dhanaraj & Parkhe's, 2006). Finally organisations are seen engaging

in the different phases presented by Nonaka et al. (2006), where organisations are seen creating new knowledge in network activities related to socialization, externalization, combination and internalization.

Establishing the structural elements that construct an ecosystem strategy, the participants in the two workshops were presented with the EPM as a tool to facilitate more value than a network. Adner's (2017) article introduced the necessity of structure in order to create an ecosystem, which manifested itself in the EPM and created a platform for two workshops to define a common ground: the EVP. The two workshops approached the structural elements very differently, where the coffee workshop found alignment through the previously established CCC and the grain workshop saw differences and risk as barriers for reaching an alignment. The elements of risk were analyzed with the use of Adner's (2006) three perspectives of risk, where increasingly more risk was found throughout the grain workshop due to their missing alignment. These perspectives affected the ways which the two workshops managed to use the EPM framework. The coffee workshop managed to both define what value could be contributed to an ecosystem, and what value could be captured from one as well. Oppositely, the grain workshop was limited by their perception of risk, which prevented the participants from moving past the definition of an EVP. The structural elements of an ecosystem were found to be highly reliant on organisations internal strategy and perception of risk in collaborating.

To analyze what parameters influenced value creation in the two workshops five parameters were defined based on the theoretical framework applied in the thesis. The first parameter; ecosystem strategy, confirmed the importance of the a structural element in order to define a shared EVP, like it was seen in the coffee workshop. Secondly, the importance of facilitation from a lead firm who guides the community was found necessary in the coffee workshop, and to a high degree in the grain workshop. Thirdly, the importance of customer centrisms were found to be recognised in both workshops, however approached slightly differently, however the customers' perception of upcycled products was seen as an important aspect in both. A parameter that was the subject for much discussion, was that of knowledge diversity. In the coffee workshop,

the diversity of knowledge was defined as broad although some overlaps were found, although perceived as opportunities for collaboration. In the grain workshop, knowledge diversity was perceived low, which increased the perception of risk with one participant especially, which made alignment unlikely. The fruits of the success of the first four parameters resulted in the success of the fifth; knowledge conversion. Low risk in the coffee workshop facilitated transparency and mutual trust, which led to knowledge conversion, however in the grain workshop the only way to collaborate would be at arm's length in an EVP where structure could be facilitated properly.

In order to fully answer the defined research question, the defined parameters were used to measure how the EPM was used as a framework to facilitate value creation in a community of organisations upcycling food byproducts. The findings of the three subquestions were measured with these parameters, to establish which elements in them contributed to value creation in innovation ecosystems. As it was found, the elements of the parameters could be tied to responsibilities of the single organisation and responsibilities of the community. Referring to the circular business models the organisations in upcycling food byproducts community shares a similar approach to changemaking; disruption of the food industry. The responsibility of the community was related to *alignment of community purpose, the EVP, structure and risk*, which were found in the case study to be the elements that failed to be met when creating value in the grain workshop. As our figure suggests, the coffee workshop met several elements with the use of the EPM, however elements of *structure* and *risk* were found to create barriers for achieving ecosystem value creation. In order to unlock the value creation an ecosystem offers, the EPM is a tool for facilitating the process of fulfilling the elements that generate the parameters which contribute to value creation in an innovation ecosystem.

Future research

The main focus of the research builds onto developing insights regarding the structural shifts and subjects of focus necessary in enabling the formation of an innovation ecosystem within the upcycling byproducts community in Denmark. Innovation ecosystems are seen as an approach to accelerating entrepreneurial activity in circular business model innovation (De Bernardi & Azucar 2020). Potential areas of further development in informing the research scope can firstly include, on a structural level, studying an already established ecosystem in Denmark. Studying an existing ecosystem can provide a longer range of view in the executive dynamics and implications of orchestrating an evolving ecosystem for joint value creation. Another aspect of further development, is in the potential of including more side streams to reinforce representation of the upcycling food byproducts community in Denmark. Including a broader range of side streams can increase the value represented in the generalisation of subject focuses that organisations deem significant in applying ecosystems for business innovation. More so reaffirming the relevance of a subject focus across the community, contributes to the structural element of identifying actors that are significant gate keeps and knowledge holders in realising the community wide value.

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