

# Exploring Sustainability in Business Models of Early-Phase Start-up Projects: A Multiple Case Study Approach

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## Research Context

For more than a decade, scholars have dealt extensively with the transformation of business models of established companies towards more sustainability but have paid relatively little attention to understanding how early-phase start-up projects elaborate and imprint sustainability aspects in their business models (Taeuscher and Abdelkafi, 2018; Voinea et al., 2019; Fischer et al., 2020).

There is a lack of knowledge about these early development phases or the drivers (or reasons) that stimulate (or lead to) the imprinting of sustainability in business models used in early-phase start-up projects (Stubbs and Cocklin, 2008; Rauter et al., 2017; Davies and Chambers, 2018; Laasch, 2018; Voinea et al., 2019).

To obtain a more thorough understanding of how early-phase start-up projects imprint sustainability aspects in their early business models, we addressed this research gap by posing the following research questions:

- (1) What elements of early-phase start-ups business models include aspects of sustainability?
- (2) What drives the inclusion of sustainability aspects in early-phase start-up business models?

## Research Process

To answer these research questions, we investigated a sample of six early-phase start-up projects using a multiple case study approach, whereby the business model of each start-up project represents one case. The start-up projects took part in a four-month academic start-up accelerator, called *Gruendungsgarage* (Mueller et al., 2019) and we collected qualitative data at three sequential points in time. These data were then analysed using a qualitative content approach (Glaeser and Laudel, 2010; Mayring, 2010) and interpreted from a business model and imprinting theory perspective (Simsek et al., 2015). Figure 1 illustrates the research process.

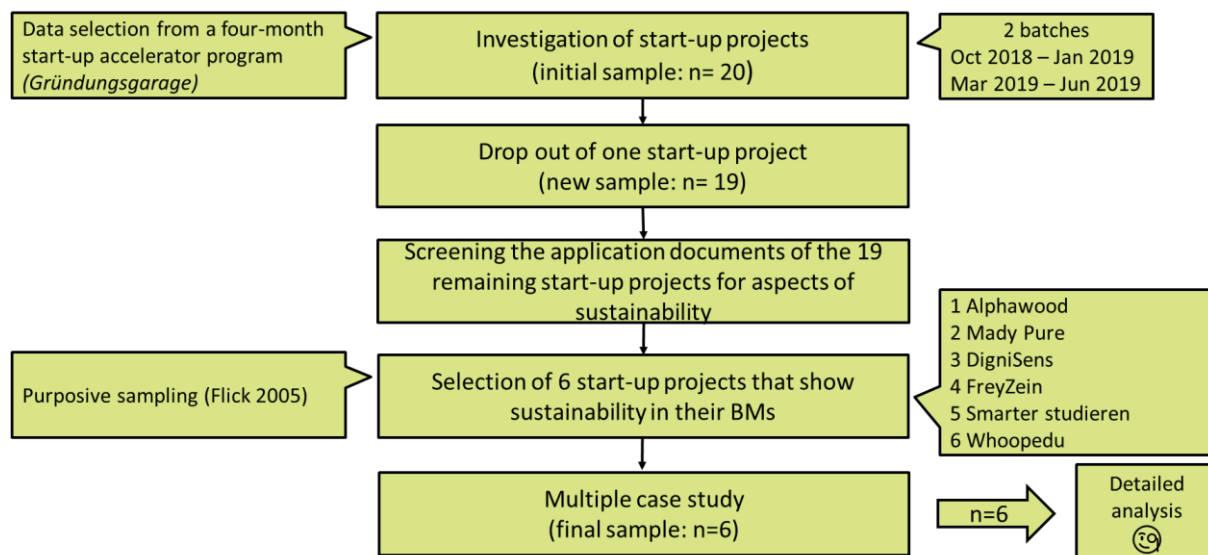


Figure 1: Research Process

The findings of this qualitative empirical study allowed us to examine the drivers that led to the imprinting of sustainability aspects in the start-up projects' business models and improved our understanding of how and why early-phase start-up projects imprinted these sustainability aspects.

## Findings

### Evidence for Sustainability Aspects in Business Model Elements of Early-Phase Start-up Projects

The analysis of sustainability aspects in business model elements was performed for the main business model dimensions of value proposition, value delivery, value creation and value capture (Teece, 2010; Remane et al., 2017).

The findings indicate that the value propositions included in five out of the six early-phase start-up projects show strong evidence of either ecological and/or social sustainability. All start-up projects emphasised sustainability aspects in the value-creation dimension of their business models whereas not all of them integrated sustainability aspects in their business models to address customers, which was an interesting finding.

Because the start-up projects had an interest in emphasising sustainability in value creation, they were driven to use local and/or sustainable resources, create local job opportunities and select partners that met sustainability standards. However, the exact focus of the sustainability in value creation in each start-up project varied. For instance, one of them saw environmental sustainability just as an ancillary benefit.

At the beginning of the accelerator program, the start-up project teams reported that the inclusion of sustainability aspects led to higher overall costs. However, after detailed analysis of their business models, no evidence could be found that this had any significant impact on their principal cost structure. It also turned out that the early-phase start-up projects used sustainability aspects to increase revenue streams by justifying higher sales prices. One of the start-up projects actively took advantage of their products' sustainable properties to establish additional revenue streams but engaged in voluntary work while being committed to making donations at the same time.

To summarize the findings, Table 1 provides an overview of the occurrence of sustainability aspects in the business models of the investigated start-up projects.

Start-up name	Value Proposition and Value Delivery				Value Creation			Value Capture	
	VP	CS	CH	CR	KR	KA	KP	C\$	R\$
Alphawood	✓	✓	✓	X	✓	X	✓	X	X
DigniSens	✓	X	X	X	✓	✓	✓	X	✓
Mady Pure	✓	✓	✓	X	✓	X	✓	X	X
FreyZein	✓	✓	✓	✓	✓	✓	✓	X	✓
smarter studieren	✓	X	X	✓	✓	✓	X	X	X
Whoopedu	✓	X	✓	✓	✓	✓	✓	X	✓

VP = Value Propositions; CS = Customer Segments; CH = Channels; CR = Customer Relationships; KR = Key Resources; KA = Key Activities; KP = Key Partners; C\$ = Cost Structure; R\$ = Revenue Streams

Note: ✓ = aspect identified; X = no aspect identified

Table 1: Overview of sustainability aspects in business model elements of investigated early-phase start-up projects.

### Evidence for Drivers Leading to Imprinting of Sustainability Aspects in Business Model Elements of Early-Phase Start-up Projects

Based on the sustainability aspects observed in the business models of the investigated start-up projects, we identified specific drivers, determined whether they were internal or external and pinpointed the aspects of sustainability they addressed. Furthermore, we assigned each driver an imprinting concept to identify which source (imprinter) or activity of imprinting (imprinting process) leads to a sustainability imprint in the investigated start-up project business model (Simsek et al., 2015).

The entrepreneur's motivation to create social value (Driver 1) was identified as a driver in all investigated start-up projects. Moreover, the start-up project teams were motivated by different factors to contribute towards ecological sustainability, such as the desire to imprint ecological sustainability to increase revenues (Driver 2) and reduce waste (Driver 3), which were identified as common drivers that supported the imprinting of sustainability aspects in the business models of the start-up projects.

Table 2 lists all identified drivers that led to the imprinting of sustainability aspects in the business models of the start-up projects. The drivers were sorted by the number of start-up projects in which they occurred and not on the basis of their absolute occurrence. This was done to avoid the influence of repeating answers of individual start-up projects on the obtained order.

Driver No.	Identified driver	Main sustainability dimension in the business model (Elkington, 1994) (imprinted entity)	Internal or external driver	Imprinting Framework (Simsek et al., 2015)	
				Level of analysis	Concept
D1	Entrepreneurial motivation to create social value	Social	Internal	<u>Individual</u> - Initial position holder and founder	Imprinter
D2	Ecological sustainability to increase revenues	Ecological/Economic	Internal	<u>Adoption and Structuring</u> - Strategy selection	Imprinting Process
D3	Entrepreneurial motivation to reduce waste for ecological sustainability	Ecological	Internal	<u>Individual</u> - Initial position holder and founder	Imprinter
D4	Entrepreneurial motivation towards ecological sustainability	Ecological	Internal	<u>Individual</u> - Initial position holder and founder	Imprinter
D5	Customers demand drives sustainability in the business model	Ecological/Social/Economic	External	<u>Environment</u> - Economic and ecological conditions	Imprinter
D6	Demonstrating added value through sustainable partners	Ecological/Social/Economic	Internal	<u>Network - Alliance</u> Characteristics	Imprinter
D7	Inclusion of sustainability aspects to achieve differentiation from competitors	Ecological/Social/Economic	External	<u>Adoption and Structuring</u> - Strategy selection	Imprinting Process
D8	Ecological sustainability to differentiate from competitors	Ecological/Economic	External	<u>Adoption and Structuring</u> - Strategy selection	Imprinting Process
D9	Enabling sustainable consumption through durable products	Ecological/Economic	Internal	<u>Adoption and Structuring</u> - Strategy selection	Imprinting Process
D10	Careful use of resources as entrepreneurial motivation	Ecological	Internal	<u>Individual</u> - Initial position holder and founder	Imprinter
D11	Local value creation activities to create ecological sustainability	Ecological	Internal	<u>Individual</u> - Initial position holder and founder	Imprinter
D12	Sustainability to communicate additional value	Ecological/Social/Economic	Internal	<u>Adoption and Structuring</u> - Strategy selection	Imprinting Process
D13	Reputation drives ecological sustainability	Ecological	Internal	<u>Selection and Synthesis</u> Identity formation	Imprinting Process

## Conclusion

This exploratory study provided valuable insights into the business models of early-phase start-up projects that took part in an accelerator programme. In this context, this work shed light on early development phases of business models by illustrating (1) how sustainability was allocated to individual business model elements and (2) what drives the inclusion of sustainability in the business models.

Although all cases of our sample exhibit a sustainable value proposition, the types and degrees of sustainability in their business models differed, explaining why most of the start-up projects did not holistically integrate the sustainability-related values.

This study, moreover, reveals the drivers that encouraged early-phase start-up projects to include sustainability aspects in their business models from an imprinting theory perspective. The characteristics of initial position holders (founders) within the investigated start-up projects strongly affected the inclusion of ecological and social sustainability in their business models during the imprint genesis. It was interesting to note that, in addition to purely altruistic drivers, rather strategic drivers could also be identified that led to the inclusion of sustainability aspects in the start-up projects business models. This suggests that the inclusion of sustainability aspects in the business models of the investigated start-up projects was influenced by a combination of personal and financial intentions.