

# EXPLORING SUSTAINABLE BUSINESS MODELING PROCESSES AND TOOLKITS

A case study of two organizations co-designing a sustainable business model in an urban mobility context

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**Abstract**

Sustainable business models can help organizations gain long-term financial benefits and contribute positively to the environment and society. However, there is relatively little practice-based knowledge on how to design sustainable business models. This thesis explores different processes and toolkits to design a sustainable business model in theory and practice. The applicability of these processes and toolkits in practice are also discussed.

In the thesis, first, the literature on sustainable business modeling processes and toolkits is reviewed. Second, semi-structured interviews with business designers are conducted to identify the sustainable business modeling process in practice. Third, this process and selected toolkits are applied in the case project to evaluate their applicability.

This thesis indicates specific implementation gaps in processes and toolkits between theory and practice. Specifically, the findings highlight the reasons for the differences between the processes identified from the literature and the interviews, the challenges in designing a sustainable business model, and the applicability gaps of selected processes and toolkits in a case project. Organizations can reflect on the findings to form their design approaches in their business environments.

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**Keywords** sustainable business model design, toolkit, business designer, urban mobility

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# 1. Introduction

## 1.1. Background

Business model innovation or innovating new business models is a well-known topic among organizations. Gassmann et al. (2013) stated that competition in the future would happen between business models, in addition to products and technologies. Indeed, many companies with advanced technologies and excellent historical financial performance still risk losing their competitive advantages in a dynamic environment in the long term (Teece, 2010). Business model innovation is also vital in helping the environment and society become more sustainable (Sarasini & Linder, 2018). Sustainability topics are increasingly popular because of the growing awareness of issues that can negatively impact the environment and society (Chofreh et al., 2020). Organizations nowadays are also encouraged to fulfill new sustainability policies (Munoz-Torres et al., 2019).

In academic research, sustainable business models or business model innovation toward sustainability have been studied substantially (Goni et al., 2020). To be more sustainable, organizations must incorporate environmental, social, and economic views into creating, delivering, and capturing value (Shakeel et al., 2020). Innovation in the business model also enables organizations to align incentives and revenue logic to leverage sustainable solutions (Rashid et al., 2013). However, business model innovations often fail (Patel, 2015), making organizations hesitant to adopt sustainable solutions (Geissdoerfer et al., 2017 a,b).

This thesis focuses on the creation of sustainable business models in urban mobility from both theoretical and practical aspects. The motivation for initiating this thesis was two-folded. First, there is a rapidly developing research field around sustainable business modeling; however, there is relatively little practice-based knowledge on sustainable business models and how to design them. Specifically, the implementation of the business model innovation process is a research gap in sustainable business model innovation (Geissdoerfer et al., 2018). In other words, knowledge of how organizations should design or implement the process to innovate new sustainable business models is relatively limited. Second, a real-life case project was part of the thesis. The case project was based on an EU-funded research and innovation project. The case companies in the case project were interested in co-designing

sustainable business models. Moreover, urban mobility was the selected focus area in the case project.

## **1.2. Research objective**

The thesis explores sustainable business modeling processes and toolkits in theory and practice. I studied the literature of sustainable business model innovation and the practical knowledge from interviews and the case project.

In this thesis, the following research questions are investigated:

1. What are the characteristics of a sustainable business model in urban mobility?
2. What are typical processes and toolkits for designing a sustainable business model?
3. To what extent can the selected process and toolkits be applied to help case organizations co-design a sustainable business model?

The first research question introduces relevant aspects of sustainable business models in an urban mobility context, for example, definition, characteristics, and how to visualize a sustainable business model. These aspects help predict and analyze the case project's outcome. The second question describes the sustainable business modeling processes and toolkits identified from literature and expert interviews. Based on the findings, I selected the suitable process and toolkits to be applied in the real-life case project. The last question addresses the applicability, including benefits and limitations, of the selected process and toolkits in the case project.

## **1.3. Case project background**

The real-life case project, which was a foundation for the empirical part of the thesis, was based on the EU-funded research and innovation project Sustainable energy Positive & zero cARbon CommunitieS (SPARCS). SPARCS is an EU-funded project that supports seven European cities to overcome challenges on their path to sustainability. The cities are Espoo, Leipzig, Reykjavik, Maia, Kladno, Lviv, Kifissia (SPARCS' website). This thesis took place in Espoo lighthouse city and was based on SPARCS task 3.8 on Smart Business Models.

SPARCS's objective is to demonstrate and validate innovative solutions for smart and integrated energy systems that will transform these cities into sustainable, zero-carbon



ecosystems with improved quality of life for their citizens (SPARCS' website). An essential part of the work is co-creating business models with diverse stakeholders, supporting transformation towards energy-positive behavior and sustainable mobility in the smart city context. Sustainable mobility and electric vehicles have been selected as one of the focus areas of the development work in Espoo lighthouse city, which this thesis is also based on.

Two companies, A and B, were involved in the case project. Company A is one of the private-sector partners in SPARCS, working towards the objectives of sustainable transformations in a smart city context. Company A provided the thesis topic, stipendium funding and guided the work along the way. Company B collaborated with SPARCS and conducted a pilot focusing on sustainable mobility with Company A during the thesis period.

Company A is a global manufacturing company. The company has core businesses in developing, selling, and maintaining elevators and escalators in buildings worldwide. Company A also collects equipment-related data to optimize urban flow inside the building. Company A has a robust sustainability approach implemented in its strategy and business tactics.

Company B is a mobility data startup based in Finland. The company develops a platform that tracks individual mobility behaviors and visualizes them in various ways. Notably, company B's technology can recognize all transport modes used and calculate carbon emissions produced. In addition, company B's platform can show individual users' routes and their transportation choices.

Before the case project, companies A and B had already collaborated on a pilot project. The aim of that pilot project was for company A to study the usage of company B's products in the SPARCS context. The case project in this thesis was an ongoing project after the pilot project and focused on potential business collaboration. Participants from both companies were familiar with each other and the case project background.

There were three expected outcomes for the case project. The first outcome was a high-level concept of a sustainable business model that companies A and B can co-offer in an urban mobility setting. Both companies, A and B, intended to explore the possibilities rather than look for something concrete they could implement at this stage. The second outcome was identifying company A's possible roles in an urban mobility ecosystem. Within these roles, company A could utilize mobility data to strengthen its core business or explore possibilities to generate new

revenue streams. The third outcome was the process and toolkits, which company A could apply in other similar projects. Company A wanted to build up its knowledge about sustainable business modeling through this thesis and produce knowledge for the SPARCS project. The case project background is summarized in Table 1.

Table 1. Summary of case project background

<b>Organization involved</b>	<b>Organization description</b>	<b>Project expected outcome</b>
SPARCS	EU-funded research & innovation project that supports seven European cities to overcome challenges on their path to sustainability	<ol style="list-style-type: none"> <li>1. Design a high-level concept of a sustainable business model</li> <li>2. Identify company A's possible roles in an urban mobility ecosystem</li> <li>3. Help company A build up and share knowledge about sustainable business modeling</li> </ol>
Company A	Global leader in elevator and escalator businesses, partner in SPARCS	
Company B	Mobility data startup, collaborator with company A and SPARCS	

#### 1.4. Structure of the thesis

This thesis has seven chapters. Chapter 2 reviews the literature for this thesis, which starts by presenting relevant aspects of sustainable business models. Then, some sustainable business modeling processes and toolkits are introduced. This chapter ends with the theoretical framework of the thesis.

Chapter 3 presents and justifies the research approach and methods. Detailed data collection and analysis activities are described. Then, the reliability and validity of the research method are discussed.

Chapter 4 summarizes findings from interviews on the processes and toolkits to design a sustainable business model. The findings are categorized into four areas, including business design project, design process, toolkit, and sustainability.

Chapter 5 illustrates the findings from workshops. Workshop results and relevant documents are presented and analyzed to evaluate the applicability of the selected sustainable business modeling process and toolkits.

Chapter 6 compares and discusses the processes and toolkits that help organizations co-design sustainable business models. In addition, relevant factors regarding the case project outcome are reflected.

Chapter 7 concludes the thesis with its main findings and contributions from practical and theoretical views. Moreover, the limitations of this thesis and further research areas are suggested.

## 2. Theoretical background

### 2.1. Sustainable business models

#### 2.1.1. Business model definitions

Business models fundamentally address strategic questions about the market, the value propositions, the customers, how to serve the customers, how to make a profit, and what technology to use (Magretta, 2002). However, business model definitions can be perceived and communicated differently depending on the context. For instance, from a focal organizational perspective, a business model can be a bridge between strategy and implementation (Baden-Fuller & Morgan, 2010), a toolkit to commercialize new technologies (Chesbrough, 2010), or a template for implementing strategic initiatives (Zott & Amit, 2010). From an ecosystem perspective, an organization's business model can be seen as an intermediary between different organizations that shape the innovation networks (Doganova & Eyquem-Renault, 2009). One approach to structurally defining and describing a business model is through its level of abstraction to reality. Massa and Tucci (2013) illustrated the abstraction level of a business model in Figure 1.

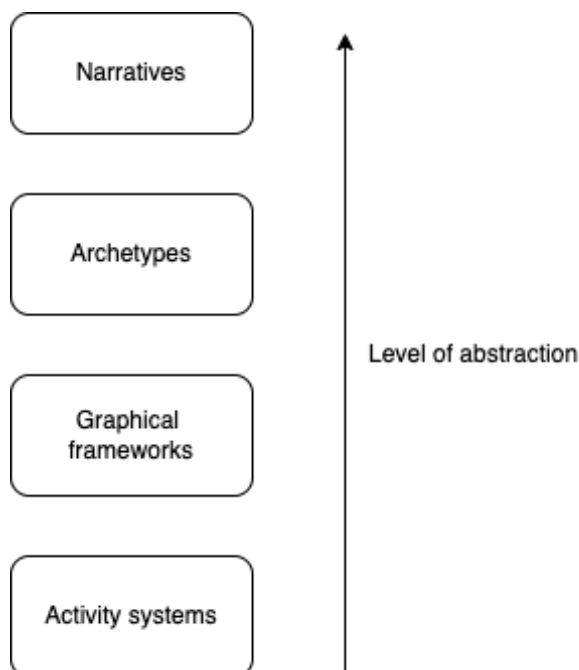


Figure 1. Business models at different levels of abstractions

From the top, a business model can be communicated as a narrative (Magretta, 2002). Narratives include stories and verbal descriptions that describe current realities and stimulate a preferred future of a business model (Osterwalder, 2004; Chatterjee, 2013), which motivates stakeholders to develop an existing or a new venture (Perkmann & Spicer, 2010). On a lower level of abstraction, business model archetypes are recognized patterns of business models in multiple companies. These patterns are often the role models which many companies can follow or imitate (Baden-Fuller & Morgan, 2010).

The need for graphical frameworks arises from the challenge of communicating the impacts of changes in one part of a business model on the entire model (Massa & Tucci, 2013). While narratives and archetypes are generic descriptions, a graphical framework provides a more systematic view of multiple components within a business model. A well-known graphical framework is the Business Model Canvas, with nine critical building blocks developed by Osterwalder and Pigneur (2010). These building blocks are customer segments, value propositions, channels, customer relationships, key activities, key resources, key partnerships, cost structure, and revenue streams.

Nearest to reality, a business model is an activity system or a system of interdependent activities. Zott and Amit (2010) introduced design elements and design themes to help conceptualize an activity system that represents a business model. In detail, design elements describe an infrastructural logic of a business model, including selected activities (content), a sequence between them (structure), and choices of who performs them (governance) in the system. These design elements can be organized within different design themes, including content, structure, and governance. For example, if the design theme is efficiency, organizations will organize the content, structure, and governance to maximize efficiency. Zott and Amit (2010) provided other examples of design themes as a novelty (innovate all design elements), complementarities (combine activities within the system to create more value than separated activities), and lock-in (keep third parties actively participating in the network).

### 2.1.2. Conventional versus sustainable business models

Conventional and sustainable business models have specific differences. Even though the boundary is not apparent, one way to compare these models is to examine their definitions as a narrative and a graphical framework.

In the form of a narrative, a sustainable business model is an expansion of a conventional business model, which primarily focuses on the financial returns of a business. Sustainable business models need to incorporate additional sustainable value, proactive

multi-stakeholder management, a long-term perspective, and solutions for sustainability (Geissdoerfer et al., 2018), as illustrated in Figure 2. Notably, sustainable value includes measurable ecological or social value together with economic value, which goes beyond the conventional product and service (Boons & Lüdeke-Freund, 2013). Therefore, sustainable business models can help organizations gain economic value like conventional business models and contribute positively to the environment and society (Boons & Lüdeke-Freund, 2013).

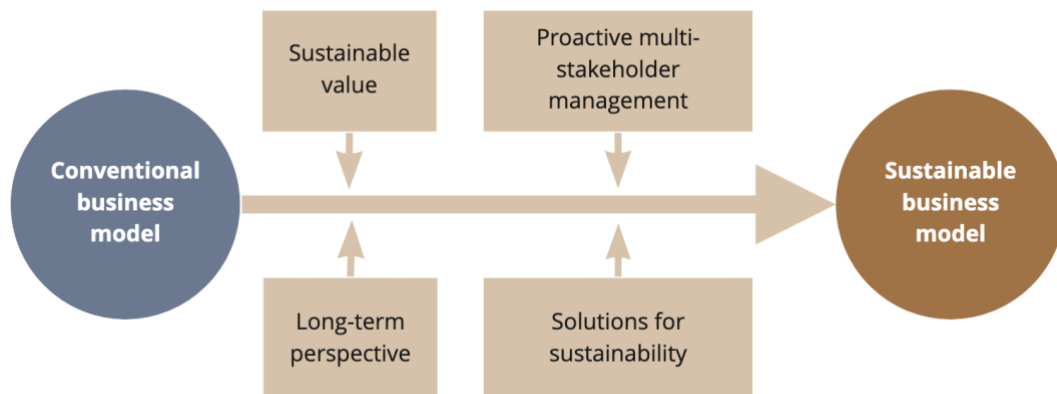


Figure 2. Conventional versus sustainable business model

In more detail, the optimal approach to developing sustainable value propositions combines economic value with environmental and social value (Bocken et al., 2015). Chou et al. (2015) also suggested that sustainability should be an integrated part of a company's value propositions. In addition, organizations aiming at sustainable business models must engage and collaborate with multiple stakeholders in value creation and delivery activities. Jonker and Faber (2019) noticed that these sustainable organizations are moving from an organization-centric supply-chain approach to organized value cycles and from a single-actor perspective to multiple actors' needs.

Performance evaluation in conventional business models is often based on profit and economic value. On the other hand, sustainable business models are evaluated with the triple bottom line approach, including three dimensions: people, planet, and profit (Bansal, 2005). Schaltegger and Wagner (2011) pointed out that these three dimensions are equally crucial to the success of the sustainable business model.

In the form of a graphical framework, a sustainable business model has some additional components. Bocken et al. (2015) created a framework to conceptualize sustainable

business models, which is illustrated in Table 2. The components in this framework are categorized into three areas: value proposition, value creation and delivery, and value capture. First, the value proposition helps identify the core offering, customer segments, and value for customers, society, and the environment. Second, value creation and delivery describe how the business provides value to relevant stakeholders via activities, resources, distribution channels, partners, suppliers, and technologies. Third, value capture shows different types of value the company can capture in both short-term and long-term and how to capture the value.

Table 2. Conceptual sustainable business model framework

<b>Value proposition</b>	<b>Value creation and delivery</b>	<b>Value capture</b>
<ul style="list-style-type: none"> <li>• Product or service</li> <li>• Customer segment and relationship</li> <li>• Value for customer, environment, and society</li> </ul>	<ul style="list-style-type: none"> <li>• Activities</li> <li>• Resources</li> <li>• Distribution channels</li> <li>• Partners and suppliers</li> <li>• Technology and product features</li> </ul>	<ul style="list-style-type: none"> <li>• Cost structure and revenue streams</li> <li>• Value for key actors including environment and society</li> <li>• Growth strategy and ethos</li> </ul>
Question: what value is provided and to whom?	Question: how is value provided?	Question: how does the company make money and capture other forms of value?

A well-known framework for conventional business models is the Business Model Canvas, including nine components introduced by Osterwalder and Pigneur (2010). These components are customer segments, value propositions, channels, customer relationships, key activities, key resources, key partnerships, cost structure, and revenue streams. Compared to the Business Model Canvas, the sustainable business model framework (Bocken et al., 2015) explicitly acknowledges the environment and society as primary stakeholders. As a result, a sustainable business model considers value created and value captured to these stakeholders, while the Business Model Canvas primarily focuses on the customer. In addition, the framework by Bocken et al. (2015) introduces a new component, growth strategy and ethos, which represents the long-term perspective of a sustainable business model (Geissdoerfer et al., 2018).

### 2.1.3. Characteristics of sustainable business models

The characteristics of a sustainable business model can be described in two forms of abstraction: archetypes and activity systems.

Sustainable business model archetypes are recognized patterns of sustainable business models in multiple companies. Bocken et al. (2014) analyzed various companies to generate these archetypes, summarized in Figure 3. The high-level groupings of the archetypes are the three business model innovation types, including technological, social, and organizational-oriented innovations. These innovation types are defined by Boons and Lüdeke-Freund (2013).

The first type is technological innovation, in which organizations attempt to commercialize (new) technologies that can succeed in given and new markets. Sustainable businesses of this type often try to maximize materials and energy efficiency, create value from waste, or substitute with renewables and natural processes. For example, to maximize materials and energy efficiency, organizations often apply lean manufacturing, reduce materials for product packaging, and increase functionality in one product to reduce the number of products produced. Organizations can create value from waste by adopting the circular economy model to reuse, recycle materials, or enable shared ownership and collaborative consumption with their customers. Lastly, organizations can substitute renewable resources, such as solar and wind power and green chemistry, for their production.

The second type is social innovation, in which organizations create and further develop innovations with social purposes. These organizations will aim to deliver functionality rather than ownership, adopt a stewardship role, or encourage sufficiency. For example, organizations such as car-sharing companies apply a pay-per-use or shared model to deliver functionality rather than ownership. Organizations can also adopt a stewardship role by promoting well-being for customer care, following fair trade, and being transparent about environmental and social impacts. In addition, organizations can encourage sufficiency by producing slow fashion or premium products to extend product longevity. However, it is not accurate to conclude that fast-fashion brands are entirely unsustainable in all dimensions, including economic, social, and environmental.

The third type is organizational innovation, where organizations implement strategic initiatives to shape their culture, structure, and processes, thus changing their way of doing business toward sustainable development. These strategic initiatives can be about repurposing for society and the environment or developing scale-up solutions. For



example, organizations' business models can be franchising, not-for-profit, social enterprises, or open innovation platforms. Another common initiative nowadays is home-based or flexible working due to the pandemic.

These archetypes also provide a common language for organizations to develop new sustainable business models. Organizations can use a combination of business model archetypes to draw inspiration when exploring new opportunities or ways to create and deliver sustainable value (Bocken et al., 2014).

Groupings	Technological			Social			Organisational	
	Maximise material and energy efficiency	Create value from waste	Substitute with renewables and natural processes	Deliver functionality rather than ownership	Adopt a stewardship role	Encourage sufficiency	Repurpose for society/environment	Develop scale up solutions
Examples	Low carbon manufacturing/ solutions	Circular economy, closed loop	Move from non-renewable to renewable energy sources	Product-oriented PSS - maintenance, extended warranty	Biodiversity protection	Consumer Education (models); communication and awareness	Not for profit	Collaborative approaches (sourcing, production, lobbying)
	Lean manufacturing	Cradle-2-Cradle	Solar and wind-power based energy innovations	Use oriented PSS- Rental, lease, shared	Consumer care - promote consumer health and well-being	Demand management (including cap & trade)	Hybrid businesses, Social enterprise (for profit)	Incubators and Entrepreneur support models
Additive manufacturing	Reuse, recycle, re-manufacture	Zero emissions initiative	Result-oriented PSS- Pay per use	Ethical trade (fair trade)	Slow fashion	Alternative ownership: cooperative, mutual, (farmers) collectives	Licensing, Franchising	
De-materialisation (of products/ packaging)	Take back management	Blue Economy	Private Finance Initiative (PFI)	Choice editing by retailers	Product longevity	Social and biodiversity regeneration initiatives ('net positive')	Open innovation (platforms)	
Increased functionality (to reduce total number of products required)	Use excess capacity	Biomimicry	Design, Build, Finance, Operate (DBFO)	Radical transparency about environmental/ societal impacts	Premium branding/ limited availability	Base of pyramid solutions	Crowd sourcing/ funding	
	Sharing assets (shared ownership and collaborative consumption)	The Natural Step	Chemical Management Services (CMS)	Resource stewardship	Frugal business	Localisation	"Patient / slow capital" collaborations	
	Extended producer responsibility	Green chemistry			Responsible product distribution/ promotion	Home based, flexible working		

Figure 3. Sustainable business model archetypes

Different archetypes may have different activity systems. Based on the abstraction level of a business model (Massa & Tucci, 2013), an activity system can be defined simply as a set of concrete activities that represent the organization's business model.

Souza et al. (2019) collected the activities that organizations with sustainable business models often implement from many studies, illustrated in Table 3. These characteristics are categorized within the sustainable business model framework created by Bocken et al. (2015).

Table 3. Characteristics of sustainable business model

<p><b>Value proposition</b></p>	<ul style="list-style-type: none"> <li>• Provide measurable ecological or social value with economic value</li> <li>• Help describe, analyze, manage, and communicate a sustainable value proposition to all customers and other stakeholders</li> <li>• Deliver services and functionality rather than ownership</li> <li>• Reflect the triple bottom line approach</li> <li>• Adopt sustainability strategies in participation with diverse local groups, thus providing better opportunities for creating innovative solutions</li> </ul>
<p><b>Value creation and delivery</b></p>	<ul style="list-style-type: none"> <li>• Encourage customers and other stakeholders to take responsibility for their consumption practices</li> <li>• Utilize and manage efficiently resources (e.g., human, financial, and raw materials) to increase profitability</li> <li>• Demand all stakeholders respond to societal needs</li> <li>• Involve learning and development of capabilities to better collaborate with stakeholders</li> <li>• Require suppliers to adapt, engage, and get actively involved in developing sustainable supply chain</li> <li>• Ensure social involvement through supplier accreditation programs, community development, and so on</li> <li>• Organize relationships with customers around a shared recognition of challenges in sustainability at various stages of market development</li> <li>• Focus on technological innovation, consumption reduction, prioritization of renewable resources, and closed-loop systems</li> <li>• Avoid harmful and irreversible changes to the environment</li> </ul>
<p><b>Value capture</b></p>	<ul style="list-style-type: none"> <li>• Capture economic value while maintaining or regenerating social, environmental, and economic capital beyond the firm</li> <li>• Enhance the role played by the government at all levels, including incentive mechanisms and exemptions</li> <li>• Reflect an appropriate distribution of costs and benefits as well as social and environmental impacts generated by firms</li> <li>• Use the triple bottom line approach to measure business performance</li> </ul>

#### 2.1.4. Sustainable business model in urban mobility

Urban mobility is a broad context in which many businesses and potentially sustainable business models exist. Instead of providing examples of the models in this section, I introduce the archetypes or recognized patterns in sustainable business models in urban mobility developed by Souza et al. (2019). These archetypes are described in Table 4.

Souza and other researchers (2019) studied the intersection of sustainable urban mobility and business model literature, then summarized the archetypes in Table 4. Precisely, the sustainable business model archetypes in general (Bocken et al., 2014) and urban mobility (Souza et al., 2019) were presented side-by-side. For example, in the technological innovation group (Boons & Lüdeke-Freund, 2013), maximizing material and energy efficiency will be translated into favoring the use of clean energy in an urban mobility context. Based on that logic, creating value from waste becomes maximizing the use of transport resources and capabilities, and substituting with renewable and natural processes turns into encouraging substitution using sustainable modes. In the social innovation group (Boons & Lüdeke-Freund, 2013), archetypes about delivering functionality rather than ownership become offering service orientation and functionality; adopting a stewardship role develop into articulating initiatives that address the needs of a wide range of stakeholders in transport systems; encouraging sufficiency. In the organizational innovation group (Boons & Lüdeke-Freund, 2013), repurposing for society and environment becomes extending benefits to society and environment in a systemic perspective, and developing scale-up solutions will be developing scale-up mobility solutions.

Table 4. Archetypes of sustainable business model in urban mobility

<b>Sustainable business model archetypes (Bocken et al., 2014)</b>	<b>Sustainable business model archetypes in urban mobility (Souza et al., 2019)</b>
Maximize material and energy efficiency	Favor the use of clean energy
Create value from waste	Maximize the use of transport resources and capabilities
Substitute with renewable and natural process	Encourage substitution using sustainable modes
Deliver functionality rather than ownership	Offer service orientation and functionality

Adopt a stewardship role	Articulate initiatives that address the needs of a wide range of stakeholders in transport systems
Encourage sufficiency	Reduce travel demands
Repurpose for society / environment	Extend benefits to society and environment in a systemic perspective
Develop scale-up solutions	Develop scale-up mobility solutions

### 2.1.5. Impact of sustainable business models

Even though sustainable business models aim to contribute positively to the environment and society, these models could carry unintended negative impacts. Notably, new carbon footprints are generated to produce solutions for sustainability, such as solar panels (Bocken et al., 2019). In addition, closing resource loops or delivering functionality, not ownership may lead to increased materials and products used, resulting in more carbon footprints (Bocken et al., 2019). Also, scaling-up solutions may go against sustainability purposes and increase product usage due to wider accessibility (Bocken et al., 2019). In Table 5, Bocken et al. (2019) summarized the potential positive and negative impacts of sustainable business models from previous studies, especially by Lüdeke-Freund et al. (2017), Bocken et al. (2013), and Ritala et al. (2018).

Table 5. Sustainable business model archetypes and impacts

<b>Archetypes</b>	<b>Typical positive impacts</b>	<b>Potential negative impacts</b>
Maximize materials & energy efficiency	<ul style="list-style-type: none"> <li>• Enhance efficiency and improve resource use</li> <li>• Cost savings</li> </ul>	<ul style="list-style-type: none"> <li>• Generate incremental change only</li> <li>• Lead to rebound effects</li> <li>• Lead to job losses</li> </ul>
Closing resource loops	<ul style="list-style-type: none"> <li>• Reduces waste</li> <li>• Turns waste into value/new business lines</li> <li>• Generate new revenue streams</li> </ul>	<ul style="list-style-type: none"> <li>• Lead to quicker sales cycles and more material use</li> <li>• Sustain waste streams because waste equals value</li> </ul>

Substitute with renewables & natural processes	<ul style="list-style-type: none"> <li>• Reduces use of finite resources, waste, and pollution</li> <li>• Supports long-term energy supply</li> <li>• Contributes to green economy</li> </ul>	<ul style="list-style-type: none"> <li>• Increase footprint of production (e.g., solar panels)</li> <li>• Lack of recyclability consideration of (solar based) products</li> </ul>
Deliver functionality, not ownership	<ul style="list-style-type: none"> <li>• Can encourage the right behaviors with manufacturers and users</li> <li>• Can reduce the need for physical good</li> </ul>	<ul style="list-style-type: none"> <li>• More product/service usage</li> <li>• If not combined with efficiency improvements, it may have negligible environmental impact improvement</li> </ul>
Adopt a stewardship role	<ul style="list-style-type: none"> <li>• Ensuring long-term wellbeing of planet (e.g., forests) and society (e.g., Health)</li> <li>• Ensuring long-term viability of the value network</li> </ul>	<ul style="list-style-type: none"> <li>• More product/service usage</li> <li>• If not combined with efficiency improvements, it may have negligible environmental impact improvement</li> </ul>
Encourage sufficiency	<ul style="list-style-type: none"> <li>• Actively reduce consumption</li> <li>• Encouraging community sufficiency, sustainable living</li> <li>• Long-term customer loyalty, and new repair and service markets</li> </ul>	<ul style="list-style-type: none"> <li>• Potential price premium for consumers</li> <li>• Remaining niche because it goes against growth principles</li> </ul>
Repurpose for society / environment	<ul style="list-style-type: none"> <li>• Deliver positive societal (e.g., community development) value</li> <li>• Deliver positive environmental (e.g., afforestation) value</li> <li>• Prepare for a resource capacity for long-term business sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Potential to remain niche without policy changes</li> <li>• Potential to remain niche within current capitalist framework</li> </ul>

Inclusive value creation	<ul style="list-style-type: none"> <li>• Sharing resources, skills and knowledge and distribute wealth</li> <li>• Leverage resources and talents</li> <li>• Create new business opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• If not combined with efficiency improvements, it may lead to limited environmental improvement</li> <li>• May induce more product/service use due to wider accessibility</li> </ul>
Develop sustainable scale up solutions	<ul style="list-style-type: none"> <li>• Achieve scale from small sustainability pilot or start-up to largescale project or business</li> <li>• Create industry-wide change for sustainability</li> <li>• Create breakthrough innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Focus on scale might detract from sustainability purposes</li> <li>• Risk of unproven radical innovation</li> </ul>

## 2.2. Sustainable business model design

### 2.2.1. Unified perspective for creation of sustainable business models

Evans et al. (2017) introduced five unified perspectives for creating sustainable business models. These perspectives aim to provide organizations with an understanding of how to innovate business models toward sustainability and assess the impact of sustainability innovation on the business models and business networks (Evans et al., 2017). The five unified perspectives are described below.

First, sustainable value incorporates economic, social, and environmental benefits conceptualized as value forms (Evans et al., 2017). In other words, a sustainable business model needs to provide and capture these three forms of value. Economic value is the typical driver in most business models. Economic value includes profit, revenue, return on investment, long-term viability, and business stability. Social value can take different forms, such as equality, diversity, well-being, community development, labor standard, health, and safety. Environmental value mainly includes renewable resources, low emissions, low waste, biodiversity, and pollution prevention.

Second, sustainable business models require a system of sustainable value flows among stakeholders, including the natural environment and society, as primary stakeholders (Evans et al., 2017). In short, sustainable business models consider the environment and society as primary stakeholders, and their interests and customers' interests need to be aligned. Bocken et al. (2015) also highlighted this perspective in the conceptual sustainable business models framework in which environment and society are mentioned in value proposition and value capture. From an organization's view, society can be its employees or communities impacted by the organization.

Third, sustainable business models require a value network with a new purpose, design, and governance (Evans et al., 2017). In other words, governance mechanisms between the focal firm and its value network must be carefully considered when designing a new sustainable business model. Also, rethinking the firm's role in its value network can enable the firm to integrate sustainability into its business model (Evans et al., 2017). In this context, Provan and Kenis (2007) defined a network as a group of three or more connected organizations that aim to achieve common and individual goals. A value network is a network in which organizations interact and exchange value, in tangible and intangible formats, to achieve the network's goals (Allee, 2008).

Fourth, sustainable business models require a systemic consideration of stakeholder interests and responsibilities for mutual value creation (Evans et al., 2017). Specifically, the duties and capabilities of primary stakeholders in a value network are as essential as their interests in making the network sustainable. Moreover, the interests and responsibilities of each stakeholder need to be aligned with other system members. This alignment is more relevant nowadays as firms have no choice but to engage with other firms, and the challenge now is how to engage effectively (Jeffery, 2009).

Fifth, internalizing externalities through product-service systems enables innovation toward sustainable business models (Evans et al., 2017). A product-service system combines tangible and intangible services that jointly provide greater customer value (Tukker, 2015). A simpler way to explain this unified perspective is that innovations could emerge when integrating external factors, such as environmental impacts, the end-of-life phases of products, and social implications, into creating products and services. For example, adverse environmental effects can be reduced when internalizing the impacts or making the business accountable for the consequences with economic instruments like taxes and permits (Bithas, 2011). Evans et al. (2017) argued that existing organizations should transform their offerings into product-service systems when developing sustainable business models.

## 2.2.2. Sustainable business modeling process

The unified perspective provides general guidelines for creating a sustainable business model. However, organizations and practitioners need a step-by-step process to design a sustainable business model. Rana et al. (2017) introduced one of the sustainable business modeling processes illustrated in Figure 4. This process contains five iterative steps, including (1) setting the scene, (2) value mapping, (3) idea generation, (4) business models or solutions selection, and (5) configure and coordinate. The process follows a network-centric approach and introduces three sustainability dimensions, including environmental, social, and economic, to the shared value creation between primary stakeholders (Rana et al., 2017).

There are other processes to design sustainable business models. Indeed, Lüdeke-Freund et al. (2022) wrote a book that introduces 45 approaches to designing sustainable business models. However, I decided to review the process proposed by Rana et al. (2017) because this process covers from the beginning to end of a business design project.

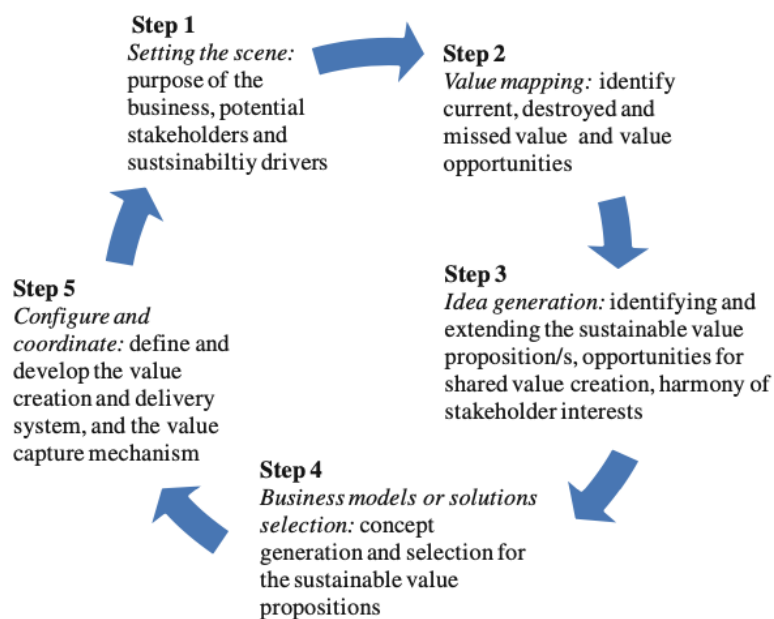


Figure 4. Sustainable business modeling process in literature

In step 1-setting the scene, organizations begin with understanding the context from both the focal organization and the value network (Rana et al., 2017). The focal organization's purpose, value, and business model should be clearly communicated as a starting point. Then, the network and its members' potential value and capabilities are identified, and



the current and future positions of the organization in the network are discussed. Lastly, sustainability drivers for the business modeling process are defined.

In step 2-value mapping, organizations continuously explore and identify their shared value with other primary stakeholders in the value network. This value can be in four forms, which are current, destroyed, missed, and opportunity. Bocken et al. (2015) described these forms of value as follows. The current value represents the value the organization captured from each primary stakeholder in the network. The destroyed value is the negative value the organization has on other members as an outcome of the current business model. The missed value shows the lost or inadequately captured value between the focal organization and its network. Lastly, the value opportunities are potential value created and captured through new activities and relationships within the network.

In step 3-idea generation, organizations ideate sustainable value propositions and value opportunities that can be developed in harmony with other stakeholders' interests in the network. Specifically, organizations analyze their relationships and value exchange with multiple stakeholders in all three sustainability aspects, including social, economic, and environmental. Based on the analysis, organizations can attempt to eliminate negative value or environmental and social impacts, such as waste, carbon emissions, and forced labor, across the network. In addition, organizations can solve the conflicts in interests between stakeholders to foster innovations and sustainable value co-creation within the network.

In step 4-business models and solutions selection, organizations evaluate and select the potential business models and solutions for the subsequent development activities among the ideated concepts. Especially, ideated concepts that address sustainability problems should be prioritized. This step aims to identify a model that enables organizations to capture new value opportunities, minimize negative value, and simultaneously maximize positive value within the network.

Step 5-configure and coordinate is a continuous activity of these previous steps. In this step, organizations further develop the details on how they can create, deliver, and capture sustainable value from the selected business models and solutions. Examples of the outcomes of this step can be the key activities, channels, resources, cost structures, and revenue logic. With more details, organizations can also have more accurate assessments of the selected business models and solutions for sustainability.

### 2.2.3. Integration of a business model into an actor network

An organization aiming to develop a sustainable business model must align its interests with other stakeholders' interests in a network (Evans et al., 2017). In other words, an existing organization needs to figure out how to integrate its business models into an actor network with multiple other business models. It is a requirement and a challenge for organizations during the sustainable business modeling process. Storbacka et al. (2012) provided three recommendations to help organizations introduce their business models into an actor network.

First, organizations should re-configure their current business models to increase resource density in an actor network, thus increasing the value created by the network (Storbacka et al., 2012). There are four common types of re-configurations, including relinking, repartitioning, relocating, and reactivating (Santos et al., 2009). For example, relinking can be about changing the governance, the link between units, or the sequence of activities in an organization, while repartitioning is about moving activities toward insourcing or outsourcing. Relocating involves location changes, such as moving a factory to a new country, and reactivating is about adding and removing an activity or a relationship. The objective of the re-configuration should be to achieve the fit between business model elements and practices inside a focal organization and among multiple organizations.

Second, organizations should identify and recognize the practices of how other actors interact and collaborate within the network (Storbacka et al., 2012). These practices are often dynamic and evolve as new actors and activities are introduced to the network. Ultimately, all actors should share a common language to describe the network's markets, value exchanges, and collaborative activities.

Third, organizations should aim to understand dynamic changes in an actor network and re-configure their business models accordingly at a meso level, which is between the macro and micro levels (Storbacka et al., 2012). Re-configuration of a business model at the meso level involves three phases: origination, mobilization, and stabilization (Storbacka et al., 2012). In the origination phase, a focal organization introduces new elements, such as resources, capabilities, and value propositions, to the current business model. Then, mobilization refers to a change management process. Specifically, the focal actor needs to prove the value of its new elements and influence other actors in the network to adapt to the changes. Stabilization is a phase where new practices in value exchanges and collaboration activities become a common logic.

#### 2.2.4. Business case for sustainability

Maximizing revenues and minimizing costs have been the dominant logic in doing business. Indeed, profit enables organizations to achieve sustainable outcomes (Stubbs and Cocklin, 2008). In addition, it is essential for management teams to understand the rationale of sustainability in innovation (Schaltegger and Hörisch, 2017). When organizations want to be profitable and sustainable, they need to specify the relationship between these variables (Lankoski and Smith, 2017). In other words, organizations need to build a business case for sustainability. Making a business case for sustainability means describing how organizations could profit from increasing environmental and societal impacts rather than simply growing costs (Rana et al., 2017b).

To support building a business case, organizations should understand the drivers for sustainability and how to measure sustainable impacts. Regarding sustainability drivers, Schaltegger et al. (2011, 2012) claimed that sustainability innovation drivers are similar to those in a conventional business model. Typical drivers are cost reduction, sales increase, risk reduction, brand value, attractiveness as employers, and innovative capabilities. Regarding sustainability measurements, Aagaard (2019) argued that it is challenging to evaluate how sustainable a business model is. Research about business models also often neglected the dynamic perspective to understand how a business model evolves (Pereira Da Costa and Levie, 2014). In practice, Lüdeke-Freund (2010) indicated that the main barrier when building a business case for sustainability is to align the benefits of the company and its customers with the positive impact on the environment and society.

### 2.3. Toolkit for sustainable business modeling

The criteria for selecting the toolkits for review are described as follows. First, the toolkits must be research-based or described in sustainable business model literature. Second, the outcomes of the toolkits should align with the most unified perspective for creating sustainable business models defined by Evans et al. (2017). Third, there is a possibility that these toolkits can be used for the case project in this thesis.

### 2.3.1. Value mapping canvas

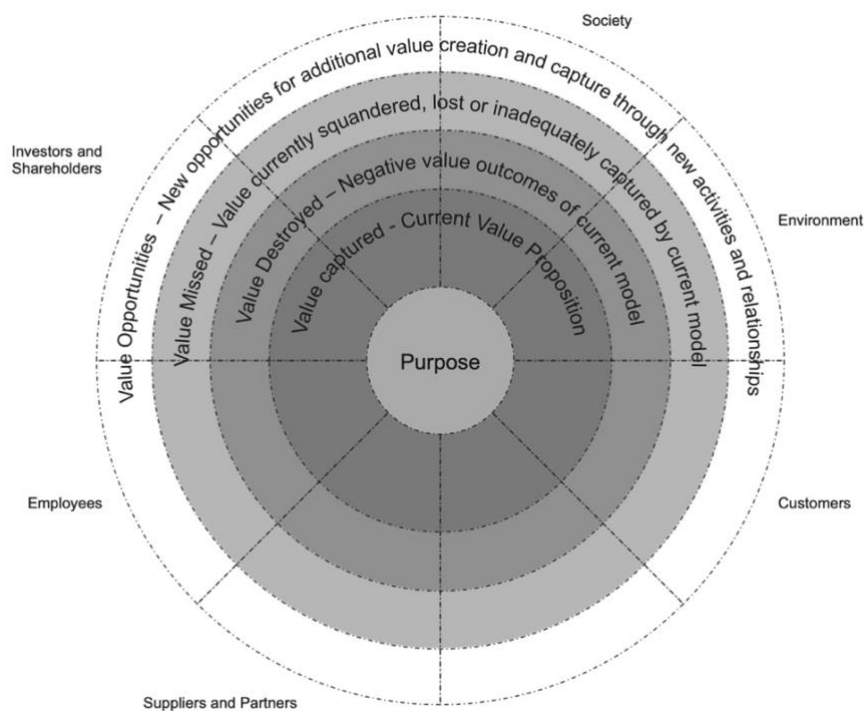


Figure 5. Value mapping tool

The value mapping tool, illustrated in Figure 5, provides a systemic approach to generating new business model ideas for sustainability by taking a multi-stakeholder perspective and considering various forms of value creation (Bocken et al., 2015). The tool aims to support organizations in rethinking their existing business models and designing new sustainable ones. By using the value mapping tool, organizations can (1) define positive and negative aspects of value within a network of primary stakeholders, (2) recognize conflicting interests among stakeholders in a network, and (3) identify opportunities for a sustainable business model redesign (Bocken et al., 2015).

In detail, the tool considers four types of value, including value captured, value destroyed, value missed, and new value opportunities (Bocken et al., 2015). Value captured represents the current value propositions or the positive benefits that the organization provides to its stakeholders. Value destroyed is the adverse outcome of the current business model to stakeholders, particularly the environment and society. Value missed describes the possible value that the organization fails to capitalize on entirely or only captures part of its full potential. Value opportunities are a new value that can be

created and captured, which is also the foundation of solutions to social and environmental problems (Bocken et al., 2015).

### 2.3.2. Triple-layered business model canvas

Triple-Layered Business Model Canvas (TLBMC) is a tool to support the creative exploration of sustainable business models and sustainability-oriented innovation (Joyce & Paquin, 2016). The TLBMC, shown in Figure 6, consists of three canvases: economic business model canvas, environmental life cycle business model canvas, and social stakeholder business model canvas. The economic business model canvas is the well-known Business Model Canvas developed by Osterwalder and Pigneur (2010). Despite its popularity, Business Model Canvas has significant limitations when it is used to design sustainable business models. Specifically, the value proposition in this canvas focuses on only the customers and leaves out the value toward society and environment. As a result, TLBMC complements the Business Model Canvas with two canvases regarding business models' environmental and social aspects.

Two additional canvases, like the Business Model Canvas, also consist of nine elements. The environmental life cycle business model canvas considers the use phase, end-of-life, distribution, functional value, production, materials, supplies and outsourcing, environmental impacts, and environmental benefits. The social stakeholder business model canvas contains elements, including end-user, societal culture, scale of outreach, social value, governance, employees, local communities, social impacts, and social benefits.

According to Joyce and Paquin (2016), TLBMC supports users creatively exploring sustainability-oriented business model innovation in at least three ways. First, the canvas provides users with a visual representation of an organization's business model. Second, the canvas can be a creative tool by which users can change each canvas element and explore the results through the impacts of such change within and across the canvas layers. Third, the canvas can be a validation tool that helps users balance the costs and benefits of the business model idea more holistically with economic, environmental, and social perspectives.

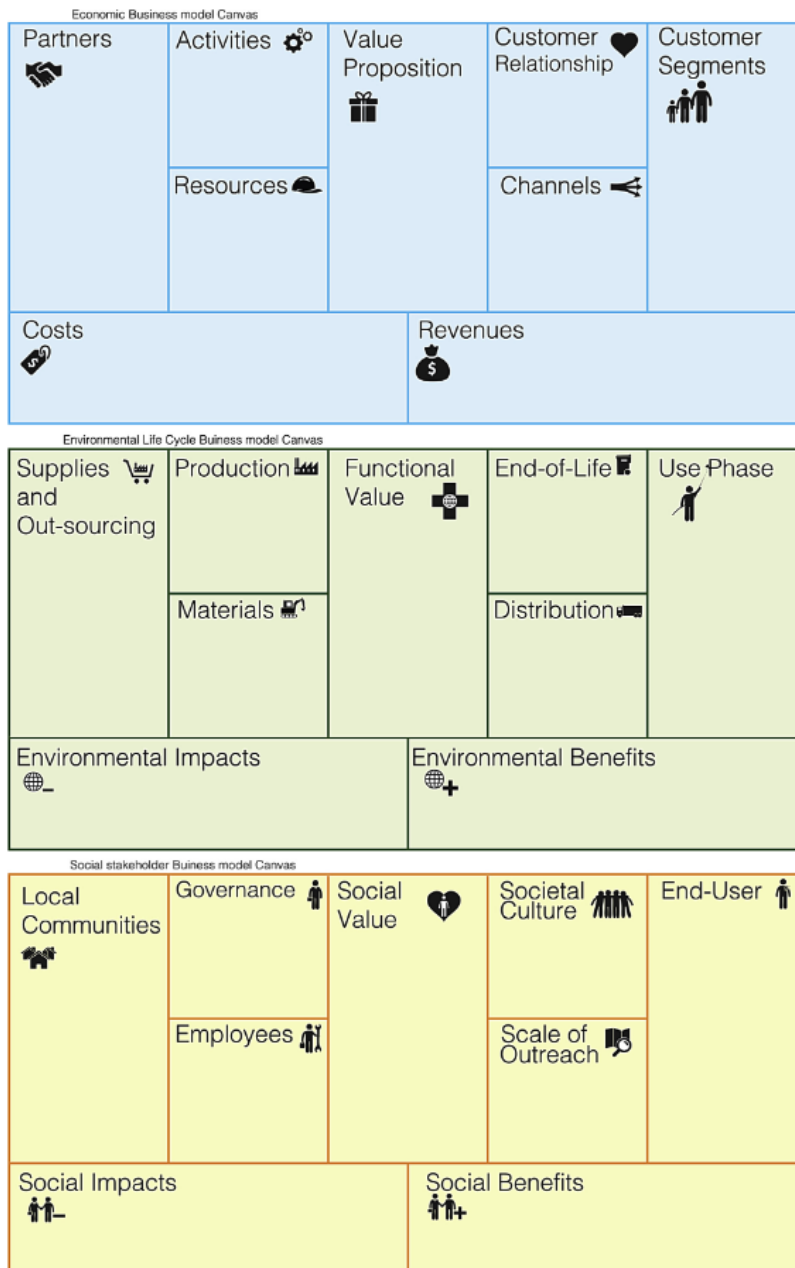


Figure 6. Triple-layered business model canvas

### 2.3.3. Flourishing business canvas

The flourishing business canvas, illustrated in Figure 7, is the updated version of the Strongly Sustainable Business Model Ontology, which was developed by Upward and Jones (2016). The canvas provides shared languages for multiple stakeholders to collaborate to ideate, design, prototype, and, importantly, tell stories about the desirable sustainable business models (Flourishing Enterprise Innovation Toolkit). The canvas has

16 building blocks categorized into four main areas and covered by three sustainability themes: economy, society, and environment. Specifically, the first main area in this canvas, People, contains five building blocks, including ecosystem actors, needs, stakeholders, relationships, and channels. The second area, Value, has two blocks: Value co-creations and value co-destructions. The third area is Process, which has partnerships, resources, activities, and governance. The last area is Outcomes with costs, goals, and benefits.

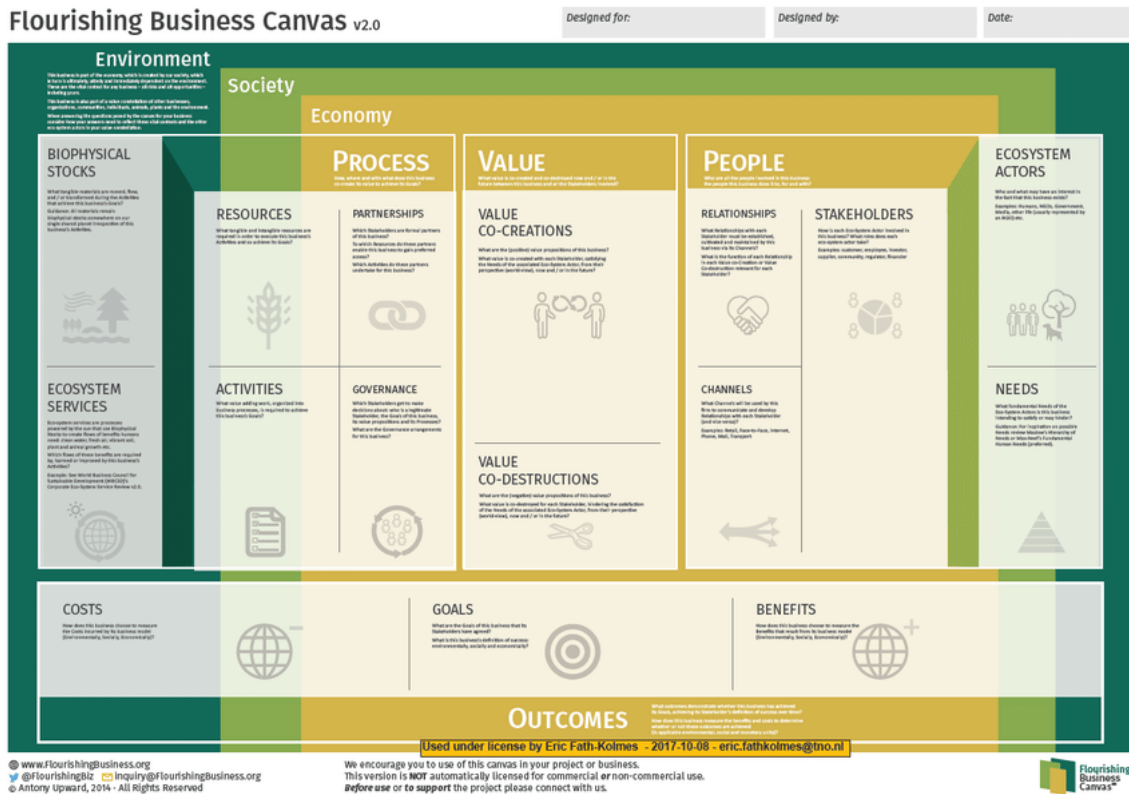


Figure 7. Flourishing business canvas

### 2.3.4. Platform design toolkit

The platform design toolkit was released in 2013 by Boundaryless. The toolkit has many canvases that support building multi-sided and platform strategies to empower ecosystems in creating shared value. These canvases cover all phases of business model development, including strategic awareness, exploration, design strategy, validation and prototyping, and growth (Boundaryless, 2013). However, only the three most relevant canvases to the case project are reviewed. The objective of the case project is to explore the possibilities and understand the big picture before deciding on the subsequent

development and validation activities. Therefore, the optimal canvases should be in the phase of opportunity exploration and strategy design, as defined by Boundaryless (2013). The selected canvases are ecosystem canvas, ecosystem entity-role portrait, and ecosystem’s motivations matrix, illustrated in Figures 8, 9, and 10, respectively.

In detail, the ecosystem canvas helps visualize an existing or future ecosystem and categorize possible stakeholders into four roles: platform owners, partners, peer producers, and consumers. Also, the ecosystem canvas highlights the relationships between stakeholders in a network or an ecosystem. The ecosystem entity-role portrait canvas helps describe the primary stakeholders’ profiles, goals, assets, and capabilities, thus providing more understanding of each player in the ecosystem. Lastly, the ecosystem’s motivations matrix canvas supports identifying shared value and motivations among the ecosystem’s members.

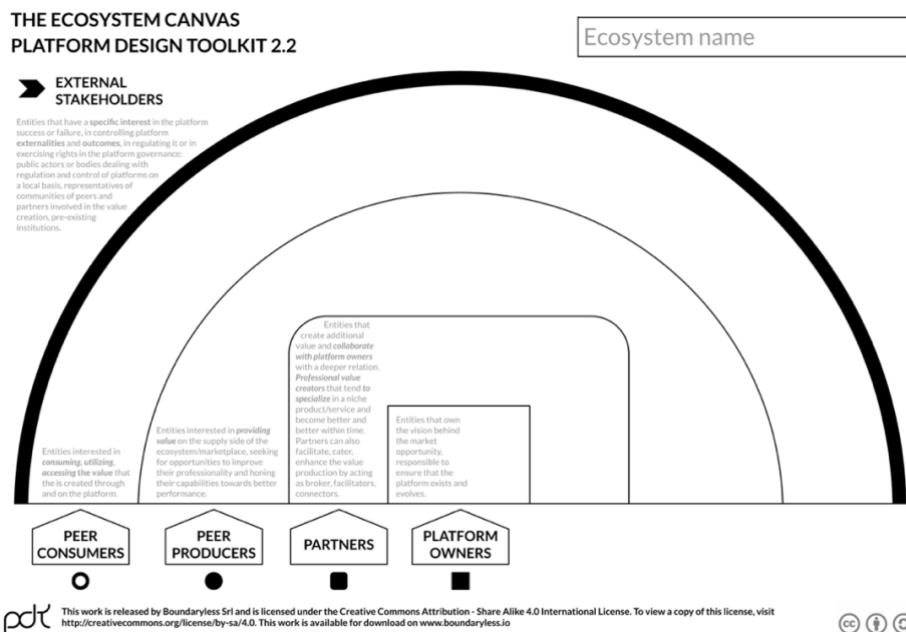
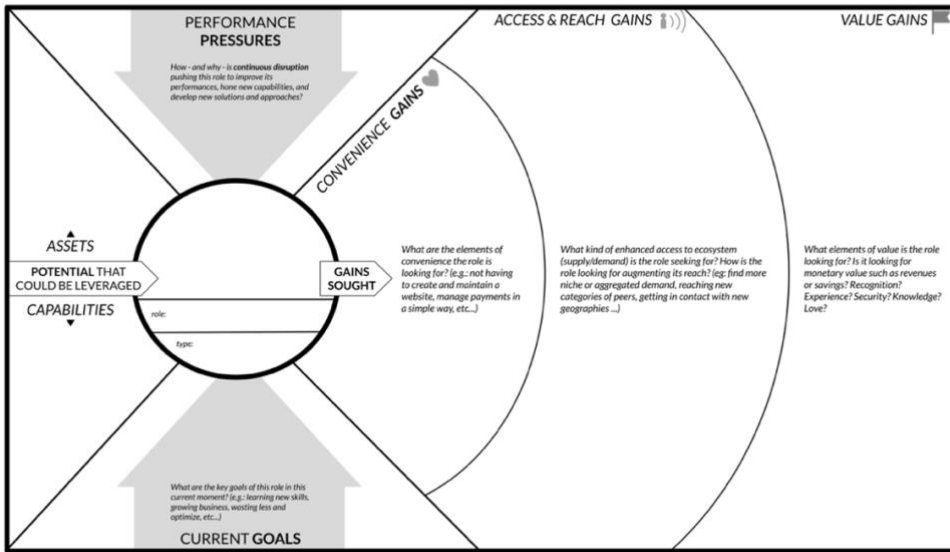


Figure 8. Ecosystem canvas



THE ECOSYSTEM ENTITY-ROLE PORTRAIT  
PLATFORM DESIGN TOOLKIT 2.2

notes



pdt This work is inspired by Xplane Empathy Map and Strategizer AG Value Proposition Canvas, plus John Hagel III's work - and is released by Boundaryless Srl and licensed under the Creative Commons Attribution - Share Alike 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-sa/4.0>. This work is available for download on [www.boundaryless.io](http://www.boundaryless.io)



Figure 9. Ecosystem entity-role portrait

THE ECOSYSTEM'S MOTIVATIONS MATRIX  
PLATFORM DESIGN TOOLKIT 2.2

notes

gives to	role	role	role	role	role
role					
Pa   PP   PC					
role					
Pa   PP   PC					
role					
Pa   PP   PC					
role					
Pa   PP   PC					
role					
Pa   PP   PC					

What could the role on the vertical axis on the left give to the role on the horizontal axis on top?  What could roles of the same type exchange between peers

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Figure 10. Ecosystem's motivations matrix

Even though I did not find the platform design toolkit in the sustainable business model innovation literature, this toolkit was selected to review in this literature because of three reasons. First, the toolkit enables organizations to explore their mutual relationships in an ecosystem view with multiple other stakeholders. The ecosystem view aligns with this unified perspective that sustainable business models require a systemic consideration of stakeholder interests and responsibilities for mutual value creation (Evans et al., 2017). Second, the toolkit helps multiple organizations to create shared value in a system. This benefit fits with another unified perspective that sustainable business models require a system of sustainable value flows among various stakeholders (Evans et al., 2017). Third, the toolkit enables organizations to define their roles in an existing or new ecosystem context, for example, who the platform owner is. These roles determine the structure and governance of the business model, which reflects the unified perspective that sustainable business models require a value network with a new purpose, design, and governance (Evans et al., 2017).

#### **2.4. Theoretical framework**

Based on the literature, many factors can determine the success of sustainable business modeling processes and toolkits. For example, business models that are considered sustainable need to incorporate sustainable value, proactive multi-stakeholder management, a long-term perspective, and solutions for sustainability (Geissdoerfer et al., 2018). In addition, sustainable business modeling processes need to follow the five unified perspectives, introduced by Evans et al. (2017). These perspectives include that (1) sustainable value incorporates economic, social, and environmental benefits conceptualized as value forms, (2) sustainable business models require a system of sustainable value flows among stakeholders, including the natural environment and society, as primary stakeholders, (3) sustainable business models require a value network with a new purpose, design, and governance, (4) sustainable business models require a systemic consideration of stakeholder interests and responsibilities for mutual value creation, and (5) internalizing externalities through product-service systems enables innovation toward sustainable business models. Furthermore, more than one toolkit can help organizations design sustainable business models.

After reviewing the literature, I realized that the link between theory and practice could be strengthened. The reason is that the process and toolkits described in the literature cannot guarantee success in designing new sustainable business models in practice. Therefore, I did empirical research to explore typical examples and study the

applicability of sustainable business modeling processes and toolkits in practice. Incorporating theory and practice can provide valuable views for organizations in designing sustainable business models. Figure 11 illustrates the overall framework of this thesis.

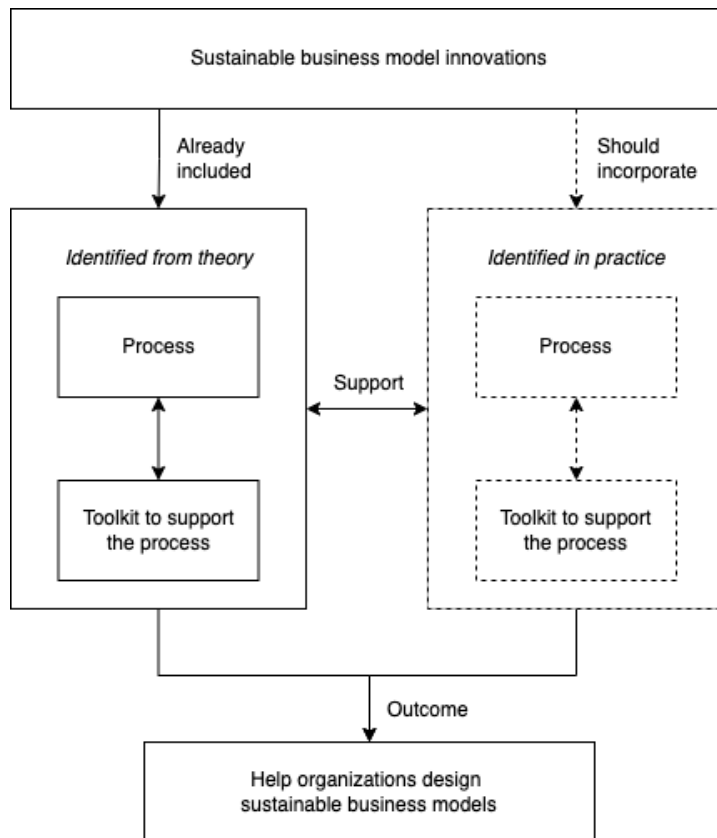


Figure 11. Theoretical framework of this thesis

### **3. Methodology**

#### **3.1. Systematic combining**

A systematic combining approach is often used when the research scope is evolving during the research. Dubois and Gadde (2002) defined systematic combining as a non-linear process that enables the expansion or change of the theoretical model based on collected empirical data. In other words, I continuously redefine the focus of the literature after collecting the empirical data. This thesis followed the systematic combining process for two reasons. First, empirical findings can enable me to understand the theory holistically and identify the gaps that have not yet been covered in the literature. Second, the real-life case project is evolving during the research, and the project outcomes are difficult to anticipate. Therefore, studying sustainable business modeling in practice requires an iterative approach, and I should avoid setting a fixed scope of the thesis before conducting interviews and facilitating the project.

Figure 12 illustrates an overview of the research process for this thesis with a systematic combining approach. Initially, background information related to this thesis was collected and reviewed. This information includes the research plan, goals, and initial case project description. After that, I drafted the initial literature review to form a general understanding of the research topic. At the same time, I designed the research process with appropriate data collection and analysis methods. Then, multiple iterations happened between extending the literature and collecting the empirical data through interviews, workshops, and documentation. I continuously analyzed and rescope the literature review and data analysis until they were finalized. The discussion and conclusion of the thesis were written at the end.

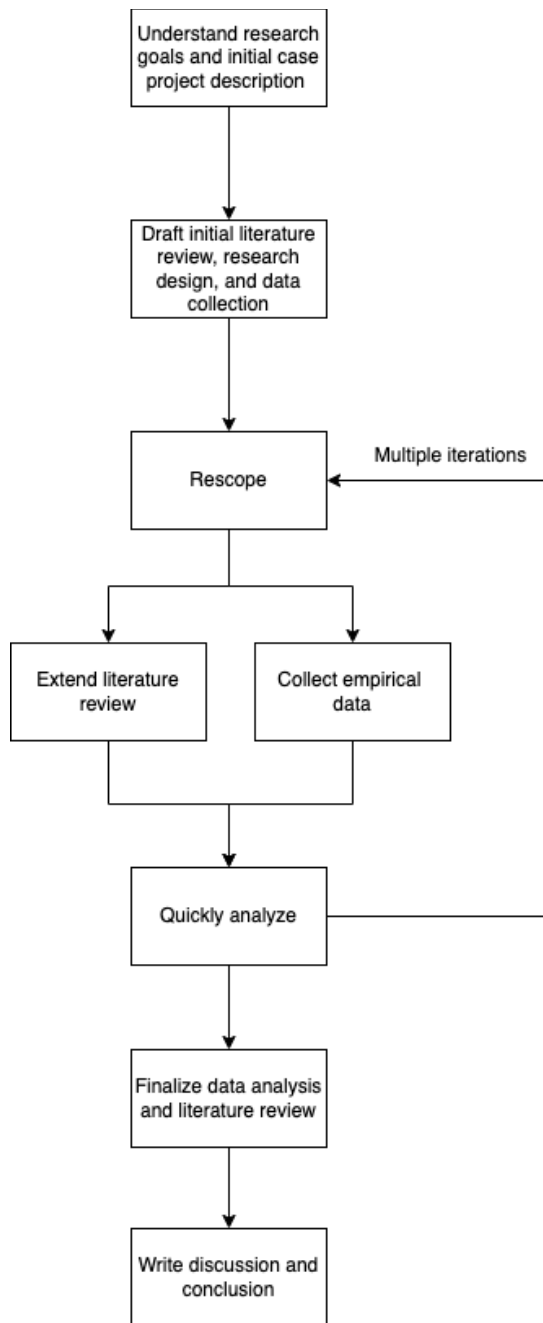


Figure 12. Systematic combining research process

### 3.2. Research design

A research design illustrates how the research activities are conducted. In other words, a research design demonstrates the logical sequence of actions that connects the empirical data to the research question, thus helping me avoid collecting irrelevant evidence (Yin, 2009).

A qualitative approach was adopted in this thesis. First, qualitative research enables researchers to produce a new understanding of how things work in real-life business contexts (Eriksson & Kovalainen, 2008). In this thesis, things are processes and toolkits, while the context is the real-life project that helps two case organizations co-design sustainable business models. Second, qualitative research supports exploratory activities when prior insights about the phenomenon are limited (Eriksson & Kovalainen, 2008). Knowledge about sustainable business modeling has not been well-established, particularly its applicability in a real-life context, thus allowing me to be more flexible and exploratory in the research activities.

In this thesis, case study research was chosen as a research approach. This approach helps a researcher understand a real-life phenomenon in depth, especially when the boundaries between a phenomenon and a context are unclear and multiple sources of evidence are used (Yin, 2009). Also, case study research is widely popular in business research because it presents complex and abstract real-life phenomena in an accessible and practical format (Eriksson & Kovalainen, 2008). Case study research is an appropriate research approach for this thesis for three reasons. First, this thesis aims to understand in-depth the process, toolkits, and their applicability to design a sustainable business model in a real-life project. Second, information needs to be collected from various sources, for instance, project participants, experts, and literature, to gain a holistic understanding of the process and toolkits. Third, the project contexts, including company information, project objectives, participants, and contextual insights, considerably affect how the sustainable business modeling process and toolkits are selected, implemented, and evaluated.

Constructing a case is vital in case study research. In detail, a researcher needs to define the case, why it is chosen, and what can be learned from studying it (Eriksson & Kovalainen, 2008). A case should be a real-life phenomenon instead of an abstraction, such as a topic, an argument, or a hypothesis (Yin, 2009). Indeed, a real-life case should relatively represent abstraction (Yin, 2009). In addition, researchers tend to compare their findings with previous research, so the cases should be similar to those previously studied (Yin, 2009). Thus, the literature part can guide the construction of the case. Furthermore, quantitative and qualitative data can be used to construct a case (Eriksson & Kovalainen, 2008). However, this thesis relies on qualitative data to form the case.

There are variations in the case study. Eriksson and Kovalainen (2008) introduced two variants, including a single-case and a multiple-cases study. A single-case study enables researchers to understand the unique case holistically and the people's perspectives

(Eriksson & Kovalainen, 2008). On the other hand, a multiple-case study aims at testing or developing theories by comparing and finding patterns among several cases (Eriksson & Kovalainen, 2008). In a multiple-case study, the case descriptions are not the main interest, while the opposite happens in a single-case study (Eriksson & Kovalainen, 2008). Yin (2009) added two more dimensions, such as holistic and embedded, to the variations of a case study. A holistic case study focuses on one unit of analysis, while an embedded case study has many units of analysis. As a result, on a broad level, case study types can be categorized into four distinct types: single-case holistic, single-case embedded, multiple-case holistic, and multiple-case embedded.

A single-case embedded case study was chosen for this thesis. This type of case study has one unique case and investigates many units of analysis. In the thesis, the case is the sustainable business modeling project in an urban mobility ecosystem context, whose details are described in the introduction chapter. These details, including the project background and organizational context, are the case boundaries.

There are four rationales for choosing a single-case embedded case study. First, a single-case study can test a well-formulated theory (Yin, 2009). Specifically, the thesis will examine the applicability of the sustainable business modeling process and toolkits identified from the literature in a real-life project. Second, a single-case study is applicable when representing a unique case (Yin, 2009). Every business model design project is unique depending on the market and organizational context, thus making it challenging to compare a process and toolkits among multiple projects. Third, a single-case study can be utilized when researchers have information inaccessible to the public (Yin, 2009). In this thesis, I have access to internal knowledge of one company in a business model design project. Lastly, an embedded case study was selected over a holistic case study because this thesis focuses mainly on two units of analysis, namely a process and a toolkit (Yin, 2009).

The goal of this single-case study is not to generalize knowledge, such as processes and toolkits, that can be applied to all sustainable business modeling projects. Instead, Eriksson & Kovalainen (2008) argued that the goal of this approach is to enable readers to form their insights. For example, after reading this thesis, readers can define the critical issues in the business modeling process, how to incorporate sustainability in the design process, how to select proper toolkits, and what could have been done to avoid pitfalls.

Table 6 presents how I attempted to answer the research questions, which supports achieving the research objective. First, I studied the literature on that topic to understand the characteristics of a sustainable business model in urban mobility. As this topic is not new, I believed knowledge from the literature was sufficient to answer the first sub-question. Second, I identified the typical processes and toolkits in sustainable business modeling by studying the relevant literature and conducting expert interviews. I utilized the findings to select and develop the appropriate process and toolkits for the case project. Third, to evaluate the applicability of the selected process and toolkit, I applied them in workshops and reviewed the workshop documentation, such as the agenda, actual results, and participants' feedback.

Table 6. My approach to answering the research questions

<b>Research questions</b>	<b>My approach to answering the research questions</b>
What are the characteristics of a sustainable business model in urban mobility?	Study the literature about sustainable business models in urban mobility
What are typical processes and toolkits for designing a sustainable business model?	<ul style="list-style-type: none"> <li>• Study the literature about the process and toolkits for designing a sustainable business model</li> <li>• Conduct interviews with experts in business model design</li> </ul>
To what extent can the selected process and toolkits be applied to help case organizations co-design a sustainable business model?	<ul style="list-style-type: none"> <li>• Apply the selected process and toolkits in workshops in the case project</li> <li>• Analyze workshop documents, specifically the agenda, actual results, and workshop participants' feedback</li> </ul>

### **3.3. Data collection**

#### **3.3.1. Expert interview**

Nine semi-structured interviews were conducted with ten business design experts, including five design consultants and five in-house designers. In one interview, there were two in-house designers. The interviewees' profiles and codes are mentioned in Table 7. The organizations' names and industries are anonymized.



Table 7. List of interviewees

<b>Number</b>	<b>Organization</b>	<b>Interviewee</b>	<b>Code</b>
1	Innovation design consultancy	Lead business designer	Design consultant 1
2	Innovation design consultancy	Business designer	Design consultant 2
3	Innovation design consultancy	Business designer	Design consultant 3
4	Innovation design consultancy	Lead business designer	Design consultant 4
5	Innovation design consultancy	Lead business designer	Design consultant 5
6	Company A in the project	Two strategic designers	In-house designer 1
7	Telecommunication company	Business designer	In-house designer 2
8	Financial company	Business designer	In-house designer 3
9	Logistics company	Business designer	In-house designer 4

The interviewees were selected based on different criteria. First, I interviewed business designers from large corporations and consultancies to collect broader perspectives. The nature of the business model design project tends to differ between in-house designers and design consultants; therefore, a more comprehensive view is necessary. Second, I prioritized business designers located in Finland, as their inputs would be more relevant to the Finnish working context of the case project. For example, people in Finland often communicate openly and straightforwardly; therefore, a process that works well in the Finnish context may not be effective in another culture. The interviewees were not necessarily of Finnish origin. Third, I noted that corporate in-house business designers tend to have the title of strategic designer. Therefore, this thesis considered in-house strategic designers as business designers.

Each interview had similar general questions but different follow-up questions, as the follow-up questions were tailored to the interviewees' profiles and insights during the conversation. I tried to ask unbiased open-ended questions to avoid leading the direction of the conversation. The interviewees received general questions before the interview.

These general interview questions could be categorized into four topics: process, toolkit, business model evaluation, and sustainability.

Specifically, at the beginning of the interview, I asked about the typical process the interviewees used to design a new business model. This question helped me explore various approaches and understand the interviewees' responsibilities and common project types. As a result, I could examine the contexts in which the mentioned toolkits were utilized. When asking about the toolkit, I often asked follow-up questions about the toolkit introduced in the literature. The goal was to learn more about these toolkits' specific benefits and limitations. After that, I asked how the interviewees would evaluate a business model and define the evaluation criteria. I assumed sustainability as another evaluation criterion; therefore, this topic bridges the next topic about sustainability. The questions related to sustainability focused on the experiences and perspectives of the interviewees on designing sustainable business models.

It is worth mentioning that I intentionally asked about the general business modeling process and toolkits for over half of the interview instead of focusing only on sustainable business modeling at the beginning. The main reason was that sustainable business modeling is still an emerging topic for business designers. Therefore, if I only asked about sustainable business modeling, the interviewees would need to imagine future scenarios rather than share their past experiences. In this thesis, past experiences were more important because I was looking for practical knowledge in real-life projects.

All interviews were conducted in English. Each took place online, lasting between 30-60 minutes. The conversations were recorded for further analysis. The interviewees did consent for the recordings to be used for research purposes.

### 3.3.2. Workshop

Workshops were adopted to study the applicability of the selected process and toolkits in designing a sustainable business model. Workshops enable two case organizations to co-design and have alignment on the new sustainable business model, which is necessary to achieve the project outcome.

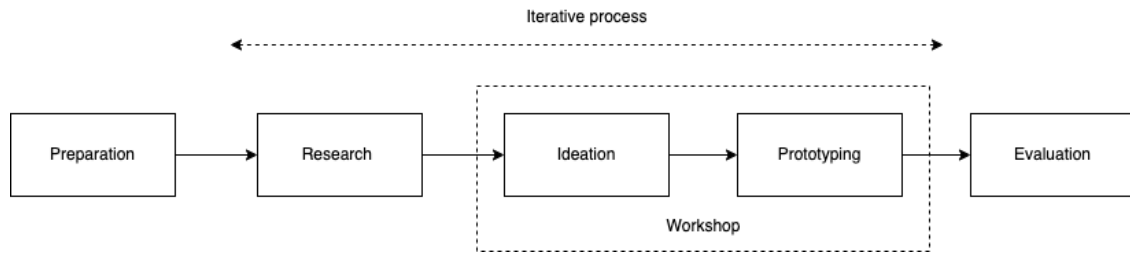


Figure 13. Design process applied in the case project

Figure 13 illustrates the selected sustainable business modeling process for the case project. This process emerged from expert interviews with business designers. The process included five iterative phases: preparation, research, ideation, prototyping, and evaluation. Within the overall process, the workshop, one of the data collection methods in this thesis, took place in the ideation and prototyping phases.

I selected this process instead of the process introduced by Rana et al. (2017) in the literature because of two reasons. First, this process has more flexibility that enables two companies co-design a business model in the same workshop. Meanwhile, the process in the literature mainly looks at one focal company perspective. For example, from my experience, it is difficult for two companies to do the value mapping activity in the same workshop. Second, this process emerged from interviews, meaning that activities in each step were clearly described in the interviews. Therefore, it is easier for me to apply this process in the case project.

Four workshops were facilitated, including (1) Stakeholder mapping & current business logic, (2) Ecosystem member, (3) Ecosystem motivation, and (4) Sustainable platform business design. The list of workshops and applied toolkits are summarized in Table 8. Each workshop took place via Teams and Miro collaboration platform and lasted 1,5-2 hours. I used Miro as a platform to facilitate the workshops.

The workshop objectives and activities were planned by company A and me. I was the main responsible person and facilitator, but company A greatly influenced the workshop direction. Specifically, company A representatives collaborated with me to define the focus, review the workshop agenda, and brainstorm different workshop activities. In addition, the content of the next workshop was planned with company A after reviewing the previous workshop results.

Even though the process of planning the workshop was iterative, the workshop objectives generally followed the unified perspectives for the creation of sustainable business models (Evans et al., 2017) and the integration of a business model into an actor network (Storbacka et al., 2012). First, sustainable business models require a value network with a new purpose, design, and governance (Evans et al., 2017). Therefore, workshop one helped companies A and B explore and identify the potential shared value network or ecosystem. Second, developing a sustainable business model involves aligning organizations' interests in a network (Evans et al., 2017), and organizations should recognize how other members interact and collaborate within the shared ecosystem (Storbacka et al., 2012). Workshops two and three were facilitated to serve these purposes. Third, to integrate an existing business model into an actor network, organizations should be able to re-configure their business models at a meso level, between the macro and micro levels (Storbacka et al., 2012). Thus, the last workshop was organized with company A to discuss the roles and value of company A in the shared ecosystem when implementing the new sustainable business model.

Table 8. List of workshops

<b>Number</b>	<b>Name</b>	<b>Objective of the workshop</b>	<b>Toolkit used in workshop</b>
1	Stakeholder mapping & current business logic	Build a shared understanding of the current business model of two case organizations and identify a potentially shared ecosystem	Ecosystem member canvas
2	Ecosystem member	Help define profiles of important members in the ecosystem	Ecosystem members profile canvas
3	Ecosystem motivation	Align on the motivations of ecosystem members and develop a high-level business model concept	Ecosystem motivation matrix
4	Sustainable platform business design	Develop more concrete sustainable business models that could be used for internal evaluation in company A	No research-based toolkit, mainly open discussion

Table 9 shows the list of workshop participants. Four core participants were in the workshop series, including me as the facilitator, two representatives from company A,

and one from company B. These company representatives were not included in the interview. Representatives from company A have titles of design researcher and business designer, while the representative from company B is the board chairman. Before the workshop, these representatives worked with each other in a pilot project between companies A and B. All participants joined workshops one, two, and three. Only representatives from company A and the facilitator participated in workshop four.

Table 9. List of workshop participants

<b>Number</b>	<b>Participant</b>	<b>Case organization</b>	<b>Participated in workshop</b>
1	I as a workshop facilitator and a participant		1, 2, 3, 4
2	Design researcher	Company A	1, 2, 3, 4
3	Business designer	Company A	1, 2, 3, 4
4	Chairman of the board	Company B	1, 2, 3

I used three research-based toolkits in the workshops, described in Table 10. These tools were developed by Ville Eloranta, Senior University Lecturer at Aalto University, Finland. The first tool is the ecosystem member canvas, which is a simplified version of the ecosystem canvas in the Platform design toolkit (Boundaryless, 2013). The second tool is the ecosystem members profile canvas, a simplified version of the ecosystem entity-role portrait in the Platform design toolkit (Boundaryless, 2013). The last tool is the ecosystem motivation matrix, a simplified version of the ecosystem's motivations matrix in the Platform design toolkit (Boundaryless, 2013). I selected the simplified versions because they were more suitable for shorter workshops that last 1,5-2 hours.

Table 10. List of toolkits used in workshops

<b>Number</b>	<b>Name</b>	<b>Developed by</b>	<b>Simplified version of</b>	<b>Used in workshop</b>
1	Ecosystem member canvas	Ville Eloranta, Senior University Lecturer at Aalto University	Ecosystem canvas in the Platform design toolkit (Boundaryless, 2013)	1, 2

2	Ecosystem members profile canvas	Ville Eloranta, Senior University Lecturer at Aalto University	Ecosystem entity-role portrait in the Platform design toolkit (Boundaryless, 2013)	2
3	Ecosystem motivation matrix	Ville Eloranta, Senior University Lecturer at Aalto University	Ecosystem's motivations matrix in the Platform design toolkit (Boundaryless, 2013)	3

I used the Platform design toolkit because the other toolkits introduced in the literature have significant limitations when used in the project context. For example, to facilitate ideation sessions with multiple stakeholder types, the triple-layered business model canvas (Joyce & Paquin, 2016) and the flourishing business canvas (Upward & Jones, 2016) were too complex. In other words, the building blocks in these two canvases contain too many details which were difficult to define clearly in an exploration project. In addition, these canvases primarily describe a business model from one focal company perspective, which was unsuitable for two companies to co-ideate a shared business model. The Value mapping tool (Bocken et al., 2015) did not have a complexity limitation, but it considered only one focal organization perspective in an ecosystem context. Notably, only the Platform design toolkit supported identifying a shared ecosystem and the role of company A in that ecosystem, which was one of the main project outcomes.

After applying the selected process and toolkits in the workshop, I analyzed documents created during the workshop to study their applicability. Even though documentary information can take many forms (Yin, 2009), three relevant documents, described in Table 11, were analyzed in this thesis. These documents are the workshop agenda, workshop results, and participants' feedback. Documents provide rich contextual information on how the chosen process and toolkits were implemented, thus providing a more accurate assessment of the applicability. I also created most of the documents.

Table 11. List of workshop documents

Number	Document name	Page	Format	Created by
1	Workshop agenda	4	PDF	Facilitator

2	Workshop results	12	PDF	Facilitator
3	Participants' feedback	1	PDF	Facilitator

The first document is the workshop agenda which consists of the key activities, selected toolkits, expected outcomes, and estimated timeline. The agenda aims to provide participants with an overview of what would happen in the workshop, thus helping them to prepare properly and have more trust in the process. Workshop participants always received the agenda via email before each workshop.

The second document is the workshop results, including the actual outcomes of each key activity in the workshop and the time needed. After each workshop, I transferred the workshop results from the Miro boards to one document file, then reorganized the content to make the document comprehensive. My intention was to compare what was planned in the agenda and what happened in the workshop. For example, in this document, I could see which activities took more time to complete, which tools were selected, and analyze to what extent the toolkits enabled participants to achieve the outcomes.

The third document is the feedback from the workshop participants, excluding the facilitator, about the process and toolkits applied in the project. After the third workshop, the feedback was collected in a 30-minute online retrospective session on Miro. I transferred all the notes from Miro to one PDF document. Four questions were asked in this session, and the participants, excluding me, wrote their answers to the Miro board. The first question is about Things that went well, for example, areas where the workshops met or exceeded expectations. The second question is about Things that didn't work well, specifically places where the workshop didn't meet expectations or unexpected problems occurred. The third one asks about the Opportunities for improvement and suggestions on how to do something better. Lastly, participants filled in Things that deserve recognition, for instance, outstanding performances and people who went above-and-beyond.

### **3.4. Data analysis**

Interview data were analyzed to explore typical processes and toolkits used by business designers to design a sustainable business model. I applied the five standard steps of analyzing interview results, described by Rubin & Rubin (2012), to this thesis. First, all

nine interview recordings were transcribed. Second, I started coding by highlighting the texts that have relevant concepts, themes, and events. This coding process can be called thematic analysis, which Gibson & Brown (2009) defined as "the process of analyzing data according to commonalities, relationships, and differences across a data set." Third, the texts across the interviews with the same code were summarized in one document. Fourth, all the codes were reviewed, compared, and sorted into different themes. Lastly, I added the definition and relationship rule to each code and theme to form a complete picture.

In this thesis, I used an open coding approach, which allows the concepts and themes to emerge from the data without a predefined set of codes or references to literature (Rubin & Rubin, 2012). This approach was recommended as the sustainable business modeling process and toolkits vary depending on the context, thus making it challenging to have a predefined set of codes before analysis. Even though Rana et al. (2017) introduced a sustainable business modeling process in the literature, it is not sure that practitioners will always follow that process.

Table 12 summarizes the coding results from the interviews. I identified relevant codes, keywords, or phrases which were then sorted into 19 themes. After that, I aggregated these 19 themes into four dimensions. The first dimension is the business design project, which includes themes about the project from the implementation point of view. The second dimension is the design process, such as stages and activities in designing a new business model. The third dimension is a toolkit which includes tools and how the tools have been used in past projects. The last dimension is sustainability in business modeling, including trend, benefit, definition, incorporation, and measurement.

Table 12. Coding results from the interviews

<b>1<sup>st</sup> order – Keywords or phrases about</b>	<b>2<sup>nd</sup> order – Themes</b>	<b>3<sup>rd</sup> level – Aggregate dimensions</b>
How business designers approach a business design project	High-level approach	Business design project
Internal and external stakeholders, including business designers	Stakeholder	



The challenges business designers face during the project	Challenge	
The project's deliverables	Outcome	
<p>Activities such as</p> <ul style="list-style-type: none"> <li>• Understand the project requirements</li> <li>• Define expected outcome</li> <li>• Plan the project</li> <li>• Estimate resources needed</li> </ul>	Preparation	Design process
<p>Activities such as</p> <ul style="list-style-type: none"> <li>• Analyze the current market</li> <li>• Forecast market trends</li> <li>• Analyze the competition</li> <li>• Identify the target customers</li> <li>• Validate customers' problems</li> </ul>	Research	
<p>Activities such as</p> <ul style="list-style-type: none"> <li>• Prepare and facilitate workshops</li> <li>• Create hypotheses</li> <li>• Ideate concepts</li> <li>• Ideate revenue models</li> <li>• Identify potential partners</li> </ul>	Ideation	
<p>Activities such as</p> <ul style="list-style-type: none"> <li>• Prototype concepts</li> <li>• Prototype financial models</li> </ul>	Prototyping	
<p>Activities such as</p> <ul style="list-style-type: none"> <li>• Define criteria</li> <li>• Evaluate desirability</li> <li>• Evaluate feasibility</li> <li>• Evaluate viability</li> <li>• Identify potential risks</li> </ul>	Evaluation	

Activities such as <ul style="list-style-type: none"> <li>• Prepare for meetings</li> <li>• Involve stakeholders</li> <li>• Build trust</li> </ul>	Side activities	
Example toolkits, canvases, and how they are used in projects	Example & usage	Toolkit
Activities of selecting the toolkits	Selection	
Activities of modifying the toolkits	Modification	
The limitations of specific toolkits	Limitation	
The current views of stakeholders and decision makers on sustainability topics in business models	Trend	Sustainability
The benefits companies will get if they are sustainable	Benefit	
How business designers and companies define sustainability	Definition	
How sustainability can be incorporated in a business design process	Incorporation	
How sustainable impact can be measured and how challenging to measure that impact in real context	Measurement	

Information from the workshop was also analyzed in addition to interviewing content. Insights from the workshop results and relevant documents were used to assess the applicability of the selected process and toolkits in the case project. Specifically, after all workshops were completed, I compared the content of each workshop's agenda and results. I checked the time spent, the selected toolkits, and the expected versus actual results from each key activity. Then, I reviewed the participants' feedback to identify new or surprising insights.

### 3.5. Research evaluation

The research quality of a case study can be evaluated by four standard criteria, including construct validity, internal validity, external validity, and reliability (Yin, 2009). Among them, internal validity is primarily for explanatory or causal studies. As this thesis is more descriptive and exploratory, internal validity is irrelevant. Therefore, this thesis's quality was assessed by the remaining three criteria.

Construct validity is about having sufficiently operational measures and being objective when collecting the data (Yin, 2009). To improve the construct validity of this thesis, I used various measures for sustainable business modeling, including processes, toolkits, and sustainability, from literature and empirical data. In addition, I used three sources of evidence, namely interviews, workshops, and documentation. However, there are always my biases when collecting and analyzing empirical data. Mainly, I could influence how the workshops were facilitated and which processes and toolkits were selected. The construct validity could have improved if I were solely an observer, without participating in the workshops and documenting the results.

External validity is the possibility that the thesis's findings can be generalized beyond the selected cases (Yin, 2009). In other words, I need to identify a domain or broader theory to which the findings can be generalized. The case study relies on analytical generalization, not statistical generalization, as in survey research (Yin, 2009). In this thesis, the case project between companies A and B can be one example of sustainable business model design projects in an urban mobility context, which can be seen as the domain for generalization. However, the sustainable business modeling processes described in this thesis could not guarantee the success of all business design projects. The reason is that many factors, notably business designers' skillset, project timeline, and participant backgrounds, can significantly determine the project's success. As a result, further studies with multiple cases are needed to improve the generalizability of this thesis.

Reliability demonstrates to what extent other researchers can arrive at the same findings and conclusions by applying the same data collection procedures in the same case (Yin, 2009). In this thesis, I carefully documented the process of collecting and analyzing data from interviews and documentation. For example, the thesis presented the interview guidelines, interviewee selection criteria, qualitative data analysis techniques, and specific information to review in various documents. However, because of the complex interactions between the facilitator and

workshop participants, it would be challenging to replicate the exact workshop results in other case projects. Therefore, the findings about the applicability of selected processes and toolkits might vary per project.

## 4. Findings from interviews

Interview results were analyzed to identify the typical processes and toolkits to design a sustainable business model in practice. The process that emerged from these interviews was then applied in the case project to examine the applicability.

### 4.1. Business design project

#### 4.1.1. High-level approach

Business design projects have many similarities with service design projects. Sometimes the difference between business and service design is unclear, especially for in-house designers, because both involve understanding customers and designing new products or services. Indeed, customer understanding helps identify value proposition in the business model.

*“I don't personally see, like there is a straight difference with service and a business design. I think it's more like a mentality or the background question. I can't distinct when I'm doing service design and when I'm doing business design.” (In-house designer 1)*

*“If you're just designing or doing a business model project, and you're not including the service design parts, that customer understanding, that's also falling short, not to understanding what is the value that you're trying to generate with the business model.” (Design consultant 4)*

*“Designing the business model happens in tandem with concept design” (Design consultant 5)*

Specifically, several frameworks or sets of practices that can be applied in a business design project were also mentioned in the interviews. These frameworks are startup lean, design thinking, play to win, blue ocean strategy, and shared value.

*“We have own methodology which utilize this lean startup and design thinking.” (In-house designer 2)*

*“Another framework that we are using is playing to win, framework that gives you an idea of where are you playing for whom and how.” (In-house designer 3)*

*“To understand the customers’ customers and customer trends and know where a place for us could be, blue ocean strategy is the one to explore.” (In-house designer 3)*

*“Not sure if you're familiar with the concept of shared value, but I think that's a great framework for this.” (Design consultant 4)*

However, no one-size-fits-all process can guarantee the project’s success. In practice, the business model process needs to be adjusted according to the project context, notably, the market, competition, and organizational objectives. Moreover, designing a business model is an iterative process that is adjusted and clarified throughout the project. Still, the fundamental activities, such as understanding customers and developing concepts, remain the same.

*“Since each business challenge, environment and strategic objectives are quite different, also the process needs to adjust accordingly. However, I believe the main ingredients to remain pretty much the same.” (Design consultant 5)*

*“That is not something that happens usually like one step along before we start the design process, but it's something that gets clarified throughout the process when we go through it. So, it is also iterative process.” (Design consultant 4)*

One relevant aspect of this thesis is designing a platform business model or a business model that involves multiple companies. One interviewee mentioned that a platform business design project could take place around one focal organization or in an ecosystem where many players are involved. In the first scenario, where there is one focal organization, business designers should view other players as partners, not necessarily strategic partners, and design a platform business model from the focal organization’s perspective. In the second scenario, where some organizations are roughly equal in the platform or ecosystem, business designers can start by understanding the synergies from these organizations’ offerings, then create a combined offer.

*“The first one is the type of situation where you have one company that's really the owner of the whole thing. But then they use various partners, that you need to create some type of platform where those different activities can play out... The other alternative is when you have a couple of companies that are basically equals and they are*

*designing a share thing. Usually, the starting point is that these companies have identified some type of opportunity to find out some synergies from their offerings and maybe to create some combined offering.” (Design consultant 4)*

#### 4.1.2. Stakeholder

There are five types of stakeholders in a business design project: business designers, project teams or participants, users or customers, clients, and partners. These stakeholders were mentioned in the interviews.

In a business design project, business designers tend to wear different hats and have various responsibilities. For example, a business designer needs to do research, facilitate workshops, creatively ideate new concepts, and prototype these concepts.

*“You need to be the designer who is also ideating stuff, but of course also you need to be that facilitator and you need to be the researcher. There are multiple different hats that you need to wear during the process.” (Design consultant 4)*

*“It was our creative process to compose those concepts.” (In-house designer 1)*

Even though business designers conduct various tasks, they need to collaborate with others, including other business designers, to generate the desired outcome. Specifically, in large corporations, business designers often act as internal consultants that work across the company on different innovation projects. In addition, a business designer needs to consider other stakeholders. For example, business designers need to consider the value created for both their companies and other partners.

*“There are two consultants working on each case, so there is a good deal of work that we do with just with the pair. But I wouldn't say that there's anything, none of the outcomes are ones where we only work by ourselves.” (In-house designer 4)*

*“Being a business designer, at least for me, and I'm basically an internal consultant. So, I work across the whole company and across many different innovation projects.” (In-house designer 2)*

Another stakeholder is a project team or participant who is actively participating in a project's activities. One example is business owners who understand the business units

and can grant resources to the project. Another example is specialists, such as business controllers, sales, and subject-matter experts, who can perform certain tasks in a project much better than business designers.

*“We encourage that an innovation project always has a business owner, who is strong a certain business unit... And normally this business owner or stakeholder also is the one who's granting the money for the project as well. And make sure that we have access to certain resources.” (In-house designer 1)*

*“Me as a business designer, I don't need do the calculations or business model calculating. That would be really sort of bold move or stupid move because we have business controllers, and we have the business leads or product owners who are on the top of their numbers all the time.” (In-house designer 3)*

Users or customers are those who will use and possibly pay for products or services associated with the business model. As business model design projects need to involve customer understanding, this stakeholder is a good source of information. Notably, teams and participants in organizations will have similar or different viewpoints on the users and customers.

*“Being a designer, you never forget the customers. Those are first source of information.” (In-house designer 2)*

*“Usually in organization, everybody has some interesting view on the customers or end users.” (Design consultant 1)*

Clients are organizations that hire design consultants to work on a business model design project. Partners are those who will help organizations to execute new business models. Information associated with these stakeholders will be mentioned throughout this chapter.

#### 4.1.3. Outcome

A business design project's outcome may differ depending on the type of organization. For example, the desired results of a new business model in an established organization may not be directly generating revenues but increasing customers' loyalty. Also, large corporations usually may not need an entirely new business model. On the other hand, a new business model for a startup usually determines the whole business logic and how



the company makes money. However, the fundamental outcome is to identify the value for the company and each partner, and describe activities needed to create and deliver the value.

*“A new business model for a startup, at the very core is some interesting new revenue model logic behind the whole thing. But when you are designing a new business model, a new concept without new business model for an established company, sometimes the business benefit or the purpose is not to directly generate new revenues.” (Design consultant 4)*

*“On a top-level view of thinking about, as I say, the value that you're creating for the company, the value that you're creating for each partner and the different activities that are needed for that value to be created and delivered.” (Design consultant 4)*

The new business model should provide measurable value, and the offerings associated with the model meet the market needs. For example, organizations or other stakeholders can easily have a reality check when potential value is communicated in a number format. In addition, the offerings, such as new products and services, need to provide the right value proposition needed in the market, and it is viable for the company to develop and deliver that solution to the customers.

*“In the end, the main objective is to provide measurable value for the customers, the business, its operations, and other stakeholders as well.” (Design consultant 4)*

*“When they saw the numbers in front of them. So that was reality check. Our objective was to find certain win-win outcome or win-win solution.” (In-house designer 1)*

*“What we're doing in our unit is more related to making sure that the solutions that we are providing to our customers, the new solutions to new products, that they are fit with market. So that they're filling a certain market need and we can do that in a viable way, in a profitable way.” (In-house designer 4)*

#### 4.1.4. Challenge

Activities in a business design project can have many possible outcomes, which are difficult to predict. For instance, the deliverables of co-creation sessions or workshops vary depending on the facilitation and context. Thus, the business modeling process is often messy and requires good facilitation from business designers. Otherwise, the project may be stuck and difficult to move forward.

*“Sometimes those outcomes might surprise us because in co-creation sessions, everything might not go as planned or as scheduled. Sometimes we ideate different things, and it seems impossible to move them forward.” (Design consultant 1)*

*“Whenever we have a new business idea, how do you really consider that, hey, if you have five different ideas, is there actually totally something else that could create even a bigger impact? So how do you deal with those things?” (In-house designer 2)*

Designing a business model in an ecosystem context can be complex and take a lot of time. For example, a business designer needs to consider the perspective of the focal organization and different stakeholders. As an example, business designers need to identify how their company and other companies can generate more revenues.

*“If there is just one company involved, that's fairly simple, but if there are multiple different stakeholders, like different companies, and you're building up more like this network or ecosystem type of model, that's usually something that takes it can take really long time.” (Design consultant 4)*

*“It would have been great if we could have identified a way how we could actually help our customers get more revenues.” (In-house designer 1)*

Finally, it takes a lot of time, even years, to realize the real impact of a new business model. The realized impact in real life can only be measured when the model is implemented. Therefore, impacts measured during the project are early predictions of the future, which may not be as planned.

*“Once the customer has started implementing it, it might take several years. If you're talking about how to measure its effect in*

*money, it's only possible, I would say, to do it in years. This is something that we can't do within the project.” (Design consultant 2)*

*“Early estimation for something that doesn't yet exist is always difficult, and a guesstimate at best.” (Design consultant 5)*

## **4.2. Process for designing new business models**

### **4.2.1. Preparation**

Preparation is usually the first phase of every project. In a business model design project, a business designer can prepare by understanding the project's background, such as objectives, deliverables, scope, and terminologies. Specifically, business designers need to know which deliverables are inside or outside the project's scope. Also, definitions of terminologies or technical words used in a project should be clarified among project participants.

*“When we start a project, we have a kickoff for the project and there, we discuss a lot on the deliverables of the project, what type of things are included in that end deliverable and what type of things are out of the scope.” (Design consultant 4)*

*“It is by understanding, what is their aim behind the whole thing? What do they seek to gain from it? (Design consultant 4)*

*“We might also discuss some terminology related things. That's when we are talking about business models, are we talking about the same thing?” (Design consultant 4)*

After understanding the project's background, business designers should gain more profound knowledge about the organization and the market. It is critical to understand what makes the organization unique and why it needs a new business model. For example, the need for a new business model arises when an organization wants to overcome a challenge or keep up with the market trend. One way to effectively gain these insights is to make use of internal studies in the organization.

*“Then the second step is understanding the problem, or why we are doing this. Why we are trying to explore new business model.” (In-house designer 3)*

*“We understand what is the current situation, what makes the company special? Already at this point, trying to find some key themes, what are the challenges at the moment? How do they see the future? How do they see the market?” (Design consultant 2)*

*“They have some customer research that they did. We want to dig deeper into the current information that they have, so we studied that.” (Design consultant 2)*

Business designers, particularly consultancies, also need to estimate the resources required to complete the project. The more business designers understand the context, the more accurately they can estimate the resources required. In addition, business designers should be aware of potential limitations and factors that may require more resources.

*“Only after this can we truly make an estimation of the process that is needed to start the development.” (Design consultant 5)*

*“Understanding what type of resources do they have that we can utilize during the design? What are some limitations we have to acknowledge, and so on?” (Design consultant 4)*

#### 4.2.2. Research

The next phase is research. Business designers should research the market, competition, and customers. Market study or analysis is about understanding the current and future demand. The market insight can be utilized during the process of ideating new concepts and identifying their drivers and blockers.

*“We did market study and signal finding here as well, which we could use then for the hypothesis creation.” (In-house designer 1)*

*“We’re doing some sort of market analysis obviously.” (In-house designer 2)*

*“We’ll use research such as industry forecasts, trend mapping and future studies to identify the potential drivers and blockers for the idea and try to quantify their impact.” (Design consultant 5)*

As part of the market study, business designers should analyze the current competition. Particularly, business designers should understand who is competing in the same

market, including established organizations and startups, what they are doing, and how these players can impact the existing business models of the organization.

*“We study the industry and competitors, look at trends and analyze their effects on the business, do benchmarking on existing business models.” (Design consultant 5)*

*“Understanding what the other players on the field are doing. So established players, or companies, startups scene, other trends and ideas are really important to map out.” (In-house designer 3)*

Alongside market and competition study, business designers should also conduct customer research. Specifically, business designers should understand customers’ needs and pain points, then help organizations to fill in these gaps.

*“It's really good to start from the customer, to understand their pain points, their needs, how could you create value for them.” (Design consultant 4)*

*“One way to go about the innovation purposes that you look at what are the needs in the market that people have, and then you try to figure out, what could we do in our organization to meet that need.” (Design consultant 3)*

However, before starting the concept ideation activities, it is vital to validate assumptions related to the customers. Business designers should collect customer data from interviews or other sources to demonstrate to what extent the customers are facing the problems and the internal assumptions are accurate.

*“From the high level, as I mentioned, we have to provide some sort of data, that is the customer problem real.” (In-house designer 2)*

*“Then after we get a good initial understanding of what are we assuming internally? We turn to customers, and we interview customers to make sure that those assumptions that we are relying our business model thinking on is validated.” (In-house designer 4)*

#### 4.2.3. Ideation

Ideation activities often happen after understanding the project, organization, market, and target customers. Business designers do not need to come up with all ideas; instead,

they can collect ideas from internal stakeholders and facilitate discussions among them to mix up the ideas. However, it is worth mentioning that ideating revenue and cost logic with a large group of people can be challenging. This case is especially true when the people come from different backgrounds and the product or service concepts have not been well-developed yet.

*“After we’ve gathered the business objectives, market realities, future opportunities, customer insights and stakeholder expectations, it’s time to start ideating.” (Design consultant 5)*

*“If we’re talking with existing businesspeople from existing business, they might have really set up minds on innovation or new ideas. So, get getting many ideas out is good or better, and making them play with them.” (In-house designer 3)*

*“In a large pool of people with different stakeholders from around the company, it’s a bit too early to talk about net revenue streams or expenses.” (Design consultant 1)*

*“The cost structure and the revenue, they can be quite rough at the first stage.” (In-house designer 2)*

The effort in preparing the ideation activity is significant. Business designers usually need a lot of preparation before the ideation workshop; notably, they must tailor the program based on various factors. For example, some aspects, such as facilitation activities and participants’ commitments, should be considered. Moreover, business designers should be aware that generating actionable insights from ideas can be even more challenging than coming up with ideas.

*“You have to do a lot of preparations for those workshops. And it’s also about the substance, the coordination, and the facilitation of people.” (Design consultant 1)*

*“Some people can commit 100%, but most people cannot.” (In-house designer 2)*

*“I think ideation is easy, but making syntheses out from the ideation, that’s the piece you need to make sense out of it, what does it mean.” (In-house designer 1)*

#### 4.2.4. Prototyping

Prototyping is about developing a simpler version of a business model that can be used for testing. There are two types of prototypes mentioned in the interviews. The first type is prototyping or simulating the buying experience for the customers. With this prototype, business designers can evaluate whether the product or service concepts appeal to the customers and to what extent the price changes can affect the buying decisions. In addition, this type of prototype can help business designers determine the possible cost required to bring the concepts to market and estimate their scalability.

*“We’ve been building a prototype, which is simulating the buying experience if customers would buy a certain type of a model.” (In-house designer 1)*

*“I’m an advocate for prototyping, even in the financial context. With prototyping we could strive to answer questions like which customer motivator is the idea appealing to (e.g., emotional vs need-based), how scalable the idea is, how price changes affect the purchasing and what hidden costs are involved in bringing the idea to market.” (Design consultant 5)*

The second type of prototype in a business design project is a financial model. This model, often created in Excel, can show the economic comparison between an existing and a proposed business model. The data to develop the financial model can be collected from multiple sources, including customers, partners, market, open databases.

*“We were using this kind of Excel report as an example with customers. We were comparing the current model and the new proposed model with the numbers to simulate how the model would look like then in reality.” (In-house designer 1)*

*“We can also use existing customer, partner, and market data to make financial estimations.” (Design consultant 5)*

However, prototyping a financial model has been a new topic until recently, and the prototyping process is sometimes tricky. For example, it is difficult to accurately calculate the potential profitability and how long an organization can achieve profit. In addition, the historical data can be misleading when used to predict how likely and how much the target customers will pay for entirely new products and services.

*“It’s trickier to know how you make money with that approach and how long you should wait until you are profitable. Getting those calculations and having some way to estimate those revenue already in the prototype of the business model is something that has not been there until recently.” (Design consultant 1)*

*“No amount of historical data can overshadow the learnings from real-life examples and experiences of human behavior when confronted with a new market entrant.” (Design consultant 5)*

#### 4.2.5. Evaluation

Before evaluating a business model, the evaluation criteria need to be defined. There are different questions that business designers can ask the management team to form the criteria. Example questions can be what is the most pressing question we have to answer, what is the successful value proposition for you, how do you know that we have succeeded.

*“There is no single answer to understanding the criteria, but the criteria are to be brought up in the evaluation phase. What are the most pressing criteria that we have to answer?” (In-house designer 2)*

*“We do this analysis of a successful and unsuccessful project. We ask them right away that what is the successful value prop for you? How do you know that we have succeeded? So, we write down these points.” (Design consultant 2)*

A business model is usually evaluated through three lenses: desirability, feasibility, and viability. Evaluating desirability is about identifying whether the concept associated with the business model helps target customers achieve their needs and whether these customers are willing to pay for that concept. The willingness to pay can be measured quantitatively via a survey. Also, to measure the willingness to pay accurately, business designers should show the customers the product or service concept as concrete as possible. Sometimes customers express interest during the interview, but they change their opinion when seeing more details.

*“We need to figure out if the idea actually solves a need or is the need an assumption of the ideating organization to sell more of their own products.” (Design consultant 5)*



*“We were focusing on desirability. Our focus was on what customers are willing to or which concept they see the most desirable or most attractive.” (In-house designer 1)*

*“If we do the quantitative research, we can say that 60% of your target group are saying that this is value adding element, and they're willing to pay for this more.” (Design consultant 2)*

*“We had few customers as well, that they were in the interview really interested in the model. But then when they were finally looking at it in the workshop in more details, they were not anymore that interested.” (In-house designer 1)*

Evaluating feasibility or how likely a business model can be implemented is crucial both in consultancy and corporation contexts. Indeed, the clients or businesspeople are looking for not only well-designed slides but also something concrete to execute. The issue is often to assess how an organization can implement the proposed business models rather than come up with more business model concepts.

*“We need to understand how this can be achieved, because in most case scenario, the customers are also telling you that the value proposition that we don't want this just a good-looking slide, that it doesn't lead to anything specific.” (Design consultant 2)*

*“The issue is not so much in identifying new business models. It's much more about assessing whether we internally can operate that business model.” (In-house designer 4)*

Evaluating the viability of a business model is about estimating the market size and calculating a business case for the new offering. Business designers need to help the organization to define whether the market for the latest offering is valuable enough and whether the revenue will cover the cost. Moreover, the amount of the future profitability is an important factor in the evaluation.

*“When we need to assess its viability, in those cases, I guess that the end deliverable or outcome is that we do market sizing.” (In-house designer 4)*

*“We have to answer questions, is the market valuable enough?” (In-house designer 2)*

*“We do a business case calculation of basically how much we need to invest into the business, and when do we expect to get a return, and how much of a return do we expect to get.” (In-house designer 4)*

When evaluating viability, the financial calculation can be rough and does not need to be too specific. For example, the scale of revenue and cost is enough for the assessment. Also, past data rarely predict the future accurately. Indeed, in some business design projects, providing customers’ understanding is more valuable than crunching the number.

*“We don't need to have exact numbers or for the business case, but we need to have some idea that, hey, what is the scale of costs? What is the scale of income for this? But it can be quite rough in the evaluation phase still.” (In-house designer 2)*

*“We try not to model too much with this sort of data, since past data on something old can rarely accurately predict the future of something new.” (Design consultant 5)*

*“We're more focusing on understanding the consumer or the customer who the value proposition is being built for. We are not sort of, I would say, we're no Deloitte or other big four consultants where the numbers are crunched.” (Design consultant 2)*

Identifying risks is also part of the evaluation activities. In detail, business designers should notice possible risks and critical assumptions that can make the business model unsuccessful. As a result, business designers can test or validate these risks and beliefs in the prototyping and evaluation activities.

*“We look at all the things that could go wrong: in a set time frame, what are the reasons behind an unsuccessful business model? That helps us identify potential risks and begin planning for a so-called alarm system ahead of time.” (Design consultant 5)*

*“We need to identify what are the leap of faith assumptions. We don't need to answer the questions at this stage, but we need to identify what are the most pressing assumptions that we must answer in the next stage.” (In-house designer 2)*

#### 4.2.6. Side activities

Business designers always have side activities besides the main activities related to preparation, research, ideation, prototyping, and evaluation. These side activities can be building trust, involving stakeholders in the design process, and doing a lot of preparation.

Gaining trust and getting buy-in from clients and other stakeholders is vital to business designers, particularly those at consultancies. One way to build trusted relationships with the clients is to open the approach and process used to design the new business models. As a result, clients can keep track of their progress and trace back the reasons behind any decision.

*“Here’s always a side-track of sorts that’s hugely responsible for the success of any business venture: gaining the trust, building rapport and achieving buy-in from the actual decision makers of the organization.” (Design consultant 5)*

*“We manage expectations by brutally and honestly opening our approach and process, which is the key to success. If our client has asked us, why did we come up with this solution or where can we back trace that? We should be able to say in this session we collected this information, then we make these decisions, and this is the result of those sessions.” (Design consultant 1)*

While design consultants must build trust with their clients, in-house business designers must actively involve internal businesspeople throughout the design process. Corporations tend to have different business units with different responsibilities, objectives, and terminologies. It is difficult for an in-house business designer to be familiar with all these contexts. That is why businesspeople in a corporation can provide many valuable inputs. However, businesspeople tend to be overconfident with their ideas, so business designers should involve other types of internal and external stakeholders as well.

*“All the time, of course, the businesspeople are involved.” (In-house designer 3)*

*“One really fundamental part is involving the business stakeholder or the business owner. That’s how you get the best input for the hypothesis.” (In-house designer 1)*

*“Being a businessperson, it's really easy to get caught in your own ideas and the excellence of your own ideas. That's just the human nature. That's why we want to include a wide set of different stakeholders, including customers and whatever is needed internally.” (In-house designer 2)*

Finally, preparation is always necessary, especially preparation for meetings. Business designers should go with an empty hand to the meeting. At least they should prepare for discussion points to move the project forward.

*“You don't go empty handed there to the meeting. You always need to do your background check because there needs to be some food for thought, so you can discuss this with the customer further.” (Design consultant 2)*

### **4.3. Toolkits for designing new business models**

#### **4.3.1. Example and usage**

A variety of toolkits and canvases were mentioned in the interviews. These tools can be categorized based on their purpose, such as designing a concept, unlocking creativity, and designing a business model.

Many service design tools could be used in a business design project to design a concept. Example tools mentioned in the interviews are surveys, interviews, focus groups, co-creation workshops, and design probes.

*“We have like a wide set of different service design tools, starting from customer interviews, surveys, co-creation, to workshops with different stakeholders. You name it, the imagination is the limit basically”. (In-house designer 2)*

*“We usually come in and do an exploratory design research with different types of human-centric design research methods, like interviews, focus groups, design probes, what not.” (Design consultant 4)*

To unlock creativity or bring in new ideas, business designers can use tools, such as brand swap, how might we question, and business model navigator. In general, these tools provide inspiration or new perspectives for discussions.

*“Brand swap is good exercise to make people innovate. Basically, if this would be Netflix, how would it then work, answering to the needs of the customers or business through that thinking.” (In-house designer 3)*

*“You can use How might we questions. Like, how might we answer to this need, or how might we make more value to the customer.” (In-house designer 3)*

*“Business model navigator, for example, is a really nice book and also a set of cards to use as a starting point to figure out, could it be this or could it be that.” (In-house designer 3)*

Many canvases introduced in the interview could help design a business model. Example canvases were business model canvas, lean startup canvas, and canvases in the platform design toolkit. These canvases are used to draft and visualize the existing and new business models, thus helping business designers present the project’s results concisely and identify important discussion areas. Notably, the platform design toolkit can be utilized in workshops to help participants ideate highly complex platform business models.

*“Business model development tools, including the business model generation, business model canvas, and lean startup canvas. We used these tools to build the first draft of what the idea could be and see if our client already had an idea that they wanted to try. We also used those tools to conceptualize the business model, giving us a good understanding of the areas that need to be touched on.” (Design consultant 1)*

*“I find the business model canvas useful once it’s time to present the results in a concise way.” (Design consultant 5)*

*“Conceptualizing platform business models makes the whole business model ideation a lot more complex. You have to have a lot of sessions and canvases for that. For that purpose, we use the canvases from the platform design toolkit.” (Design consultant 1)*

### 4.3.2. Selection

Even though there are many toolkits for designing a business model, business designers must select the right tools for the project. The selection criteria can be based on the understanding, background, knowledge of the project team, and the project's needs at that moment. Notably, there is no strict rule to prefer one toolkit over another, so business designers can freely decide to use any toolkit that works best to achieve the intended outcome.

*“The tools are selected based on the understanding, background, knowledge of the team.” (Design consultant 1)*

*“There might be some more toolkits that we have been looking or exploring at some points, but I think it's more like, based on the needs of what we are going to do.” (In-house designer 3)*

*“We made some toolkit as well when we put this innovation function into play, but I would say that use whatever works.” (In-house designer 1)*

Regarding project success, the facilitation skillset of a business designer is more important than the tool itself. Indeed, effective facilitation requires a deep understanding of the toolkit, participants, and context. Moreover, business designers can choose different toolkits based on their preferences and still achieve similar project outcomes. However, the business designers' abilities to navigate under uncertainties, think creatively, and communicate effectively can significantly impact the project's success.

*“When people have difficult discussions about like what's possible and what's not, you can help them think about this problem in different ways depending on how they are struggling. So, the facilitation requires deep understanding of the tool that you are using and the environment where people are coming together.” (Design consultant 1)*

*“The greatest tool at your disposal is your own mind, and ability to make sense of the noise; how you decide to then present this sense to others, where you might choose different tools from your toolbox as per your professional liking.” (Design consultant 5)*

### 4.3.3. Modification

It is common for business designers to modify existing toolkits to fit the project contexts and requirements. Indeed, business designers tend to come up with their own tools.

*“We don't have one template that we always use, but it is more like that you create it for the purpose because it is always so different, but there they're certain same elements.” (Design consultant 4)*

*“We often make my own versions better suited to showcase the business of my client.” (Design consultant 5)*

*“But then all other sort of tools, it depends a lot on the case, it depends a lot on the customer's business. So, we came up typically with different tools ourselves.” (Design consultant 2)*

There are two typical types of toolkit modification. First, some elements in existing toolkits will be removed if these elements are not the project's focus. Second, some parts will be added to existing toolkits. For example, one interviewee added extensions to the Business Model Canvas to allow viewing the current and proposed business model from another organization's perspective.

*“We often want to modify and tailor the tools to fit the problem and potential solution. For example, we take out things that we don't want to focus on and emphasize certain areas to go deeper.” (Design consultant 1)*

*“Some version of a business model canvas that can have some type of extensions, to really look at it from both partners perspectives.” (Design consultant 4)*

### 4.3.4. Limitation

Every toolkit always has certain limitations. For example, even though practitioners widely use the Business Model Canvas, there are several limitations when using the canvas in a business design project. In one project, the building blocks of the Business Model Canvas are too complex for ideation. In another project, these building blocks are too generic, so established organizations who do not want to change the entire business logic may not be beneficial when using the Business Model Canvas. Notably, the competition is not mentioned in the Business Model Canvas.

*“Depending on the team, if the members are from different areas in a company, business model canvas may be a bit too complex for ideation.” (Design consultant 1)*

*“This business model canvas rarely works because of the fact that we are in a big corporation and we're rarely changing the whole logic of the whole company.” (In-house designer 1)*

*“Business model canvas falls short in many ways. For example, there is not much, how would I say, not much focus on, for example, what's your competitors are doing in a business model canvas.” (Design consultant 4)*

It generally requires creativity to select, modify, and apply the toolkit in the project. Also, it isn't easy to know the best-suited toolkits in specific scenarios. However, the toolkit should not be the driving factor of the project's success.

*“You don't exactly know if you have customized the tool so that it is helpful and solves the problem.” (Design consultant 1)*

*“You can get inspired by the toolkits, but it should help you and not dictate your work or limit your work. I think there needs to be this creativity using the toolkits as well.” (In-house designer 1)*

#### **4.4. Sustainability in business models**

##### **4.4.1. Trend**

Sustainability has become an increasingly relevant strategic topic in large organizations. There are two drivers for that trend to happen. First, the organizations themselves want to be sustainable. Second, customers are expecting sustainable value propositions, especially from established companies.

*“Sustainability questions have started to be on the agenda of different innovation and product development team. It is also coming from the higher strategy of a company. We want to be more sustainable, and we want to do things that make our company more sustainable.” (Design consultant 1)*



*“This is always a huge topic when it comes, for example, the big companies, because they're supposed to have sustainability in their value proposition.” (Design consultant 2)*

Consequently, sustainability also becomes an important factor in evaluating business performance, in addition to desirability, feasibility, and viability.

*“Coming back to the Venn diagram picture or that model, the feasibility, desirability, and viability, that sustainability is becoming this new bubble that is taking a more significant part in that framework.” (Design consultant 4)*

*“In order to be successful, any new business venture must be at the very least three things: desirable, feasible and viable. In today’s world, there’s often a fourth characteristic added to the list: sustainable.” (Design consultant 5)*

However, the sustainability topic has not been emphasized or discussed sufficiently. Specifically, sustainability is still an afterthought or something nice to have when designing new business models. Moreover, in business design projects, sustainability has mainly been considered as part of the value proposition, but not yet the organization’s competitive advantage.

*“I think this is a matter of all of the companies that sustainability is still not enough discussed.” (In-house designer 2)*

*“I can’t recall a project that I would have done where the customer had first proactive when they came to us and said, hey, we would be really interested in creating this sustainable business model.” (Design consultant 4)*

*“It's the part of the value proposition, but it's not in the competitive advantage part of the value proposition. I haven't really seen any of those in my projects that I've been working on.” (Design consultant 2)*

#### 4.4.2. Benefit

Being sustainable can bring a lot of value to the organization. For example, sustainable organizations have a competitive edge in the market as the demand for sustainable

products increases. In addition, employees are more motivated to work for a sustainable company that contributes positive value to the environment and society.

*“In the future, it is becoming a more important competitive edge also for you, if you can be sustainable. So, it is not just showing good sustainability report numbers, but it is really linked to the customer value. There is an increasing demand for sustainable things.”*

*(Design consultant 4)*

*“For me, it's actually a big thing that keeps me in the company that's sustainable.” (In-house designer 2)*

#### 4.4.3. Definition

Sustainability is still a broad topic, so organizations sometimes are unclear what sustainability means for their business and which areas they should focus on. In a perfect scenario, from a high-level view, organizations should already have well-defined strategic sustainability actions and objectives. In a project, the areas on which sustainability can have an impact are also clearly defined.

*“In an optimal world, the company or organization has carefully defined their strategic sustainability actions and goals.” (Design consultant 5)*

*“Companies come to work with us to somehow define of what sustainability means for them and in what areas sustainability has an impact on.” (Design consultant 1)*

Notably, the definition of sustainability varies depending on the organization or project context. For example, one interviewee mentioned a sustainable business model means that the organization grows with the customers and adapts to the customers' needs. In a logistics corporation, safety, which is part of social sustainability, is among the organization's primary focus. In addition, a telecommunications company introduced digital sustainability as one of the aspects of the company's sustainable business model.

*“This sustainable business model or new contract model could be also just the fact that we grow with the customer. They need change, and we can adopt according to their needs.” (In-house designer 1)*

*“Safety being another key topic from social type of perspective that is often considered. I think governance related things are perhaps*

*less thought about in the business that we are in.” (In-house designer 4)*

*“You mentioned, I think environmental, economic, and social aspects in sustainability. But we also include digital sustainability. We do this because our own mission is a sustainable future through digitalization.” (In-house designer 2)*

In addition to the definition, organizations can perceive the level of priority and importance of sustainability differently in a business design project. One interviewee proposed three ways to define that level in a real-life business design project. First, when stakeholders proactively consider sustainability the primary factor they are looking for, sustainability is a very topic in a project. Second, business designers can directly ask the stakeholders whether sustainability should be the priority. Third, organizations seriously consider sustainability when there are clear sustainability targets.

*“One is when you're talking to stakeholder, whether the stakeholders bring that up themselves as a key thing that they're looking in a concept. Because if they bring it up, then it's more important than if you ask how important sustainability is. Because that's something that the interviewee will always feel that they should answer in a positive manner: that yes, it's very important.” (In-house designer 4)*

*“We asked about sustainability and its important quite in a straightforward way... Do you think that this is the priority they should be focusing on?” (In-house designer 4)*

*“Another way of knowing that people are serious about sustainability, whether they have it made as a target in the company.” (In-house designer 4)*

#### 4.4.4. Incorporation

There are three main approaches to incorporating sustainability in a business design project. For example, economic sustainability is the most common approach. Environmental sustainability, specifically carbon footprint reduction, and social sustainability are the other two approaches.

*“Economic sustainability is perhaps the easiest and most traditional for companies to tackle.” (Design consultant 5)*

*“There are definitely focus areas on sustainability, not just on carbon footprint, but I think that's like the easiest way to approach sustainability.” (In-house designer 4)*

*“Sustainability can be the launch for the whole thing, the thing that sets everything in motion that you want to solve a societal problem, for example.” (Design consultant 4)*

Regardless of the approach, sustainability should be a strategic driver and an integrated part of a strategy in an organization. As a result, sustainability guidelines will be incorporated into every organization’s initiative.

*“Including sustainability to the business model work comes from the strategy point of view.” (In-house designer 3)*

*“These sustainability goals will act as a guiding framework from the get-go, as they should be an integral part of the organization’s strategy.” (Design consultant 5)*

Importantly, business designers should aim to initiate sustainability discussions at the beginning of a business design project. The reason is that the later the discussion, the less likely sustainable initiatives will be implemented. Moreover, there should be clear goals for sustainability initiatives to be effectively implemented.

*“I'd say at the beginning definitely. Because as an afterthought, sustainability is something that you look back. Okay, we should have thought that earlier, our hands are tied to certain choices that we made.” (Design consultant 4)*

*“When they have stated that they will meet a certain goal, then there are much more likely to act on it. If there's not a clear-cut target for the customer, it's usually not so important.” (In-house designer 4)*

#### **4.4.5. Measurement**

There are frameworks dedicated to measuring sustainability impacts, such as SDG, ESG, and impact modeling. Specifically, SDG stands for Sustainable Development Goals; ESG

is the Environmental, Social, and Governance framework, and impact modeling is a method to quantify the social impact of the business model.

*“Sustainability actions and goals often tied to some wider initiatives such as the SDGs and accompanied by set metrics to monitor advancement. Then, the main task for a new business model is to evaluate the effect the model will have on these metrics.” (Design consultant 5)*

*“There’s like impact on these ESG things.” (In-house designer 3)*

*“We often talk about impact modeling, where we try to showcase and quantify the impact the model has on society.” (Design consultant 5)*

Organizations have different approaches to measuring sustainability metrics. For example, certain companies focus on measuring the reduction of CO<sub>2</sub> emission, while others, like financial corporations, may focus more on other measurements.

*“We’re not creating tangible products, so carbon footprint calculations are not maybe the main thing that we can directly affect ourselves.” (In-house designer 3)*

*“One thing that we will be tracking is what is the expected reduction of carbon footprint, so basically how much CO<sub>2</sub> would a concept save?” (In-house designer 4)*

All these sustainability measurements are often indicated positively in a report. However, most interviewees agreed that measuring the actual impact of sustainability is challenging. Moreover, sustainability sometimes becomes a superficial objective without concrete metrics for evaluation.

*“The strategy and the top-level reports, they look really good.” (In-house designer 2)*

*“You really take a look at the new business ideas, you’re wondering like, does this really create a more sustainable future?” (In-house designer 2)*

*“But I don't know how to evaluate them. This was the question that I really realized beforehand that this is really hard.” (In-house designer 3)*

*“As a subject it remains quite undefined, unregulated and somewhat even feared, often leading to rather superficial objective statements with little metrics behind them.” (Design consultant 5)*

Two ways are mentioned in the interviews to prevent sustainability from being a green-washing discussion. First, organizations should have the numbers to demonstrate sustainable impacts in addition to customers' quotes. Second, there should be a broader strategy and an action plan to turn sustainable value propositions into competitive advantages.

*“If there's no wider strategy or even plans for one to begin with, sustainability evaluations of something new will run a high risk of superficial and even green-washing labelling - unless it can act as a catalyst for a wider company evaluation.” (Design consultant 5)*

*“We always try to back it up with the numbers over the customer quotes. So, this is something that to sort of prevent the greenwashing.” (Design consultant 2)*

*“If you have the sustainability in your value proposition as an element, you really need to understand how exactly this allows you to create the competitive advantage.” (Design consultant 2)*

## **5. Findings from workshops**

Information in the workshop is analyzed to study the applicability of the selected process and toolkits when helping two case organizations co-design a sustainable business model. This chapter introduces key activities, results, and participants' feedback on the workshops. Then, the applicability study is presented.

### **5.1. Workshop activities and results**

It's worth mentioning that this thesis will display workshop results as blurred for confidential reasons. The purpose of showing the results is to provide more context to the design process and not to show the result details. The process, activities, and toolkits in each workshop will be described in more detail.

#### **Workshop 1: Stakeholder mapping & current business logic**

In this first workshop, participants from each company began by filling in their company's current ecosystem members on a separate canvas. The mission of the ecosystem or the focal company is in the middle of the canvas. Around the mission, there are four types of ecosystem stakeholders, including leaders & key partners, contributors, users, and other stakeholders.

Company A is a global corporation with many business units, so the number of ecosystem members of company A is enormous. Therefore, only the consulting department in company A was selected for this exercise.

After both companies filled in and shared the results on their ecosystem members canvas, they brainstormed to identify potential shared members and ecosystems. There were more stakeholders in company A's canvas, so company A needed to decide which stakeholders that have the most potential to collaborate with company B. After relevant stakeholders from company A were selected, I acted as a facilitator and copied post-it notes from two ecosystem canvases into one shared canvas. Then, participants asked questions and shared ideas to seek concrete collaboration opportunities. The middle canvas, shown in Figure 14, illustrates the possible shared ecosystem.

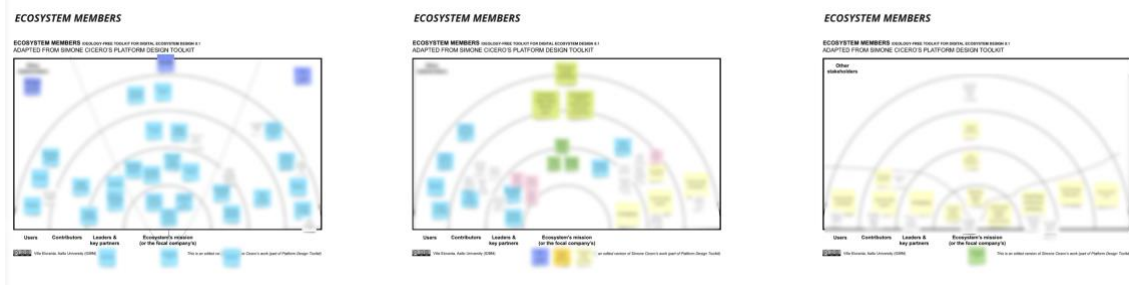


Figure 14. Results of ecosystem members canvas

After the first workshop, I discussed with one representative from company A to consolidate all the ideas and visualize a shared ecosystem for companies A and B using the same ecosystem members canvas. The proposed shared ecosystem, illustrated in Figure 15, with five members was developed. The ecosystem mission was also rewritten for clarity. The shared ecosystem members and mission were a starting point for the next workshop.

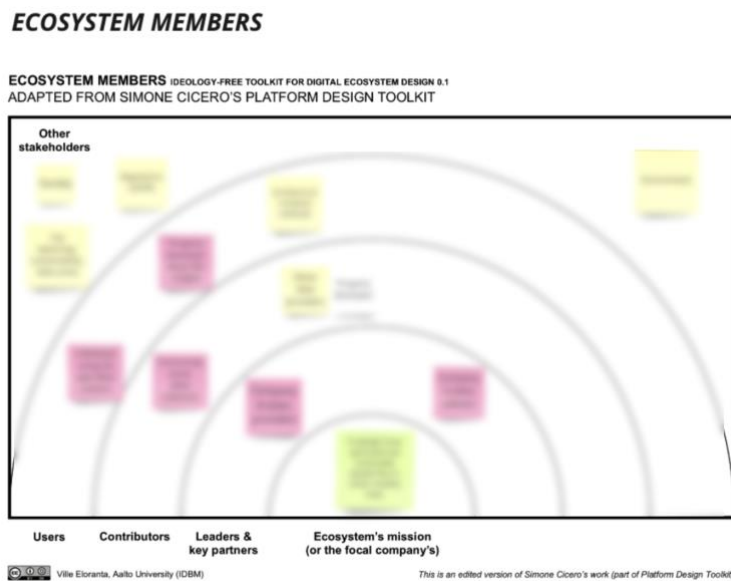


Figure 15. Shared ecosystem and its members for both companies

## Workshop 2: Ecosystem members profile

I began by introducing the shared ecosystem with its five members, including companies A and B, property owners, community owners, and individual users, as shown in Figure 15. These members were picked from the



current ecosystems of the two companies, so there were no unfamiliar members to both company. The environment and society were also mentioned as other stakeholders on the canvas.

After some clarifications, the participants continued describing the members using the ecosystem members profile canvas. This canvas contains four sections: member name, characteristics, valuable assets, and valuable capabilities. The activity results are shown in Figure 16.

At the end of workshop two, participants worked on the ecosystem motivation matrix. Participants aimed to define the value each member could give other members in the shared ecosystem. However, there was a lack of time, so most of the content on this matrix was created in the next workshop.

**ECOSYSTEM MEMBERS PROFILE**



Figure 16. Results of ecosystem members profile canvas

### Workshop 3: ecosystem motivation

All five members in the shared ecosystem were listed vertically and horizontally in the same order on the canvas, shown in Figure 17. The participants brainstormed and filled in the exchange value from each member to other members. Exchange value could take different forms. For example, money, network, or data could be the exchange value.

After the canvas was completed, I asked, "What are the most powerful relationships, where most of the value can flow?" to help participants identify the critical relationships in the shared ecosystem based on the ecosystem motivation matrix. There was no clear answer to the question, as participants argued that there was more than one strong relationship. Examples of these relationships were company A-company B, company B-end users, company A-property owners.

#### ECOSYSTEM MOTIVATION MATRIX

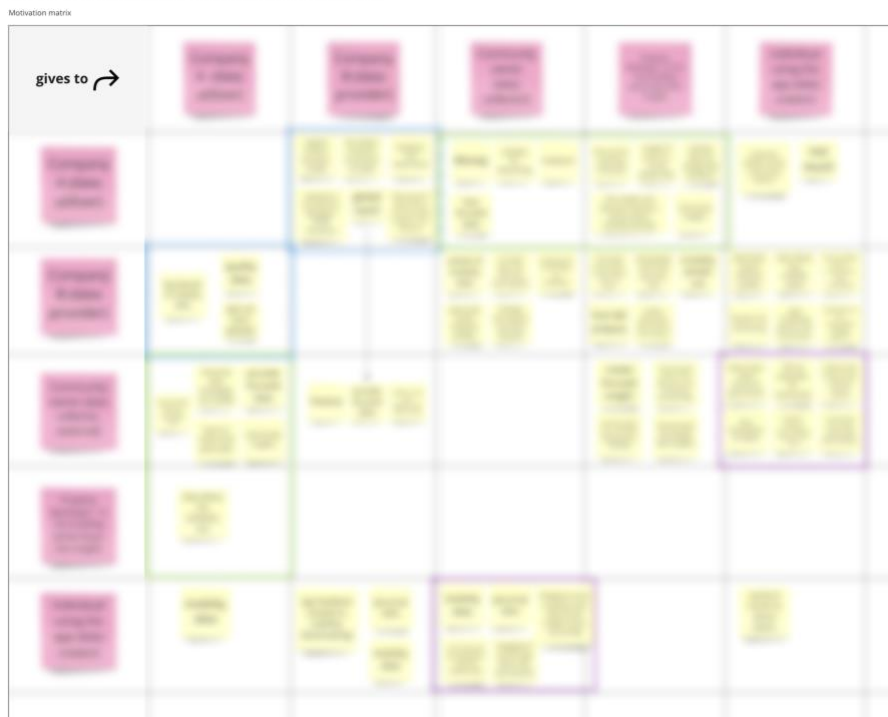


Figure 17. Results of the ecosystem motivation matrix

### Workshop 4: Sustainable platform business design

This last workshop occurred approximately one month after the third one due to the summer break. This workshop was organized between me and company A to synthesize all the ideas after exploration activities in three previous workshops. This workshop

aimed to produce concrete sustainable business model concepts that company A could use for internal evaluation. During the workshop, major risks were also identified.

I could not find a suitable research-based toolkit to facilitate this workshop. The toolkits introduced in the literature either were too complex for ideation or lacked a single canvas that could visualize an entire sustainable business model. Instead, I created a custom framework for this workshop. At the beginning of this workshop, I proposed three preliminary business models to company A's representatives, as seen in Figure 18. Then, the workshop continued with an open discussion using notes and whiteboards.



Figure 18. Preliminary business model ideas

It was a creative process to develop three preliminary business model ideas. First, I transformed the shared ecosystem mission into a "How might we" question. This type of question supports generating new ideas. Second, I looked for the opportunity space with a gap in the urban mobility market. Specifically, I identified activities or elements needed to make urban mobility more sustainable. Sustainable urban mobility was also a theme in the SPARCS project. Third, I transformed these activities or elements into "How might we" questions. Based on these questions, I ideated three sustainable business models. During the ideation, I used six types of notes to represent various aspects of a business model, including stakeholder, an example of stakeholder, product or service offering, the value captured, an example of value, and opportunity space. I mapped and connected these notes to form three preliminary business models. Each model presented one theme or approach, even though the offering could be the same. The preliminary business models incorporated proactive multi-stakeholder management, long-term perspective, and sustainability solutions, which are three components of a sustainable business model

(Geissdoerfer et al., 2018). However, it was challenging to state if these models were sustainable.

The final workshop result was a high-level sustainable business model concept in urban mobility that companies A and B can co-create. Through this model, companies A and B can deliver and capture more value from the existing stakeholders in their ecosystems. Nevertheless, to achieve the intended outcome from the business model concept, companies A and B need to invest significantly in upgrading technical capabilities and attracting more users. The final concept could not be shared in detail due to confidentiality; however, reflections on the concept and final project outcome are written in chapter 6.

## **5.2. Participants' feedback**

The feedback was collected in a 30-minutes retrospective session after the third workshop. In general, the feedback was about things that went well or did not work well, opportunities for improvement, and things that deserve recognition.

On the positive side, participants enjoyed the online workshop format in which they could collaborate, share ideas, and learn from others. Also, Miro was an excellent platform for online workshopping. In addition, trust between participants was acknowledged when participants openly shared information, as business modeling is a strategic activity that requires sharing confidential information. The essential factor contributing to building this trust was that representatives from both companies had already established a good relationship through a pilot project before the workshop.

On the negative side, lack of time was the biggest issue. Most activities in the workshop took more time than expected, and some actions needed to be removed. In addition, participants wanted to have more visibility on activities that happened in between each workshop. Sometimes the focus was lost, especially at the beginning when there were many possible approaches to designing a business model. Lastly, some participants had technical issues with Miro during online workshops.

On the improvement side, the facilitator could bring more materials other than sticky notes to the workshop because business modeling was a highly abstract topic to discuss. One example of the material is inspirational cards that can be used in ideation. Also, the participants would need more introductions to the sustainable business model concepts and the current business models of the two companies at the beginning of the workshop

series. If possible, there should be more time for warm-up activities so that participants can get to know each other better and be more familiar with the tool Miro. Finally, the facilitator should narrow the ideation quicker to focus on selected topics.

On the recognition side, participants endorsed that the facilitator could adjust the workshop plan according to the new information. Moreover, designing a sustainable business model was a complex topic, especially co-designing from two companies' perspectives. However, the facilitator overcame the complexity and developed structural programs for the workshop series.

### **5.3. Applicability of the selected process and toolkits**

#### **Applicability of the selected process identified from interviews**

The process I selected is described in Figure 13. This process emerged from interviews with ten business designers in corporations and consultancies. In general, the selected process has benefits and limitations.

The selected process had two primary benefits. First, the process encouraged project participants to conduct in-depth research about both companies' current business models and customers. With this understanding, the participants were more effective when identifying the shared problem space that both companies could solve. In addition, the discussion in the workshop was more structured and relevant. Second, the process was iterative and flexible enough for big changes during the project. For example, even though a series of workshops were planned, company A and I always needed to redefine the next workshop's objectives and activities after each workshop.

There are three fundamental limitations. First, the process was broad, providing limited guidance to plan concrete workshop activities and allocate time accurately. For example, after comparing this workshop agenda and the actual results, I realized most of the activities in the workshop required almost double the time expected. Second, even though sustainability was integrated into the thinking during the process, there was no dedicated step to discuss in-depth sustainability matters. In addition, sustainability was primarily discussed in the last step, evaluation, and was not emphasized as the driving factor throughout the selected process. Therefore, sustainability was only one of the evaluation criteria, together with desirability, feasibility, and viability. Third, the process could not guarantee to create a sustainable business model in the end. The exact process could be applied to develop a conventional business model. In other words, concrete

activities under the process, which project participants planned, determined the success of creating a sustainable business model. As a result, organizations would need more guidance when applying this process to design sustainable business models.

### **Applicability of the platform design toolkit**

The platform design toolkit has two main benefits when used in the case project. First, the three canvases used in the workshops structurally guided case organizations to explore their mutual relationships in an ecosystem view with other stakeholders. Second, the ecosystem members canvas enabled organizations to define their roles in an ecosystem context, specifically, who the platform owner is. These roles were important because new sustainable business models require a value network with a new way of governance (Evans et al., 2017).

On the other hand, the platform design toolkit has three key limitations. First, the canvases in the platform design toolkit required sufficient time to accomplish. Even though I used the simplified versions of the selected canvases in the workshops, participants still lacked time to fill in each canvas. As documented, most activities in the workshop took more time than expected, and some actions were removed.

Second, the toolkit had limited guidance on identifying a shared ecosystem between two or more companies. This limitation occurred in the first workshop, stakeholder mapping, and current business logic. In detail, participants could quickly fill in information about each company ecosystem but faced challenges in identifying a shared ecosystem or synergies.

Third, in the platform design toolkit, I could not find a suitable canvas that could visualize the whole sustainable business model concept. Precisely, I needed a canvas to consolidate all information in one place to be used for internal evaluation. That was why I could not use any canvas in the platform design toolkit in the final workshop. On the one hand, the last workshop was unstructured, so it was difficult to predict the results and estimate the time needed to arrive at the intended results. In addition, the open discussion was sometimes stuck without clear direction or guided questions from the toolkits to continue. On the other hand, the participants could decide the critical topics to discuss that serve their needs at that moment. For example, company A wanted to have a sustainable business model concept for internal evaluation, so the discussion could focus on what internal stakeholders were looking for from the concept.

## **6. Discussion**

### **6.1. Sustainable business modeling outcome**

This section discusses the possible outcomes when designing a sustainable business model. In the first part, I reflect on the outcome of the case project with the characteristics of a sustainable business model in urban mobility identified from the literature. In the second part, I point out the challenges of differentiating a sustainable business model from a conventional one.

#### **Outcome of the case project**

The final business model concept developed in the case project can be considered a sustainable business model in an urban mobility context to some extent. It is essential to acknowledge that the explanations below are hypotheses because the actual impact of the business model has not been validated in practice.

First, that business model follows two sustainable business model archetypes in urban mobility defined by Souza et al. (2019). For instance, on a concept level, the business model outcome empowers city residents to select more sustainable transportation modes, thus encouraging substitution using sustainable modes (Souza et al., 2019). Also, both companies aim at global uses of the technology solution associated with the business model concept, which follows another archetype: developing scale-up mobility solutions (Souza et al., 2019). Second, the final business model concept covers all aspects of the conceptual sustainable business model framework (Bocken et al., 2015). For example, sustainable value for the environment and society is integrated into the ecosystem mission. Indeed, findings from interviews also recommend that sustainability should be a strategic driver so that sustainability guidelines will be incorporated into every initiative. In addition, sustainability drivers were one of the main motivations for other members to join the ecosystem. For example, motivations for property owners to join the ecosystem are to develop more sustainable buildings, reach green-building specifications, and optimize energy efficiency.

#### **Challenges of differentiating a sustainable business model from a conventional one**

Reflecting on the case project results, I believe that justifying whether a business model is sustainable in all aspects is unrealistic and unnecessary. Three main factors contribute to that belief.

First, designing or exploring a new business model is a strategic activity, and the outcome of a business design project is often a high-level business model concept. Therefore, the sustainable impact of the business model is too generic to be accurately evaluated. Indeed, interview findings indicate that it takes a lot of time to realize the real impact of a new business model. Also, impacts measured during the project are predictions of the future, which are likely inaccurate.

Second, evaluating a business model from three aspects of sustainability, including economic, social, and environmental, together with multi-stakeholder views, involves complexity and ambiguity. There are multiple factors and stakeholders to consider during the evaluation. Notably, the project team may not be aware of all the stakeholders' interests and could not access all internal information of these stakeholders during the business modeling process. Thus, it is likely that there are areas where the business model concept would cause adverse impacts and conflicting interests.

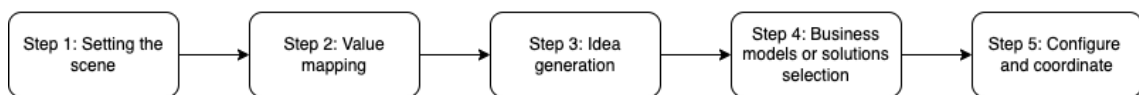
Third, defining concrete measurements to evaluate sustainability initiatives is not easy. Even though there are frameworks such as ESG (Environmental, Social, and Governance) or SDG (Sustainable Development Goals), organizations still need to translate these frameworks into project metrics and involve multiple discussions with various internal stakeholders. These activities take time and commitment. Without concrete metrics for evaluation, sustainability drivers will likely become superficial objectives, and there will be little progress made. Consequently, sustainability is usually an after-thought and nice-to-have factor in a business design project.

## **6.2. Sustainable business modeling processes**

This section discusses the processes identified in theory and practice that can be used to co-design a sustainable business model. First, I compare the similarities and differences between processes identified in theory and practice, as seen in Figure 19. The summary of the similarities and differences can be seen in Table 13. Second, I explain possible causes for the differences between the two processes. Third, I summarize potential challenges when designing sustainable business models in real projects. Lastly, I discuss the applicability of the sustainable business modeling process, introduced by Rana et al. (2017), in practice.



*Sustainable business modeling process (Rana et al., 2017)*



*Sustainable business modeling process identified from interviews and applied in the case project*

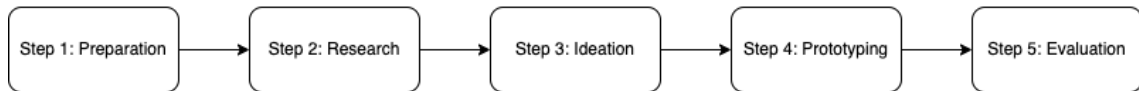


Figure 19. Compare sustainable business modeling processes in theory and practice

### **Similarities and differences between two processes**

Regarding the similarities, first, both processes contain five iterative steps. Rana et al. (2017) define the process as setting the scene, value mapping, idea generation, business models or solutions selection, and configure and coordinate. The process identified from interviews and applied in the case project also includes five steps: preparation, research, ideation, prototyping, and evaluation. Second, all unified perspectives for creating sustainable business models, introduced by Evans et al. (2017), can be incorporated into both processes. In other words, each process can produce outcomes that include sustainable value, sustainable value flows, new governance mechanisms, mutual value creation between stakeholders, and integration of external factors into product and service development. Third, both processes start with the preparation activities, including understanding the project context, the current business model, potential stakeholders, and sustainability drivers. Fourth, there are always ideation activities in the middle of the process, after gathering sufficient background knowledge and before developing something concrete. Both processes encourage companies to take multiple stakeholders' perspectives during the ideation and harmonize stakeholders' interests. Lastly, both approaches from the literature and practice aim to produce concrete outcomes in the end. The result can be a sustainable business model, including three conceptual areas: value proposition, value creation and delivery, and value capture (Bocken et al., 2015).

Regarding the differences, the sustainable business modeling process identified from the interviews has six differences compared to the one introduced by Rana et al. (2017). First, this process emphasizes research as a separate step because researching the market, competition, and customers is crucial and may require enormous effort. Also, a critical

activity in the research phase is to validate the customers' problems, which can generate valuable insights for the subsequent development steps.

Second, the ideation scope in this process is greater than the one in Rana et al. (2017) process. Specifically, in the process defined by Rana et al. (2017), ideation focuses more on the value, for instance, identifying sustainable value propositions and opportunities for shared value creation. In the process developed from interviews, ideation is not limited to value but expands to solution concepts and revenue models. In other words, this process combines value mapping activity with product or service concept ideation.

Third, interviewees emphasize prototyping as a separate step in sustainable business modeling. Prototyping is to create a simpler version of a product concept or a financial model, which can be used to collect stakeholders' feedback accurately. Prototypes are needed to support evaluation and prioritization activities in a real-life context, particularly when resources are limited.

Fourth, evaluation is based on the prototypes, not the value concept. In the process introduced by Rana et al. (2017), concept selection happens before considering the concept's feasibility and viability aspects, particularly how to create and capture the value. In the process that emerged from the interviews, concept selection happens during the evaluation phase after the prototypes are tested with target customers or businesspeople. The prototypes should cover the proposed concepts' desirable, feasible, and viable aspects.

Fifth, this process aims at designing a business model in which sustainability is only one of the evaluation criteria. On the other hand, the theoretical process defined by Rana et al. (2017) aims at designing a truly sustainable business model. That is why the theoretical process starts with mapping various forms of value between stakeholders while the practical process begins with researching the corporate business, market, and competition. As a result, sustainability is not yet the primary driving factor when designing a sustainable business model in practice.

Lastly, this process looks like the five iterative stages of the Design Thinking process, including Empathize, Define, Ideate, Prototype, and Test (Rikke, 2022). Indeed, the process that emerged from interviews and the Design Thinking process seem to have similar approaches to designing new things, either business models or service concepts.

Table 13. Similarities and differences between two sustainable business modeling processes

<b>Number</b>	<b>Similarities</b>	<b>Differences in the process emerged from interviews</b>
1	Contain five iterative steps	Emphasize research as a separate step
2	Can incorporate all unified perspectives for the creation of sustainable business models, introduced by Evans et al. (2017)	Ideation is not limited to value but expands to solution concepts and revenue models
3	Start with the preparation activities	Emphasize prototyping as a separate step
4	Have ideation activities	Evaluation is based on the prototypes, not value concept
5	Aim to produce concrete outcomes in the end	Aims at designing a business model in which sustainability is only one of the evaluation criteria
6		Is similar to the five stages of Design thinking process

### **Possible causes for the differences**

First, implementing a new business model requires significant investments and transformations for organizations. In addition, an organization rarely changes its entire business model in practice, so it is essential to understand the current business model before innovating a new model. As a result, the business modeling process in practice emphasizes research and prototyping as separate steps. These steps can help an organization make informed decisions, spend resources more efficiently, and reduce potential risks during implementation.

Second, organizations and business designers are more familiar with designing business models than designing sustainable business models. Moreover, business designers or decision-makers may not be well-equipped with sustainability-related knowledge. Also, the term sustainable value may be understood differently among organizations and business designers. Therefore, the process identified in practice aims more at designing

a business model that is sustainable, meaning sustainability is only one of the evaluation criteria.

Third, the background of the interviewees may determine the process they use in their projects. All interviewees are business designers with a design mindset, so they are familiar with the Design Thinking methodology. In addition, business design projects in practice often require designing new products or services, and Design Thinking can be used effectively in these projects. Therefore, the sustainable business modeling process used by these interviewees is similar to the five stages of the Design Thinking process.

### **Challenges in designing sustainable business models in practice**

Designing a sustainable business model in an actual project can be challenging. These challenges are categorized into three aspects of the sustainable business modeling process, including broadness, complexity, and adaptability. The challenges are summarized in Table 14.

Regarding the broadness of the process, there are many possible approaches to executing the project. Literature and interviews indicate that designing a business model is an iterative process, meaning a business designer can repeat and iterate on a step several times before moving forward to the next step. In addition, designing a sustainable business model requires the participation of multiple stakeholders. These stakeholders often have different desires toward each other. As a result, stakeholders participating in the process can influence the process in various directions, which they think would benefit them or the shared ecosystem. Therefore, it is challenging to find synergies among stakeholders. This broadness issue was also mentioned in the participants' feedback that sometimes the focus was lost, especially at the beginning. The focus should be defined and maintained actively during the process.

Regarding complexity, first, multiple variables must be considered when designing a sustainable business model. Specifically, compared to conventional business models, sustainable business models have four additional elements: sustainable value, proactive multi-stakeholder management, a long-term perspective, and solutions for sustainability (Geissdoerfer et al., 2018). The conceptual framework of sustainable business models (Bocken et al., 2015) also explicitly acknowledges the environment and society as primary stakeholders in addition to the customers. Consequently, the more elements or stakeholders consider, the more complex the modeling process is. However, involving stakeholders in the process would be necessary to better understand and design mutual relationships between these stakeholders.

Second, there is a need for more collaborations when two or more organizations are actively involved in the design process. For example, extra activities were required in the case project, such as getting to know each company's business models, building trust among project participants, identifying shared customers or users, finding suitable meeting times, and having meetings frequently to update new information. Third, the context defines the outcome and the process, so no approach can guarantee to generate the same result in different projects. The interview findings also indicate that a business design project's outcome varies depending on the market context, competition, and organization. Fourth, Evans et al. (2017) stated that when developing a sustainable business model, an existing organization needs to figure out how to integrate its business models into a network with existing other business models. That integration is another complex challenge in the sustainable business modeling process. In the case project, both companies faced this integration challenge. Companies A and B have a defined existing business model and market. As a result, co-implementing a shared business model would require radical changes and entrance to new markets, which is unlikely to happen based on a few workshops.

Regarding adaptability, the sustainable business modeling process in practice should be flexible enough to adapt to new findings, limitations, and contextual changes. For example, the interview findings indicated that ideation activities could have many possible outcomes and these outcomes are difficult to predict. Indeed, in the case project documentation, most activities in the workshop took more time than expected in the schedule, and some actions were removed. Thus, the planned process and activities, particularly during and after the ideation, often need to be adjusted to fit the latest situation. Notably, the modeling process needs to be communicated openly with stakeholders throughout the project. According to the interview findings, open communication is a great way to build trust and get buy-in from the decision-makers, which can significantly determine the project's success. In the case project, one improvement feedback from the participants is to communicate what happened in between the workshops.

Table 14. Challenges in designing a sustainable business model in practice

Number	Area of challenge	Challenge
1	Broadness	There are many possible approaches to design a sustainable business model

2		Focus should be defined and maintained actively during the process
3	Complexity	Multiple variables and stakeholders are considered when designing a sustainable business model
4		More collaborations are needed when two or more organizations are actively involved in the design process
5		Process and outcome of a business design project vary depending on the context
6		Integrating a current business model into a network of existing business models is challenging
7	Adaptability	Sustainable business modeling process in practice should be flexible enough to adapt to new findings, limitations, and contextual changes

### **Applicability of the theoretical process in practice**

After reviewing the theory and working on the case project, I realized two areas that could prevent organizations from adopting the theoretical sustainable business modeling process introduced by Rana et al. (2017) in real-life projects. These areas are understanding new terminology and making a business case for sustainability.

In terms of new terminology, sustainable value and value mapping may not be well understood by business designers and general audiences, including decision-makers or project sponsors. As can be seen from the interview findings, business designers seem to be more familiar with design thinking methodology, and value mapping is an entirely new approach. In addition, business designers will face challenges when explaining different forms of value and how to measure these value forms in the business model context. In practice, business designers need to understand sustainability topics or work with sustainability experts to apply the theoretical process. Consequently, it requires more effort for business designers to educate themselves on the approach suggested by Rana et al. (2017).

In terms of making a business case, it may be quicker for organizations to realize the business value of a business design project when starting with designing a business model and then evaluating the model through the lenses of sustainability. In other words,

organizations, particularly business stakeholders, prefer first to see how they can profit from the new business model and second to understand how to make the business model sustainable. Moreover, organizations nowadays understand the value of sustainability, but they are also aware that it takes plenty of resources to make something sustainable. In addition, extensive research about stakeholders is needed to effectively map value among these stakeholders in a value mapping activity. Therefore, aiming at designing a sustainable business model from the beginning with value mapping activity could be too ambitious or sometimes superficial in practice.

### **6.3. Sustainable business modeling toolkits**

In this section, I discuss the applicability of research-based toolkits in a real-life project. These tools, introduced in the literature, include value mapping canvas, triple-layered business model canvas, flourishing business canvas, and platform design toolkit.

After reviewing these toolkits, I realized three major aspects of these tools. First, the tools are primarily suited for ideation activity. This aspect leads to two hypotheses: there is a lack of dedicated tools for other steps, or the other steps can utilize tools from different disciplines. Indeed, to support the later hypothesis, interview findings indicate that many service design toolkits and even Excel can be used in a business design project.

Second, all toolkits reviewed in the literature are canvases. Canvases can provide a structure for ideation or a group discussion. However, canvases are also static, thus limiting the flexibility to focus more on critical topics and canvases also require excellent facilitation from the facilitator to achieve the best possible outcome. For example, the triple-layered business model canvas and the flourishing business canvas could be too complex for ideating new business models because one interview finding mentions that the Business Model Canvas, which has fewer elements, is already complicated in some cases. Indeed, it is one of the reasons why the platform design toolkit was selected for the case project.

Third, these toolkits incorporate major elements of a sustainable business model, including multi-stakeholder views and sustainable value to the environment and society. As presented in the findings, business designers tend to modify the tools in every project. Therefore, it is fair to assume that every toolkit can be utilized in a sustainable business modeling project if the toolkit incorporates one of these four elements, including sustainable value, proactive multi-stakeholder management, a long-term perspective, and solutions for sustainability (Geissdoerfer et al., 2018).

## 7. Conclusion

### 7.1. Main findings

The objective of this thesis is to explore sustainable business modeling processes and toolkits in theory and practice. Specifically, the thesis aims to answer these three research questions:

1. What are the characteristics of a sustainable business model in urban mobility?
2. What are typical processes and toolkits for designing a sustainable business model?
3. To what extent can the selected process and toolkits be applied to help case organizations co-design a sustainable business model?

To answer the first question, the literature shows different characteristics of a sustainable business model in urban mobility. On a broad level, sustainable business models must incorporate all four elements, including sustainable value, proactive multi-stakeholder management, long-term perspective, and solutions for sustainability. In an urban mobility context, sustainable business models follow common patterns or archetypes. These archetypes include: (1) favor the use of clean energy, (2) maximize the use of transport resources and capabilities, (3) encourage substitution using sustainable modes, (4) offer service orientation and functionality, (5) articulate initiatives that address the needs of a wide range of stakeholders in transport systems, (6) reduce travel demands, (7) extend benefits to society and environment in a systemic perspective, and (8) develop scale-up mobility solutions. For example, the business model resulting from the case project follows two archetypes: encouraging substitution using sustainable modes and developing scale-up mobility solutions.

To answer the second question, two design processes and four toolkits are introduced. Specifically, the first process is identified from the literature, including five iterative steps: (1) setting the scene, (2) value mapping, (3) idea generation, (4) business models or solutions selection, and (5) configure and coordinate (Rana et al., 2017). The second process emerged from interviews with business designers. This process also has five iterative steps, namely (1) preparation, (2) research, (3) ideation, (4) prototyping, and (5) evaluation. Both processes have primary similarities and differences.

On the one hand, both processes show that service design is a significant part of business model design. On the other hand, the noticeable difference is that the process that



emerged from interviews aims at designing a business model, then sustainability is considered as one of the evaluation criteria at the end. Meanwhile, the approach developed by Rana et al. (2017) attempts to design sustainable business models from the beginning based on mapping different forms of value among ecosystem members.

Four research-based toolkits are also reviewed in the literature, including value mapping canvas, triple-layered business model canvas, flourishing business canvas, and platform design toolkit. Each tool has strengths and limitations when used in sustainable business modeling. Most toolkits, except the platform design toolkit, focus only on the focal firm's perspectives toward the ecosystem rather than enabling two organizations to co-design a business model in an ecosystem. It is one of the reasons why the platform design toolkit is used to facilitate the workshops to help two case organizations co-design a sustainable business model.

To answer the third question, I applied the process identified from interviews and three canvases from the platform design toolkit to the case project. Generally, the selected process and toolkits help case organizations co-design a sustainable business model. However, there are some limitations to both the process and toolkits.

For the process, it was challenging to apply the process identified from interviews in the case project. These challenges are associated with three process aspects: broadness, complexity, and adaptability. First, there could be many approaches to designing a sustainable business model, so it was challenging to plan concrete activities and estimate the time needed. Second, there are different variables and stakeholders to consider when designing a sustainable business model, which increases the complexity of the process. Third, new findings during the process often result in new activities, so the project participants may feel lost if the information is not well-communicated.

For the toolkit, the platform design toolkit had three significant limitations when it was used in the case project. First, the platform design toolkit has limited guidance on exploring a shared ecosystem between two companies. Second, the toolkit does not have one canvas that can visualize an entire sustainable business model. Third, the toolkit has limited consideration for sustainability.

## **7.2. Theoretical contributions**

This thesis highlights the applicability gaps of specific processes and toolkits in the sustainable business model innovation literature. These gaps come from the limitations

in applying sustainable business modeling process, introduced by Rana et al. (2017), in practice, the reasons for the differences between processes in theory and practice, and the applicability of research-based toolkits in practice.

First, the thesis identifies two areas that may prevent organizations from adopting the sustainable business modeling process introduced by Rana et al. (2017) in real-life business design projects. In detail, business designers and general audiences may not understand new terminologies such as sustainable value and value mapping. As a result, to advocate and implement the theoretical process, business designers need to further educate themselves on the intersection of sustainability and business model innovation. Additionally, organizations may realize the business value of a business design project quicker when they first have a business model and second evaluate to what extent that model is sustainable. Aiming to design a sustainable business model based on value mapping at the beginning of the business modeling process without extensive research could be superficial in practice.

Second, the sustainable business modeling process, which emerged from interviews with business designers, indicates the importance of having research and prototyping when designing a sustainable business model. Meanwhile, the process by Rana et al. (2017) in the literature does not explicitly highlight these steps. This difference can be explained as follows. Business model innovation is a strategic activity that requires organizations' significant investments and transformations to implement; therefore, organizations must do extensive research and test various prototypes to make informed decisions and spend resources efficiently.

Third, the thesis presents the limitations of selected research-based toolkits in designing a sustainable business model, especially the platform design toolkit. These limitations can guide the improvements to enhance the applicability of research-based toolkits in real projects. One notable limitation is that all toolkits presented in the thesis provide limited guidance to help two or more organizations find a shared ecosystem in which these organizations can co-operate.

### **7.3. Practical contributions**

This thesis presents three implications for organizations and business designers when designing sustainable business models. First, this thesis introduces in detail two sustainable business modeling processes, one from literature and one from expert interviews. Each process contains five iterative steps going from beginning to end in a

business design project. Business designers can use this information as a starting point to form or tailor the approach to their business design projects.

Second, four sustainable business modeling toolkits from the literature are presented, together with their benefits and limitations in practice. Business designers can utilize these toolkits or be inspired to develop more suitable ones for specific project contexts. Indeed, one interview finding indicates that business designers often need to modify the toolkits to fit the project objectives and requirements.

Third, results from interviews with business designers introduce many best practices for designing sustainable business models. These results cover four areas, including business design projects, design processes, toolkits, and sustainability. Notably, a business model developed in a project does not need to match all the characteristics and criteria defined in theory to be considered sustainable in a real-life project. Instead, business designers should ask the organizations to explain their sustainability definitions and measurements at the beginning of the project and then stick to this information. Moreover, business designers usually need to modify the toolkits to fit the project context, but these toolkits should not be the driving factor of the project. The business designers' expertise and facilitation skills are more critical to project success. Furthermore, it is important for business designers to be equipped with sustainability knowledge when designing sustainable business models.

#### **7.4. Limitations and suggestions**

This thesis has two main limitations from an academic point of view, including the number of interviews and the generalization of the findings. First, more interviews may result in more diverse insights, as every business designer often has unique experiences and perspectives on sustainable business modeling. However, my timeline for interviewing activities is narrow because most interviews needed to be conducted before the series of workshops. I wanted to use interview findings to plan the workshop activities. Second, findings from studying the applicability of the selected process and toolkit may not be generalized to other project contexts. In other words, the sustainable business modeling process emerged from interviews, and the platform design toolkit could be more or less applicable depending on the project. Nevertheless, this thesis is a single-case study, so the goal is not to generalize knowledge. Instead, this thesis supports readers in forming their understanding of sustainable business modeling processes and toolkits by reflecting on the findings and discussions.

Further research is recommended to develop more holistic pictures of sustainable business modeling processes and toolkits. New research can study multiple cases with a more extensive project scope or different context. For example, the case project can take place outside an urban mobility ecosystem and involve a longer timeline. In addition, more processes and toolkits can be applied in real-life projects to study their applicability in practice.

## References

- Aagaard, A. 2019. Sustainable Business Models, Palgrave Studies in Sustainable Business. In Association with Future Earth.
- Allee, V. 2008. Value network analysis and value conversion of tangible and intangible assets. *Journal of Intellectual Capital* 9(1): 5–24.
- Baden-Fuller, C & Morgan, M S. 2010. Business Models as Models. *Long Range Planning* 43: 156–171.
- Bansal, P. 2005. Evolving Sustainability: A Longitudinal Study of Corporate Sustainable Development. *Strategic Management Journal* 26: 197–218.
- Bithas, K. 2011. Sustainability and externalities: is the internalization of externalities a sufficient condition for sustainability? *Ecological Economics* 70(10): 1703–1706.
- Bocken, N M P, Rana, P & Short, S W. 2015. Value mapping for sustainable business thinking. *Journal of Industrial and Production Engineering* 32(1): 67–81.
- Bocken, N M P, Short, S W, Rana, P & Evans, S. 2014. A literature and practice review to develop sustainable business model archetypes. *J Clean Prod* 65: 42–56.
- Bocken, N, Boons, F & Baldassarre, B. 2019. Sustainable business model experimentation by understanding ecologies of business models. *Journal of Cleaner Production* 208: 1498–1512.
- Bocken, N, Short, S, Rana, P & Evans, S. 2013. A value mapping tool for sustainable business modelling. *Corporate Governance: The International Journal of Business in Society* 13(5): 482–497.
- Boons, F & Lüdeke-Freund, F. 2013. Business Models for Sustainable Innovation: State-of-the-art and Steps Towards a Research Agenda. *Journal of Cleaner Production* 45: 9–19.
- Boundaryless. 2013. Platform Design Toolkit. [Last accessed 20 May 2022]. Available at: <https://www.boundaryless.io/pdt-toolkit/>.
- Casadesus-Masanell, R & Ricart, J E. 2010. From strategy to business models and to tactics. *Long Range Planning* 43: 195–215.

- Chatterjee, S. 2013. Simple Rules for Designing Business Models. *California Management Review* 55: 97–124.
- Chesbrough, H. 2010. Business Model Innovation: Opportunities and Barriers. *Long Range Planning* 43: 354–363.
- Chofreh, A G, Goni, F A, Klemes, J J, Malik, M N & Khan, H H. 2020. Development of guidelines for the implementation of sustainable enterprise resource planning systems. *J Clean Prod* 244: 118655–118670.
- Chou, C, Chen, C & Conley, C. 2015. Creating Value Through Service Offerings: Creating Sustainably-Led Service Offerings Requires Integrating Customer Context with Sustainably Values. *Research-Technology Management* 58 (2): 48–55.
- Doganova, L & Eyquem-Renault, M. 2009. What Do Business Models Do? Innovation Devices in Technology Entrepreneurship. *Research Policy* 38: 1559–1570.
- Dubois, A & Gadde, L E. 2002. Systematic combining: an abductive approach to case research. *Journal of business research* 55(7): 553-560.
- Eriksson, P & Kovalainen, A. 2008. *Introducing Qualitative Methods: Qualitative methods in business research*. London: SAGE Publications.
- Evans, S, Vladimirova, D, Holgado, M, Fossen, K V, Yang, M, Silva, E A & Barlow, C Y. 2017. Business Model Innovation for Sustainability: Towards a Unified Perspective for Creation of Sustainable Business Models. *Business Strategy and the Environment* 26: 597-608.
- Flourishing Enterprise Innovation Toolkit. The toolkit and canvas. [Last accessed 20 Aug 2022]. Available at: <https://flourishingbusiness.org/the-toolkit-flourishing-business-canvas>.
- Gassmann, O, Frankenberger, K & Csik, M. 2013. The St. Gallen business model navigator.
- Geissdoerfer, M, Savaget, P & Evans, S. 2017a. The cambridge business model innovation process. *Procedia Manufacturing* 8: 262-269.
- Geissdoerfer, M, Savaget, P, Bocken, N M P & Hultink, E J. 2017b. The circular economy – a new sustainability paradigm? *J. Clean. Prod.* 143: 757-768.

- Geissdoerfer, M, Vladimirova, D & Evans, S. 2018. Sustainable business model innovation: A review. *Journal of Cleaner Production* 198: 401-416.
- Gibson, W J & Brown, A. 2009. Identifying themes, codes, and hypotheses. In *Working with qualitative data* (p. 127-144). SAGE Publications Ltd.
- Goni, F A, Chofreh, A G, Orakani, Z E, Klemes, J J, Davoudi, M & Mardani, A. 2020. Sustainable business model: A review and framework development. *Clean Technologies and Environmental Policy* 23: 889–897.
- Jeffery, N. 2009. *Stakeholder Engagement: A Road Map to Meaningful Engagement*, Doughty Centre 'How to do Corporate Responsibility' series. University: Cranfield.
- Jonker, J & Faber, N. 2019. *Sustainable Business Models*, Palgrave Studies in Sustainable Business. In Association with Future Earth.
- Joyce, A & Paquin, R L. 2016. The triple layered business model canvas: A tool to design more sustainable business models. *Journal of Cleaner Production* 135: 1474-1486.
- Lankoski, L & Smith, N C. 2017. Alternative Objective Functions for Firms. *Organization & Environment* 1–21.
- Lüdeke-Freund, F & Dembek, K. 2017. Sustainable business model research and practice: emerging field or passing fancy? *J. Clean. Prod.* 168: 1668-1678.
- Lüdeke-Freund, F, Breuer, H & Massa, L. 2022. *Sustainable Business Model Design - 45 Patterns*.
- Lüdeke-Freund, F. 2010. Towards a conceptual framework of business models for sustainability. In: Wever R, Quist J, Tukker A, Woudstra J, Boons F, Beute N (eds), *Proceedings of the knowledge collaboration and learning for sustainable innovation conference*, Delft, 25–29.
- Magretta, J. 2002. Why Business Models Matter. *Harvard Business Review* 80: 86–92.
- Massa, L & Tucci, C L. 2013. Business model innovation. *The Oxford handbook of innovation management* 20(18): 420-441.
- Munoz-Torres, M J, Fernandez-Izquierdo, M A, Rivera-Lirio, J M & Escrig-Olmedo, E. 2019. Can environmental, social, and governance rating agencies favor business models that promote a more sustainable development? *Corp Soc Responsible Environment Management* 26(2): 439–452.

- Osterwalder, A & Pigneur, Y. 2010. Business model generation. Hoboken, NJ: John Wiley and Sons.
- Osterwalder, A. 2004. The Business Model Ontology: A Proposition in a Design Science Approach. PhD thesis, Université de Lausanne, Lausanne.
- Patel, N. 2015. 90% of startups fail: here's what you need to know about the 10%, vol. 16. Forbes.
- Pereira Da Costa, A S & Levie, J. 2014. Effectual and Causal Behaviors, Business Model Change, and Performance of Early-Stage Firms. Academy of Management Annual Meeting Proceedings 2014 (1): 14305–14305.
- Perkmann, M & Spicer, A. 2010. What are Business Models: Towards a Theory of Performative Representations. Research in the Sociology of Organization 29: 265–275.
- Provan, K G & Kenis, P. 2007. Modes of network governance: structure, management, and effectiveness. Journal of Public Administration Research and Theory 18(2): 229–252.
- Rana, P, Short S W, Evans, S & Granados, M H. 2017b. Sustainable Business Models: Theoretical Reflections. In: J.P. Liyanage and T. Uusitalo (eds.), Value Networks in Manufacturing, Springer Series in Advanced Manufacturing.
- Rana, P, Short, S W, Evans, S, Granados, M H & Valkokari, K. 2017. Toolset for Sustainable Business Modelling. In: Liyanage, J., Uusitalo, T. (eds) Value Networks in Manufacturing. Springer Series in Advanced Manufacturing. Springer, Cham.
- Rashid, A, Asif, F M A, Krajnik, P & Nicolescu, C M. 2013. Resource Conservative Manufacturing: an essential change in business and technology paradigm for sustainable manufacturing. J Clean Prod 57: 166–177.
- Rikke, F D. 2022. The 5 Stages in the Design Thinking Process. [Last accessed 10 November 2022]. Available at: <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process>.
- Ritala, P, Huotari, P, Bocken, N, Albareda, L & Puumalainen, K. 2018. Sustainable business model adoption among S&P500 firms: a longitudinal content analysis study. J. Clean. Prod. 170: 216-226.



Rubin, H J & Rubin, I S. 2012. *Qualitative interviewing: the art of hearing data* (3rd Ed). Thousand Oaks: SAGE Publications.

Santos, J, Spector, B & Heyden, L. 2009. Toward a theory of business model innovation within incumbent firms. INSEAD Working Paper No. 2009/16/EFE/ST/TOM.

Sarasini, S & Linder, M. 2018. Integrating a business model perspective into transition theory: The example of new mobility services. *Environmental Innovation and Societal Transitions* 27: 16-31.

Schaltegger S, Lüdeke-Freund F & Hansen E G. 2012. Business cases for sustainability: the role of business model innovation for corporate sustainability. *Int J Innov Sustainable Dev* 6(2): 95–119.

Schaltegger S, Lüdeke-Freund F, & Hansen E G. 2011. Business cases for sustainability and the role of business model innovation: developing a conceptual framework. Centre for Sustainability Management Leuphana University, Lueneburg.

Schaltegger, S & Hörisch, J. 2017. In Search of the Dominant Rationale in Sustainability Management: Legitimacy or Profit-Seeking? *Journal of Business Ethics* 145: 259–276.

Schaltegger, S & Wagner, M. 2011. Sustainable Entrepreneurship and Sustainability Innovation: Categories and Interactions. *Business Strategy and the Environment* 20 (4): 222– 237.

Shakeel, J, Mardani, A, Chofreh, A G, Goni, F A & Klemes, J J. 2020. Anatomy of sustainable business model innovation. *J Clean Prod* 121201.

Souza, J, Mello, A & Marx, R. 2019. When Is an Innovative Urban Mobility Business Model Sustainable? A Literature Review and Analysis. *Sustainability* 11 (6).

SPARCS' website. [Last accessed 5 March 2022]. Available at:

<https://www.sparcs.info/about>.

Storbacka, K, Frow, P, Nenonen, S & Payne, A. 2012. Designing Business Models for Value Co-Creation, Stephen L. Vargo, Robert F. Lusch, in (ed.) *Special Issue - Toward a Better Understanding of the Role of Value in Markets and Marketing* (Review of Marketing Research, Volume 9). Emerald Group Publishing Limited: 51-78.

Stubbs, W, and Cocklin, C. 2008. Conceptualizing a “Sustainability Business Model”. *Organization & Environment* 21: 103–127.

Teece, D J. 2010. Business Models, Business Strategy and Innovation. *Long Range Plan* 43: 172–194.

Tukker, A. 2015. Product services for a resource-efficient and circular economy—a review. *Journal of Cleaner Production* 97: 76–91.

Upward, A & Jones, P. 2016. An Ontology for Strongly Sustainable Business Models: Defining an Enterprise Framework Compatible with Natural and Social Science. *Organization & Environment* 29(1): 97 –123.

Yin, R. 2009. *Case study research: Design and methods* (4th Ed.). Thousand Oaks: SAGE Publications.

Zott, C & Amit, R. 2010. Business Model Design: An Activity System Perspective. *Long Range Planning* 43.