

MASTER

Expedition venture

a design-science approach to managing tensions in sustainability-oriented ventures

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Expedition Venture: a design-science approach to managing tensions in sustainability-oriented ventures

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Management summary

Entrepreneurs leading sustainability-oriented ventures aim to achieve environmental goals as well as financial goals through their value propositions. This causes tensions, as these goals cause a paradoxical contradiction against each other. What may be beneficial to the revenue of the company may be harmful to its environmental objectives, and vice versa.

The goal of this thesis is to support entrepreneurs leading these ventures who face tensions. This thesis firstly provides an overview on the sustainable entrepreneurial process as entrepreneurs develop opportunities to sustainable value propositions through interviews with entrepreneurs. Secondly, it is uncovered how entrepreneurs might manage paradoxical tensions in their venture based on a literature review. Finally, this thesis describes the design and evaluation of an intervention aimed to assist entrepreneurs in the acknowledgement of tensions.

The first research question (*How can entrepreneurs leading sustainability-oriented ventures be supported*

when managing performance tensions arising from the pursuit of divergent financial and environmental goals?) is answered on the basis of interviews conducted with entrepreneurs. As a foundation for this, the entrepreneurial process model (Belz and Binder 2017) is used. Interviews were transcribed and analysed through a thematic analysis deriving the themes from the entrepreneurial process model. Five stages were identified: (1) sustainable problem recognition, (2) sustainable opportunity recognition, (3) double bottom line solution development, (4) sustainable venture funding and formation, and (5) sustainable market creation or entry. An understanding of this entrepreneurial process is important to create a design that fits the entrepreneur's experience.

Each of these stages pose a different scenario for tensions to emerge, and how these can be managed. It was discovered that the sustainable problem recognized in the first step is seldom changed to a different problem as value propositions are pivoted, which could be a beneficial strategy in managing tensions. Next to that, opportunities are often evaluated based on a gut feeling rather than data. Furthermore, as entrepreneurs develop the double bottom line solution, they often

work together with stakeholders. These influence tensions in two ways: by increasing the plurality of people involved and therefore the number of views that have to be taken into account, and by decreasing the flexibility of the organisation. Next to that, entrepreneurs also experience the possibility of tensions in the funding and formation stage. As financial resources are more scarce, entrepreneurs experience tensions more prevalent. Depending on the type of funding, an investor can also serve as an additional stakeholder and play a role in the plurality causing tensions. As entrepreneurs enter the market, it will become apparent whether they are able to realize both financial and environmental objectives through their value proposition. Finally, though it is not mentioned in the entrepreneurial process by Belz and Binder (2017), all entrepreneurs iteratively worked on their value proposition through a testing phase. Propositions were tested early in the market which enabled them to adjust the value proposition prior to offering a completed product in the market.

The second research question (*How can entrepreneurs leading SOVs manage performance tensions?*) has been answered by conducting a literature review and

synthesising the findings into design principles. These design principles are connected to the framework by Hahn et al., (2015), and are divided in resolution strategies and acceptance strategies. Seven design principles are formulated in line with resolving tensions, and three design principles are formulated to accept tensions. The strategies for resolving tensions rely upon changing the value proposition, resulting in a different realization of financial or environmental objectives. For example, choosing a different market may yield an increase of higher paying customers. Another example is that the environmental benefits might be dependent on the application area of products: energy efficient air conditioning units are less beneficial to the environment in cold climates than in hot climates, where a larger proportion of inhabitants already use air conditioning units. Looking at acceptance strategies, three design principles are formulated. These all focus on starting a dialogue on the tension and understanding the different polarities that cause the tension and in turn accept these.

Finally, the third research question (*How can a tool support entrepreneurs leading SOVs in managing performance tensions?*) has been answered by designing

an intervention to be used by entrepreneurs. Firstly, design cards have been designed that were based on the design principles synthesised by research question two. The design cards illustrated examples of existing companies and how they have managed tensions in their venture. The goal of these cards was to enable entrepreneurs to come up with novel ideas on how they can manage tensions within their venture. These cards have been used in interviews with entrepreneurs to understand their view on both tensions within their venture, and the role of an intervention that can be designed to support them. This set of design cards was evaluated poorly. This might have to do with the awareness of tensions prior to the interview, as it is required to acknowledge tensions within the organisation prior to being able to manage these.

These insights have influenced the design phase to focus on nascent entrepreneurs, rather than existing entrepreneurs. A new design, Expedition Venture, has been created in order to assist future entrepreneurs in acknowledging tensions through serious gaming. Expedition Venture is a board game designed for entrepreneurs to play together with a facilitator. The game represents the journey that entrepreneurs go

through and simulate the potential tensions that can emerge in the future. Entrepreneurs are asked to create a product passport, representing their (prospective) value proposition, and place these on the board. They will then draw a random challenge card, based on the category of market, environmental benefits, funding, and production process. These challenge cards are validated through an expert review and designed to represent realistic challenges that cause tensions to emerge through creating a situation of scarcity, plurality, or change within the venture. The entrepreneurs are then asked to discuss this card and create a new value proposition that will be able to overcome this problem. Salvation cards can be used to serve as inspiration on how to solve various challenges. The goal is to reach the fifth destination of the journey.

This game has been evaluated with nascent entrepreneurs based on the Kirkpatrick evaluation model (Kirkpatrick and Kirkpatrick 2006) based on the satisfaction of the game and its success of acknowledging tensions. It appears to be a successful tool to aid entrepreneurs in the acknowledgement of tensions, and demonstrates first steps in providing potential strategies to manage these tensions.

Abstract

We face numerous environmental challenges. Entrepreneurs seek out to provide solutions to these through sustainability-oriented ventures (SOVs). Through their value proposition they aim to provide a solution to these environmental challenges, in addition to meeting financial objectives. Yet what may be beneficial to the environment, is not necessarily beneficial to the venture's financial figures, and vice versa. This inherent incompatibility between a venture's sustainability impact and financial performance causes management tensions. This master thesis aims to support these entrepreneurs to manage these tensions. I first conducted interviews with some of these entrepreneurs to uncover the entrepreneurial processes of how they transform entrepreneurial opportunities into (viable) businesses, supported by additional literature. Secondly, I conducted a literature review to uncover how entrepreneurs currently manage these tensions. Finally, by building on paradox theory, I developed a tool to support nascent sustainability-oriented entrepreneurs in acknowledging these tensions as a first step in successfully managing these. I

have found that even though there are multiple strategies for entrepreneurs to manage these tensions, they are unaware of these. In the entrepreneurial process, entrepreneurs experience the danger of losing the flexibility to pivot as they engage more with stakeholders and seem to hold on to the initial problem area, whereas this could be used as a pivoting point. Finally, the developed tool creates awareness of paradoxical tensions through role-playing various value propositions and challenges to be faced by nascent entrepreneurs. This research contributes to paradox theory by offering a prescriptive approach on how these tensions can be managed and acknowledged.

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I - Introduction

We tend to perceive entrepreneurs as those who exploit activities in return for profits. However, due to pressing global issues entrepreneurs also increasingly set-out to achieve an environmental objective in their venture next to making a profit. An example of this is a clothing venture that produces and sells sustainable clothing. Their environmental ambition is to make consumers more aware of the impact clothing has on the environment. Meanwhile, they must also make a profit in order to stay in business. These sustainability-oriented ventures (SOVs) have organisational goals that are economic as well as environmental. Both in academia and the business world, SOVs are increasing in popularity (Dees 2001; Tracey and Phillips 2007).

These dual goals are achieved through value propositions. In the case of SOVs, the value proposition must be developed with environmental objectives as well as financial objectives at the core (Lüdeke-Freund 2010). This value proposition impacts the environment on the level of resource extraction, production, usage, and disposal. A good product-market fit is required to make sure both sufficient revenue can be obtained, as

well as environmental goals are met. Even though there are various methods and tools available to help entrepreneurs in the development of sustainable value propositions (Bocken et al. 2013), the addition of the environmental objective increases the complexity in the decision-making process as it increases uncertainty on the outcomes of achieving the two goals (Baumgärtner, Faber, and Proops 2002). Entrepreneurs face difficulties in aligning these goals through their value proposition. Literature offers strategies on how or when this duality can be managed (Hahn et al. 2015), but lacks in the operationalization on how that can be implemented.

From this goal duality, paradoxical tensions can emerge (Smith et al., 2013). These tensions are caused by the different lenses through which success is measured. A goal can be accomplished when perceiving it only through the environmental lens but may not yield the expected financial returns and vice versa. An example of performance tensions can be considered for Evening Breeze Keskin, Wever, and Brezet 2020). Evening Breeze is a venture that offers air conditioned beds. In hot climates, the air conditioning unit often runs the entire night to provide for a cool temperature in the bedroom. Only cooling the bed itself is more energy

efficient than cooling the entire room. Initially, Evening Breeze offered their product to resorts in hot climates, but the product was not adopted here. Instead, they pivoted their value proposition and offered it to upper class people in the Netherlands. Here, the beds sell well. However, the environmental impact of an air conditioned bed in the Netherlands is not as good as in tropics. The environmental benefits are low in the Netherlands as air conditioning units are sold to people who do not already own one. They faced a paradox: low sales in hot climates where the environmental gains would be high, or high sales in a cold climate where the environmental gain is very low.

When financial goals are emphasized over environmental goals, entrepreneurs run the risk of mission drift (Santos, Pache, and Birkholz 2015) meaning they will not remain true to their environmental ideas. On the contrary, when environmental goals are more dominant than financial goals, entrepreneurs run the risk of declining revenues (Drummond 2008; Smith et al. 2012). When these objectives are in balance, SOVs may experience an increase in innovative or creative abilities (Gebert, Boerner, and Kearney 2010; Harvey 2014; Hoever et al.

2012), better organisational effectiveness, and a stronger competitive advantage and long-term performance (Klarner and Raisch 2013). This balancing act is vital for the sustainability of a venture in terms of both environmental and financial outcomes.

Paradox theory appears to offer a useful theoretical lens for analyzing the tensions that arise from pursuing multiple objectives as these tensions are considered both contradicting and interdependent. Rather than looking at the sources or impact of the paradox, paradox theory enables the researcher to focus on the paradox itself. The research is primarily concerned with solving or understanding the paradox itself. Within this thesis, a paradoxical tension is defined as “contradictory yet interrelated elements that exist simultaneously and persist over time” (Smith and Lewis 2011, 385). In this definition the core of the tension can be identified: it is both contradicting and interdependent (Schad et al. 2016). Paradox theory enables the researcher to examine the tension itself and explore potential solutions, rather than isolating the polarities causing the tension. This is an integrative approach. Through this approach, this thesis will be able to focus on providing a solution and identify opportunities across the tensions.

Other lenses typically consider the tension as a problem of maximization and recommend the prioritization of one option over the other.

Traditionally, research methods within business studies focus on understanding something through descriptive, explanatory, or predictive studies (van Aken, 2004). Yet design science is able to create solutions with a prescriptive nature to provide solutions to problems that are also relevant to managers and entrepreneurs. Design science will be used to gather insights, develop, and evaluate a solution to support entrepreneurs leading SOVs in managing the environmental and financial goals. This approach lends itself to developing solutions that are applicable to the businesses in question to implement as it brings together theory and practice (van Aken, 2004). This combination of theory and practice enables the development of a solution that is contextualized, which is comparable to real-world implementations.

This thesis contributes to a better understanding of the role of tensions in the entrepreneurial process as entrepreneurs develop an opportunity to a sustainable value proposition. This will be researched through

interviews with entrepreneurs. Understanding this through the eyes of the entrepreneurs enables a more contextualized development of future products, services, or other types of aids which can eventually support these entrepreneurs to manage the paradoxical tensions. Furthermore, taking a paradox perspective enables an approach in which the tension is analysed as a whole, rather focusing on either the environmental or financial polarity creating this tension. Secondly, this study contributes to getting an understanding of how paradoxical tensions can be managed. The answer to this will be formulated based on design principles that will be developed based on a literature review. Lastly, the design outcome will be used to support entrepreneurs leading SOVs in acknowledging performance tensions. The goal is to enable entrepreneurs to acknowledge tensions in their firm, and assist in the exploration of possibilities to manage these. The fields in which these entrepreneurs operate are very complex, and it is left up to them to evaluate the possibilities and make the decision.

1.1 Research gap and research questions

Entrepreneurs leading SOVs experience difficulties in managing performance tensions arising from the duality of their goals that emerge from their value proposition. These ventures' survival is vital based on the effective management of these tensions. When either the financial or environmental goal is prioritized too much, neither goals might be met. Possible management strategies have been identified (Hahn et al. 2015), but it is unclear under which conditions which strategies are advised. Furthermore, when committing to a strategy, it is unclear how the strategy should be applied as the field of the tension is very dynamic and complex.

The following problem statement is formulated from the aforementioned challenges:

Entrepreneurs leading sustainability-oriented ventures face challenges in balancing tensions arising from the duality of environmental and financial goals. These stem from the positioning of the value proposition. It is unclear how they must balance their financial and environmental goals through the value proposition. Several strategies are discussed in literature, but

information is lacking on how a balance of these tensions can be achieved through the value proposition to achieve both environmental and financial goals. Possibilities in pivoting the value proposition to balance these goals are to offer the product in a different market or providing a different benefit to the customer or user. If pivoting tactics for value propositions are more readily available within the possibilities to manage these tensions, it would help the survival rate of SOVs and achieve financial and environmental goals.

1.1.1 Research questions

This thesis aims to prescribe a product/service solution that will help entrepreneurs leading SOVs to manage tensions. The tensions that these entrepreneurs face, coming from the duality of addressing both financial and environmental goals within their venture, are difficult to manage. The focus of this thesis lies on balancing performance tensions originating from the value proposition. An incorrect balance results in ventures emphasizing one goal over the other, rather than achieving both goals. The main research question is as follows:

How can entrepreneurs leading sustainability-oriented ventures be supported when managing performance tensions arising from the pursuit of divergent financial and environmental goals?

In order to answer this main research question, sub research questions are derived in order to define a fitting answer. Design phases will be used to synthesize knowledge and develop a concept aimed to provide a solution to the problem. Empirical findings, together with data obtained from literature, will be synthesized to provide a fitting solution.

Research question 1:

How do entrepreneurs leading sustainability-oriented ventures transform an opportunity into a sustainable value proposition?

This first sub-question addresses the difficulties entrepreneurs face when developing an opportunity towards a value proposition. The goal here is to understand the context and the experience of entrepreneurs in the decision making process. This research question will be answered empirically through

interviews, using an deductive approach for the interview. An empirical approach provides contextual cues that can later serve as input for the final design. Examples of these contextual cues are whether the entrepreneurs are self-efficient in identifying the origin of these tensions or what parties they might reach out for in order to overcome these difficulties. The answer to this research question will build on existing literature examining the development process from opportunity to value proposition within SOVs (Belz and Binder 2017). This information will be gathered through semi-structured interviews. The answer of this research question will take the form of an experience flow, in which the touchpoints of this experience can be mapped in order to identify opportunities for the final design to tap into.

Research question 2:

How can entrepreneurs leading SOVs manage performance tensions?

In order to guide entrepreneurs in managing the aforementioned tensions, it is important to understand the current situation on performance tension

management. To answer this question, design principles will be distilled from literature. Here I look at various social and sustainable ventures and companies that face tensions, and what steps they took to manage these. The answer to this question will address the decision making process of the entrepreneur regarding dealing with tensions.

Research question 3:

How can a tool support entrepreneurs leading SOVs in managing performance tensions?

The final research question takes place in the design context and synthesizes the information of prior research questions into a final design. This will be an iterative process, taking into account the developed design principles and research question one and two in order to develop a fitting solution in the identified context. The final design aims to support the entrepreneur in the decision making process on the value proposition. The goal is not to make the decision for the entrepreneurs on what the next step should be,

but rather help in exploring possibilities and the risks involved.

1.2 Thesis structure

The thesis is structured as follows. First, literature is examined on SOVs, the opportunity development process by entrepreneurs, and on the paradoxical tensions between environmental and financial goals experienced by entrepreneurs leading these SOVs. This is followed by the methodology section which will explain the design science process conducted in this project, the data collection, data analysis, and the participants who have made this thesis possible. Finally, the results chapter will elaborate upon the design parts of the thesis consisting of a design card set as probes and a final design of a serious game. Finally, the discussion and conclusion will provide answers to the posed questions, discuss the limitations of the study, and provide recommendations for future research.

2 – Theoretical background

The aim of this chapter is to provide an overview of the existing literature. Firstly, the aim is to get an understanding of how entrepreneurs leading SOVs develop opportunities into value propositions. Secondly, this chapter describes the tensions emerging from the value propositions of these ventures and how these could be managed.

2.1 Sustainability-oriented ventures

Over the past decades, customers have let organisations know they care about products that also serve a sustainability purpose besides the utilitarian. The origins of these demands range from the public disagreeing on the efforts of dealing with existing problems (Gregory Dees 2001), to increased customer awareness on the way a company operates, to companies itself changing their focus and goals (Santos, Pache, and Birkholz 2015). As a result of this, SOVs are increasingly common in both literature and the business world (Gregory Dees

2001; Tracey and Phillips 2007). This type of venture addresses problems of sustainability through a commercial venture.

An example of a SOV combining environmental and financial goals is the company Evening Breeze (Keskin, Wever, and Brezet 2020), as also mentioned in the introduction. Evening Breeze aims to decrease the energy consumption used for cooling. They commercially offer air conditioned beds. It is more energy efficient at night to only cool the bed rather than using an air conditioning unit to cool the entire room. Through their value proposition offering, they aim to achieve both their environmental goals, as well as obtaining financial objectives.

2.2 Value propositions

Business models have been brought to life in order to communicate and analyse how organisations run their business (Alt and Zimmermann 2014; Wirtz et al. 2016). One primary part of the business model is the value proposition. A value proposition *“Gives an overall view of a company's bundle of products and services”* (Osterwalder, Pigneur, and Tucci 2005, 18). In essence, this is the value a company offers through a product or

service, for which a specific customer is intended to pay. Traditionally, this focuses on obtaining revenue through the offering of a product/service. SOVs aim to achieve both their commercial goals and sustainability goals through their value proposition. The progress on these objectives are determined in the case of products by the level of resource extraction, production, usage, and disposal.

When the metric of environmental goals is introduced, it becomes more difficult to adhere to all objectives. Factors that play a part in its success are the actors involved, as well as the way a product or service offers value (Boons and Lüdeke-Freund 2013). Therefore the product-market fit is considered important to succeed in balancing environmental and financial objectives. Challenges in business model innovation are often tied to conflicts between the new and existing model, or with the assets that support the existing model (Chesbrough 2010). In the case of start-ups or younger ventures, this tends to be less of an issue as they are more flexible than mature organisations. Yet the development of successful value propositions remains an obstacle for SOVs aiming to achieve both financial and environmental objectives.

Business models are different for SOVs as they seek to achieve environmental missions next to the financial mission. Their business models create a competitive advantage through customer value, whilst simultaneously assisting the development of the company and society - in this case through environmental gains (Lüdeke-Freund 2010). It is suggested that SOVs, as opposed to traditional ventures, take on both a system and firm-level perspective, define the venture's purpose based on the triple bottom line approach and measure performance both in the environmental objectives and financial objectives (Stubbs and Cocklin 2008). However, paradoxical tensions emerge as entrepreneurs want to achieve both of these goals through their value propositions.

2.3 Performance tensions

The complexity of goal duality is further increased as paradoxical tensions emerge from the duality of environmental and financial goals (Smith et al., 2013). Environmental and financial goals can be contradictory as accomplishing goals in one domain can be considered a loss in the other. This is caused by the difficulty to

judge this through both the perspective of financial goals and environmental goals simultaneously. These tensions are considered performance tensions as they stem from the way objectives are quantified and how success is measured (Smith, Gonin, and Besharov 2013).

Performance tensions become salient when an entrepreneur wants to address the conflicting demands between divergent goals of creating value for the environment, as well as meeting financial objectives (Smith & Lewis, 2011). Tensions are often latent within SOVs and might not surface or become problematic until certain conditions are met (Smith and Lewis 2011). Three factors play a role in the emersion of tensions: plurality, change, and scarcity. Plurality is the abundance of perspectives in the environment of the venture, such as stakeholders. It increases the uncertainty and makes processes inconsistent. Secondly, change in the venture's identity enables new opportunities to arise and therefore enable divergent short- and long-term needs. In general, environmental goals can be considered long-term needs, whereas cash-flow can be considered short-term needs. Finally, scarcity involves the limitation of resources. When

resources are limited, tensions are exaggerated when situated between opposing or interdependent alternatives. This indicates that start-ups experience tensions more likely and more intensely than larger organisations.

Performance tensions do not always cause problems. For example, some ventures may be aware of the drawbacks from sourcing their materials from low wage countries as opposed to locally. They might not be in the financial position to be able to pay for locally sourced materials. This does not mean their main environmental goal is currently unmet, as this is only one aspect of it. However, there is a tension where the balance between these goals could cause friction.

It is unclear how performance tensions must be managed correctly. Tensions are very abstract and it is often unable to measure whether a tension has been successfully managed or not. However, mismanagement or not managing tensions can be detrimental to the organisation itself. If an organisation experiences tensions between their financial and environmental goals, it is possible to suffer from mission drift (Santos, Pache, and Birkholz 2015). These risks vary depending

on the power of stakeholders and the reliance of the business model on these stakeholders. Finally, the organisational performance can drop due to an imbalance in focus on social and financial goals (Smith et al. 2012; Drummond 2008). When financial goals are overemphasized, the environmental mission will pay the price and vice versa.

Part of the difficulty in managing performance tensions lies in the ambiguity of measuring environmental objectives. Measuring financial objectives has become standardized over time and is well incorporated in the assessment of the performance of an organization. This standardization increases the comparability within the venture, or towards other ventures. Examples of these methods are key performance indicators (KPIs,) such as the revenue over time, sales over time, or gross profit margins. Environmental objectives are much harder to specify and measure than financial objectives.

Environmental goals are often addressed qualitatively, ambiguous, or compared with unstandardized metrics (Liket, Rey-Garcia, and Maas 2014; Ebrahim and Kasturi Rangan 2010; Epstein and Buhovac 2008). A much seen approach is to quantify the environmental objective and use it similarly to a financial measure. An example could

be the sales of sustainable products versus the regular variant. Measuring environmental performance lacks - as opposed to the financial objectives - standardization and comparability (Dimaggio 2001). The causal models required for defining clear goals and how these are achieved is unclear for environmental objectives. When looking at a hospital's performance for example, the quality could be expressed in the infant mortality ratio. However, this is very much affected by the context of the environment. If one hospital is situated in an area with very health-conscious mothers, infant mortality will automatically be lower than a hospital which is situated in an area with a lot of drug abuse - even though the latter hospital might even provide better healthcare (Dimaggio 2001).

SOVs experience tensions stronger than other organisations facing these goals. For SOVs, it is at the core of the venture to provide value to the beneficiaries whilst at the same time keeping up with financial performance. If there is no more value created for the beneficiaries, the financial performance will represent this. It is of vital importance for the organisation to keep these goals balanced. It is currently undiscovered what characteristics organisations entail that successfully

(Smith, Gonin, and Besharov 2013) embrace these tensions. Yet there are several possibilities in managing tensions.

2.4 Managing tensions

One way of managing tensions in SOVs is through taking an integrative view (Hahn et al. 2015). This integrative view (figure 1) builds on paradox theory in a way to embrace the tensions, instead of eliminating these. Three management strategies are suggested, if the requirement of tension acknowledgement is met. If an organisation does not acknowledge that a tension could or should exist, and can not identify and characterise this tension, it can not be managed. The strategies to deal with these tensions are proposed through opposition, spatial or temporal separation, or synthesis (Poole and Van de Ven 1989). These strategies are conceptualized as distinct strategies, but are in reality often able to be combined or considered interrelated. It is not clear what factors influence the organisation to opt for either strategy over the other.

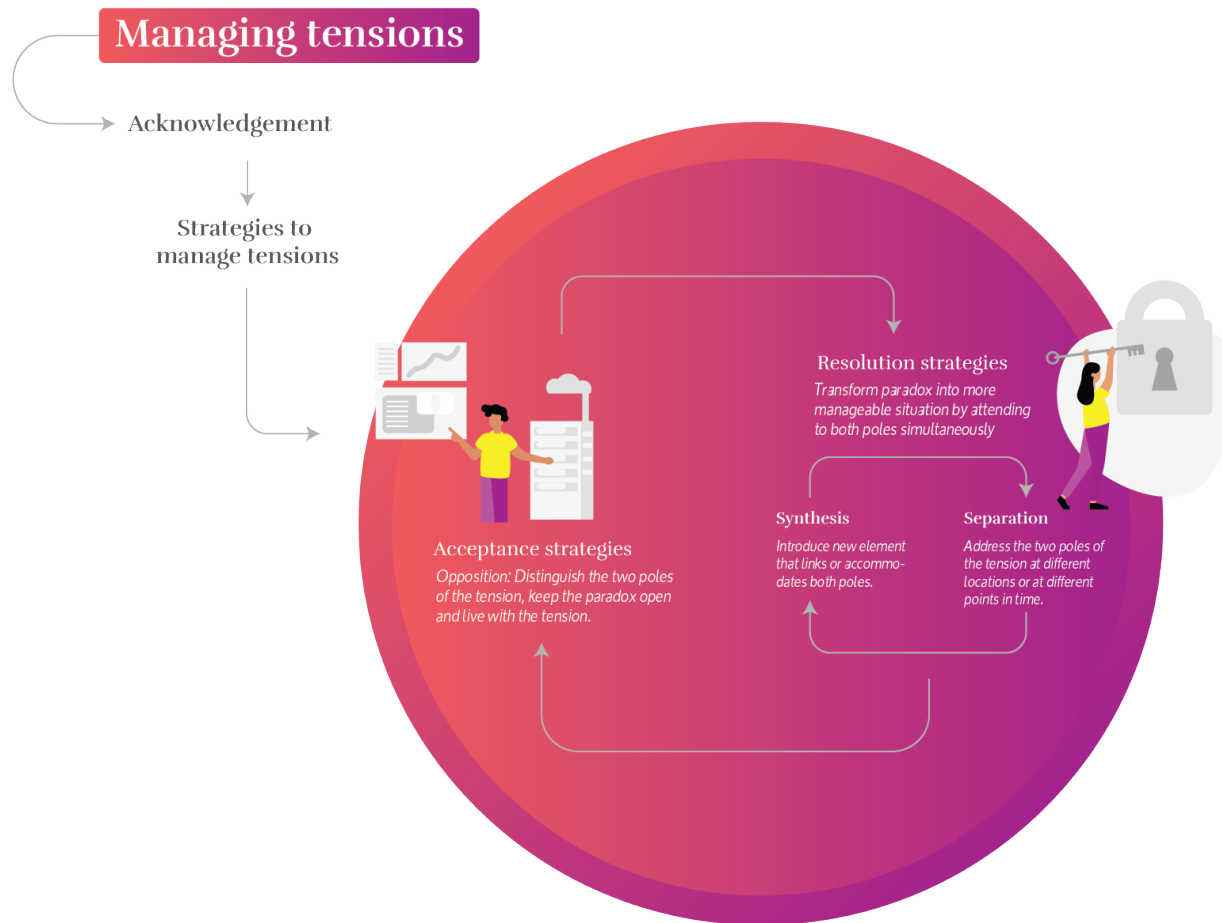


Figure 1: Framework of strategic tension management, adapted from Hahn et al. (2014)

Acceptance strategies

The first of the two branches of strategies that will be discussed, are acceptance strategies. Opposition is a type of acceptance strategy, entailing a distinction of two poles of a paradox. The organisation must accept the tension and find ways to live with this. Neither pole of the tension will be emphasized; both are pursued simultaneously. This contrasts with finding a compromise, where one of the two poles would be emphasized more than the other. Beneficial to these strategies are the possibility of a synergy for the organisation without solving the tension (Clegg, da Cunha, and e Cunha 2002) as opposites and contradictions could inform each other (Poole and Van de Ven 1989).

Looking at value propositions, an acceptance strategy would not change the value proposition. An entrepreneur would acknowledge a tension between the environmental and financial objective because the environmental objective is not met in the specific use case. Yet the entrepreneur does not pivot the value proposition and may be considered a commercial entrepreneur instead of a sustainability-oriented entrepreneur.

Resolution strategies

The second branch that will be discussed are resolution strategies (Hahn et al. 2015). These entail two strategies: (1) synthesis, and (2) separation strategies. Within this branch, there is an attempt to resolve the paradox by *“spelling out the nature of the tensions between contrary positions”* (Poole and Van de Ven 1989). Through this, paradoxical tensions will be made more manageable by offering ways to attend both positions simultaneously, whilst still having an underlying tension. Beneficial to this strategy is that specific targets in either domain of the tension are more easily identified and defined. This also enables managers to develop skills for addressing said domain without interference (Smith and Tushman 2005). Separation strategies address these poles in either different points in time, or at different locations. Temporal separation strategies address poles at different poles in time; these tensions are of financial, social, or environmental nature. Spatial separation strategies address poles at different points through different locations (e.g. systemic, organisational, individual).

An example of a separation strategy can be seen in the venture of Mobile School [SOURCE!]. Their social mission is to provide education to third-world countries. However, they are not able to meet their financial goals in this market as they are unable to pay. In order to solve this tension, the company has separated the polarities across their business. One branch located in Belgium offers business consultancy services to obtain revenue, whereas the other branch focuses on providing educational. By splitting the polarities that create the tensions to different businesses, they have resolved their tensions.

A synthesis strategy can be observed in the venture of Sustainable Dance Club (Keskin, Diehl, and Molenaar 2013). Sustainable Dance Club set out to make the clubbing scene more sustainable through a floor that is able to generate energy. During the development of the product, the entrepreneurs discovered that the generated energy is not sufficient in the market of clubs and would therefore not be able to develop. In order to synthesise the polarities of the tension, they have pivoted their value proposition. Instead of making the clubbing scene more sustainable, they now develop educational tools for children through the same flooring

system. Through this pivot, they are able to use a product that is relatively the same whilst applying it to a different target market and offering a different benefit.

We see that the positioning of the value proposition is important in managing the emergent tensions. Yet there are many factors involved as entrepreneurs develop an opportunity towards a sustainable value proposition.

2.5 Sustainable entrepreneurship process

The sustainable entrepreneurship process is the development from business opportunity to sustainable value proposition development. Commercial entrepreneurs generally base their decisions upon standardized financial criteria that are easy to compare to other offerings of the venture, or offerings of competing companies. The differences in this process for social entrepreneurs is largely unexplored (Lumpkin et al. 2013). It is unclear how entrepreneurs develop these opportunities and how their environmental mission impacts this development process.

Social metrics are unstandardized and difficult to compare, as opposed to financial metrics (Liket, Rey-Garcia, and Maas 2014; Ebrahim and Kasturi Rangan 2010; Epstein and Buhovac 2008). Next to that, maximization of financial projections might not be the maximization of the environmental impact with the created offering. A different optimum must be found, but that is hard to measure. Literature explores methods on how social goals can be quantified, but entrepreneurs generally do not use this (Lingane and Olsen 2004). That begs the questions how entrepreneurs choose between alternative opportunities or value propositions as they develop their venture from an idea to market entry.

Belz and Binder (2017) have derived an empirical model based on case-studies, defining five stages in the sustainable entrepreneurship process. These stages are (1) sustainable problem recognition, (2) sustainable opportunity recognition, (3) double bottom line solution development, (4) sustainable venture funding and formation, and (5) sustainable market creation or entry.

This model fails to acknowledge the iterative nature of the opportunity development process of entrepreneurs

(Keskin, 2015). Through a testing phase, entrepreneurs will obtain new knowledge that will inform decisions. This new knowledge creates the possibility for the entrepreneur to adjust the course of the entrepreneurial process. This is known as *entrepreneurial adjustment* (Parker 2006). This adapted model can be seen in figure 2. The solid arrows represent the model as depicted by Belz and Binder, whereas the dashed arrows are modifications.

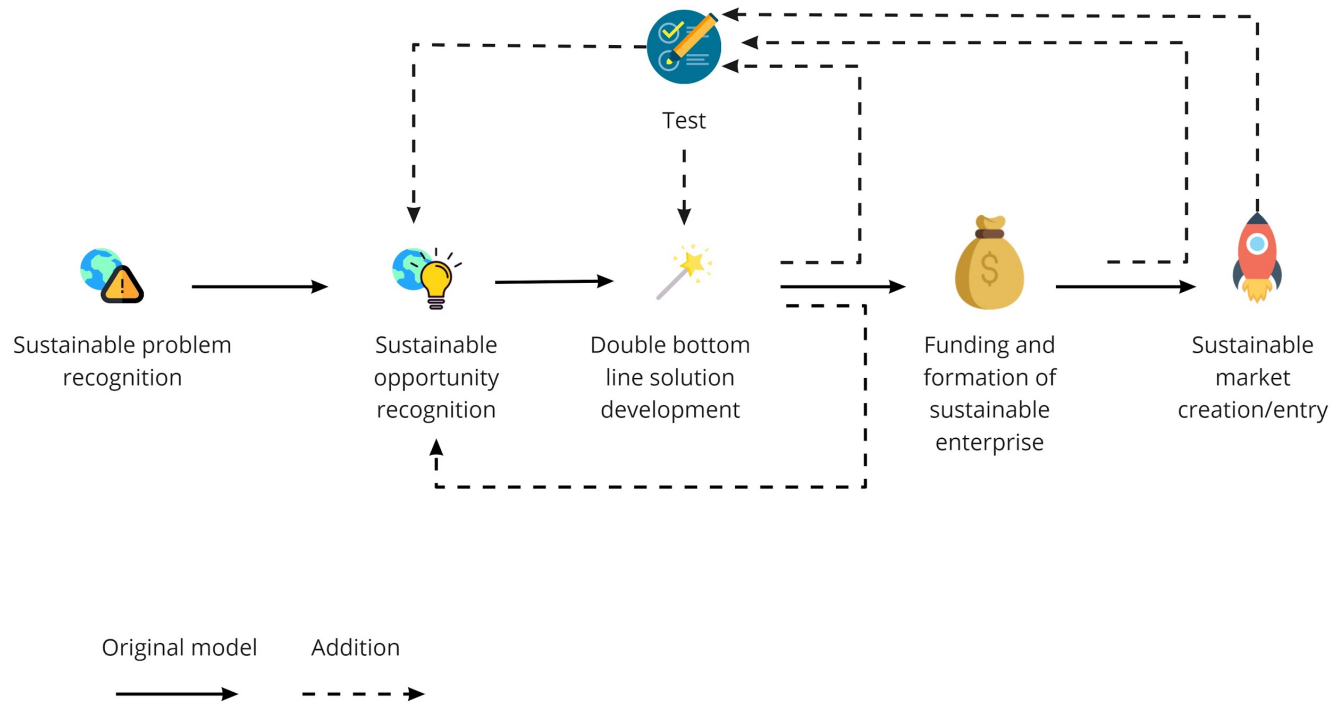


Figure 2: Modified sustainable entrepreneurial process, original from Belz and Binder (2017)

2.5.1 Sustainable problem recognition

The first step in the development of a value proposition is recognizing the sustainable problem. This can be something an entrepreneur finds unfair or feels frustrated by. An example of this is the waste caused by the fast fashion industry (Belz and Binder 2017). This problem can be experienced either through the personal life of the entrepreneur, or in a professional environment. It appears that a first-hand experience is important in recognizing this opportunity. The authors consider this an *experience corridor*. An experience corridor states that entrepreneurs are only able to recognize opportunities in lines with areas that they have experience in. Choosing a problem area in which entrepreneurs are experienced in could increase the odds of success, rather than creating a new venture focusing on a problem that is also unknown. Secondly, Belz and Binder state that sustainable problems are generally recognized on a global scale, such as climate change. This differs from social enterprises, who typically tackle a local problem. The problem

recognition phase therefore sets the stage for the environmental goal that will be addressed through the venture's value proposition.

2.5.2 Sustainable opportunity recognition

The second stage in the sustainable entrepreneurship process is to recognize an opportunity that targets both the problem, as well as the identification of an opportunity in the market to commercialize it. Opportunities are considered the first step in the development towards a value proposition. In this stage, entrepreneurs start forming the value proposition and include a financial component to the environmental goal.

According to Belz and Binder, sustainable opportunities are often recognized in line with what can be considered market imperfections. For example, start-ups aiming to revolutionize the vehicle market aim to provide a more sustainable alternative to fossil fuel powered cars. Here they address market imperfections through the value proposition. Through addressing market imperfections at the core of the venture, the

entrepreneurs take a first step in synthesising the polarities of environmental and financial objectives.

It is often the case that several opportunities are available for the entrepreneur to develop further. Entrepreneurs leading SOVs tend to consider the long lasting change and the economic sustainability of the opportunity in question (Perrini, Vurro, and Costanzo 2010). Commercial entrepreneurs tend to base the decision on which opportunity to further develop on the rarity, relatedness, and possible value generation of the opportunity (Haynie, Shepherd, and McMullen 2009). It is unknown if this is the same for sustainability-oriented entrepreneurs. Next to that, the sense of control over the situation in order to generate value appears to be important. It is unclear if this sense of control takes into account potential tensions between environmental and financial goals.

In the case of social entrepreneurs, entry barriers are considered an important criteria for the decision whether to pursue the opportunity or not (Robinson 2006). These are economical, social, or institutional in nature.

Economical entry barriers refer to the required money to deliver a competitive product. Factors that come into play here are investments such as research and development or assets, but also customer switching costs. Social entry barriers refer to the entrepreneur's network and social contacts. Examples of this are employees, political contacts, banking contacts, or other stakeholders. If these are high, the entrepreneur is unable to make use of these people. Finally, institutional entry barriers are related to the rules, norms and values of a market or its practices. An example of this is social norms within a culture. High entry barriers may result in disappointing financial returns, as the products are less purchased by the customer base. These entry barriers might be higher in technology-driven startup, as they face the hurdle of proving effectiveness of their product. Entry barriers play a role in tensions as they influence the realization of financial and environmental objectives.

2.5.3 Double bottom line solution development

Once the problem and market are known, entrepreneurs can start by developing a double bottom

line solution. The double bottom line here refers to the duality of environmental as well as financial goals they wish to adhere to. Value must be created to the stakeholders involved with these goals. The complexity of a growing number of stakeholders involved, also referred to as plurality, increases performance tensions. Examples of value that needs to be provided to stakeholders are providing a benefit to a customer, offering the product or service at an adequate price, and being able to generate a sufficient environmental impact.

The field of stakeholders to whom value needs to be provided is more complex for SOVs than for commercial ventures. Next to the essential stakeholders such as customers, suppliers, and partners, SOVs also consider the environment and society as stakeholders (Tantalo and Priem 2016; Bocken et al. 2013). Here, the performance tensions surface as some stakeholders represent the more commercial aspect of the SOV, whereas others represent the environmental aspect. A proper balance needs to be found here. This value creation amongst the very diverse group of stakeholders is very context dependent (Boons and Lüdeke-Freund 2013).

It is difficult to determine how “*much*” value each stakeholder requires in order to create a balanced proposition. One strategy here is to specify this based on the stakeholder salience (Mitchell, 1997).

Stakeholder salience is the degree to which the stakeholders are important and managers prioritize their desires. Secondly, the goal could be to create synergy and therefore cooperation amongst stakeholders (Tantalo and Priem 2016; Gilles and Christine 2016).

Assessing or predicting whether a solution meets desired goals is difficult. As discussed in section 2.1.4, many standardized options are available for financial metrics (Dimaggio 2001). Yet for environmental metrics, this is much more difficult. Sources of this increased level of difficulty is the ambiguity of environmental impact, together with unstandardized metrics (Liket, Rey-Garcia, and Maas 2014; Ebrahim and Kasturi Rangan 2010; Epstein and Buhovac 2008). In fact, many entrepreneurs leading SOVs do not even measure their actual or intended environmental impact. In the cases that they do, these metrics are often inadequate (Ormiston and Seymour 2011). Factors that may play a role in this are the difficulty level of quantifying this, the

ambiguity of the goals, or actually the emphasis of financial goals over environmental goals.

There are limited tools available to support entrepreneurs in managing the goal duality during the solution development stage. One of these is the *value mapping tool* (Bocken et al. 2013) which helps entrepreneurs in identifying and addressing the needs of the large number of stakeholders. It is used in a workshop format and can be used without the use of trained facilitators. Additionally, a user centered approach to the development stage assists entrepreneurs in the discovery of alternative solutions when expectations do not meet reality. This will be further elaborated upon in section 2.5.6 on *feedback loops*.

2.5.4 Funding and formation of sustainable enterprise

Fourthly, SOVs have to acquire funding and form the venture. This funding can be of their own capital, or from external parties such as investors, angel investors, family, or friends. Financial resources play a role in the emersion of tensions through scarcity (Smith and Lewis

2011). As entrepreneurs have fewer financial resources, tensions become more apparent as they rely stronger on financial objectives to become or remain successful in their objectives.

During this stage, the measurement of financial and environmental impact plays an important role. Dependent on the types of funding, it may be required for the venture to indicate what kind of environmental impact they have. In fact, the consideration of environmental impact by potential investors is often the moment entrepreneurs actually assess the environmental impact (Lingane and Olsen 2004). When they measure this environmental impact, the sole purpose is often to provide validation for an assessment. Even though measuring the environmental impact helps in achieving mission alignment (Nicholls 2006), it is seldom used in the decision-making process (Arvidson and Lyon 2014).

2.5.5 Sustainable market creation/entry

The fifth stage is the sustainable market creation or sustainable market entry. Here, the product or service is

commercialized and put into the marketplace. The value that has been created in the third stage, the double bottom line solution development stage, is put to the test here. As the value proposition is brought to the market, the financial objectives are put to the test. Traditionally, in this stage the focus only lies on the financial value provided. *Does the price-point reach the desired number of sales and revenue? Is the supply chain optimized sufficiently?* Within this thesis, we also focus on the environmental value. *Is the environmental impact realized in this customer segment? Does the supply chain not cause more harm than good?* For example, a tension may emerge if products are sourced from countries far away, it might be more beneficial for the sustainability goals to obtain these from local areas. However, from a financial perspective importing these might be cheaper. Next to that, focusing on growth might deplete resources better used to realize the environmental goal (Austin, Stevenson, and Wei-Skillern 2006).

One risk that SOVs face is the customer-related market risks. As these ventures are often in a niche market or immature market, they often face entry barriers related to unawareness of the environmental problem or

scepticism in regards to the performance of the product or service.

2.5.6 Feedback loops

Even though this stage is not covered in the model by Belz and Binder, developing and marketing a successful value proposition is often an iterative approach. In every stage, new knowledge will be present that might alter previously made decisions. For example during the product development stage. An entrepreneur might find out the needs of their target group are different than expected and either the product or market needs to be altered. This will enable the entrepreneur to revisit the previous moment, yet with a narrower scope as he has more information to base his decisions on (Lee et al. 2004). Testing a value proposition in the market decreases the potential risk, yet not all entrepreneurs choose to do so (Shepherd, Sattari & Patzelt, 2020).

3 Methodology

The previous chapter has set the scene and sketched the context of this thesis. In this chapter, I will explain the methodology of this thesis. I will first explain the role of design science within this thesis and how this is positioned within the intersecting disciplines of Industrial Design and Industrial Engineering & Innovation Sciences. Secondly, I will explain the used methods to collect and analyse the data. Finally, I will explain the participant groups in this study.

To prescribe a solution to managing tensions in SOVs, a design science approach is used in combination with empirical research. This chapter firstly describes the design process that has been used in this thesis for understanding the problem space. Secondly, it describes the approaches used for answering the formulated research questions.

3.1 Design science process

Design science focuses on solving problems; prescribing solutions or exploring possibilities. Research conducted through social sciences generally has a goal aimed to explore, describe, explain, or predict (Dresch, Lacerda,

and Antunes 2014). For design science, emphasis lies on discovering and designing solutions that provide a better result than the existing situation, whereas social sciences and natural sciences tend to focus on the understanding of the problem itself.

At its core, design can be seen as something of the “artificial”; man-made (Simon 1996). Design is concerned with “the activity of changing existing situations into desired ones” (Simon 1996). Within design science, the artefact itself can take a role through which new knowledge is created. In these instances, an artefact is often referred to as a probe or prototype. This way of conducting design research is considered research through design (Zimmerman, Forlizzi, and Evenson 2007), as new knowledge is generated through the design probe.

Within management and organisational sciences, a lack of relevance often causes a mismatch between theory and practice (van Aken 2004). Van Aken (2004) argues that design science could solve this relevance issue. The goal of design science is to provide practical output that is applicable to a specific context. Design will not solely take the role at the end of the design science process in

order to synthesise the findings, but also intermediary in which it will be used as a generative method to facilitate learning.

Within this thesis, the design science cycle by Keskin and Romme (2020) will be used as a foundation for the design activities as seen in figure 3. This cycle is, likewise to many other design processes, to be executed iteratively. The design stages consist of *explore*, *synthesise*, *create*, and *evaluate*. Centrally positioned in this process are *design principles*, which are a continuous work of progress throughout the design process.

The exploration stage focuses on the definition of the problem stage and understanding the opportunity and/or problem. Field review and a literature review are part of this phase in understanding the problem, whereas a literature review could also explore potential solutions. The second stage, synthesis, focuses on creating insights to formulate a future situation. Literature is collected and analysed to synthesise design principles. Thirdly, the creation stage focuses on the development of artifacts, envisioning the desired future situation. This stage consists of typical design activities

such as ideation, conceptualization, visualisation, and prototyping. Finally, evaluation assesses whether the designed solution works as intended. Next to that, its goal is to understand why it works and also likely revising the design principles.

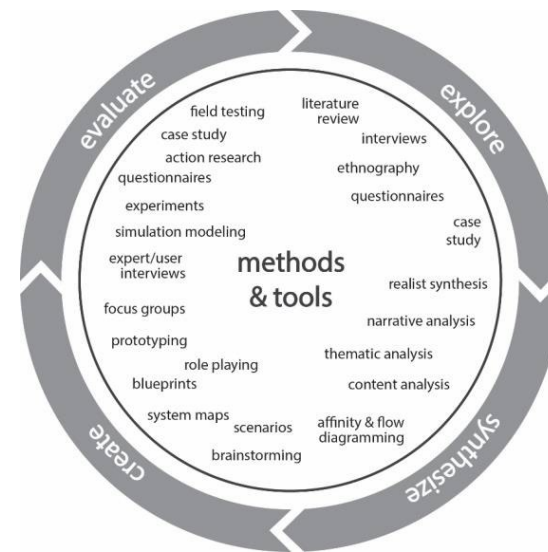


figure 3: Methods and tools in design science cycle, from (Keskin and Romme 2020)

In figure 4, a general representation can be seen of the design activities shaping this thesis. Firstly, an initial literature review (1) was conducted in order to formulate the problem statement (2). After this, interviews were conducted with entrepreneurs leading SOVs (3) to uncover how they transform opportunities into sustainable value propositions. Moreover, a second literature review was conducted in order to understand how tensions can be managed (4). A synthesis of this research in combination with interview findings on the entrepreneurial process resulted in design principles (5) that were used as a guideline for the development of the final design. probes were designed (6) based on these design principles in the form of a set of design cards aimed to assist entrepreneurs in coming up with novel alternatives to managing tensions. These probes were used to elicit responses from entrepreneurs (7) on the management of tensions in their venture. These findings formed the foundation of the initial design(8). This design has been evaluated with entrepreneurs and resulted in the final design (9). Next to that, the focus group aided in the creation of additional design principles to manage tensions.

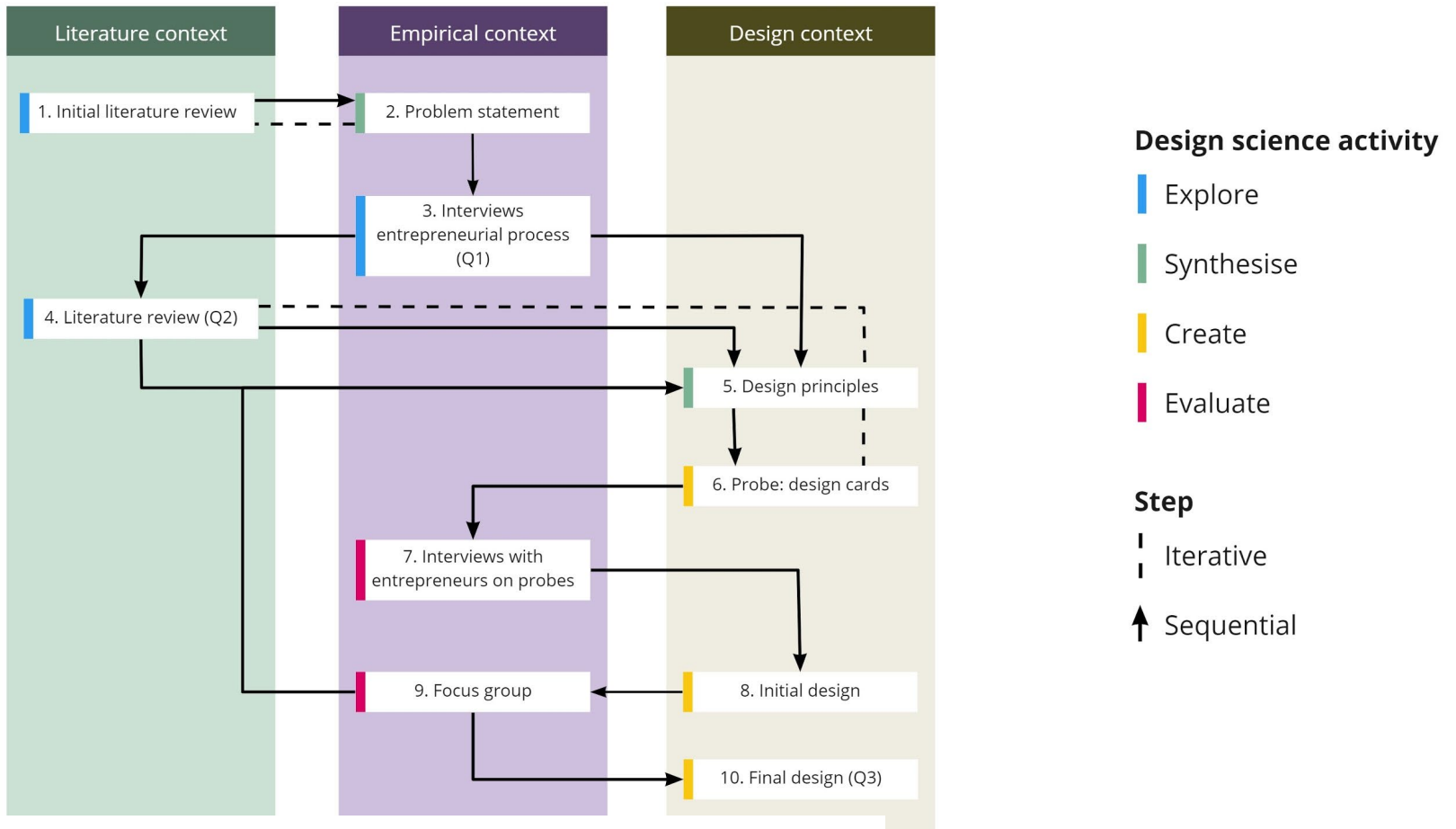


Figure 4: overview of design science process

3.2 Participants

Two participant groups are interviewed in light of this thesis. Entrepreneurs leading SOVs are interviewed to gain insights in the decision making process on the development from opportunities to value propositions. Nascent entrepreneurs will be used to evaluate the final concept. Both of these participant groups are described below.

3.2.1 Entrepreneurs leading sustainability-oriented ventures

The first participant group to discuss is the entrepreneurs leading SOVs. Purposeful sampling has been used in order to recruit participants. The participant is required to be part of a SOV now or in the past in the function of (co-)founder. These participants are expected to know the reasoning behind the positioning of the organisation and know how it has evolved over time. Another criterion of these ventures is that the product or service offering must be live. Finally, a mix of various industries is selected in order to obtain a random sample. An overview of the

represented companies and the description of these companies can be seen in table 1.

Company name	Industry	Offering type	Market entry	Description
Yumii	Baby products	Product service	2020	Yumii offers subscriptions on baby products such as strollers and cradles. They contribute to the environment by reducing the waste of products that children outgrow. These products are returned and refurbished so they can be used by other parents.
E-waste Race	Electronic waste	Service	2012	E-waste Race focuses on the proper recycling of electronic waste. They apply gamification to the recycling of electronic waste. Primary schools can participate and within a geographical area, children at these schools can score points by picking up electronics from households in the area.
BlauwDak	Building materials	Product	2017	BlauwDak (<i>English: Blue Roof</i>) offers a sustainable substrate for plants to grow on rooftops. This substrate is created from waste received from the Dutch water authorities (<i>Dutch: waterschappen</i>). This is a sustainable approach by prolonging the material's life, producing less carbon dioxide than current products, and slowing down the water flow to the sewer after heavy rain.
Healthy Seas Socks	Sustainable Clothing	Product	2014	Healthy Seas Socks produces and sells socks created from plastic fishing nets retrieved from the ocean. They add to the environment by working together with divers who fish up plastic waste and using this as a raw material for the production of new socks.
AquaBattery	Energy	Product	2013	AquaBattery produces sustainable energy storage solutions through large batteries, such as for apartment complexes. The batteries are based on water and salt, pH balances, membranes, or acid/bases. Some of their batteries are already fully circular.

Table 1: Participants of entrepreneurs leading sustainability-oriented ventures.

3.2.2 Nascent entrepreneurs

Nascent entrepreneurs are entrepreneurs who intend to found a venture in the future - a SOV in the case of the participants in this study. These entrepreneurs can not be found through a Google search, so reaching out to acquaintances was necessary to reach these people. This resulted in a convenience sampling method for the selection of these entrepreneurs, with the requirement that they have a clear idea of their future value proposition. The participants can be seen in table 2 (right).

3.3 Data Collection

This research focuses on qualitative data for providing answers to the research questions. These are gathered both through scientific literature, as well through conducting primary research in empirical settings. The most common method used in this research is interviews, which will be further elaborated upon below. Next to that, design probes take a supporting role in some of these interviews in supporting the elicitation of responses. Data will be securely stored on SURFdrive (SURFdrive: n.d.) through the TU/e portal, and will be deleted after the project is completed.

3.3.1 Interviews

Semi-structured Interviews were conducted in order to answer research question 1 (*How do entrepreneurs leading sustainability-oriented ventures transform an opportunity into a sustainable value proposition?*). Considering the exploratory nature of the research question, semi-structured interviews are considered a fitting approach (Saunders, Lewis, and Thornhill 2009). The themes as depicted in chapter 2.1.3 on the entrepreneurial process were used as a foundation for the development of the interview guide. Entrepreneurs leading SOVs were interviewed one-on-one on their development process from opportunity to sustainable value proposition. In total five entrepreneurs were interviewed. The interviews lasted between thirty minutes to one hour. The interviews were structured by first introducing the research set-up and verify whether the consent form was clear. After this, the interview covers the entrepreneur's professional experience, the problem recognition and current value proposition. It addresses what the decision making process was leading up to the current value proposition, and how the value proposition has changed over time.

company name	Industry	Offering type	Description
Interior design consultancy	Interior design	Service	The interviewed entrepreneur aims to found a self-titled interior product design studio focusing on using sustainable and used materials through working together with sustainable suppliers, and making and assembling furniture herself. She aims to contribute to the environment by making circular products and making households more aware of the value in discarded products. The nascent entrepreneur is currently in the sustainable opportunity recognition stage.
Lava Laundry	Cleaning	Service	Lava Laundry aims to make laundry more sustainable by offering a centralized instead of decentralized approach for laundry. This way, washing machines can be used more efficiently in terms of washing loads and energy consumption. The nascent entrepreneur is currently in the opportunity recognition phase in which he is researching whether the demand is sufficient to be able to offer this service.
Coffee Creators	Indoor gardening	Product	Coffee Creators offers a do-it-yourself kit to use previously used coffee grounds as a fertilizer for growing herbs indoors. Through re-using these grounds as a fertilizer, the entrepreneurs aim to create awareness of the food waste in households that can still serve a purpose. The nascent entrepreneurs are currently in the double bottom line solution development stage, in which they are research how such a kit could be developed
Cup of Green	Interior products	Product	Cup of Green offers a sustainable interior product, combining second-hand coffee cups and indoor plants that are intended to be put to waste due to cosmetic defects (Dutch: <i>kneusjes</i>). Through offering this combination, both the cups and plants are given a second life. The nascent entrepreneur is currently in the sustainable market entry stage testing the market viability by offering the products but without the necessity to turn a profit. At the moment, it is more of a side-project with the potential to turn it into a venture in the future.
Beegrateful	Urban bio-diversity	Product	The nascent entrepreneurs aiming to found Beegrateful want to develop urban bee-hotels to stimulate the biodiversity and green image of cities. These bee hotels can be attached to traffic light posts. They will contribute to the environment through the additional pollination of these bees over the commercial honeybees and make the city greener, next to adding to the biodiversity by protecting endangered bees.

Table 2: Participants of the nascent entrepreneur group

Considering the corona pandemic as of writing this, physical proximity to the entrepreneurs was avoided from an ethical and safety perspective - even if it would be relatively safe according to infection rates.

Conducting all interviews through the same medium will yield a more consistent approach and allow the results to be more easily compared. Data acquisition will take place through video-calling platform Microsoft Teams.

The semi-structured interview is conducted with both audio and video streams. Both of these have been recorded and the interviews will be transcribed for analysis. Participants have the option to make their video and/or audio footage unrecognizable if they desire. Furthermore, the audio and video data will be deleted after the project has been completed. The collected data has been analysed through a thematic analysis. Thematic analysis is suitable for this research goal for two main reasons. Firstly, it enabled identification of several key themes and patterns of entrepreneurs in opportunity development. This assisted the synthesis step to develop a design. Secondly, a thematic analysis is very suitable for combining data sources from different transcripts and notes (Saunders, Lewis, and Thornhill 2009). Analysis

will be conducted in a deductive manner, where the labels have been derived from the entrepreneurial process.

3.4 Data analysis

This research combines empirical and theoretical data. Below, it is explained how these findings will be synthesised.

3.4.1 Interviews

A thematic analysis will be conducted to analyse the interviews within this thesis. The foundation of this type of analysis used for qualitative studies is to find patterns, or themes, within a specific data-set. In the case of this thesis, it will be used to analyse the interviews conducted on the entrepreneurial process, and the evaluation of the design. A thematic analysis is a flexible yet systematic approach in analysing qualitative data (Saunders, Lewis, and Thornhill 2009). For this thesis, the steps proposed by Kolko (2010) on insight combination will be used as a foundation to analyse the qualitative data. The interviews will be transcribed and meaningful snippets of the transcripts, utterances, will be placed on (virtual) post-it notes.

These utterances will be grouped based on similarity to each other. This group of similarities together form a code. Groups of codes together form the theme of which they describe the actions or beliefs.

For answering research question 1 (*How do entrepreneurs leading sustainability-oriented ventures transform an opportunity into a sustainable value proposition?*), the themes are derived from the literature based on the entrepreneurial process as depicted by Belz and Binder (2017). These are *sustainable problem recognition, sustainable opportunity recognition, double bottom line solution development, funding and formation of sustainable enterprise, and sustainable market creation*. Additional themes may emerge if groupings of similar utterances do not fit to any of the aforementioned themes.

3.4.2 Design principles

Design principles will be used as a method to synthesise literature review findings and translate these to

actionable principles. These principles will serve as guidelines to generate new knowledge. A design principle describes the context (C) in which a design principle suggests a type of intervention (I). Through a certain mechanism (M) an intended outcome (O) is achieved.

When designing an artefact, either digital or physical, it is important to realize the context in which it will be used. It is in human nature to take a mechanistic view. A mechanistic view entails the notion where the outcomes of complex systems are determined by the components of which they exist. This can be seen most clearly in engineering or in healthcare. In engineering for example, the maximum load of a bridge should be larger than the exerted load by people or vehicles moving across the bridge. This mechanistic view can also be seen as Input Output Logic. Denyer et al., (2008) introduce CIMO-logic that increases the relevance of a design and thereby also its chances of successful adoption.

The CIMO logic results in design principles. These are guidelines that shape the boundaries of a design. These propositions are synthesised by using an existing

literature base, preferably a systematic literature review. Empirical work from individuals can be admitted, but these tend to focus only a single perspective causing potentially conflicting findings. These CIMO logics provide a research for design approach (Frankel and Racine 2010). Here, research is used to enrich the design context and provide guidelines for the solution space; it is closely related to practice.

The CIMO logic is constructed as follows:

“In this class of problematic Contexts, use this intervention type I to invoke these generative mechanisms, to deliver these outcomes.”

(Denyer, Tranfield, and van Aken 2008, 395)

An example of a design principle would be the following, in the field of project management:

“If you have a project assignment for a geographically distributed team (class of contexts), use a face-to-face kick-off meeting (intervention type) to create an effective team (intended outcome) through the creation of collective task insight and commitment (generative

mechanisms).”

(Denyer, Tranfield, and van Aken 2008, 396)

Prescriptive studies on paradox research lend itself well to the application of CIMO logic. Paradoxical tensions within organisations are highly contextualized, making it very difficult to distil knowledge on a case-by-case basis. Taking a systematic approach in the research synthesis on how these tensions are managed will help in designing an artefact that will fit the context and in turn increase the likelihood of adoption

These design principles will contain the literature review, conversations with entrepreneurs leading SOVs and publicly available information. In contrast to the other parts of this thesis, it is not limited to SOVs or environmental goals. Larger organisations (e.g. large energy companies) as well as other organisations with a societal focus (e.g. hospitals) are also included as they experience tensions too. Even though they do not align perfectly with the user group of the final design of this thesis, their actions might still be valuable as input for the design process.

3.5 Literature review

Successful tension management is vital to the viability of ventures, both in their financial viability as well as the realisation of their environmental goals. No study has currently collected the various examples of managing tensions to one study. Although several strategies are researched such as resolving or accepting tensions (Hahn et al. 2015), concrete design principles on tension management of value propositions is missing. It is important to understand how tensions have been managed in organisations and ventures in order to guide entrepreneurs in their tension management. For this study, both corporates and start-up ventures are used to obtain knowledge from. Combining these different methods of managing tensions will enable the synthesis of design principles to guide tension management in the future, as well as understanding the context amongst which tensions are managed successfully. Even though it is an impossible task to understand all contextual cues and managerial approaches to managing tensions emerging from value propositions, this study will serve to create an understanding and provide design principles that can guide entrepreneurs in managing these tensions.

To learn on how tensions have been managed, the focus lies on empirical studies such as case studies, interviews, focus groups, or other observed behaviours of managers or entrepreneurs as they manage tensions. Both successful as well as unsuccessful management interventions will be included in this review. Furthermore, only studies in English and Dutch will be considered.

Studies were identified through searching online database SCOPUS. The reference lists of articles meeting the inclusion criteria were scanned to find additional appropriate studies. A time-frame of the last fifteen years is used (2006 - 2021).

The search terms were iteratively modified, removed and added as more and less appropriate search terms became known. The search query does not limit itself to performance tensions, as not every article concerning tensions uses the same denotation for the types of tensions. The final search query that was decided upon is the following:

*(TITLE-ABS-KEY("green entrepreneurship" OR
ecopreneurship OR "hybrid ventures" OR*

***"hybrid organisations" OR "hybrid
organizations" OR "social corporate
responsibility" OR csr)***

AND

***TITLE-ABS-KEY(paradox OR tension OR "dual
goals" OR "dual goal management"))***

Papers were screened by reading the title and abstract first. The goal was to understand whether the article demonstrates the management of tensions on an operational level, rather than focusing on the high level circumstances of the situation such as strategies. There is a risk of publication bias in favour of successful management of tensions. The goal is to also identify unsuccessful cases of tension management.

The identified appropriate studies are then read thoroughly and synthesis through the use of CIMO design principles (Denyer, Tranfield, and van Aken 2008). The overview of this process can be seen in figure 5, depicted according to the PRISMA statement (Moher et al., 2009).

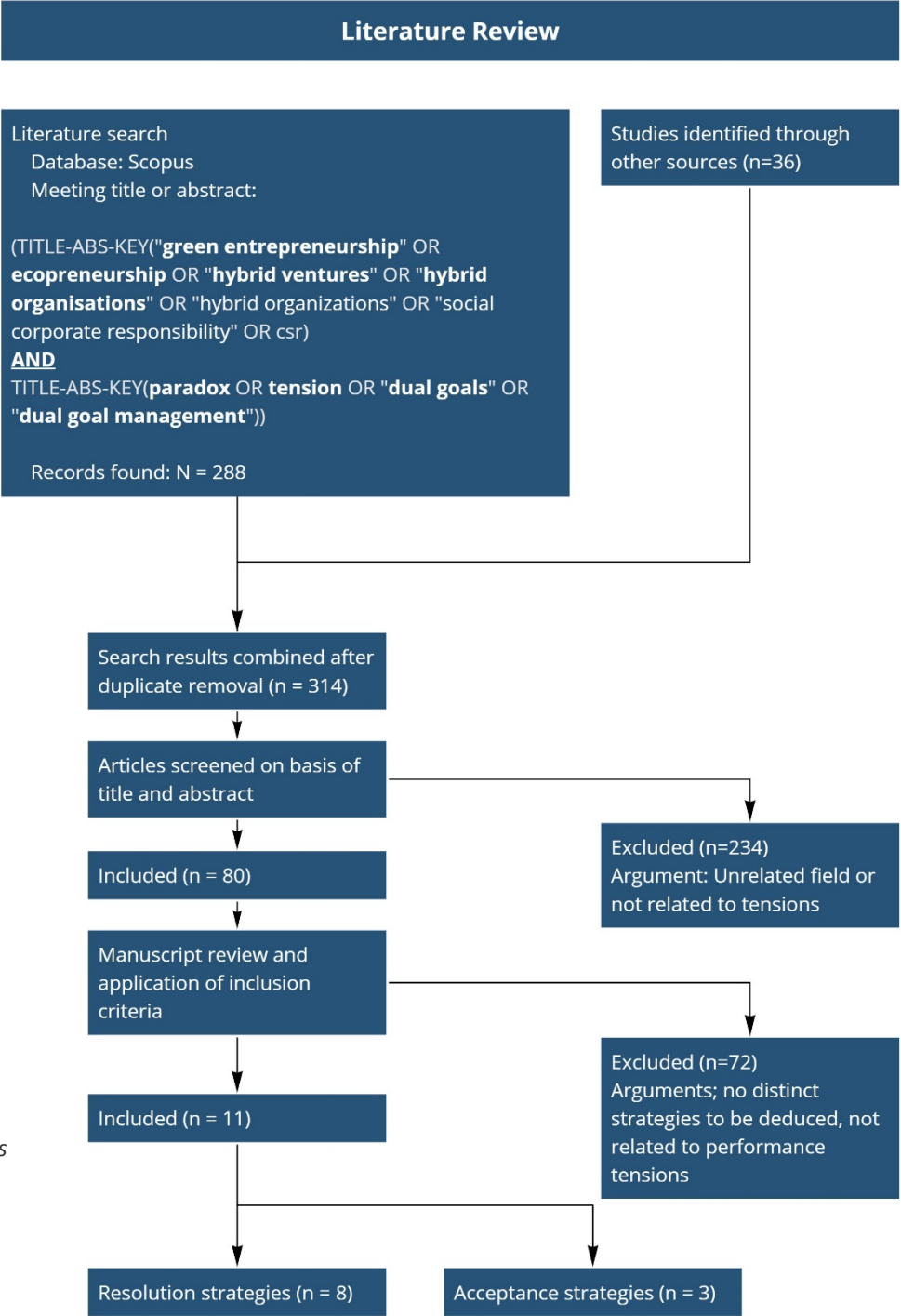


Figure 5: Literature review process

4 Results

This chapter will discuss the empirical findings on the sustainable entrepreneurship process from the development of opportunities to sustainable value propositions, and how this relates to the literature. Furthermore, this chapter will present a synthesis of the design principles based on theoretical and empirical findings.

4.1 Sustainable entrepreneurship process

The decision making process on the development from opportunities to value propositions has been researched on the basis of interviews with entrepreneurs leading SOVs as depicted in section 3.4.1. The interview questions can be found in appendix A. The stages have been derived through a deductive approach, and added if deemed necessary based on the empirical findings. The main findings can be seen in table 3. In the upcoming sections, each stage will be elaborated upon.

4.1.1 Sustainable problem recognition

First hand experience

(Belz and Binder 2017) suggest that the recognition of sustainable problems is often based on first hand experience. This entails that, according to literature, recognized problems are often in line with the existing knowledge or experience of the entrepreneur. This is partly in contrast to the entrepreneurs interviewed in light of this research. Healthy Seas Socks was founded as a spin-off of the commercial organisation Star Sock. The founder aimed to do “*something*” about the environment, but was unsure what. He did know he wanted to do something with socks, as that is where his expertise lies. The founder of AquaBattery founded the company as an extension of his master degree.

Stage	Main findings
Sustainable problem recognition	Problem domain locked early in process Often no first-hand experience
Sustainable opportunity recognition	Narrows scope of domain. Stage focuses on creating a profit from the problem and further narrows it down. Opportunities in line with market imperfections
Double bottom line solution development	Stakeholder engagement further limits entrepreneurs in pivoting flexibility. Environmental impact is expected to be positive, whereas financial impact is used to guide decisions. Alignment of needs of customer group
Funding and formation of sustainable enterprise	Funding further limits flexibility based on stakeholder ties.
Sustainable market creation/entry	Lean approach to entering the market. Lean approach assists in customer related market entry barriers All entrepreneurs focused on entering a niche instead of a crowded market.
Feedback Loops	Not based on the labels from research, but present in every entrepreneur's venture who participated. Tensions emerge as environmental and financial goals are tested. When pivoting, the problem often remains the same whereas the opportunity is changed. Either through a different product or through a different market.

Table 3: Outcome of thematic analysis on sustainable entrepreneurial process

“I graduated from my master’s degree in energy and environmental sciences at the Rijksuniversiteit Groningen.” [...] “During the master I enlisted for a program called the Energy Battle in which students were selected by several big companies to look for solutions experienced by these companies. I signed up for a challenge by Fujifilm who was looking for new application areas for their water membrane technology.” - Founder of AquaBattery

The other entrepreneurs, however, have little first hand experience in recognizing the problem area. The founders of Yumii primarily focused on waste caused, but none of them have any experience of a parent. The founders of BlauwDak and E-waste Races share a similar story. They were both aware of environmental problems, but had no first hand experience in the domain they ended up in. Both ventures started off as a submission for a contest - similarly to AquaBattery. First-hand experience with the problem at hand might relate to the control and knowledge entrepreneurs have to creating a solution for the problem. From this perspective, it can be considered that more knowledge of a problem would result in less tensions as the value

proposition can be better accommodated to fit the case. However, that can not be identified in these findings.

Lock-in

Not mentioned in the model by Belz and Binder is the approach to seemingly “lock-in” of the environmental problem: as entrepreneurs pivoted their value proposition, the intended environmental goal would remain the same. This could be caused by the authors taking a convergent approach, rather than an iterative approach. As entrepreneurs pivot their value proposition, they choose a different market and/or different product or way to provide value. It is consistent that the participants do not change the sustainable problem area as they pivot their value proposition. There appears to be no exploration or evaluation of different problem spaces, though many alternative approaches to solving a problem are available.

AquaBattery, BlauwDak and E-waste Race started as a solution for a competition to solve a specific environmental problem. Yet after these competitions had ended they had the liberty to pivot to different problem areas. They did not choose to do so, indicating

the restrictions of the competition did not limit their inclination to pivot. Assets also did not play a role in this decision, as they had little money invested by this time. Instead they focused on making the value proposition work within the defined problem area. Yumii did pivot their value proposition, but they switched to a different service within the same market and aiming to solve the same environmental problem.

4.1.2 Sustainable opportunity recognition

Opportunity evaluation

Comparing and analysing opportunities against each other occurs qualitatively - if at all. The financial and environmental impact of the product are both based on the gut feeling of the entrepreneur. When evaluating opportunities, the financial benefits always outweigh the environmental ones on the condition that the environmental benefits are not negative. AquaBattery and E-waste Races share their origin through a competition and both did not evaluate alternatives. These opportunities worked out for them at the beginning and they stuck with them. In this stage, the entrepreneurs do not accurately calculate or measure

the expected impact and as a result compare the different opportunities at face value. The founder of Healthy Seas Socks saw an opportunity to work together with one of his customers, a diver, and develop socks using salvaged fishing nets from the ocean. He did not seriously consider other alternatives. This finding is in line with literature (Haynie, Shepherd, and McMullen 2009) stating this founder experienced a higher level of control over the outcome of the opportunity as he was in touch with a stakeholder that could provide him with materials. The founder of Yumii stated that the team was primarily looking for a financial opportunity to realize a value proposition leveraging off the problem. The founder of BlauwDak had a different set-up: they were given a waste stream from one of the water authorities to transform into a product. Here, they focused on maximizing the amount of waste they use as it will likely correlate to the sales or volume and therefore revenue:

“This [roof substrates] is a market in which you can start quickly on a roof as it’s a closed environment. Eventually it was comparing the pros and cons. And, as I was saying, it’s primarily the impact you realise with the material. When there is x million kilograms available and

*you make a lamp out of it, you make a small impact.
And for us, it was about the impact and the scalability of
the idea. And that is what this is, to be honest.” –
Founder of BlauwDak*

Market imperfections

The entrepreneurial process model states that opportunity recognition tends to focus on fixing market imperfections. These findings are mostly in line with that claim. Four of the participants, Yumii, E-waste Races, Healthy Sea Socks, and BlauwDak focus on used materials as the foundation of their venture. Waste products can be considered as a flaw in the market. In the case of E-waste Races and Healthy Seas Socks, one could argue that the disposal of these products should be the responsibility of the manufacturer and their venture is therefore an effort to fix this imperfection. In the case of Yumii it can be seen more as a business opportunity. It is not up to the manufacturer of a stroller to take it back as babies outgrow them - although it might be a viable business model for the manufacturers instead of a third party. For AquaBattery, it is more complex to consider energy storage a market imperfection as energy is an intangible product.

4.1.3 Double bottom line solution development

Meeting customer needs

According to the entrepreneurial process, entrepreneurs tend to focus on developing a solution that aligns with the customer needs of the target group. That is in line with the findings of this study as the entrepreneurs focused on turning the opportunity into a profit. In the case of AquaBattery, the technology is leading in terms of the product offering. There is a demand for energy storage, yet they have little opportunities to tweak their offering. Healthy Seas Socks sells sustainably produced socks to environmentally-aware shoppers. In the case of E-waste Races the focus on meeting customer needs still holds true - albeit a bit more difficult as their paying customers are not the main beneficiaries. The paying customer is the municipality that wants to focus on electronic waste recycling in their city, partly due to PR reasons. The beneficiaries are the primary schools as the E-waste Races team facilitates classes once a week for eight weeks, and concludes that with a “race”. During this race, the students at these schools compete against other schools in the region by recycling

electronic waste and score points. In the case of Yumii, they have found out during this stage that the customers did not like the original value proposition. This value proposition revolved on a subscription to baby clothing. As babies outgrow the clothing, parents could return these and receive new clothing that fit the baby. Through interviews with customers, they have identified that they do not like the idea of second hand baby clothing as it gets dirty often. Taking this into account, the entrepreneurs set out to focus on baby products such as strollers and cradles instead. Through this pivot, they still address the same environmental problem and market, yet through a different offering.

“We have conducted about 45 to 50 interviews with parents to understand what they think of it [baby clothing subscription]. The conclusion is basically: “You also do not buy second-hand underwear.” And baby clothing for babies of this age feels like underwear considering it is so intimate.” - Founder of Yumii

Stakeholder involvement

During the double bottom line solution development stage, the entrepreneurs work on operationalising their value proposition. Stakeholders play a big role in the

solution that the entrepreneurs develop. The founder of Healthy Seas Socks wanted to produce sustainable socks, but was unaware how to do this. His approach was to keep talking to his customers in order to identify an opportunity. As he came in touch with a diver who scavenges fishing nets from the ocean, he used this stakeholder as a leading force in the development of his product. In the case of BlauwDak there is a strong dependency on the stakeholder of the water agencies as they provide the waste material they were required to use in light of the competition that started the venture. AquaBattery, E-Waste Races and Yumii have a relatively small dependency on the stakeholders. AquaBattery and Yumii both rely on suppliers, but these are replaceable. Yumii does rely on more suppliers to realise their offering: dry-cleaners and refurbishers of baby products for example. These are harder to replace as they rely on building a relationship with these to obtain a competitive advantage. This makes it harder to pivot their value proposition, similarly to BlauwDak. If tensions arise from the value proposition, they are at a disadvantage.

4.1.4 Funding and formation of sustainable enterprise

Funding

All entrepreneurs used a lean approach in the scaling of their venture and often required no external funding from investors. Only BlauwDak received external funding. As a requirement for this, they had to quantify the environmental impact of their product offering and compare it to the existing alternative to determine their environmental benefit. This funding also further limited their ability to pivot the value proposition. As part of the requirements for obtaining the funding, they had to stick to the application area of substrates for roofs. Once they realised they were unable to realise this competitively, they were unable to pivot their value proposition and were forced to sell the company.

“Everything was going to take so long due to Corona, but also because one type of funding wasn’t in our favour from the Stoa. This made it all take longer before we eventually got a return on our investment [...] After a while you have to make the trade-off on how long will I work on this and how much do I get from this? [...] Eventually, I didn’t know if I was even able to get a

paycheck from this. Then it will take so long before you get a return. Especially as small as we are. Then it’s better for a bigger company to take it over.” – Founder of BlauwDak

4.1.5 Sustainable market creation/entry

Customer-related entry barriers

According to the model of Belz and Binder, SOVs typically experience customer-related entry barriers. The findings of this study contradicts that. BlauwDak did experience market entry barriers, but these were mostly regulatory of nature in regards to waste labels and proving the product is sufficiently clean. Only Yumii, one of the five interviewed ventures, experienced customer-related entry barriers. As mentioned in section 4.1.3 on solution development, Yumii originally aimed to provide a subscription to baby clothing. Yet the target market did not like this idea as they were skeptical on the cleanliness of the returned items.

High-end market

In contrast with the literature, the findings do not

indicate a market offering in the higher-end of the market. Positioning the product in the higher market segment might decrease the size of the target group and in turn decrease the potential revenue. Whether this is the case is difficult to assess for AquaBattery and E-Waste Races, as they have positioned themselves in a new market with little competition. Yumii positions themselves in the higher end of the market through the subscription offering. Most of the products cost about twenty to thirty euros per month. In general, it takes about eight to ten months to break even on the subscription in comparison to buying the product. This does not take into account the resale value of the product in case of a purchase. The socks offered by Healthy Seas Socks are about ten euros per pair - also higher than your average pair of socks.

4.1.6 Feedback loops

Testing

This phase is not included in the model by Belz and Binder. The development of products goes hand-in-hand with testing in the market as it's a very iterative process. As the entrepreneurs test the value proposition in the market in this stage, tensions become apparent.

Entrepreneurs face the reality of a target market who might not be interested in their product and therefore might not reach the financial goals. Some entrepreneurs pivot more than others to solve this, yet all pivots remained within the originally set problem area. Only the opportunity or value proposition to solve that has changed. Furthermore, the environmental impact takes a less important role here as the focus on running a financially viable business increases. Even though all value propositions revolved around an environmental purpose, the magnitude of this purpose was minimized.

4.2 Design principles

Several design principles have been distilled from literature and empirical findings. Looking back at the framework by Hahn et al., (2015) on managing tensions, there are two main outcomes to target the design principles at. The first group of design principles is the management through resolution strategies and bringing the polarities of the tensions together. Secondly, acceptance strategies are discussed in which the course of action is basically to not act upon the tensions. In this section, design principles related to these two strategies

will be derived based on analysing existing cases and literature using design principles in the CIMO format:

“In this class of problematic Contexts, use this intervention type I to invoke these generative mechanisms, to deliver these outcomes.”

(Denyer, Tranfield, and van Aken 2008, 395)

4.2.1 Tension resolution

The design principles below are related to resolving tensions. The design principles here focus on ways in which resources can be obtained through alternative methods. For example, pivoting the value proposition to a different market or to a different way of creating value can enable entrepreneurs to resolve tensions (Keskin et al., 2013) as additional resources become available. The seven design principles below, gathered from existing companies and literature, show possibilities in pivoting the value proposition.

Substitution

BambooBaby (“BambooBaby Homepage” n.d.) is a Dutch SOV focused on selling and leasing reusable diapers. Because the market is still in its infancy and

parents tend to continue the usage of disposable diapers, BambooBaby would not be able to realize a large scale. However, the design of the diapers does enable a substitution of the disposable diaper. Through the sale or lease, parents are tempted to stop using disposable diapers from a cost perspective. As BambooBaby facilitates this change through the way the product is offered to the market, they are able to realize their environmental goal of reducing waste caused by disposable diapers. Offering a sustainable product that not only serves as an alternative but also as a substitution, is able to resolve these tensions by bringing the polarities causing this tension together. In this case, their environmental impact is in line with their sales and therefore their financial goals.

Design principle 1:

[C] When facing tensions arising from limited environmental impact, [I] entrepreneurs should position the product to substitute the current alternative [M] to pivot the value proposition [O] leading to tension resolution.

Different application area

Sustainable Dance Club (Keskin et al., 2013) is a SOV that originally set out to make the clubbing scene more sustainable through a tiled floor that generates electricity as people dance on it. Through experimentation, their product turned out to be too weak to generate this type of power. In turn, they experienced tensions as they were unable to realize their environmental goal. As the tiles were able to generate electricity, different markets could be explored in which this could be of use. Experimentation led to the implementation of the tiles in a different market with a different added value. Instead of fully powering dance clubs, they have pivoted to gamifying energy and they have created a playground in which children can gain awareness of energy generation through the developed floor tiles. Offering the product in a different application area is able to generate a different environmental impact and may therefore be realised.

Design principle 2:

[C] When facing tensions arising from limited environmental impact, [I] entrepreneurs should market the product in a different application area [M] to pivot the value proposition [O] leading to tension resolution.

Niche market

Crowded markets are a great barrier to enter, especially for start-ups. As the market becomes more crowded, it becomes more difficult to provide value to this market. One solution for this is to identify and enter a niche market. The electric vehicle market becomes more dominated by Tesla and incumbents switching to electric vehicles. Lightyear (“Lightyear One — Long Range Solar Powered Car” n.d.) has developed an electric powered car that is able to charge through solar panels. This allows for a longer range because it is able to simultaneously charge and drive. In turn, it provides value by a longer driving range of the electric vehicle market where batteries used to be the existing bottleneck. Offering the product in a less crowded market gives entrepreneurs the opportunity to better realize their financial goals.

Design principle 3:

[C] When facing tensions arising from reaching financial goals due to heavy competition in an existing market, [I] entrepreneurs should market the product in a niche

market [M] to pivot the value proposition [O] leading to tension resolution.

Target market with different values

Yumii, as discussed, is a SOV that focuses on reducing the environmental impact of baby products. Initially, they aimed their venture at developing a leasing model for baby clothing. As babies outgrow their clothing rather quickly, the clothing still has plenty of life in it prior to when it is put out of use. Yet parents of babies did not feel comfortable in using second-hand clothing for their babies. This resulted in a tension of their value proposition where their environmental goal would be realized, but they have no paying customer. The entrepreneurs leading this venture still saw an opportunity in this market that outgrows products quickly. Instead of focusing on the clothing the babies wear, the company pivoted their offering to focus on re-using baby products, such as strollers and cradles. These products feel less personal and the customers are more inclined to adopt the service in which children can grow along with these baby products. Pivoting the product offering to address a different customer need enables

the entrepreneurs to resolve the tension and meet the customer needs.

Design principle 4:

[C] When facing tensions arising from difficulty in reaching financial goals due to insufficiently meeting customer needs, [I] entrepreneurs should change the offering to the same market addressing different customer needs [M] to pivot the value proposition [O] leading to tension resolution.

Minimize financial requirements

An anonymous venture (Yin, Lai, and Zhou, n.d.) offers dance classes to elderly. They want to enable as many elderly as possible to attend these classes. As a result the managers minimize the costs of these classes. Tensions emerged as they were unable to host their dance classes due to the inability to pay for the instructor to teach the classes. They have been able to resolve their tensions by changing the product they offer through decreasing the demand on the financial goal. Instead of hiring teachers to teach the classes, they have switched their offering to rely on volunteers to teach these classes. The needs of the elderly lie in the social activity, and not in the quality of the dancing

teacher. Through switching from hiring teachers to working with volunteers, this venture has been able to resolve the tension and rely less on revenue to realize their offer.

Design principle 5:

[C] When facing tensions arising from insufficiently meeting financial goals due to high costs, [I] entrepreneurs should focus on cost reduction of the offering whilst retaining the primary value [M] to pivot the value proposition [O] leading to tension resolution.

Split tension

Entrepreneurs leading social ventures might face difficulties in securing revenue whilst realizing their social goals (Park 2020). This is less prevalent in SOVs, but can still occur. One solution in the article by Park (2020) on resolving this type of tension is demonstrated by venture *Alpha* that focuses on people who are unable to become self-reliant due to social or economic constraints. The venture has resolved this type of performance tension by applying the separation strategy (Hahn et al. 2015). The venture has been able

to resolve the tension by splitting the beneficiaries and paying customers over two spatially separated domains.

“I started a new business to provide beneficiaries with more comprehensive help for their self-support [...] I thought out this new business to resolve the tensions between the different outcomes of our social mission and business, and to pursue both goals.” (Park 2020, 12).

In the company *Beta*, described by Battilana, Sengul, Pache, and Model (2015), spatial separation of the tension also resulted in a successful resolution. This social venture focuses on waste recycling by providing work to people with poor job prospects. They experienced tensions in the social and financial performance of their venture. In order to solve this, they appointed two managers, one to each of these domains, and focused on good lines of communication between these managers. The financial and social performance of this venture was compared to a similar venture with a different strategy, whose performance was inferior.

Design principle 6:

[C] When facing performance tensions arising from a

target group unable to pay, [I] entrepreneurs should spatially separate the beneficiaries and customers [M] to separate the tension [O] leading to tension resolution.

Resource transfer

Teasdale (2012) has analyzed the cases of six social ventures, who all have a social mission to provide jobs to homeless people, in balancing financial and social goals. These ventures either experienced a lack of resources which made it difficult to achieve their financial goal, or experienced difficulties in their social goals due to for example a lower productivity of former homeless people as opposed to average workers. Based on the actions of the entrepreneurs, the author proposes the term resource transfer to shift resources to either increase commercial viability, or social viability. For example, a venture that we will call Gamma experienced tensions as customers favoured a product made in low-wage countries over their offering, that was made by homeless people. In order to overcome the price gap, the entrepreneur emphasized the social value of their product offering and therefore drew more resources from their customer base in the form of payments. On the other side of the spectrum, a different venture experienced tensions as their social

value was difficult to realize. This venture, which we will call Delta, has transferred the resources from their own resources (offering jobs to homeless people) to the government. By offering training to the homeless people instead of jobs, they were able to obtain resources from the government to provide these and in turn were able to resolve the tensions.

Design principle 7:

[C] When facing performance tensions causing an inability to reach financial or environmental goals, [I] entrepreneurs should obtain the required resources elsewhere [M] to transfer resources [O] leading to tension resolution.

4.2.2 Tension Acceptance

Accepting tensions can be seen as an act of doing nothing about the conflicting demands, whilst still acknowledging these. Through acceptance strategies, organisations learn to live with these tensions. The two design principles below, gathered from literature, show possibilities in accepting paradoxical tensions.

Sensemaking

Sensemaking is the iterative process in which an

interpretation is given to meaning and action. It does occur without the call for an intervention, but this may end up with a feeling of confusion or conflict for the user. Strategic sensemaking is used within this design principle to show how the company Cambridge Energy Alliance (CEA) (Jay 2013) has accepted organisational tensions arising from divergent demands. CEA's environmental mission is to decrease the energy consumption of the city by installing energy-efficient measures to buildings. Their financial revenue comes from the installation of these measures, whereas they offer the energy auditing service for free. Through iterative cycles of sensemaking, the managers within CEA retrospectively realised the impact of their identity on their financial performance. In the initial stage, CEA's revenue depended on the installation of energy efficient measures where they included free audit services. Customers went to CEA for a free audit and put the project out for bid afterwards, resulting in no revenue to CEA. Through sensemaking, managers gave meaning to their organisational identity and reiterated how they are able to obtain revenue from these services. In the case of CEA, they have understood the conflicting polarities caused by the source of their financial model.

Retrospectively discussing the polarities of the tensions through sensemaking will therefore enable entrepreneurs to understand tensions and in turn be able to accept these. As researched by Reynolds and Holt (2021), sensemaking is more widely used to understand and accept tensions. Through making sense of the role of entrepreneurs and the entrepreneurial venture, entrepreneurs can understand the tension better and also move forward to other resolution strategies.

Design principle 8:

[C] When facing tensions arising from insufficiently meeting financial goals due to missing revenue, [I] managers should retrospectively discuss the polarities of the tension [M] to start a dialogue with the team [O] and accept it.

Paradoxical thinking

Conflicting demands arising from divergent goals, such as nonprofit/for-profit demands or social/financial, typically elicit an “either/or” approach by people facing these (Smith and Lewis 2011). Paradoxical thinking focuses on taking a different approach and instead takes a paradoxical perspective thinking “both/and”. Depicted

in the article by Smith et al., (2012), it is used in a classroom setting to teach students on accepting conflicting demands. Paradoxical thinking revolves on the dialogue of understanding a duality in two goals. In this article, students discuss the conflicting goals of Jews and Arabs in settling in the middle east. Through the narration of understanding both sides of the conflict, students are able to embrace the competing claims and take a “both/and” perspective. Furthermore, the article covers paradoxical thinking through the development and articulation of an overarching vision to connect employees. This teaches managers and employees conflicting demands of the organisation as change occurs, such as growth. During growth, long-term goals might be prioritized over short-term goals to meet with the organisational vision, whereas the project goals itself might not be met. Prospectively discussing polarities of the tension enables managers to start a dialogue with the team. This enables an understanding of the different perspectives and therefore the possibility to accept the tensions.

Design principle 9:

[C] When facing tensions arising from divergent perspectives , [I] managers should use paradoxical

thinking to prospectively discuss the polarities of the tension [M] to start a dialogue with the team and [O] accept it.

Serious play

Serious play is considered a playful way to promote complex problem solving. Through engaging in a game, players develop a kind of desire and emotion in relationship to the course of the game and the outcome. This mechanic can be useful to simulate paradoxical tensions within organisations. Within the case of the NHS (Beech et al. 2004), a paradox emerged between a centralized and decentralized approach to managing cancer care in hospitals. The centralized approach came from the hospital employees, whereas the decentralized approach came from higher management. Serious play in this design principle relies on four concepts: expressing emotions, experimenting with boundaries, challenging rules, and exploiting ambiguity. Through expressing emotions, a resistance for change can be created. Through the experimentation of boundaries, people take the perspective of other actors (e.g. doctors and managers switch perspectives), resulting in actions that were unfitting to that role. Challenging the rules resulted in

friction and instability, unable to find a new equilibrium. Finally, ambiguity was exploited with the result of management being perceived good and bad. This type of serious play in general created a resistance to change and, in turn, lets participants accept the paradox and do nothing to solve it. Serious play can be used to facilitate perspective taking when dealing with tensions in different approaches to reach goals. As a consequence, employees are able to understand the tension and accept it.

Design principle 10:

[C] When facing tensions arising from different approaches to reach goals, [I] managers should use serious play [M] to enable employees to take different perspectives and [O] accept it.

5 - Design intervention

This chapter describes the development of the first design probe, as well as the development of the final concept. It will describe which insights led to the development of these probes, elaborate upon the specifics of the designs, as well as the evaluation and findings.

5.1 Design probes: Card set

Since this thesis took an iterative approach, the results on the entrepreneurial process were not known at the time of the development of this set of cards. This card set is based on the design principles.

5.1.1 Problem space

Based on the results from the design principles, described in section 4.2, various opportunities are available to entrepreneurs in order to manage tensions arising from value propositions. There appears to be no pattern when certain strategies are advised over others. However, it is common practice to pivot the value proposition if either the financial or environmental objective can not be realized.

The first step in managing tensions is to acknowledge these tensions (Hahn et al. 2015). The companies depicted in the design principles on tension acceptance (section 4.2.1) are rather large organisations, making the environment complex. For start-ups, this field is less complex due to a smaller number of stakeholders that the team is involved with. This might makes understanding the tension easier than depicted in these design principles. In fact, the entrepreneurs might even be aware of the tensions themselves. One of the tools that can be used in understanding the stakeholder field is value mapping (Bocken et al. 2013). Bocken states that creativity is a difficulty that entrepreneurs encounter when using this tool. The entrepreneurs lack the capabilities to develop a creative solution to the problems that arise.

5.1.1.1 Managing dual goals

It appears that entrepreneurs leading SOVs are aware of the dangers of performance tensions and aim to synthesise the goal duality early on in their venture. For example, the founder of E-Waste Race aims to decrease environmental pollution as a result of improper electronic waste disposal. They obtain revenue from being hired by municipalities to provide guest lectures

at primary schools and organize competitions for the children at these schools to recycle electronic waste. Here, they align the environmental objective as a direct result of the offering of their service. On the contrary, AquaBattery produces and sells various environmentally friendly batteries based on water or acid, amongst other technologies. They are aware of the environmental impact when sourcing their materials from China instead of a country closer to them, but are currently unable to source locally due to money constraints.

There are tools available to support entrepreneurs in understanding the origins of the tension, as well as developing new value propositions with the duality of goals at the centre through a resolution strategy. In the case of AquaBattery, the latter could for example be used to explore alternative products relying less on technology from distant countries.

5.1.1.2 Design cards

Design cards are a deck of cards designed to assist the player in reaching a certain goal that is often related to a stage in the design process. A set of design cards could help in overcoming the barrier of creativity experienced by entrepreneurs. Goals of design card can vary from

the design and evaluation phase (Lucero & Arrasvuori, 2013, 2010), to earlier stages where no particular solutions are selected (Halskov & Dalsgård, 2006), to a research stage for interpreting observations (Buur & Soendergaard, 2000).

There are several characteristics why design cards work. According to Lucero et al., this is the case because of (1) the role of tangible idea containers, (2) cards trigger combinational creativity, and (3) cards enable collaboration (Lucero et al. 2016).

Tangible Idea Containers

Design cards can serve as physical anchors in a conversation. Especially during a creative conversation, the aid of a tangible marker helps in creating a common ground between players.

Trigger combinational creativity

Combinational creativity occurs when two concepts from different domains are brought together. This juxtaposition causes creativity in which a new perspective can shed light on a problem.

Enabling collaboration

Collaboration is enabled through the common ground a

card serves in a discussion. It tends to take the attention away from other participants in a card game, and shifts it towards the card. This is especially helpful for people unacquainted with design thinking.

One example of design cards are PLEX cards (figure 6) (Lucero and Arrasvuori 2010). These have been designed to support the design process in adapting products to enable more playful experiences. A second example would be PERSWEDO cards (figure 7) (Ren et al. 2017) which are developed to design for behavioural change. Both of these sets of cards have been evaluated on their ability on idea generation and both yielded positive results. Another advantage of design cards is the ability to use these without a creative background. However, these were all tested in workshop environments and validated with the use of a facilitator.

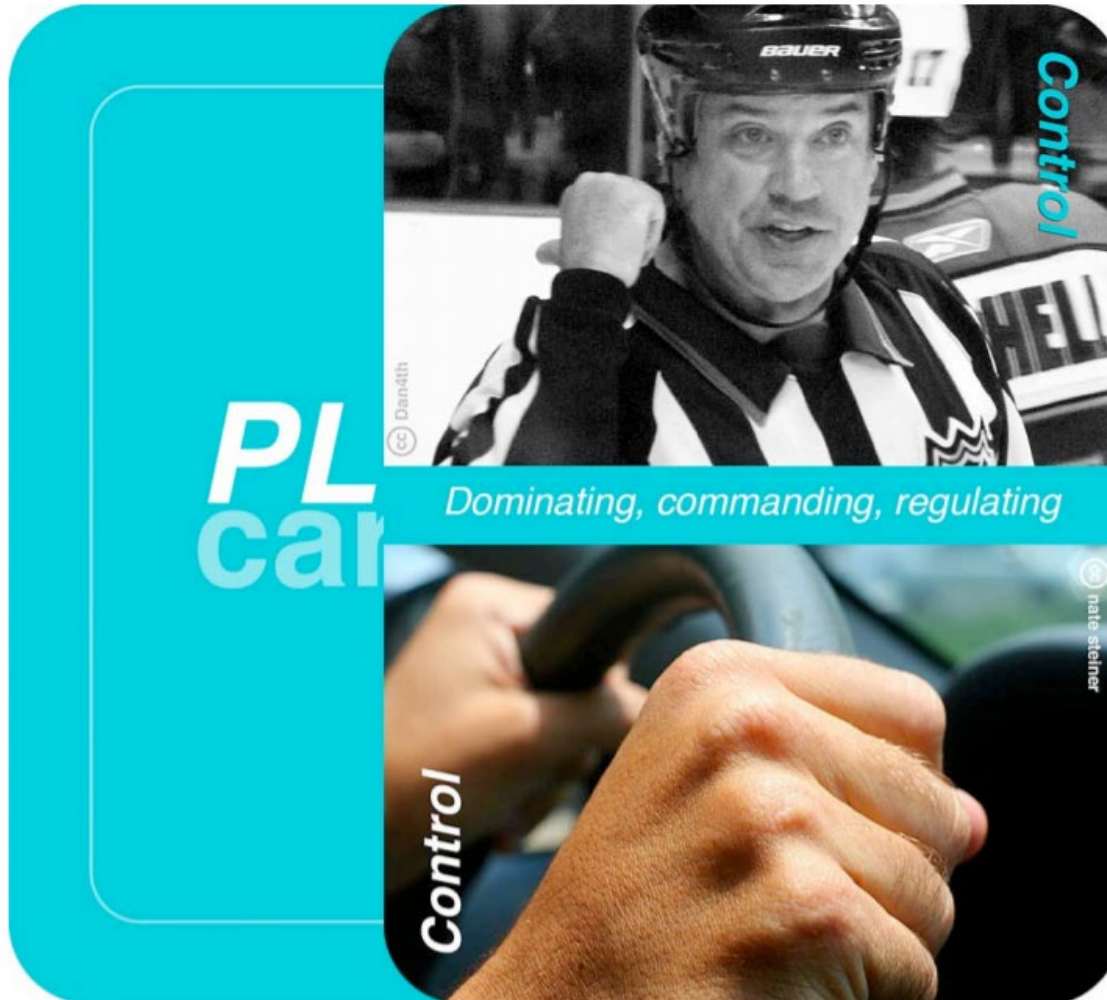


Figure 6: An example of PLEX cards (Lucero and Arrasvuori 2010).



Figure 7: An example of PERSWEDO cards (Ren et al. 2017).

5.1.2 Design cards

A set of design cards has been designed in order to support entrepreneurs thinking of novel alternatives to the product-market fit as they experience performance tensions. The full set of cards can be seen in appendix B. In figure 7, one of the designed cards is depicted. The designed cards will take the role of idea carrier as performance tensions are quite abstract notions. Design cards will be used as probes in this thesis. The contents of the cards have been derived from the design principles, as well as other insights obtained from various ventures through informal conversations with entrepreneurs and literature. Cards will be used to address the opportunity to support creativity for ideas forward as depicted as a difficulty by Bocken (2013). An overview of the card's content and origin can be seen in appendix B.

The game rules of the cards are simple. Entrepreneurs sit together with their start-up team and draw one card. Then, they discuss the principle description and envision how it could be applied to the context of their venture. The implementation example will assist in envisioning

scenarios. If a card is discussed and options are noted, a new card is drawn and the cycle repeats itself.

The cards are designed taking a similar approach as cards designed in Persuasive Technology literature (Ren et al. 2017). Each card contains (1) a category, (2) the principle name, (3) the principle description, and (4) an implementation example as seen in the example (figure 8). Visualisations on the cards help the participants in envisioning application areas within their venture in addition to a thought provoking question. The back of the card entails an example from which the card has been implemented, which coincides with the origin of the design card.

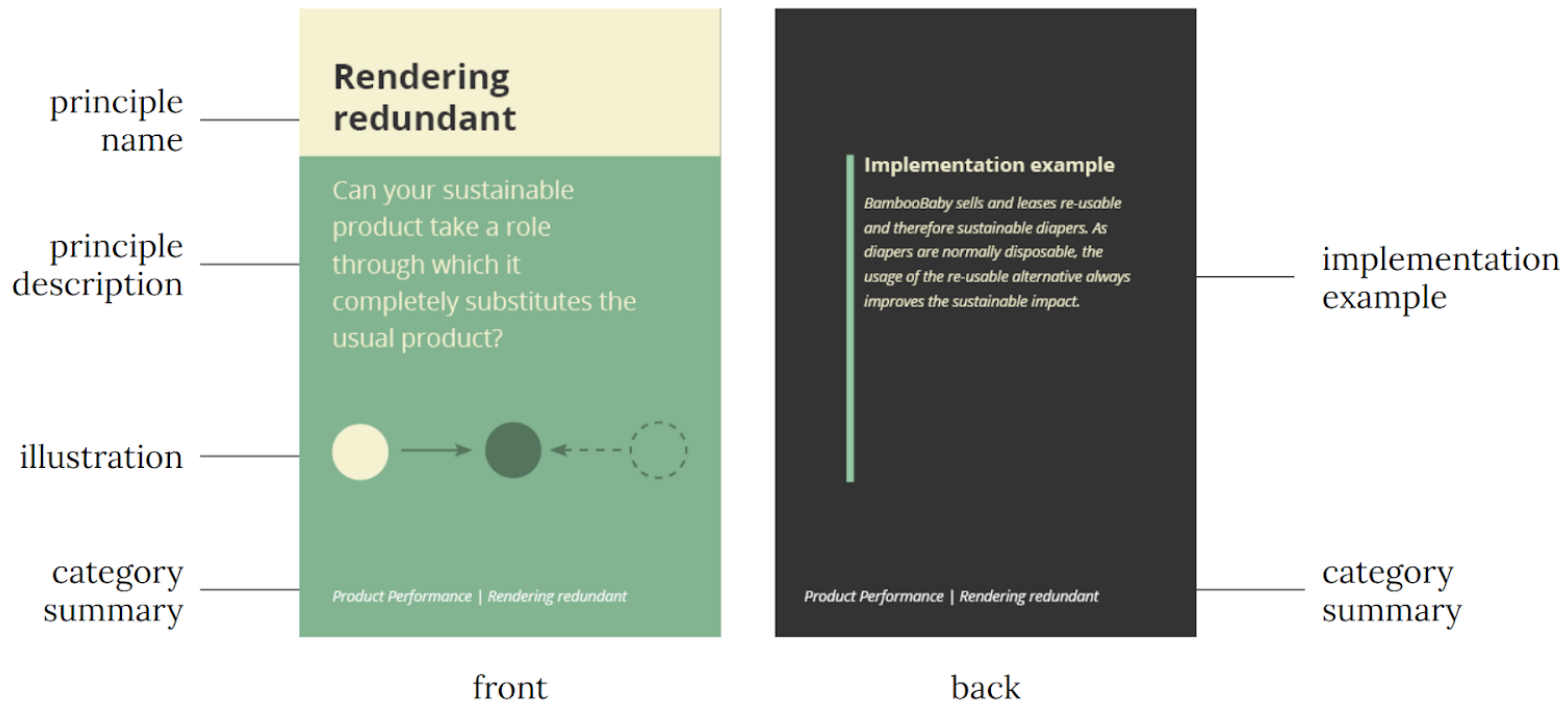


figure 8: An example of the designed cards

5.1.2.0.1 Categories

For defining the categories of the cards, we turn to *ten types of innovation* by Keeley et al., (2013). This is a framework for developing innovations. These ten types fall in three divisions: configurations, offerings, and experience. Configurations are internal aspects and distant to the consumer, such as the shipping process. Offerings are related to the product itself: the performance of the product and the system in which the product operates. Finally, the experience is very visible to the consumer such as the branding experience. In the scope of performance tensions, the product offering fits the tensions of the value propositions the best. The target market is not included in the ten types of innovation model as it is an inherent feature to all of these aspects. For this set of design cards, the target market is made explicit.

Three categories have been selected for the development of this probe: (1) the product performance, (2) the product system, and (3) the target market. A product offering will be considered as the product performance and product system (Keeley et al. 2013), which is in line with the findings of the design principles. Both the product performance and the

product system are characteristics of the value proposition and define how it can create value to the customers or other stakeholders, together with the target market.

The product performance is defined by the features of a product. It defines the goal to achieve with the product or service, and how it will be accomplished. Cards falling under the product performance categories focus on different ways in which product features aim for creating value in the targeted market. An example of this would be Sustainable Dance Club (Keskin, Wever, and Brezet 2020) who originally set out to create an interactive floor for bars that generates electricity through dancing in order to make the bar scene more sustainable. Their idea did sell well, and instead they pivoted towards using the floor to generate awareness on energy consumption.

The product system entails how individual products and services connect or bundle together to create a robust and scalable system. This can be accomplished through, for example, interoperability, modularity, and integration. One example of the usage of this category can be seen in the SOV “De Krekerij” (Dutch play on

words for “The Cricket”). De Krekerij creates and sells insect-based food. As the Dutch market is not fully ready to adopt this on a large scale from stores, they offer meals incorporating the insects as ingredients. This way, they ease the market into adoption by creating a bundled product.

Finally, the target market covers which customer group the product is marketed. This can be to consumers, but also other businesses. Addressing a different target market can help the product in reaching different objectives. One example of this is the SOV Evening Breeze, who sells air conditioned beds. If they would sell these in the Netherlands, their sustainability-based goals will likely not be met due to the few instances it would run. Besides that, it is unknown whether it would replace or be used next to a regular air conditioning unit. If it were sold in countries with a warmer climate, households would likely already have air conditioning. This shift to a more efficient air conditioning system would decrease the household energy consumption.

Principle names

Each design card denotes a name for the principle, giving it a short name to refer to in conversations.

Principle description

The principle description poses a question that players of the design cards can discuss. These questions are related to either the sustainability financial goals, but do not explicitly state this. As every SOV is different, it would be assessed on a case-by-case analysis which focus would be more appropriate for which venture.

Implementation example

The implementation example explains how existing SOVs have demonstrated the usage of the principle in their favour. This coincides with the origin of the design card in question.



Mockup from mockup-designs.com

5.1.3 Evaluation

The design cards have been evaluated in short interviews with entrepreneurs. These cards have been used in the same interview as depicted in section 4.1 on the entrepreneurial process. First, the entrepreneur was asked questions on the entrepreneurial decision making process and how the opportunity has developed over time to form a value proposition. After this, the design cards were introduced and the entrepreneur was asked how these would have benefited the entrepreneur if they would have been available during the double bottom line solution development stage.

The participants were asked to join a Miro board on which all cards were digitally showcased. They were asked to read a couple of cards prior to discussing it. All participants stated that they could not see themselves using it, but they could imagine it would be helpful for certain scenarios. The fit between the implementation example and the strategy did not meet up with the market that the venture was active on, or considered a different product. It was unclear in what cases the cards could be beneficial.

When asked to apply the card to their venture, they were able to discuss the possibilities for them and how they could be used. Yet they reported they were not in need of such a type of tool when they were in earlier stages of product development or opportunity evaluation.

5.2 Expedition venture

5.2.1 Problem space

Based on the finding described in the evaluation of the design cards, entrepreneurs did not see themselves fit in the stage of the product development stage to make use of the design cards. When we look at the findings depicted in section 4.1 on the entrepreneurial process, we see that entrepreneurs increasingly lose flexibility as they increase their stakeholder engagement. In turn, this increases the difficulty to pivot the value proposition as they will experience tensions. For this reason it is decided to pivot the target group to nascent entrepreneurs. In order to assist entrepreneurs in the management of tensions it is important they are aware of tensions prior to starting their entrepreneurial venture. Next to that, they must acknowledge the

existence of tensions in their venture (Hahn et al. 2015).

Nascent entrepreneurs are entrepreneurs who have not yet started their own venture, but do intend to do so in the future. This can be by themselves, or with the help of a co-founder (Lückgen et al. 2006). It goes without saying that the focus of these entrepreneurs lies on SOVs. It is unimportant whether these entrepreneurs have already founded companies in the past.

5.2.2 Serious play

Looking back on the distilled design principles based on the theoretical insights, we see serious play as an intervention to acknowledge the tension that is experienced (Beech et al. 2004). Serious play is considered a method for teaching higher-order thinking, whilst also enabling a strong commitment and engagement to the subject (Rieber, Smith, and Noah 1998). This enables serious play to be used as a training tool for tension awareness and acknowledgement for nascent entrepreneurs, as they are not required to already have an existing venture.

Outside of this, serious play can be seen in many shapes and forms

5.2.3 Initial Design

5.2.3.1 Goal

Expedition venture is designed to make nascent entrepreneurs aware of performance tensions and provide potential strategies to address these tensions. Creating awareness and acknowledging the tension is the first step in managing these tensions. Teaching nascent entrepreneurs prior to founding their own company will also aid in their ability to take an objective view. Furthermore, it will yield a simplified view of the environment, stakeholders, and implications. Through influencing plurality, change, and scarcity (Smith et al., 2012), tensions will be stimulated to emerge.

The design principles that have been distilled based on the literature review focus on how tensions can be resolved or accepted. This intervention intends to elicit these responses. In the cases of the design principles, the organizations adjust their value proposition as they face a challenge in order to resolve the tension. This will be similar in this design; value propositions will be

simulated through product passports. They will face challenges through challenge cards that will call them to use the design principles present in the salvation cards.

5.2.3.2 How it works

A session of Expedition Venture lasts about 90 to 120 minutes. A nascent entrepreneur can join this session by himself, or with his team of potential co-founders. Furthermore, one facilitator is required to guide the session through challenging the assumptions that are created and making sure discussions stay relevant.

The game is designed to take the form of a journey, similarly to how founding a venture can be metaphorically seen as a journey. The game is a board game, with an island group as a playing board. There are five destinations a player can reach with his venture, each representing a different value proposition. In between these destinations, the players will encounter challenges that are based on empirical and theoretical findings from SOVs. These challenges all elicit tensions of some sort, and are generalised. They are not all applicable to every venture. The participants jointly work towards a common goal: optimizing the environmental and financial goals whilst solving

challenges along the way. An overview on the contents of the game can be seen in figure 8.

Every turn, the participants are asked to create a product passport. This product passport represents the value proposition of their venture. Once a product passport is created, a challenge card is faced. This is a short description of a realistic problem they could run into. It is up to them how to overcome this challenge through a new product passport. When a new product passport is created to overcome a challenge, a new challenge will be faced. The game is over once the participants reach the final island - which is after 5 product passports. Finally, salvation strategies can be used for inspirational purposes if a challenge is difficult. These demonstrate existing strategies based on actions from existing ventures. These strategies are very heavily based upon the developed design probes as described in section 5.1. The only difference is the removal of the *Sensemaking* card, as this caused confusion from the participants.

Product passport

The product passports (figure 8) are aimed to be a concise representation of the value proposition. The product passport consists of (1) a descriptive name of the value proposition, (2) the target market (3) the environmental benefit, and (4) the consumer benefit. Next to that, the participants are asked to rate on a five-point scale (5) the likelihood of success, (6) the difficulty of realisation, (7) the expected revenue, and (8) the expected environmental benefit. These aspects were present in the various resolution strategies and were modified those cases in order to resolve tensions

Based on the interviews in section 4.1, it is indicated that entrepreneurs rarely quantify their results. This insight forms the foundation of the scales for comparing the product passports against each other. The target market and environmental benefit are clear why they belong to this value proposition within a thesis on tensions. The likelihood of success and difficulty are included to help entrepreneurs think realistically on their value proposition and reflect what resources, assets, or stakeholders they might lack for this value proposition to become reality.

Due to the easy comparability, the physical version of Expedition Venture has the Product Passports printed on thin paper in order to promote participants to write on these and not let them worry about making a mess. It is an explorative game after all.

Product Passport

Name

Target Market

Benefit

Likelihood Difficulty

Money Planet

Figure 8: empty example of product passport

Challenge cards

The challenge cards (figure 9) are based on a mix between the empirical and theoretical findings. Their foundation lies on the premise to force change (e.g. growth), plurality (e.g. investor influence), or scarcity (e.g. less money available) in the value proposition of the players. There are eight challenge cards in the game, divided over four categories. These categories are (1) market, (2) production process, (3) environmental benefits, and (4) funding. They were first brainstormed on a big canvas. Next, they were labelled based on the mechanism that enables tensions to emerge. This way, they are developed in order to help tensions emerge during the roleplaying. This is based on the scarcity, organisational change, or stakeholder plurality as discussed in section 2.4. Tensions that were deemed unfit or too abstract were left out. Finally, through a thematic analysis the categories were created. Lastly, they were reviewed together with mentor D. Keskin based on the applicability and clarity. An overview of the challenge cards can be seen in appendix C.

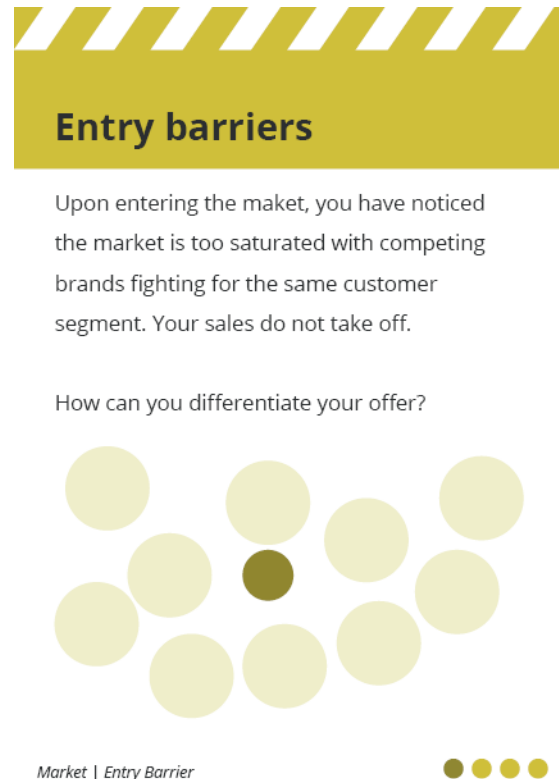


Figure 9: Example of a challenge card

Salvation strategies

The salvation strategies are the same as depicted in the design cards in section 5.1.2. These salvation strategies are directly related to the design principles on resolving tensions, as can be seen in appendix B. However, the *Sensemaking* card is excluded due to the confusion that arose by the participants when using it. The design cards were evaluated as unfit for the existing entrepreneurs in the stages they have reflected upon. This could have been the case because of the complexity of the actual value proposition and the time frame it would take to pivot a value proposition. These cards have however been included in Expedition Venture as this might enable a better use. The context is much more abstract and the time component plays a smaller part than in reality. Furthermore, the implementation strategies are on a similar abstraction level as the product passports which might improve comparability.

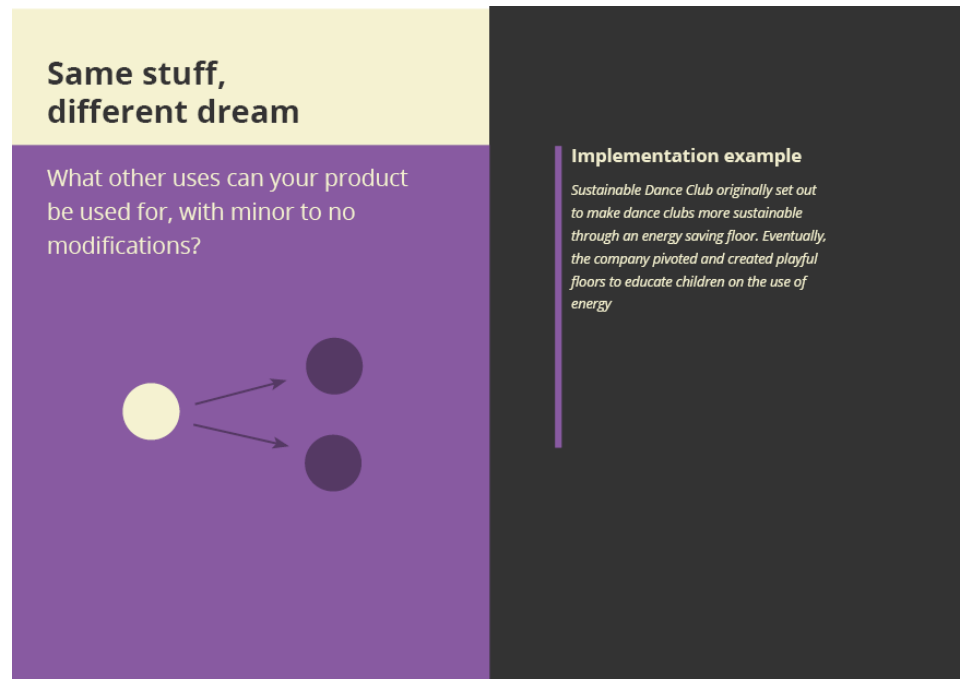


Figure 10: Example of salvation strategy, front & back

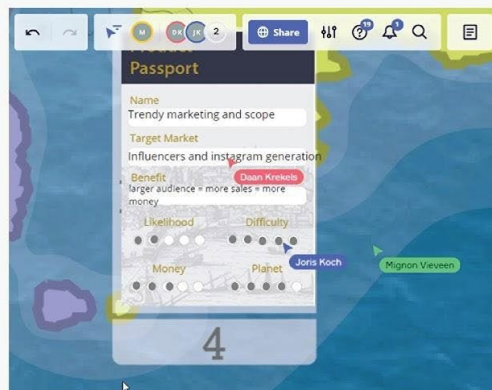
5.2.4 Evaluation

The goal of the evaluation is to understand whether the participants have been able to acknowledge tensions as a result of the intervention, and to learn how they experienced the intervention in terms of participant satisfaction.

5.2.4.1 Setup

In the ideal case, this game would be played physically together with the entrepreneurial team (if available) and a facilitator. Due to the Corona-pandemic, this is avoided from an ethical and safety perspective. Instead, a board game can be simulated through the use of the online brainstorming tool Miro. An overview of the online evaluation can be seen in figure 9. The evaluation protocol can be found in appendix D.

Evaluation | Online version



Intervention set-up

Miro enabled multi-user collaboration and simulation of board. Teams is used for communication purposes.

Figure 9: Set-up of online evaluation

5.2.4.2 Participants

The participants are described in more detail in section 3.4.2. Five games have been executed, in which 10 participants have participated. This is divided over three individual sessions, and two group sessions with respectively four and three participants. Below, an overview of the sessions can be seen in table 4.

Session	1	2	3	4	5
Venture	Interior Design Consultancy	Lava Laundry	Coffee Creators	Cup of Green	BeeGrateful
Entrepreneurs	1	1	4	1	3
Participant IDs	1	2	3, 4, 5, 6	7	8, 9, 10

Table 4: participants of evaluation of Expedition Venture

5.2.4.3 Analysis

The evaluation is conducted qualitatively. The interviews conducted with the participants after the game has been conducted will be transcribed and analysed through a thematic analysis. The themes for the thematic analysis will be based on themes that have a theoretical foundation, as well as new themes that will emerge from this evaluation. The thematic analysis will be conducted as described in section 3.4.1 using Miro as a virtual environment to hang post-its. A screenshot of the final analysis can be seen in figure 11. This screenshot shows all emergent themes, whereas the remainder of this chapter will only focus on the emergent themes relevant for the evaluation of this design.

The Kirkpatrick training evaluation model will be used to evaluate the intervention as a whole (Kirkpatrick and Kirkpatrick 2006). It was developed in 1959 and is still used to this day and is used to analyse and evaluate training and educational programs. It takes a holistic approach at training programs, viewing “evaluation” as several characteristics that determine together whether a program is considered successful. In the case of this intervention, the goal is to create awareness of the

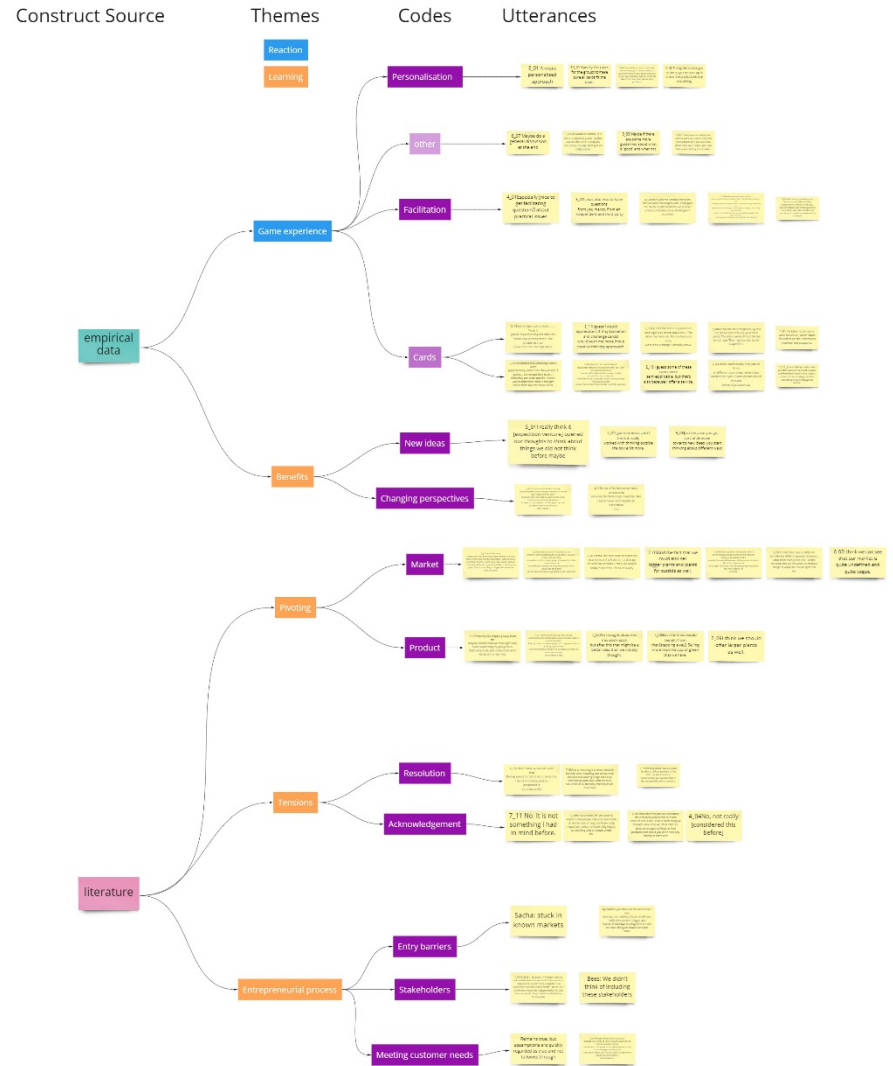


Figure 11: thematic analysis overview of Expedition Venture evaluation

entrepreneur. This model bases the success of a training on four factors: (1) reaction, (2) learning, (3) behavior, and (4) results.

The *reaction* is reflected by the participant's level of satisfaction based on the usage of the training. *Learning* dictates to which extend participants change attitudes, improve knowledge, and/or improve skill as a result of the training. *Behaviour* considers whether a participant actually changes his or her behavior as a result of the training. Finally, the *results* refer to the outcome of the behaviour change. This is often a quantifiable metric, such as productivity.

Due to the scope of this thesis, it is impossible to observe the behaviour and results of the participants after the intervention. In order to observe behaviour change, it is required to evaluate both the participant's reaction and learning as positive. This does not guarantee a change in behaviour, but a negative evaluation of either of these metrics does prevent the occurrence of behaviour change.

Reaction and learning will both be evaluated through a within-group evaluation, addressing reaction qualitatively and quantitatively, whereas learning will

only be measured qualitatively. Reaction will be measured quantitatively after the intervention based on the reaction sheet depicted in the *Evaluating Training Programs* handbook (2006). Furthermore, the participants are asked after the usage of the intervention how they have experienced it. The evaluation questions on reaction are as follows:

- [1-5] How do you rate subject content?
- [1-5] How do you rate the instructor?
- [1-5] How do you rate the schedule?
- [1-5] How would you rate the program as an educational experience to help you do your job better?
- [Open]What topics were most beneficial?
- [Open] What would have improved the program?

The *learning* component will be addressed qualitatively. The goal is to evaluate whether participants have been able to experience tensions as a result of the intervention and thereby acknowledge tensions. Interview questions after using the intervention will

target how they based the decisions as they experienced challenges, and how they experienced achieving both environmental and financial goals. This will be analysed through a thematic analysis, as

described in section 3.4.1. The first step is to familiarize with the data, after which it is coded. Then, themes and relationships are searched for based on clustering the insights. Labels of these teams are derived from literature on the entrepreneurial process and tensions, as well as new labels emerging from this study.

5.2.5 Results

In general, the design has been evaluated well. In table 5 (right), the outcomes of the thematic analysis can be seen, divided in themes originating from theory, and emergent themes from the evaluation itself. In the upcoming chapters, the themes will be discussed on how they shape the reaction and learning criteria according to the Kirkpatrick training evaluation model.

Measure	Theme	Data source	Description	Sample Quote
Reaction	Personalisation	Empirical	A higher degree of personalisation to the venture will yield a better satisfaction and learning experience	<i>"It would be an option to include more company's in one workshop. It would be harder to talk about problems in your own company, but you might get ideas from how other people solve problems"</i> Participant 7
Reaction	Facilitation	Empirical	A facilitator plays a role in challenging assumptions	<i>"I know from myself that I think in mostly positive thinkg, meaning I don't critically look at it unless I was challenged, which did happen here. So that was really interesting."</i> Participant 4
Learning	Tensions	Theoretical	Tensions were acknowledged as a result of the intervention, whilst participants were unaware of these prior to the intervention.	<i>"It's like a trade-off. We want to impact a few people a lot and have them do workshops and have a big impact per person, or have a big impact by reaching a lot of people a little bit."</i> Participant 5
Learning	Pivoting	Theoretical	The intervention enabled participants to reconsider and re-evaluate value propositions.	<i>"We thought about the mix-and-match but after this that might be a better idea than we initially thought."</i> Participant 4
Learning	Ideation	Empirical	The intervention has assisted the entrepreneurs to think outside of the box and try out different options in a simulated manner.	<i>"Just because you got sort-of directed towards new ideas, you start thinking about different ways"</i> Participant 5

Table 5: Outcome of the thematic analysis of Expedition Venture

5.2.5.1 Reaction

The reaction has been measured both quantitatively, as well as qualitatively. All scores are measured on a scale of 1 to 5. The lowest score reported by the participants was 3, whereas the mean is 4. The average of the four questions measuring the reaction was 4,4, as can be seen in table 4. Overall, the reaction can be considered a success. The scores of the reactions can be seen in table 6.

Question	Average score (scale of 1 to 5)
How do you rate the subject content?	4,5
How do you rate the instructor?	4,8
How do you rate the schedule?	4,1
How would you rate the program as an educational experience to help you do your job better?	4,1
Total average: 4,3	

Table 6: results of reaction on intervention

From the thematic analysis, three themes of satisfaction were uncovered in relationship to the intervention. These are the aspect of personalisation, the role of facilitation, and the change that is forced to the entrepreneurs.

Personalisation

This theme covers the aspect of personalising the intervention to the venture. The intervention has been designed for SOVs in general. No difference has been made based on the type of product or service that will be offered, the market that the entrepreneurs aim to position themselves in, or the way through which they aim to realise an environmental impact. Some of the salvation and challenge cards were difficult to apply to the venture of the participants. In some cases, a work-around was used by slightly modifying the challenge. For example, This generalisability is considered a point of improvement to the participants. Improving on personalisation may yield a more satisfactory satisfaction from the participants, but could also aid in delivering a better learning experience. As challenges are more tailored to the venture in question, it might be easier to emerge, and therefore acknowledge, tensions.

“I found it hard to use the salvation strategies and think of how they could be implemented, it is for inspiration I guess, but in case of the beachhead it made me have more questions, it was a challenge in itself to figure out how to fit that in.” - Participant 1

Facilitation

The second theme that emerged in relationship to the satisfaction and quality of the intervention came from the facilitation. The participants positively experienced an outsider to join their discussions as it challenges them on their assumptions. What can be observed in the progression of the games is that the participants often thought in extensions of the current value proposition that they had in mind. It was difficult to open them up creatively to think about other stakeholders to involve, or other markets to serve.

“I know from myself that I think mostly in positive things, meaning I do not critically look at it unless I was challenged, which did happen here. So that was really interesting.” - Participant 4

The participants positively experienced how the challenge cards forced resistance for the venture. For example, It seemed that many participants

overestimated the expected financial returns. Challenge cards proved resistance here as it simply stated that the market would not be interested in their product. This skips the discussion on *why* that might happen, and focus the discussion on other ways to create a successful value proposition.

5.2.5.2 Learning

Four themes emerged from the thematic analysis in relationship to the learning component. The themes that deductively emerged based on literature are related to tension acknowledgement and management, the entrepreneurial process, and the role of pivoting. Based on the empirical case, the theme of benefits of the intervention emerged.

Tensions

The main objective of the intervention was to create awareness of tensions between the environmental and financial goals of value propositions for SOVs. In the interviews conducted after using the intervention,, 4 out of the 5 groups mentioned this trade-off as a learning experience. The participant in one of the solo sessions (participant 2) who did not mention this said he did not consider it a trade-off because he viewed it as

mandatory to combine both of these goals. His future venture entails a centralized washing service, aiming to be more efficient than a decentralized approach which is common now. He was unable to formulate a value proposition in which both of these goals were achieved. Separating the tension over time was discussed, in which he would first build a viable business after which he would focus on making it more sustainable. Yet he did not see this as a successful option because it would mean he had to run an unsustainable business and he simply did not want to do this without a guarantee on turning it sustainable in the future. Changing markets and providing a less complete service only changed the balance between these goals, and did not solve it.

In the session with Coffee Creators, the participants were unaware of the tensions beforehand. Coffee Creators is a venture in the opportunity discovery stage, in which the entrepreneurs aim to develop and sell a kit that will enable households to use coffee waste to grow indoor plants and herbs. Through this, they want to create waste awareness amongst consumers and in turn aim for a less wasteful household. The tensions emerged when the challenge card “More money less time” was discussed. This card entails the challenge in

which they are given an investment, but have to pay it back as quickly as possible. To solve this challenge, they wanted to invest the money in influencer marketing through sustainability-oriented influencers in order to attract a bigger audience. This caused a tension: if they chose to market their product through this outlet, they would have a bigger audience and therefore a larger financial return. However, this consumer would also be less likely to change their behaviour as a result of the product, as they are already aware of environmental problems.

“The discussion with my team members and the various scenarios given [was beneficial to us]. This gave us more visualization in the balance between scale and environmental impact.” - Participant 4

Overall, the challenge card of “More money less time” proved to be a good challenge in light of emerging tensions as a result of it. This is caused by the clash of goals between the environmental and financial nature (Smith and Lewis 2011). This challenge seems to implicitly force the participants to prioritize profits over environmental goals.

Pivoting

The intervention has enabled the participants to experience other possibilities in pivoting their value propositions. They have also experienced the role of tensions in these moments of pivoting, as it became evident that the different offerings yield different environmental and financial projections. However, it is also stated that difficulties are experienced in breaking free from existing thoughts on how the product or service may be offered. The intervention played a role in changing this way of thinking and enabled participants to also take a different perspective on how they can realize their environmental mission.

“I think we should look for a way to compromise that [sustainable] value. To really make it environmentally friendly other than to print, or maybe look for a printing solution that is environmentally friendly or a production process of cups then that are more [responsible]” -

Participant 7

Ideation

The intervention has been able to enable entrepreneurs to think outside the box better and consider different perspectives. Through the simulation of various

challenges and reflecting how these impact the value proposition, entrepreneurs were able to consider value propositions and partnerships they had not considered before. In some cases, these were also applicable to their current situation. For example, BeeGrateful ideated on how they could work together with the city in different ways to provide value. As a result, they realized they could work together with companies placing flower baskets on street lights. This saves them from the logistics and costs required to install this themselves at these hard to reach places. Through partnering with flower companies, their value is still realized whilst requiring less resources.

“Just because you got sort-of directed towards new ideas, you start thinking about different ways”

Participant 5

5.2.6 Final Design

Based on the learnings obtained from the evaluation of the initial design, several points of improvements can be identified. Some of these require further research to be successfully implemented, whereas others can already be implemented to improve the experience of the design. The overall rules of the game stay intact,

whereas some aspects can be more refined for upcoming versions. This section will therefore yield recommendations for the further design and development of the design, as these can not be tested due to time constraints.

Cards

Firstly, a change will be made to the contents of the product passports (figure 12). During the design stage of the initial design, the cards were designed with a single textbox to enter the benefit of the product. However, this was deemed difficult as both environmental and financial benefits change over the course of the game, or may be realized through a different approach. For the final design, the choice has been made to split the *benefit* textbox into *environmental benefit* and *customer benefit*. This can also enable a more direct discussion and reflection on the polarities of possible tensions as these factors are made more apparent. Furthermore, the phrasing of “money” for expected revenue has been changed for “revenue”, to reduce confusion.

The image shows a redesigned product passport card. It features a dark red header with the title "Product passport" in white. Below the header are four text input fields: "Name", "Target market", "Environmental benefit", and "Customer benefit". At the bottom, there are two columns of progress indicators, each consisting of five empty circles. The left column is labeled "Likelihood" and "Revenue", and the right column is labeled "Difficulty" and "Planet".

Figure 12 – Redesign of the product passport card

Furthermore, the salvation strategy of *sensemaking* has been removed from the card deck. Not all salvation cards have obtained the same amount of use over the various sessions and it is therefore not known whether other cards need to be excluded. Yet the salvation card of *sensemaking* has caused confusion to the participants several times and will therefore be excluded. The remaining salvation cards and challenge cards remain untouched.

Facilitation

Facilitation turned out to be more vital to the success of the design than originally anticipated. Successful facilitation can steer and trigger discussions on tensions, which may otherwise be overlooked. As is also reported by the participants, a facilitator also serves as an independent party that can challenge the assumptions which may be taken for granted by the entrepreneurs themselves.

Physical board game

The original idea of Expedition Venture implied a physical board game. Although the online evaluation went well, a physical experience of Expedition Venture will likely give a different dynamic. For the final design, a

physical version will be recommended to explore and be able to discuss topic more easily.

The ease of modification for the product passports was enjoyed on the online version. To translate this to a paper version, standard printer paper (80 gsm) will be used for these cards. This enables people to print the cards themselves if they run out. The participants can write on these cards with supplied markers or writing utensils of their own.

Challenge cards need to be re-used over many games. For the physical version, these have been laminated to a sheet of acrylic plastic. This gives it a luxurious yet solid quality.

Finally, the salvation strategies are presented as a deck of cards and need to be re-used for multiple games as well. These cards will be printed on heavy paper stock (250 gsm or up) to highlight its re-usability and give it a luxurious and tacit experience.

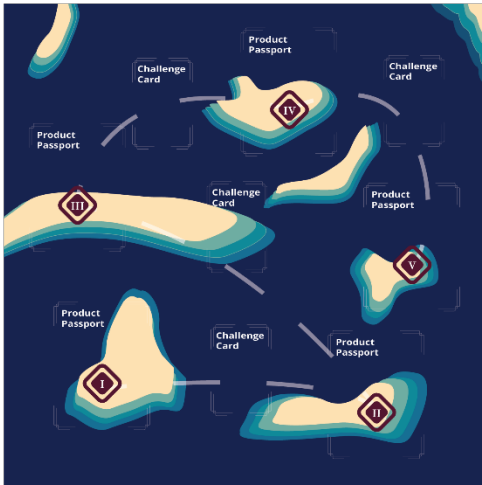
These cards can be stored inside containers for the cards. The challenge cards and passports can be stored together in one box, whereas the salvation strategies are in a different box. This limit the amount of

containers to two, whilst still having a similar volume of cards per container.

Finally, the board map is redesigned to fit a square board map and can be folded. This should be printed on thick paper to prevent damage from moisture in case liquids get spilled on the table as the game is played.



Figure 13 – Physical version of expedition venture, including card boxes and a foldable board for storage



Game map
Guides the players through the game and directs which card comes next.

The price is right

The incumbents feel more threatened than you expected. They have started a price war to chase you out of the market.

Can you identify a positioning where you don't have to worry about incumbents?

Market

Challenge cards
Challenges entrepreneur with a realistic obstacle, forces tension between environmental and financial goal

The niche

Which market is overlooked by the bigger organisations?

Salvation cards
Poses the strategy of an existing venture and how they have solved their tension. This serves as inspiration for facing the challenge.

Product passport

Name _____

Target market _____

Environmental benefit _____

Customer benefit _____

Likelihood	Difficulty
○○○○○	○○○○○
Revenue	Planet
○○○○○	○○○○○

Product passports
Short description of the value proposition

6 - Discussion & conclusion

6.1 Main research findings

6.1.1 Research question 1

How do entrepreneurs leading SOVs transform an opportunity into a sustainable value proposition?

In order to provide an answer to the first research question, semi-structured interviews have been conducted with five entrepreneurs leading sustainability-oriented ventures. This interview was deductive of nature as the labels for the entrepreneurial process were based on literature. The findings are in line with the entrepreneurial process model (2017). This model depicts the entrepreneurial process in five steps.

The first step is the *sustainable problem discovery* stage, in which entrepreneurs become aware of a sustainable problem. The notion that entrepreneurs typically recognize sustainable problems based on first-hand experience with these problems contradicts with the

findings of this thesis. Addressing environmental problems that are in line with existing knowledge of the entrepreneur might give the entrepreneur better odds in creating a more successful venture. However, only one of the interviewed entrepreneurs has started a venture that aims to address a problem that the entrepreneur is already familiar with. It can not be stated that either of these groups experienced more tensions than the other group. What has not been mentioned in the reviewed literature is the notion of entrepreneurs rarely pivoting the goal of sustainability within their sustainability-oriented venture. It remains consistent throughout this entrepreneurial process that the entrepreneurs do not consider pivoting to a different environmental problem if the value proposition does not end up being viable, whereas they are much more flexible in the value proposition that aims to realize this objective. This could be explained by the limited applicability of a value proposition to be used to realize a different environmental goal. This might be more difficult in technology-driven ventures such as AquaBattery.

The second step in the entrepreneurial process is the *sustainable opportunity recognition* stage. In this stage

entrepreneurs aim to recognize an opportunity that can create a solution to the problem that was identified in the previous step. The sustainable opportunity is often recognized according to market imperfections which is in line with literature. Entrepreneurs aim to fix what they consider broken in the market, such as waste, and therefore provide a solution to the environmental problem.

Thirdly, entrepreneurs enter the *double bottom line solution development* stage. In this stage, entrepreneurs bring together the sustainable problem and opportunity to create a value proposition that addresses these two. In this stage, goal duality starts to emerge as the goals become measurable and therefore the ability for either one of them to be successful or unsuccessful. It is consistent with literature that the entrepreneurs rarely quantify their environmental impact. Only BlauwDak and Healthy Seas Socks have quantified their environmental impact, whereas BlauwDak only measured this as a requirement for funding. The other parties made sure their environmental impact was positive but did not precisely calculate it. The final bottom line remains to be the financial bottom line, as the companies need to ultimately make a living from

the venture. Also in line with literature is the double bottom line solution development in order to meet customer needs. This could also contribute to entrepreneurs attempting to resolve polarities in tensions (Hahn et al. 2015) whilst they are possibly unaware of that at that point in time. Entrepreneurs tend to use an approach in which they verify their idea often, similarly to the LEAN start-up method.

Fourthly, entrepreneurs go through *funding and formation of sustainable enterprise* stage. Depending on the financial needs of a venture, this stage can take longer or shorter. Some entrepreneurs are able to finance their venture with their own money, whereas other entrepreneurs require some kind of investment. As entrepreneurs have fewer financial resources, they are more likely to experience tensions based on scarcity. Furthermore, the addition of an investor as a stakeholder to the venture can also create tensions based on plurality (Smith and Lewis 2011). As a final factor, tensions can become apparent as some entrepreneurs quantify their environmental impact as a requirement to obtain funding. This quantification may highlight an insufficient environmental impact.

Fifthly, entrepreneurs enter the *sustainable market creation/entry* stage. Next to that, customer-related entry barriers did not appear to be a barrier for the entrepreneurs in this study. Only Yumii, who is one out of the five entrepreneurs, experienced these barriers. BlauwDak experienced entry barriers primarily on a regulatory level. Finally, it turns out that as entrepreneurs are further in the entrepreneurial development process, the ties to stakeholders are stronger and the flexibility to pivot to different value propositions becomes lower. Literature expects tensions to increase as stakeholders increase (Smith et al. 2012), but do not state the decrease in organisational flexibility. As a counter-effort, the entrepreneurs took an approach similarly to the Lean start-up method in which they took small steps in a relatively safe environment to reduce risk. As stakeholders are introduced, tensions are more likely to emerge based on the plurality of goals of the people involved. As plurality increases, the flexibility of entrepreneurs to pivot decreases. Entrepreneurs need to be aware of the tensions in the future so their venture can be made fit prior to its occurrence.

Finally, feedback loops have not been identified in the model depicted by Belz and Binder (Belz and Binder 2017) although the iterative process in ventures is generally acknowledged (Keskin et al., 2013).

6.1.2 Research question 2

How can entrepreneurs leading SOVs manage performance tensions?

This research question has been answered in the form of design principles as a way to synthesise theoretical and empirical knowledge. The design principles are based on the framework by Hahn et al., (2015), focusing on combining empirical and theoretical insights to formulate design principles on management strategies on resolving and accepting tensions. Ten design principles have been created to answer this research question, split over seven design principles on resolution strategies and three design principles on acceptance strategies.

The first design principle originates from BambooBaby's ("BambooBaby Homepage" n.d.) approach on offering reusable diapers as a sustainable alternative to

disposable diapers. They have shaped their value proposition to create an alternative to disposable diapers as it is used. As a result, every use of their product is more environmentally friendly than the use of disposable diapers. Design principle 1 is therefore as follows: *[C] When facing tensions arising from limited environmental impact, [I] entrepreneurs should position the product to substitute the current alternative [M] to pivot the value proposition [O] leading to tension resolution.*

The second design principle is based on Sustainable Dance Club (Keskin et al., 2013). This SOV originally created a dance floor that generated energy in order to make the clubbing scene more sustainable. Their product could not produce enough energy for this, and the entrepreneurs pivoted their value proposition to educate children on energy. Through this, they have been able to synthesise the polarities causing their tension. Design principle 2 is therefore as follows: *[C] When facing tensions arising from limited environmental impact, [I] entrepreneurs should market the product in a different application area [M] to pivot the value proposition [O] leading to tension resolution.*

The third design principle originated from the value proposition of Lightyear, who offers a solar-powered electric vehicle. The electric vehicle market is becoming increasingly competitive, but Lightyear has been able to identify a niche within this market as they pursued a charging system using solar panels on the roof of the car. Through this, they have become able to better realize their financial goal and formed the third design principle: *[C] When facing tensions arising from reaching financial goals due to heavy competition in an existing market, [I] entrepreneurs should market the product in a niche market [M] to pivot the value proposition [O] leading to tension resolution.*

The fourth design principle finds its origin from Yumii, one of the empirical cases of this study. Yumii aims to make baby products more sustainable by offering a leasing construction, rather than buying. Once babies outgrow certain products, these can be swapped to proper fitting products. Their initial value proposition was focussed on clothing, yet prospective customers did not consider this hygienic. Yumii was able to pivot their value proposition to focus on larger products, such as cradles, instead. Through this pivot they have addressed the same customer group through different needs,

forming design principle 4: *[C] When facing tensions arising from difficulty in reaching financial goals due to insufficiently meeting customer needs, [I] entrepreneurs should change the offering to the same market addressing different customer needs [M] to pivot the value proposition [O] leading to tension resolution.*

The fifth design principle originates from a venture teaching dance classes to elderly (Yin, Lai, and Zhou, n.d.). This venture experienced difficulties in obtaining revenue as the teachers were expensive. They have been able to resolve this tension by using volunteers to teach the classes, as they realized the customers did not focus on the quality of the dance classes itself. This forms the fifth design principle: *[C] When facing tensions arising from insufficiently meeting financial goals due to high costs, [I] entrepreneurs should focus on cost reduction of the offering whilst retaining the primary value [M] to pivot the value proposition [O] leading to tension resolution.*

The sixth design principle focuses on spatial separation of the tension to resolve tensions. As depicted in the company Alpha (Park 2020) and in company Beta (Battilana et al. 2015), creating two business units that

each focus on one polarity of the tension. This sixth design principle enables the company to resolve the tension and let each business unit focus on maximizing their respective goals: *[C] When facing performance tensions arising from a target group unable to pay, [I] entrepreneurs should spatially separate the beneficiaries and customers [M] to separate the tension [O] leading to tension resolution.*

The seventh and final design principle on resolution strategies focus on resource transfer. If either the sustainable goal or financial resources are insufficient, companies can transfer resources from different domains to bridge this gap. For example, a price gap can be resolved through leveraging the social mission and justify the higher price (Teasdale 2012). The seventh design principle is formulated as follows: *[C] When facing performance tensions causing an inability to reach financial or environmental goals, [I] entrepreneurs should obtain the required resources elsewhere [M] to transfer resources [O] leading to tension resolution.*

The eighth formulated design principle focuses on sensemaking, which is demonstrated by the company CEA. Through sensemaking, they have been able to

understand the polarities causing the tension of their value proposition. They have been able to understand this through active discussions on their mission and how they realize this through their value proposition. Design principle 8 is formulated as follows: *[C] When facing tensions arising from insufficiently meeting financial goals due to missing revenue, [I] managers should retrospectively discuss the polarities of the tension [M] to start a dialogue with the team [O] and accept it.*

The ninth design principle is paradoxical thinking. This is demonstrated by Smith and Lewis (2011). Tensions are instinctively addressed through an “either/or” approach, focusing on one of the two polarities that cause the tension. Instead, they propose a “both/and” approach, in which the tension in itself is addressed. The ninth design principle is as follows: *[C] When facing tensions arising from divergent perspectives, [I] managers should use paradoxical thinking to prospectively discuss the polarities of the tension [M] to start a dialogue with the team and [O] accept it.*

The final and tenth design principle is serious play, which is a way to promote complex problem solving. This is demonstrated by Beech et al., (2004). Through

promoting discussions in which people take the perspective of opposing parties, tensions are understood from both perspectives and enable the acceptance of the tension. This 10th design principle is formulated as follows: *[C] When facing tensions arising from different approaches to reach goals, [I] managers should use serious play [M] to enable employees to take different perspectives and [O] accept it.*

These design principles remain difficult to apply concretely for ventures experiencing tensions. Taking a niche market for example, it is unclear what the next step would be on identifying the correct niche. Furthermore, it remains unclear in which cases to switch to a different market and in which cases the value of the product should be reconsidered. Boundaries based on the market or type of product offering might shed more light into deciding when to apply which design principle.

It must be noted that there might be a publication bias on tension management. It could be the case that only successful tension management cases are published. This could result in either an overrepresentation of one strategy or the underrepresentation of a different strategy. The former is not the case, but the latter is still

feasible. It is an interesting approach to focus on companies that have failed to manage tensions. In these cases, the outcome is definitive and learnings might become more apparent.

The literature review has been conducted with a focus on performance tensions. A large number of articles were excluded in the literature review as they did not fit the scope of this research. Yet these may be beneficial in getting a better understanding of tensions as a whole and understanding the scenarios in which case one strategy may be favoured over another. Due to the limited amount of cases that these design principles on performance tensions rely on, it is unable to draw conclusions on understanding when certain strategies should be favoured. Furthermore, researching a broader scope of tensions might also enable the researcher to understand how strategies can be executed better.

6.1.3 Research question 3

How can a tool support entrepreneurs leading SOVs in managing performance tensions?

As a solution to this question, we turn to the design space. Expedition Venture is a board game that has

been designed to assist entrepreneurs in the acknowledgement of tensions and providing first steps in showing how these can be managed. Expedition Venture consists of product passports (representing value propositions), challenge cards (representing realistic challenges the entrepreneurs might face), and salvation strategies (inspirational cards based on the design principle from research question 2). All challenge cards and salvation strategies have either an empirical or theoretical foundation. A facilitator is required to challenge the participants and guide the discussion. This game offers solutions based on the design principles on resolving tensions, in addition to other empirical sources. The game has been validated with five nascent entrepreneurs and indicates an increase in learning caused by the acknowledgement of tensions.

To firstly assist entrepreneurs in coming up with creative solutions for tensions, a set of design cards has been created. These take the design principles as mentioned in research question 2 as a foundation. The cards are designed based on Perswedo cards. However, these were evaluated poorly in a retrospective session with existing entrepreneurs. This could be caused by the scope of the design cards being unable to provide

solutions retrospectively. However, in the evaluation of Expedition Venture these salvation strategies remained confusing. The salvation cards are expected to be more tailored to the specific situation. Only one participant was very interested in these cards and stuck around after the session to read all of them. Similarly to the design principles, these may be bounded by the market the venture is positioned in or the type of product offering. Furthermore, the stage of the venture may play a role in this.

The evaluation of Expedition Venture has been conducted with ten participants, divided over two group sessions and three solo sessions. All sessions included a facilitator. Overall, the intervention succeeded in enabling participants to experience tensions and discuss these. Next to that, the intervention also scored high in regards to customer satisfaction. Due to the pandemic, the evaluation has been conducted online through the Miro platform. It is unclear to what extent the dynamics would change if the intervention is played physically rather than on an online board. Participants have stated the platform has allowed them to easily go back to previous product passports and make changes. This has been simulated to some extent by providing plenty of

product passports, giving the participants the opportunity to just get a new card if desired.

Personalisation is considered a point of improvement. The challenge cards were designed as a one-size-fits-all, and the entrepreneurs could decide themselves whether they considered a card unfit for their venture. However, multiple participants shared their thoughts that they would prefer it if the contents of the game were more tailored to their venture in specific. Options to explore this can be on a customizability basis in which items are left blank and are left for the facilitator to fill in, or to create more challenge cards in more specific domains.

New design principles can be distilled based on the evaluation of Expedition Venture. As mentioned in the aforementioned paragraph, personalisation appears to be an important factor in the experience of entrepreneurs. A facilitator has added to the factor of personalisation by the ability to tailor discussions to the venture in question and thereby enable tensions to be discussed. Through this facilitating role, This poses the following design principle:

Design principle 11:

[C] When simulating tensions for entrepreneurs leading sustainability-oriented ventures, [I] the intervention should be personalised [M] to stimulate discussion on tensions relevant to the venture [O] leading to the acknowledgement of tensions.

Furthermore, it appears that the intervention was successful in teaching these nascent entrepreneurs in acknowledging tensions through simulation of the challenges in light of the value proposition:

Design principle 12:

[C] When discovering opportunities for founding a sustainability-oriented venture, [I] entrepreneurs should use serious play [M] to simulate various challenges and their effects on the goal duality [O] leading to tension acknowledgement.

Next to that, the nascent entrepreneurs have explored various options on how they could pivot their value proposition to resolve certain tensions in their venture. Even though it is not possible to determine whether these are methods of successful tension management, the following design principle can be formulated:

Design principle 13:

[C] When discovering opportunities for founding a sustainability-oriented venture, [I] entrepreneurs should use serious play [M] to simulate various pivoting options and their effects on the goal duality [O] leading to ideas on resolving tensions.

6.2 Theoretical implications

This thesis contributes to paradox theory by firstly combining literature on managing tensions and how these can be identified and managed. It adds to the framework by Hahn et al., (2015) by providing an operationalization on how the framework can be applied in the areas of tension acceptance and tension resolution. This serves as a stepping stone for further research on how tensions can be acknowledged, accepted, or resolved. This thesis prescribes a solution to acknowledging tensions for nascent entrepreneurs. This solution, Expedition Venture, can be seen as a starting point for further research on managing tensions. Depicted by Hahn et al., (2015), acknowledging tensions is the first step in being able to manage these tensions. A first step is made in assisting these entrepreneurs in resolving these tensions, but due

to the time frame of this thesis it is not an option to observe this behavioural change.

Secondly, this thesis contributes through understanding the entrepreneurial process in light of decision making and the development of sustainable value propositions (Belz and Binder 2017). This helps in the development of future tools to assist these entrepreneurs as the decision making process has become clearer. The notion that entrepreneurs leading SOVs seldom change the sustainable problem they aim to solve appears to be new in the literature and is perhaps present in more ventures than the ones identified in this study. Furthermore, the inflexibility of entrepreneurs decreases as their ties to stakeholders increase. As a result of this, they might be less able to pivot their value proposition as tensions emerge. Next to that, from the insights in this thesis it appears that entrepreneurs do not discover opportunities in light of their experience. This might be a result due to sampling, as three out of the five entrepreneurs have founded their venture as a consequence of a competition.

Thirdly, the framework used by Hahn et al., (2015) was originally theorized within the scope of corporate

sustainability. This thesis has demonstrated its applicability to the field of entrepreneurship, to which it seems fitting. Tensions are considered through a paradox lens, looking at the tension itself rather than the individual polarities. This seems to be a suitable lens through which tensions can be researched and has enabled the final design to address tensions as a whole as well. This lens has enabled the research participants to be able to acknowledge tensions. It is unknown if other research lenses are also capable of this.

Finally, literature does not currently have an overview on ways to execute these strategies. Several papers are published on the acceptance of tensions, but literature is limited on the management of tensions arising from value propositions. Prior research shows that entrepreneurs pivot their value proposition to resolve tensions (Keskin et al., 2013). This study contributes by identifying strategies on how the market or product offering can be pivoted to resolve tensions.

6.3 Limitations and recommendations for future research

Several limitations can be observed in this study. The most prominent limitation at the time of writing is of course the Covid-19 pandemic. Even though the workshop did not appear to be hindered by being conducted online rather than offline, it may alter the behaviour of the participants (e.g. social loafing) or the ability to facilitate these sessions. Next to that, it may have implications on the usage of the game such as how easily cards are modified in an online environment rather than a physical environment. Future research should consider evaluating the intervention in a physical environment rather than online.

Secondly, a limited group of entrepreneurs has been interviewed within this thesis due to both time constraints, as well as the availability of the entrepreneurs. Covid-19 played a role in this, as entrepreneurs had an increasingly high workload and had less time available to assist in research inquiries such as this thesis. A larger group of entrepreneurs need

to be interviewed to be able to generalize the insights better. For example, three out of the five existing entrepreneurs founded their venture as a result of a competition. This does not seem representable for the general population of entrepreneurs.

The design principles are not exhaustive and are limited to the literature and companies identified in the scope of this thesis. Further research needs to be conducted on providing more concrete cases on the resolution of tensions arising from the value propositions. In turn, this could help in providing better boundaries for the application of the design principles itself, but also in the understanding on when to apply which type of strategy.

Furthermore, Expedition Venture offers a stepping stone to acknowledging tensions and providing potential solutions to these tensions. Future research may shed insights on how successful (or unsuccessful) tension management may be identified to further guide the learning process of the entrepreneurs. Currently, the assessment of a solution to a challenge is based on the gut feeling, but there is a lot of ambiguity on whether that actually resolves a tension or delays it.

Finally, Expedition Venture offers no guidance in the identification of the correct strategy for managing tensions. Design principles have been used to provide the participants possibilities in managing the tensions and discuss the implications of various changes in the value proposition to the environmental and financial goals. Further research should dictate which strategies should be conducted in which cases, and how to evaluate this. It is unclear if acceptance strategies can even be viable in the case of tensions arising from value propositions for sustainability-oriented ventures.

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8 Appendix

Appendix A: Interview guide entrepreneurial process

Goals

Learning goals:

1. How are opportunities or markets evaluated for further development?
2. How is the opportunity translated to a value proposition?
3. How do sustainability-oriented entrepreneurs develop the value proposition of their ventures over time?

Interviews will be semi-structured and retrospective by nature on the entrepreneur's past experience.

Set-up

Introduce myself, goal of the study, verify whether consent form was clear and if s/he has any remaining questions.

Introduction - Demographics of entrepreneur and his professional working history

Can you tell me about yourself?

How did your professional life look prior to starting [Company]?

How important is sustainability for you?

What does sustainability mean to you? (understanding motive; is sustainability complementary or a second thought?)

General understanding of venture in current time

Can you tell me in your own words what [Company] is about?

What is your ambition in contributing to sustainability with the products/services you develop?

When was it founded?

What does your team at [Company] look like?

Who are you often involved with? (Stakeholders)

On what parties are you dependent on? (Stakeholders)

You've named the parties X, Y, Z. How do they benefit from the relationship with [Your Company]?

What are your goals for the near future (1-3 years) with [Company]?

What are your goals for the distant future (3-10 years) with [Company]?

How did the venture evolve to this? Focus on shifting means or goals throughout time

How did you come up with the idea of [Company]?

When did you come up with this?

What was the initial business idea (product, target group)? What is it now?

- In what ways has it changed?
- What have been your difficulties in this process?
- How have you overcome these?

What were the reasons for the changes in your value proposition? (Opportunity evaluation criteria)

How did these changes influence the sustainability impact of your business or value proposition?

How easy or difficult was it for you to make these decisions?

Can you explain more on the time-frame in which this occurred?

Decision making process during process between opportunity development and now, self-efficacy in the process

Why has it changed? (Follow-up questions on the change in stakeholder field)

You mentioned you originally wanted to do A, whilst eventually you came to [current value proposition]. What other possibilities have you explored?

Why did you choose this value proposition?

- Could the environmental goals have been achieved if you went with option [...]?
- Could the financial goals have been achieved if you went with option [...]?
- How did the decisions concerning VPs impact the sustainability outcome of the venture?

Did sustainability motivation create tensions?

What made you dismiss those other possibilities?

How did you think consider new possibilities?

How did you determine what was a good or bad option?

What difficulties did you face in this process?

Design probes - Focus on linking it back to aforementioned difficulties

[Explanation of probes. Designed as a creative tool for entrepreneurs looking for new options]

For what companies would you consider these to be helpful?

In what way would this have been beneficial for you during [give example of exploration stage from before]?

Let's say we use a random card and apply it to your current organisation, what could this imply?

Let's say your current business model would suddenly be outdated and you needed something new. How would you conduct your next steps?

Appendix B: Design Cards

Category	Principle name	Principle description	Implementation example	Solves tension because...	Source
Product Performance	Sensemaking	Is the mission of your business in line with your goals for making environmental impact?	Cambridge Energy Alliance's has shifted their mission statement from "One-stop-shop in the Energy transition" to "Catalyst in the Energy transition". Now, they realise environmental impact through taking a role in various steps in energy saving materials as opposed to the previous requirement of being constantly included.	Rationality between environmental and financial goals will be discussed and tested. Other combinations of missions may emerge from the discussion.	Jay 2013
Product System	Work-around	Are there ways in which you rely less on revenue from this product or activity?	One venture focuses on teaching dancing classes to seniors. They do not obtain large revenues from these classes. However, the venture relies on volunteers instead of employees to make it possible. This results in less need for financial gains.	If the revenue is insufficient for the financial goals but the environmental goal(or social goal in the example) may be met, other options of income may be explored to pivot.	Yin 2018

Target Market	On the other side	If you were to place this in a market on the other side of the globe, what would this target market look like?	Evening Breeze sells air conditioned beds, requiring less energy to sleep in a cool bed as opposed to normal air conditioning units. If it sells in the Netherlands, the usage of the product would be limited. If they sold it in warmer climates, the environmental gains would be higher.	Positioning the product in a different market may alter the environmental gains due to different product usage.	Keskin 2020
Product Performance	Same stuff different dream	What other uses can your product be used for, with minor to no modifications?	Sustainable Dance Club originally set out to make dance clubs more sustainable through an energy saving floor. Eventually, the company pivoted and created playful floors to educate children on the use of energy	Positioning the product in a different market may alter the environmental gains due to different product usage.	Keskin 2020
Product Performance	Rendering redundant	Can your sustainable product take a role through which it completely substitutes the usual product?	BambooBaby sells and leases reusable and therefore sustainable diapers. As diapers are normally disposable, the usage of the reusable alternative always improves the sustainable impact.	Positioning the product in a different market may alter the environmental gains due to different product usage.	Bamboo Baby

Product Performance	Like no other	Are there other ways to reach the same goal in what you want to achieve?	Hable's founder has noticed that blind people experience a lack of privacy using their mobile phone. Unlike companies offering text-to-speech software to provide inclusion of blind people, Hable has developed a tangible braille pad.	When entering a competitive market, it is difficult to reach financial objectives. Identifying a niche or less competitive market may yield more positive results.	Hable
Product System	Baby steps	Can you enable customers to try out your product in order to improve adoption?	De Krekerij offers edible insects in the forms of burgers or balls. In order to increase the people they can reach, they also offer these meals through caterers and restaurants.	When entering a competitive market, it is difficult to reach financial objectives. Identifying a niche or less competitive market may yield more positive results.	De Krekerij
Target Market	The Beachhead	There's likely many possibilities for adoption for your product, but which group experiences the highest need?	Iron Roots sells plastic-free athletic attire. This could appeal to both sustainability-oriented shoppers, but also sports fanatics. As their pricing is above average for the clothing, the sales focus on avid athletes as they are more accustomed to spending money on their hobby.	When entering a competitive market, it is difficult to reach financial objectives. Identifying a niche or less competitive market may yield more positive results.	Iron Roots
Target Market	The Niche	Which group is overlooked by the bigger organisations?	Lightyear produces an electrical car using solar panels. The market for competitive electric vehicles is getting increasingly competitive, yet there is ample competition at the level of solar panel powered cars.	When entering a competitive market, it is difficult to reach financial objectives. Identifying a niche or less competitive market may yield more positive results.	Lightyear

Appendix C: Challenge Cards

Category	Description	Tension Mechanism (Smith and Lewis 2011)	Origin
Market			
One Man's waste is another man's treasure	<p>You have found a potential investor working within circular economies. She has agreed to invest in your product, on the requirement that you use used materials in your production process.</p> <p>What would your product or business model look like?</p>	Scarcity	BlauwDak interview
2 Low 4 You	<p>It appears that the demand for your target group is lower than you anticipated and you will not be able to make a profit.</p> <p>Can you change markets or cut costs?</p>	Scarcity, Change	
The Price Is Right	<p>The incumbents feel more threatened than you expected. They have started a price war to chase you out of the market.</p> <p>Can you identify a positioning where you don't have to worry about incumbents?</p>	Plurality, scarcity	
Production Process			

Scale Required	<p>In order to be able to sell your product at a reasonable price, your production has to be scaled up. Yet you do not have the storage capacity for all those items.</p> <p>Can you identify a market in which customers buy in bulk more?</p>	Scarcity, Change	Blauwdak Interview
Import Tax	<p>The government has decided to increase taxes on imports outside of the EU higher. This implies that your product has to be sold for a much higher price, making it unsuitable for your target market.</p> <p>Can you position the product differently or produce a cheaper product?</p>	Plurality	AquaBattery interview
Environmental benefits			
Insufficient return on investment	<p>It appears that your product is not as environmentally friendly as you thought. Its environmental impact is better than current alternatives only in a certain use scenario.</p> <p>How can you reframe your value proposition?</p>	Plurality, Change	Evening Breeze (Keskin, Diehl, and Molenaar 2013)
Alternative Too Strong	<p>Even though your product is more environmentally friendly than the product you aim to replace, customers see no value in using it and changing their behaviour.</p> <p>Can you identify an alternative target group who sees more value in it?</p>	Plurality	Yumii Interview

Funding			
Stakeholder lock-in	<p>Your funding has been granted with the restriction that you are not allowed to switch markets.</p> <p>If your product will not be able to take off in this market, what other demands can you fulfill?</p>	Scarcity, Plurality	Sustainable Dance Club (Keskin, Diehl, and Molenaar 2013)
More Money Less Time	<p>You have finally found your angel investor who loves your product. However, he aims to retire soon and requires you to provide return on his investment in 3 years rather than 5.</p> <p>How will you be able to manage this increase in revenue?</p>	Scarcity, Plurality	Evening Breeze (Keskin, Diehl, and Molenaar 2013)

Appendix D: Research protocol final concept evaluation

Rationale of the study

A final design has been developed in order to enable nascent entrepreneurs in the acknowledgement of tensions. This study examines whether that goal is achieved or not.

Study design

Within group experimental research design

Primary objective

Assess through qualitative evaluation whether participants indicate the learning of tension acknowledgement.

Expected results

Participants will experience tensions during the usage of the design.

Afterwards, entrepreneurs will be questioned on their learnings and potentially indicate the experience of tensions between sustainability and financial performance.

Analyzed criteria

What was their experience with the final design?

What have they learned?

What was the knowledge of this prior to participating? (retrospective)

Study population

Nascent entrepreneurs or early entrepreneurs in the domain of sustainability-oriented ventures. These can be student teams, or groups of people in the early stages of their venture. This is bounded by the stages of “sustainable problem recognition” and “sustainable solution recognition”

Sample size

10 participants.

Participants will join in their entrepreneurial team. This varies from one to four persons.

Estimate of the duration of the study

60 - 120 minutes

Questionnaire

Pre- and post-questionnaire will be used to evaluate whether behaviour change is a possibility. According to Fitzpatrick’s training evaluation model, reaction and learning will be evaluated to determine whether the training is successful. For reaction, a satisfaction questionnaire is used. For learning, the Entrepreneurial Self-Efficacy (ESE)

questionnaire is used. Furthermore, during the study various semi-structured questions will be posed in regards to the decision making process of the participants.

The ESE is influenced by the usage of pedagogical tools. An increase in the ESE score between pre- and post-experiment would indicate a learning has occurred (Nowiński et al. 2019). Though the sample size is too small for a statistical evaluation, an general increase in the ESE would indicate that participants had learned from the experiment. A qualitative evaluation after the experiment will highlight whether their education on tensions has been the cause of this.

Reaction (Customer satisfaction)

[1-5 + Open] How do you rate subject content?

[1-5 + Open] How do you rate the instructor?

[1-5 + Open] How do you rate the schedule?

[1-5 + Open] How would you rate the program as an educational experience to help you do your job better?

[Open] What topics were most beneficial?

[Open] What would have improved the program

Learning through entrepreneurial self-efficacy questionnaire:

Searching

How much confidence do you have in your ability to ... ?

- Brainstorm (come up with) a new idea for a product or service
- Identify the need for a new product or service
- Design a product or service that will satisfy customer needs and wants

Planning

How much confidence do you have in your ability to ... ?

- Estimate customer demand for a new product or service
- Determine a competitive price for a new product or service
- Estimate the amount of start-up funds and working capital necessary to start my business
- Design an effective marketing/advertising campaign for a new product or service

Marshaling

How much confidence do you have in your ability to ... ?

- Get others to identify with and believe in my vision and plans for a new business
- Network - i.e., make contact with and exchange information with others
- Clearly and concisely explain verbally/in writing my business idea in everyday terms

Implementing - people

How much confidence you have in your ability to ... ?

- Supervise employees
- Recruit and hire employees
- Delegate tasks and responsibilities to employees in my business
- Deal effectively with day-to-day problems and crises
- Inspire, encourage, and motivate my employees
- Train employees

Implementing - financial

How much confidence do you have in your ability to ... ?

- Organize and maintain the financial records of my business
- Manage the financial assets of my business
- Read and interpret financial statements

Attitude towards venturing

In general, starting a new business is...

- Worthless / worthwhile

- Disappointing / rewarding
- Negative / positive

Open questions (interview)

How did you experience the development of the various value propositions?

Confronting

Realistic scenarios

What were the difficulties you faced in this?

What kind of trade-offs did you make in the development of the value propositions?

Were you aware of the trade-offs between environmental and financial goals?

Do you have an idea on how this can be seen in other ways in your venture?

How would you manage these?