

Scale-up Navigator: Conceptual Development of Artefacts Supporting Stakeholders of Scaling Ventures [Working Paper]

Michael Greger, Dietmar Grichnik, Manuel Hess

ARTICLE INFO	ABSTRACT
<i>Keywords:</i> Scale-ups Scaling Design Science Research Processual Framework ESG Framework Sustainability	Scaling has become a dominant topic in the startup ecosystem and political landscape, as evidenced by the development of scale-up-focused news, forums, databases, and public interventions, such as public venture capital programmes. Even though existing bottlenecks in scaling are known, the literature lacks concrete guidance on how to navigate a scale-up journey from an entrepreneur's perspective, let alone how to do it sustainably. Based on available research, workshops and interviews with experts, this paper addresses this shortcoming by developing two artefacts: (1) the Venture ESG model that takes environmental, social and governance aspects into account, and (2) the Scale-up Navigator framework. The results provide guidance to both stakeholders of scaling ventures and entrepreneurship researchers on which ESG variables exist that might impact the scaling process of ventures today and in the future (model 1). They also highlight relevant issues during a venture's scale-up journey and how to address these efficiently and sustainably (model 2). Thus, this paper contributes significantly to the field of entrepreneurship research while providing practical guidance to practitioners.

Suggested citation:

Greger, M., Grichnik, D., & Hess, M. (2024, February 13). Scale-up Navigator: Conceptual Development of Artefacts Supporting Stakeholders of Scaling Ventures [Working Paper]. www.alexandria.unisg.ch/handle/20.500.14171/119455

1. Introduction

‘Closing the scale-up gap between the EU and the US could create up to one million jobs in Europe over the next 20 years and generate EUR 2 trillion in additional GDP.’

Christian Lindner, Federal Minister of Finance, Germany (2022)

Scaling has become a dominant topic in the startup ecosystem and political landscape, as evidenced by the development of scale-up-focused news, forums, databases, and public interventions, such as public venture capital programmes. Even though ‘scaling is a “hot topic” in the practitioner literature, it has largely been ignored (at least explicitly) in the academic literature’ (Shepherd & Patzelt, 2022). The existing literature lacks concrete guidance on how to navigate a scale-up journey, let alone how to do it sustainably.

This paper addresses this shortcoming by developing two artefacts targeted at entrepreneurs, employees, investors, and other stakeholders who are involved in scaling a venture. Based on the methodology of Peffers et al. (2007), data collected from a narrative literature review and 25 workshops and interviews with investors, entrepreneurs, and lawyers of scale-ups are used to address the following research question focused on the sustainable scaling of ventures: *What are application-oriented (process) models supporting stakeholders of ventures in scaling these sustainably?*

The authors found a total of 60 ESG variables of general interest for scale-ups, which are aggregated and visualised in a first artefact called Venture ESG Model. In addition, twenty scale-up challenges were identified and summarised in a process framework called Scale-up Navigator. The latter has been expanded into a book that offers concrete guidance on how to address these twenty challenges by providing background knowledge, recommended actions (so-called ‘playbooks’), (digital) tools and illustrative case studies. The findings provide guidance to both stakeholders of scaling ventures and entrepreneurship researchers on what ESG variables currently exist that might impact the scaling process of ventures today and in the future (model 1). They also highlight relevant issues during a venture's scale-up journey and how to address these in an efficient and sustainable way (model 2). Thus, this paper contributes significantly to the field of entrepreneurship research while also providing practical guidance to practitioners.

The following sections introduce existing artefacts (Section 2), present the data and methods (Section 3), show the results in the form of the artefacts (Section 4), discuss the findings (Section 5), and conclude the paper (Section 6).

2. Background: Existing Artefacts

2.1 ESG-related artefacts

Background

ESG refers to sustainable development across three dimensions. Gillan et al. (2021, p. 2) define ESG as ‘*an acronym developed in a 2004 report by 20 financial institutions in response to a call from Kofi Anon, Secretary-General of the United Nations. As it implies, ESG refers to how corporations and investors integrate environmental, social and governance concerns into their business models*’.

Policymakers are increasing regulatory pressure to make ESG-compliant behaviour more financially attractive. Governments worldwide have started to raise the costs of non-compliant behaviour, especially of non-sustainable behaviour from an environmental perspective. In 2015, 195 countries committed to keeping global warming below 2°C in the *Paris Agreement*. At the European level, the European Commission presented the EUR 1 trillion *European Green Deal* in December 2019. The deal aims to ‘transform the EU into a modern, resource-efficient and competitive economy’ with zero net greenhouse gas emissions by 2050 – making Europe the first ‘climate-neutral continent’.

However, to the best of the authors’ knowledge, no artefacts are available that specifically integrate and visualise all three sustainability dimensions in detail– environmental, social, and governance. The following three artefacts played a significant role in developing the artefacts of this paper, as each one covers at least one of the three dimensions.

St. Gallen Management Model

The St. Gallen Management Model (SGMM, see Figure 6 in Appendix A.1) was originally developed at the University of St. Gallen in the 1960s and first published in 1972 by Hans Ulrich, the pioneer of system-oriented management theory in German-speaking countries, together with Walter Krieg. This management model takes a holistic approach, viewing companies as complex systems. It aims to develop an integrative perspective on the central tasks of top management.

The model can be considered a pioneer of the ESG approach for companies, as it addresses all three ESG dimensions: the environmental and social dimension through its ‘environmental spheres’ (‘Umweltsphären’ in Figure 6 in Appendix A.1, German version), and the governance dimension through its ‘leadership cube’ (‘Führungswürfel’ in Figure 7 in Appendix A.1,

German version). Although the SGMM addresses all three dimensions, it does so only vaguely. At the same time, it is not specific in any of the three dimensions, requiring a great deal of additional work on the part of the top management teams of scale-ups. In reality, scale-ups do not have the time to do so.

Sustainable Development Goals (SDGs)

In 2016, the United Nations defined 169 global goals, which are summarised in 17 Sustainable Development Goals (SDGs; see Figure 8 in Appendix A.1). While the Paris Agreement and the European Green Deal are legally binding for the participating countries and force them to achieve the agreed goals through possible sanctions, the SDGs are a call to action for all countries in the world.

In concrete terms, the 17 SDGs can be clustered into eleven social goals (e.g., 1 – No poverty, 2 – Zero hunger, 10 – Reduced inequalities), five environmental goals (e.g., 13 – Climate action, 14 – Life below water, 15 – Life on land), and one goal that is both social and environmental (7 – Affordable and clean energy) (see Table 11 in Appendix A.1). Targets and indicators are available for each goal. For instance, one of the targets of goal 3 (good health and well-being), is to ‘reduce the global maternal mortality ratio to less than 70 per 100,000 live births’ by 2030. To monitor the achievement of this target, the ‘maternal mortality ratio’ and ‘proportion of births attended by skilled health personnel’ have been defined as relevant indicators (United Nations, 2023).

Overall, while an increasing number of scholars, policymakers and global citizens are familiar with the SDGs, they have several weaknesses that ultimately make them an inadequate tool for scale-ups to address ESG challenges. First, the SDGs focus on the environmental and social dimensions while ignoring governance. Second, the SDGs can be seen as primarily macro-economic goals, often leaving unclear what they mean at the level of a company or scale-up. In addition, the SDGs lack concrete, practical advice on how to achieve the goals. As a result, the SDGs also require significant additional time investment to understand how a scale-up can contribute to these goals and how they can be achieved in practice.

Planetary boundaries

Another artefact of increasing popularity is the concept of ‘planetary boundaries’ (see Figure 9 in Appendix A.1). It was developed by a group of 27 scientists and first published in the journal *Ecology & Society* in 2009, before being introduced to the wider public by lead author Johan Rockström in a TED Talk in 2010 (Rockström, 2010).

In concrete terms, the planetary boundaries consist of nine ecological limits ‘within which humanity can continue to develop and thrive for generations to come’ (Stockholm Resilience Center, 2023; Rockström et al., 2009). These nine boundaries relate to climate change (atmospheric carbon concentration, total anthropogenic radiative forcing), change in biosphere integrity (genetic diversity, functional integrity), stratospheric ozone depletion (ozone concentration), ocean acidification (carbonate ion concentration), biogeochemical flows (phosphate flow from freshwater systems into oceans and from fertilisers to erodible soils, industrial nitrogen fixation), land system change (area of forested land relative to original forest cover and relative to remaining area as potential forest), freshwater change (human-induced disturbance of blue and green water flows), atmospheric aerosol loading, and chemical pollution (proportion of synthetic chemicals, so-called novel entities, emitted into the environment without adequate safety testing) (Richardson et al., 2023). Since first measured and published in 2009, the planetary boundaries have been remeasured and updated regularly. The most recent update was published in 2023 by Richardson et al., who found that six boundaries have been transgressed, and all other dimensions except ozone depletion are worsening. The boundaries that have been overshoot are climate change, novel entities, biogeochemical flows, freshwater change, land system change, and biosphere integrity (see Figure 9 in Appendix A.1).

The planetary boundaries provide a clear framework for understanding environmental sustainability by defining specific variables that affect our environment. However, they do not take into account social and governance variables. In addition, it is challenging to determine which boundaries and variables are relevant in different business contexts. While the planetary boundaries play an essential role in our process of developing an ESG-focused artefact supporting scale-ups, they are insufficient and need to be placed in a business context, such as a value chain.

Doughnut Economics

In 2012, Kate Raworth combined the concept of planetary boundaries with humanity’s basic needs to be able to thrive, resulting in the so-called ‘Doughnut Economics’ (visualised in Figure 10 in Appendix A.1). The doughnut represents the safe space ‘that is both ecologically safe and socially just’ – framed by an inner circle (life’s essentials as the social foundations) and an outer circle or ceiling (planetary boundaries as the ecological ceilings) (Raworth, 2012).

Doughnut Economics was associated with a fundamental shift in economic thinking: from linear (GDP) growth to social and ecological sustainability, recognising, for example, the

embeddedness of economies and the urgency for distributive, regenerative designs. While the concept of the ecological ceiling in the form of planetary boundaries was introduced in the previous section, Doughnut Economics also focuses on the following social variables as the artefact's foundation: food, health, education, income and work, peace and justice, political voice, social equality, gender equality, housing, networks, energy, water (Raworth, 2017).

Thus, Doughnut Economics goes one step further than the planetary boundaries by integrating some social variables. However, since it ignores governance-specific variables, Doughnut Economics lacks a business perspective as it requires some interpretation of what the integrated variables mean in a business context.

2.2 *Scaling-related artefacts*

While four relevant ESG-specific artefacts could be identified, only one, the St. Gallen Startup Navigator, touches upon the issue of scaling .

St. Gallen Startup Navigator

The St. Gallen Startup Navigator is a process-oriented, holistic framework that supports entrepreneurs in starting a venture. The framework consists of four areas with a total of 20 building blocks (Grichnik et al., 2024; see Figure 11 in Appendix A.2).

The first area is 'profiling'. It guides entrepreneurs through the very first steps of initiating a business venture based on the following building blocks: motivation of the founder(s), customer(s), task(s), problem(s), and solution(s). The second area is 'prototyping', which helps entrepreneurs to design products/services, define the value propositions, analyse the competition, design an initial go-to-market strategy, and identify the venture's unique selling point (USP). The third area, 'sourcing', addresses team roles and competencies, networks and partners, intellectual property (IP) strategies, value chain requirements, co-creation strategies, risk analysis and roadmaps ('call to action'). The fourth area, 'scaling', leads through the building blocks of defining capital requirements ('investment'), finding investors ('deal & exit'), and defining a growth strategy ('performance').

While the St. Gallen Startup Navigator addresses some challenges that scale-ups face, such as go-to-market strategies or fundraising, these challenges are often less complex during the early stages than in the later scaling stage. Also, the framework does not explicitly address ESG aspects (Grichnik et al., 2024).

3. Methodology

The aim of this paper is to support stakeholders of ventures in scaling them sustainably, a problem that has not yet been adequately addressed (see Figure 12 in Appendix A.3 for an overview of the research design). To this end, artefacts in the form of models will be developed.

3.1 Type of artefact

There are different types of artefacts, from constructs to models, methods, and instantiations. In this paper, a model is developed for several reasons.

As the St. Gallen Management Model and the framework of the St. Gallen Startup Navigator have shown, models are generally characterised by both moderate complexity and high usability. They are also highly customisable. Thus, models perfectly fit the use case of the target users of this paper's artefact: stakeholders of scaling ventures. These users need a model, such as a framework, that is easy to understand, immediately applicable and adaptable to the context of each individual venture.

3.2 Artefact development

3.2.1 Process

Commonly acknowledged practices of design science research were applied to develop two artefacts: the Venture ESG Model (Section 4.1) and the Scale-up Navigator framework (Section 4.2).

In concrete terms, the authors applied the process model for artefact development by Peffers et al. (2007) (see Figure 2). It consists of six main steps in developing an artefact. First, a problem is defined and its importance is illustrated. The second step is to identify the objectives and requirements of a new artefact. In order to do this in a scientifically sound way, several workshops were conducted with stakeholders of scaling ventures. In addition to the above-mentioned criteria of limited complexity, high usability and high customisability, the stakeholders asked for holistic artefacts that cover the full spectrum of ESG and scaling, while delving as deeply as possible into the topic, so that users can both grasp the breadth of the topics and apply the artefacts directly to their contexts. For instance, the ESG framework ought to map all three dimensions, and list relevant criteria for each in the context of a scaling venture.

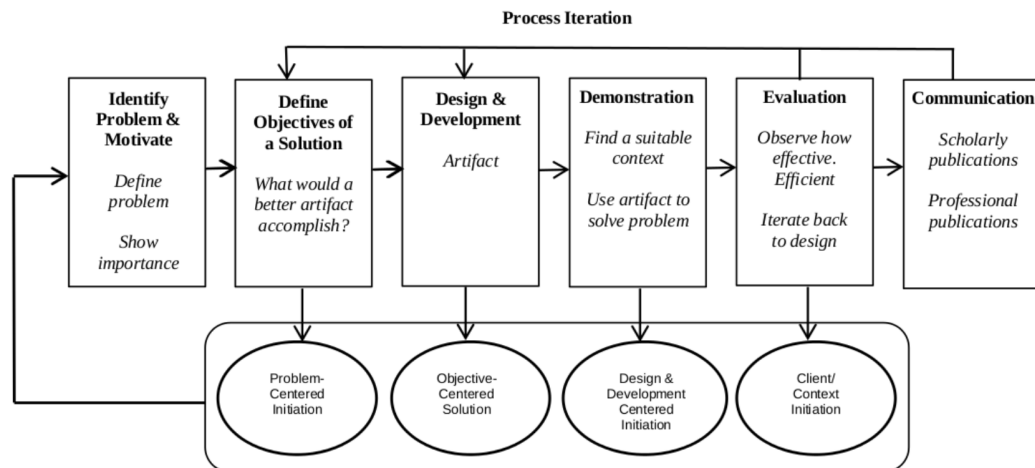
Figure 1: Requirements and objectives (RO) of artefacts to be developed

RO #	Description of objectives and requirements
RO1	The artefact should comprehensively cover the topics of ESG and/or scaling in the context of a venture, with a broad and holistic approach.
RO2	The artefact should provide sufficient depth regarding the topics of ESG and/or scaling in the context of a venture to be practically applicable without requiring additional fundamental research.
RO3	The artefact should aggregate and present the insights regarding the topics of ESG and/or scaling in the context of a venture in a clear and concise manner, reducing complexity.
RO4	The artefact should exhibit high usability for stakeholders of scaling ventures.
RO5	The artefact should be highly customisable to the specific contexts of scaling ventures.

The third step is the subsequent development and design of the respective artefact. The first version of the Venture ESG Model was based on the literature (see Section 3.2.2), and the design was inspired by the Doughnut Economics (see Section 2.1; Figure 13 in Appendix A.4), while the design of the Scale-up Navigator framework was inspired by the framework of the St.Gallen Startup Navigator (see Figure 14 in the Appendix A.4).

The fourth and fifth steps in the development of an artefact involve demonstrating and evaluating its effectiveness with target users, in order to improve it through iterations. The Venture ESG Model was iterated twice (three versions in total; see Section 3.2.2). In contrast, the Scale-up Navigator framework underwent 19 iterations (20 versions in total). These iterations resulted in significant changes to the design of the Venture ESG Model, whereas changes to the Scale-up Navigator framework focused on the content of the artefact.

Lastly, artefacts need to be published and made available to the target users (step six, ‘communication’). This paper serves this purpose, along with the publication of the ‘Scale-up Navigator’ handbook, which presents both artefacts and will be available from Wiley as of February 2024 (in German). The first artefact, the Venture ESG Model, is presented below in Section 4.1, before the Scale-up Navigator framework is introduced in Section 4.2.

Figure 2: Process model for the development of artefacts (Peppers et al., 2007)

3.2.2 Data

Existing literature on scaling and ESG in the context of ventures was narratively reviewed to initiate the development of the artefacts. Insights from the literature review formed the basis for the initial versions of both artefacts. The Venture ESG Model is based on the following key literature (see Table 1): Li et al. (2021), Sinha et al. (2019), Lagasio and Cucari (2018), Steffen et al. (2015), and Rockström et al. (2009). Subsequently, the identified ESG criteria were compared with the European Sustainable Financial Disclosure Regulation (SFDR), which is aimed at venture capitalists (VCs), and the Corporate Sustainability Reporting Directive (CSRD), which is a European ESG reporting regulation aimed at larger companies. Starting with the financial year of 2024, the CSRD requires large corporates and listed SMEs to report on various sustainability criteria according to the European Sustainability Reporting Standards (ESRS). Applicable ESRS criteria and reporting standards were taken into account as they might become mandatory for reporting at a later, more established stage of the ventures and stakeholders that are the focus of this paper and its artefacts.

Table 1: Literature the Venture ESG Model is based on

Author(s)	Title
Li et al. (2021)	ESG: Research Progress and Future Prospects
Sinha et al. (2019)	Inclusion of ESG Factors in Investments and Value Addition: A Meta-Analysis of the Relationship
Lagasio and Cucari (2018)	Corporate Governance and Environmental Social Governance Disclosure: A Meta-Analytical Review
Steffen et al. (2015)	Planetary Boundaries: Guiding Human Development on a Changing Planet

Rockström et al. (2009)	Planetary Boundaries: Exploring the Safe Operating Space for Humanity
European Parliament and The Council of the EU (2019)	European Sustainable Financial Disclosure Regulation (SFDR)
European Commission (2023)	European Sustainability Reporting Standards (ESRS)

The initial theoretical base of the Scale-up Navigator framework was established using multiple sources of academic literature (such as Edmondson and Bransby, 2023) and grey literature. However, the existing literature only served as a starting point, as it lacked maturity or only provided a deep dive into a single (sub)topic. Compared to the development of the ESG Model, which consisted of two iterations and a total of three versions due to the availability of ESG criteria and artefacts in existing literature (see Section 2.1), the development of the Scale-up Navigator framework required significantly more iterations (19 in total). To define the objectives of the artefact and develop, design and demonstrate it (steps 2-4 of Peffers et al., 2007), a series of more than 25 workshops and interviews were conducted with investors, entrepreneurs, and lawyers of scaling ventures.

Lastly, the artefacts were tested in six scale-up case studies: SumUp, Ledgy, DeepL, Frontify, 1Komma5, and dress-for-less. Each case study focused on one subset of the Scale-up Navigator framework, while ESG aspects were addressed in almost all of them.

4. Results

4.1 The Venture ESG Model

The Venture ESG Model provides a comprehensive overview of existing ESG variables in the context of scaling ventures. The model is structured into two parts: company-specific ESG criteria on the left and product-/service-specific ESG criteria on the right. The aim of the model is to capture any activity of a scale-up that might impact the environment and society (inside-out). Thus, it integrates one part of the ‘double materiality’ concept of the ESRS, which refers to both the impact of a scale-up on its environment (inside-out) and the impact of the environment on a scale-up (outside-in). This artefact is supposed to serve as a value-creating management framework for scale-ups. The framework’s left and right sides differ significantly in terms of the direct control that scaling ventures have over the respective ESG criteria. Top management teams inherently have high control over their ventures (left side). In contrast, their control of some product-/service-specific ESG variables is often limited as supply and value

chains are highly complex (right side) and – completely or partly – outsourced to business partners. This can limit the access to ESG-relevant data. At the same time, changing an entire supply chain can be highly complex, as it often involves many companies.

Both parts of the artefact are structured along two levels of categories. The first level (outer circle) subdivides the criteria along the ESG dimensions. The second level (inner circle) divides the criteria of each dimension into stakeholder- and/or supply chain-specific criteria groups. The governance level of company-specific ESG criteria, for instance, is clustered into stakeholder-specific groups: criteria related to executives, board members, and shareholders. The environment level of company-specific ESG criteria is clustered into supply chain-specific groups, including sourcing, building/infrastructure and production/logistics.

4.1.1 Company-specific ESG criteria

The Venture ESG model (see Figure 3) provides an overview of the company-specific ESG criteria on the left-hand side. The governance criteria are divided into four groups: executive-, board member-, and shareholder-specific governance criteria, plus a group of generic criteria. Table 2 (governance criteria), Table 3 (social criteria), and Table 4 (environmental criteria) provide an overview of all ESG criteria at the company level, including a ‘defining question’ that allows stakeholders of ventures to analyse these criteria in the context of their venture.

The governance criteria relevant to executives and board members of scaling ventures are almost identical: duality, which refers to the potential imbalance of power and oversight when the same person holds the positions of both CEO and Chairman of the Board; compensation; diversity (e.g. age, gender, educational and professional background; adherence to the Non-Financial Reporting Directive (NFRD)¹ of the EU); and size. These criteria enable effective (diversity) and efficient (size) decision-making by a venture's governing bodies. Additionally, board members need to be independent to avoid potential conflicts of interest. This criterion is not simple to adhere to during the early and/or growth stages of ventures, as startup investors often fill the positions themselves² and genuinely independent, highly professional board members can be expensive to hire. The shareholder-specific governance criteria refer to shareholder rights, shareholder engagement on ESG issues, and owner-driven risk management. Lastly, several governance criteria were identified that affect and concern more

¹ The Non-Financial Reporting Directive (NFRD) remained in force until the financial year of 2023.

² Managing partners or managers of invested VC or PE funds are often appointed as board members to represent their (organisation's) interests and provide the startup with their knowledge, resources and networks.

than one group of stakeholders, so-called ‘agnostic’ criteria, such as the definition of internal codes of conduct or the creation of transparency and the prevention of bribery/corruption. They also encompass litigation fees paid by a venture, which allow conclusions to be drawn about how employees and shareholders live up to a venture’s ethical standards.

Table 2: Venture ESG Model – Governance criteria at the venture level

Stakeholder(s)	Governance Criteria	Defining Question
Executives, board members	Duality	Are the positions of a venture's CEO and chairman of the board positions filled by different persons?
Executives, board members	Compensation	Are executive and board remuneration policies aligned with long-term financial and ESG goals?
Executives, board members	Diversity and size	Are diverse perspectives shaping a venture's effective and efficient decision-making?
Board members	Independence	Are the board members truly independent (free from conflicts of interest)?
Shareholders	Rights and Duties	Are shareholders granted sufficient rights to contribute to a venture's decision-making?
Shareholders	Active, ESG-driven ownership and advocacy	Are shareholders leveraging their power to incorporate sustainability into business strategy?
Shareholders	Risk management	Are financial and ESG risks adequately identified, assessed, mitigated, and monitored?
Agnostic	Codes of conduct and business principles	Is there a formal ethical framework in place, and is its implementation observable?
Agnostic	Firm transparency and disclosure	Is relevant financial and ESG information shared with both internal and external stakeholders?
Agnostic	Stakeholder engagement	Are stakeholders willing and able to participate in resolving issues and driving financial and ESG (F-ESG) performance?
Agnostic	Bribery and corruption	Is ethical business conduct ensured, and are adverse practices prevented and stopped immediately?
Agnostic	Litigation fees	Are legal disputes kept on an industry-average level?
Agnostic	Accountability	Are mechanisms in place to hold a venture's employees and shareholders responsible for their financial and ESG-related performance?
Agnostic	Data security	Is sensitive information protected, and are cybersecurity mechanisms in place to minimise damage in case of any data breach?

A total of 16 social criteria were found at the venture level. They can be divided into three groups: workplace/workforce-, community-, and supply-chain-specific criteria (see Table 3 for

definitions). Most of the social criteria concern the workforce and the workplace. They relate to employees' human rights, equal opportunities (in terms of diversity and inclusion), working hours (in terms of duration, flexibility, and family-related leave), remuneration, collaboration and teamwork routines, transparency and communication practices, training and education, protection of vulnerable groups, freedom of association, health and safety policies, detection of misconduct, and data protection and security. In addition to workforce-specific criteria, community- and supply chain-specific social criteria were identified, such as a venture's involvement in local communities and its proactive management of supply chains.

Table 3: Venture ESG Model – Social criteria at the venture level

Stakeholder(s)	Social Criteria	Defining Question
Workforce, workplace	Human rights	Are employees granted their fundamental human rights?
Workforce, workplace	Equality of opportunity	Are all applicants and employees given equal opportunities for employment and promotion?
Workforce, workplace	Working hours	Do working hours ensure both productivity and employee well-being?
Workforce, workplace	Compensation	Are fair compensation schemes in place for short- and/or long-term work?
Workforce, workplace	Collaboration and teamwork	Are working routines implemented to ensure productive collaboration and teamwork?
Workforce, workplace	Transparency and communication	Are employees consulted and informed about decisions made and events impacting their work?
Workforce, workplace	Training and education	Are employees (financially) supported in their ongoing personal and professional development?
Workforce, workplace	Child, forced, and compulsory labour	Does the venture ensure ethical labour practices, including the protection of vulnerable groups?
Workforce, workplace	Freedom of association	Does the venture allow employees to form and join representative organisations?
Workforce, workplace	Health and safety policies	Does the venture ensure a safe working environment that minimises health risks?
Workforce, workplace	Detection of misdeeds	Are mechanisms in place to identify and address non-ethical wrongdoing?
Workforce, workplace	Data privacy and security	Is (sensitive) employee information protected to the highest standards and, thus, privacy respected?
Community	Involvement and impact	Is the venture involved in local communities to have a positive social impact?
Community	Philanthropy	Does the venture contribute to local communities with resources, both financial and non-financial?
Supply chain	Proactive management	Does the venture proactively manage its supply chain(s) to ensure adherence to ethical standards?

Supply chain	Transparency	Does the venture share relevant supply chain information with other stakeholders?
--------------	--------------	---

Finally, a number of environmental factors were identified and divided into three groups of criteria: related to sourcing, buildings/infrastructure, and production/logistics/commute/travel (see Table 4 for definitions). It is important to note that these criteria go far beyond the emission of carbon dioxide or other greenhouse gases (GHG) such as methane. Following the Planetary Boundaries (see Section 2.1), other variables, such as the conversion of forests, the loss of biodiversity or the alteration of natural freshwater systems, also play a crucial role in analysing a venture's ecological footprint.

Table 4: Venture ESG Model – Environmental criteria at the venture level

Value chain	Environmental Criteria	Defining Question
Sourcing	Regionality, distance to origin, means of transport (GHGs)	Does the venture assess and minimise GHG emissions by sourcing as close as possible to the place of origin using GHG-neutral means of transport?
Sourcing	Way of sourcing and production	Does the venture prioritise the use of ethically/sustainably sourced and processed materials?
Sourcing	Quality and lifetime	Does the venture aim to reduce waste by focusing on the durability and longevity of materials?
Buildings, infrastructure	Net emission of CO ₂ and other GHGs	Does the venture take steps to minimise GHG emissions from operational activities (e.g. energy consumption)?
Buildings, infrastructure	Conversion of forests, grasslands, and wetlands	Does the venture consider ecosystem conservation and restoration when planning infrastructure projects?
Buildings, infrastructure	Biodiversity loss	Does the venture incorporate biodiversity aspects when planning new infrastructure?
Buildings, infrastructure	Freshwater system change	Does the venture minimise the impact of its infrastructure on freshwater systems?
Buildings, infrastructure	Waste management	Is sustainable and holistic waste management ensured across all facilities of the venture?
Production, logistics, commute, travel	Net emission of CO ₂ and other GHGs	Does the venture assess and minimise GHG emissions across production, logistics, and commute/travel activities?
Production, logistics, commute, travel	Freshwater usage and contamination	Does the venture assess and minimise freshwater usage and contamination?
Production, logistics, commute, travel	Waste management	Is sustainable and holistic waste management ensured across all production-related processes?

4.1.2 Product/Service-specific ESG criteria

On the right-hand side of the Venture ESG Model, product/service-specific ESG criteria are visualised. These social and environmental variables are listed and defined in Table 5 and Table 6, respectively. This allows stakeholders of scaling ventures to analyse these criteria in the context of their ventures.

The social criteria in Table 5 include product-specific characteristics, such as affiliation to specific industries (e.g. tobacco, weapons, gambling) or the availability of information on a product's supply chain. The list also encompasses several customer/user-specific criteria, such as customer health and product safety, which refers to the design of products/services according to safety standards to identify and minimise any potential negative impact on user or customer health, or data protection and privacy.

Table 5: Venture ESG Model – Social criteria at the product/service level

Segment	Social Criteria	Defining Question
Product properties	Affiliation to controversial industries	Do the venture's products/services align with its ethical standards or are they used in controversial industries (e.g. gambling)?
Product properties	Supply chain information	Is relevant supply chain information available to stakeholders?
Product properties	Product quality	Are the products designed with a focus on sustainability and waste reduction (e.g. repairable)?
Customer, user	Customer health	Are the products/services designed to minimise any negative impact on the user's/customer's health?
Customer, user	Product safety	Do the products/services adhere to safety standards (including the provision of manuals)?
Customer, user	Customer (data) privacy	Do the products/services adhere to legal data privacy standards (data usage)?
Customer, user	Data security	Are measures in place to protect user data from illegal access and breaches?

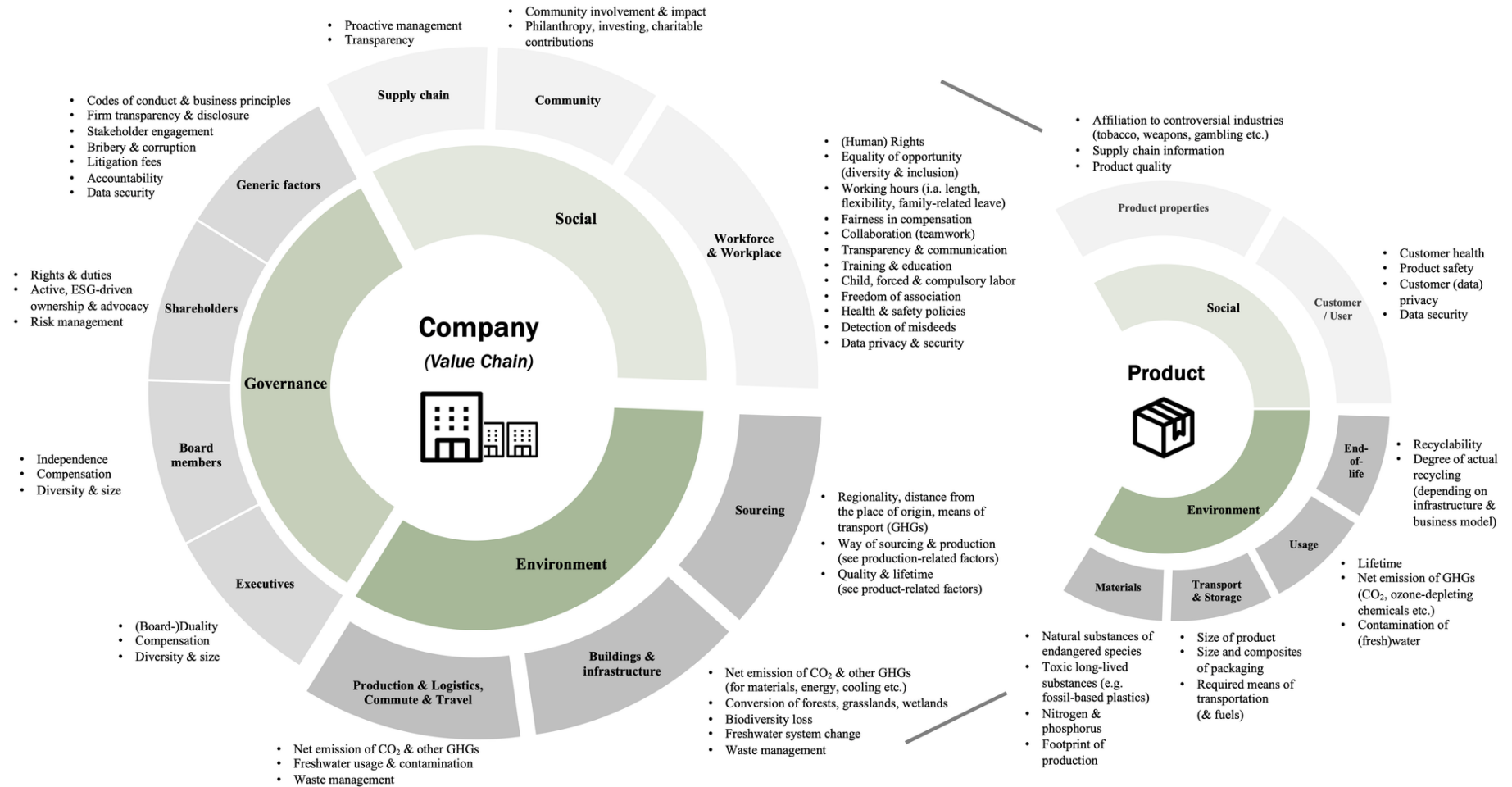
The ecological criteria of products/services can be divided into criteria referring to materials, transportation and storage-, usage- and end-of-life-specific criteria (see Table 6). End-of-life includes the theoretical recyclability of a product and the actual level of recycling, which goes further than usage, as marketing (knowledge), infrastructure and business model considerations are taken into account in order to analyse the awareness and convenience of recycling, which impacts the actual rate of recycling. Other factors include, for example, the lifetime of products and the greenhouse gas emissions associated with their use. Product size

and packaging are also important criteria that have a significant impact on a product's environmental footprint (transport-specific). Furthermore, the composition of a product's materials must be designed and assessed to exclude materials from endangered species and/or toxic substances (material-specific).

Table 6: Venture ESG Model – Environmental criteria at the product/service level

Segment	Environmental Criteria	Defining Question
Materials	Natural substances of endangered species	Are products designed without materials derived from endangered species?
Materials	Toxic long-lived substances	Are products designed without toxic substances (e.g. fossil-based plastics)?
Materials	Nitrogen and phosphorus	Are products designed to minimise the usage of nitrogen and phosphorus?
Materials	Footprint of production	Are products/services designed to minimise their ecological footprint?
Transport, storage	Size of product	Are products designed to minimise material usage and enable efficient storage/transport?
Transport, storage	Size and composites of packaging	Are products designed to minimise the ecological footprint of their packaging?
Transport, storage	Means of transport (and their fuels)	Are the means of transport for products assessed and designed to minimise their ecological footprint?
Usage	Lifetime	Are products designed for durability and longevity to minimise waste and resource consumption?
Usage	Net emission of GHGs	Are products and designed to minimise net GHG emissions during product use?
Usage	Contamination of (fresh)water	Are products and designed to minimise (fresh) water contamination during product use?
End-of-life	Recyclability	Are products/services generally designed to maximise the recovery and recyclability of materials used (circular economy)?
End-of-life	Degree of actual recycling	Do products/services and their business models facilitate convenient recovery and recycling?

Figure 3: Venture ESG Model



Author(s): Greger, M., Hess, M., Grichnik, D. (2024)

Source(s): Based on Li et al. (2021), Sinha et al. (2019), Lagasio & Cucari (2018), Steffen et al. (2015), Rockström et al. (2009), Regulation (EU) 2019/2088 (Sustainable Financial Disclosure Regulation, SFDR), European Sustainability Reporting Standards (ESRS)

4.2 *The Scale-up Navigator framework*

Based on existing literature and workshops with experienced investors, entrepreneurs and lawyers, twenty scaling challenges of ventures were mapped in a structured, iterative process. The challenges were divided into four central thematic ‘focus areas’. In addition, a fifth one was identified that encompasses scale-up routines (‘habits’). These five focus areas are critical to a successful and sustainable scaling process.

4.2.1 *Due diligence*

The first focus area is a scale-up due diligence that guides a venture’s core team of founder(s) and top employees (incentivised by stock ownership) through an analysis of their venture’s scale-up maturity. A due diligence is an in-depth analysis and evaluation of multiple factors relating to a specific company, such as its management, competitors, key financial figures, and forecasts (Cumming & Zambelli, 2017). Due diligence is an integral part of any investment process by investors, such as venture capital firms, to verify the information provided by founders and other shareholders of investment targets. The due diligence of the Scale-up Navigator framework aims to identify scaling gaps and derive a corresponding scaling strategy that can be implemented with the help of the subsequent steps. It can be seen as a first preparatory step in scaling that creates transparency on the company’s current scale-up readiness. Thus, it may be used as a regular self-assessment tool, e.g. on an annual basis. The main components of the scale-up due diligence are the (1) team, (2) product(s) and/or service(s), (3) markets, and (4) finances of the venture planning to scale (see Table 7).

Many startup failures can be attributed to team problems, particularly through the early growth and scale-up phases. To increase the likelihood of success during the scale-up phase, ventures need competent team members who are qualified for the company's upcoming development stage (Quality Fit), a suitable organisational structure (Setup Fit), and an appropriate culture of the team (Culture Fit).

Furthermore, a scaling journey cannot succeed without a product and/or service that can be scaled and has a sustainable and scalable product-market fit (PMF). Thus, the analysis of the competitors and the product-specific USP(s), the analysis of the PMF and its scalability, the analysis of the scalability of the product/service itself, and the analysis of product-specific ESG implications are essential when examining a venture's scale-up readiness.

Another prerequisite for successful scaling is to move from haphazardly exploring markets to systematically capturing market share. For a founder and team member of a scale-up venture,

the ability to systematically analyse and seize opportunities is crucial. To transition effectively, ventures need to understand and strategically analyse their current and future market segments, potential market entry strategies and their ESG implications.

However, the transition from burning capital to earning capital and achieving profitability is one of the most critical and complex challenges along a venture's growth journey. It can make or break a growth company, especially in market situations such as the downturn in the venture capital market since 2022. Missteps in this transition can lead to premature scaling, liquidity shortages and/or failure to meet investor expectations. All of this can be fatal for a scale-up. At the same time, financial decisions influence a company's ESG performance, particularly in terms of governance. Overall, detailed analyses of a venture's unit economics and financial key performance indicators (KPIs) are essential to understand whether the KPIs are sufficient to facilitate an upcoming scaling journey.

The scale-up strategy can then be derived from the analysis of a venture's team, product/service, (go-to-)market and financials. A scale-up strategy is a clear growth plan for the next three years, broken down into prioritised steps that each team member should be familiar with. Research shows how important it is for a company to develop a common strategy and communicate it both externally and internally in a way that every team member understands and respects. A study by Kaplan and Norton (2005) shows that, on average, 95% of team members do not know or understand the company's strategy – which is why growth strategies can be doomed from the start. Therefore, ventures should conduct a strategy workshop with the core team to discuss the following points: expectations for the company's future, (comparison with the) current status, and derivation of the final scale-up strategy.

Table 7: Scale-up Navigator framework – Due Diligence

Dimension	Challenge / Question	Focus
1. Team	Is our team ready to scale?	People, setup, culture
2. Product / Service	Is our product/service ready to scale?	USP, PMF, scalability
3. (Go-to-)Market	Are we ready to scale across markets and geographies?	Market entry, segments
4. Financials	Do our financials allow scaling?	Unit Economics, KPIs
5. Scale-up Strategy	What to focus on when scaling?	Gaps, benchmark, strategy

4.2.2 Growth Engine

The second area of the Scale-up Navigator framework, the ‘Growth Engine’, focuses on sales growth. It addresses the structure and collaboration of all teams within a scale-up that directly influence sales growth through customer contact (see Table 8).

The technology and product team is responsible for developing a product roadmap, positioning products and services, and setting appropriate prices. A product roadmap strategically guides business planning and execution over various timeframes. Product positioning involves defining target customers, allocating resources to ideal customer profiles, and developing market differentiation and communication strategies. Effective pricing, critical to success, balances conflicting dimensions and often requires experimentation. Additionally, ESG factors such as data and product security and net carbon emissions are vital for B2C and B2B customers.

Marketing teams need to develop a clear and well-organised plan, efficient collaboration, and effective technology stacks and marketing channels to help scale successfully despite limited resources. Regularly updated plans should be aligned with strategic goals, current analyses, and budget considerations. Cross-department collaboration is essential to achieve common goals, particularly with sales, product, and customer service. The marketing technology stack also needs to be optimised for cost-effectiveness and integration along the scale-up journey. In addition, scale-ups need to understand diverse marketing channels, produce high-quality content, measure advertising success, structure the marketing organisation (with roles from Chief Marketing Officer to Head of Content Marketing), and develop effective strategies that require precise measurement, clear departmental handoffs, and consistent product messaging to target customers – all while adhering to ESG considerations in both digital and physical marketing materials.

Selling the product and/or service is the sales team's responsibility. Drawing on Goeldi (2024a), crucial issues when scaling the sales team are process, methods, roles and organisation, and compensation. In general, ventures go through phases of exploration and learning, followed by standardisation and optimisation of their sales strategies, where a clear sales organisation becomes critical to growth. In order to establish a well-defined and structured sales process, it is essential to carefully evaluate multiple aspects, such as organisational structure and customer understanding, so as to make customer acquisition predictable. There are different ways of selling to businesses (B2B), including product-led growth, solution selling and partner selling, with each model having its own challenges,

benefits, and best practices. Scale-ups need to choose the suitable approach for a company's specific needs. Sales compensation is usually a combination of fixed salary and variable commissions based on performance. Scale-ups need to set realistic and motivating targets based on historical data, taking into account the salesperson's role and region. Clear guidelines and integrity are required for long-term success, as ethical dilemmas often arise in sales.

Customer success (CS) teams support customers throughout their journey, from sales to offboarding, providing resources and support to maintain a mutually beneficial relationship with a customer. CS teams report to either product, sales, or business units and are structured around various roles, from account managers to technical support experts (organisational aspects). Scaling and managing CS teams requires a scalable support system, clear organisational structures, process-oriented strategies, resource management, performance metrics, continuous training, close collaboration with other departments to optimise customer engagement, and an overall balance between providing excellent customer service and achieving KPIs. Typical KPIs range from customer conversion to customer lifetime. Scale-ups that align their CS practices with ESG criteria not only improve ethical standards and support quality, but also promote customer loyalty and sustainable growth.

Table 8: Scale-up Navigator framework – Growth Engine

Dimension	Challenge / Question	Focus
6. Tech & Product	How to increase the stickiness of our product?	Roadmap, product positioning, pricing
7. Marketing	How to build a scalable marketing machine?	Plan and organisation, cooperation, tech stack, channels
8. Sales	How to set up a scalable sales department?	Process, methods, roles and organisation, compensation
9. Customer Success	How to set up a scalable customer success team?	Onboarding, retention, support & training, upselling

4.2.3 Operations

The third area, 'Operations', focuses on the efficient and sustainable operation of a scale-up. Key operational challenges include building a high-performance team, setting up a scalable infrastructure, managing employee stock ownership plans (ESOPs), managing intellectual property (IP), and monitoring one's sustainability impact (see Table 9).

Leaders' growth mindset is a critical success factor, with the Navy SEAL team serving as an example of a high-performance team that emphasises trust, communication, training, adaptability, and accountability. Objectives and key results (OKRs) are a well-established goal-

setting framework for coordinating and measuring a scale-up team's performance. In general, a healthy culture is essential for scaling, with culture serving as the foundation for all operational decisions and being integrated into everyday life through a 'cultural operating system'. It is essential to manage interpersonal chemistry to strengthen social cohesion in high-performing teams. Methods such as systematic onboarding and the creation of personal one-page profiles can speed up the process of getting to know each other. People and culture in scale-ups are significantly affected by governance and social ESG variables, such as transparent communication of relevant information, employee rights, equal opportunities, and workplace culture.

Drawing on Goeldi (2024b), the role of employees is transformed from individual talents to clearly defined and specialised positions within an organisational chart as a startup grows, emphasising the need for structured workforce planning and professionalisation of HR processes (human resources *infrastructure*). Even in the age of remote working, companies have a physical footprint, with an office infrastructure – whether fully remote, co-working, traditional offices or dedicated buildings – that has a significant impact on company culture and collaboration. Modern scale-ups rely heavily on digital solutions and require a robust IT infrastructure that addresses challenges such as 'bring your own device (BYOD)', server versus cloud infrastructure, software-as-a-service (SaaS) applications, data management and backup strategies. As startups evolve into scale-ups, they need to define and manage formalised processes, with the top management team striking a balance between structure and pragmatism. In addition, concrete process management steps are essential, including identifying core processes, training employees, documenting implementation, measuring quality and performance, and appropriate automation. A scale-up's infrastructure, e.g. buildings and materials, landscape transformations and waste management, also determines its environmental footprint.

Moreover, scale-ups face the challenge of adequately protecting and exploiting their intellectual property (IP). Mistakes in this area can lead to significant legal and financial risks, which can be avoided by an early and thoughtful IP strategy. Employee stock ownership plans (ESOPs) offer employees the opportunity to participate in the company's success through stock options, thus promoting long-term loyalty and motivation. However, the implementation of ESOPs in a growing company, especially a global one, is fraught with legal and tax challenges. In the Venture ESG Model, IP rights and ESOPs relate to specific governance and social criteria. They can thus contribute to the economic success and positive social impact of the scale-up.

In recent years, the integration of environmental, social, and governance factors into corporate strategies has increased, with differences between the terminologies of sustainability, ESG, and impact. The EU Sustainable Finance Disclosure Regulation (SFDR) and the new Corporate Sustainability Reporting Directive (CSRD) increase transparency and reporting requirements for venture capitalists and scale-ups on environmental, social and governance factors. Scale-ups in Europe should recognise the increasing importance of sustainability and actively integrate it into their growth strategy by measuring and reporting relevant metrics such as carbon footprint and gender pay gap (following Tribolet, 2024).

Table 9: Scale-up Navigator framework – Operations

Dimension	Challenge / Question	Focus
10. People & Culture	How to build a high-performance team and culture?	Leadership & OKRs, growth mindset, culture management
11. Infrastructure	How to build a scalable basis for a venture?	Personnel, physical, IT, processes
12. Legal & Finance	How to set up Legal and Finance for growth?	IP, ESOPs, financial management
13. Sustainability Monitoring	How to monitor scalable sustainability?	Phases, roles & organisation, KPIs and hurdles

4.2.4 Impact Scaling

The fourth area, ‘Impact Scaling’, focuses on fundraising from later-stage investors, inorganic growth, and potential exit strategies (see Table 10).

In Series B and subsequent financing rounds (Series B+), scale-ups have more experience and a more extensive network compared to fundraising in earlier stages. However, raising funds from later-stage investors requires highly professional preparation and presentation, including strong business development figures, while taking into account complex financial and legal considerations. In addition to traditional venture capital (VC) or private equity (PE) financing, there are various alternative financing routes such as government programmes, public VC, venture debt, bank loans and mezzanine financing. However, the choice should be carefully considered depending on the scale-up’s situation and needs. A company’s ESG performance is closely linked to its investors, with a trend towards active engagement and more robust ESG practices, and founders and executives must understand and align with their investors’ ESG priorities.

Scale-ups need to grow quickly to survive in highly competitive markets, with inorganic growth through mergers and acquisitions (M&A) being strategies to strengthen themselves

against competitors and drive company growth. Large technology companies, such as Google, have significantly strengthened their market presence through strategic acquisitions (e.g., YouTube), often complementing technologies, accelerating growth or shortening development times (following Schweitzer, 2024). A roll-up (or ‘buy-and-build’) strategy involves acquiring and combining multiple small companies in a fragmented market to achieve economies of scale and higher valuation multiples. The German scale-up 1KOMMA5° is a recent European example (2024). Rapid inorganic growth, technological additions and roll-ups can have a significant impact on ESG performance, such as social criteria. Therefore, ESG considerations should be taken into account before and after mergers.

Maturing startups that become scale-ups and have VC investors on board will at some point have to decide how to pay back investors. This is where an IPO or a sale of the company comes into play, with different types of sale, such as to PE companies, complementary strategists, or competitors. A corporate sale or IPO can significantly impact a company's ESG performance, increasing public expectations of governance and pressure on management.

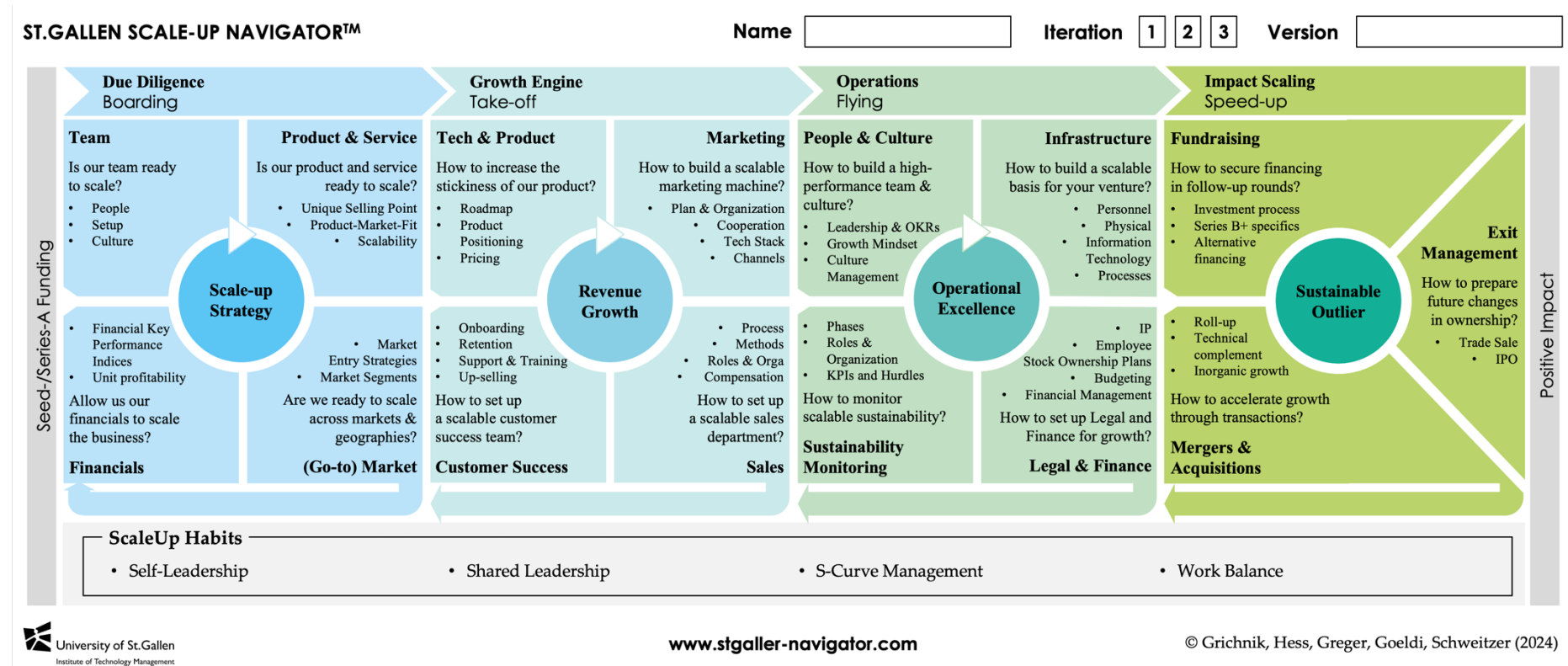
Table 10: Scale-up Navigator framework – Impact Scaling

Dimension	Challenge / Question	Focus
14. Fundraising	How to secure financing in follow-up rounds?	Investment process, Series B+ specifics, alternative financing
15. Mergers & Acquisitions (M&A)	How to accelerate growth through transactions?	Roll-up, technical complement, inorganic growth
16. Exit management	How to prepare for future changes in ownership?	Trade sale, IPO

4.2.5 Habits

This area describes various concepts and ideas that support stakeholders of scale-ups in self-management, shared leadership, s-curve management (acting with foresight and staying one step ahead of the growth curve) and work balance management (e.g. managing the productive work schedules of different types of team members). Developing healthy, productive ‘habits’ is essential for long-term success and health in both organisational and private contexts, requiring regular reflection and adjustment of routines.

Figure 4: Scale-up Navigator framework



5. Discussion

In the following, the artefacts will be analysed to determine whether they meet the objectives and requirements introduced in Section 3.2.1, before discussing the use of the artefacts by the target audience and addressing limitations as well as future research directions.

5.1 Objectives and requirements

The first objective or requirement (hereafter referred to as requirement), which was introduced in Section 3.2.1, relates to the breadth and comprehensiveness of the artefacts: they should holistically capture the issues of ESG and/or scaling in a business context. This requirement is met by both artefacts. To the best of the authors' knowledge, the Venture ESG Model is the first ESG-related artefact for ventures that covers all three ESG dimensions. The Scale-Up Navigator framework, on the other hand, is the first artefact that visualises the full thematic scope of a venture's scale-up journey.

The second requirement relates to the artefacts' depth: they should provide sufficient depth so they can be applied in practice without the need for additional basic research. At first sight, this seems to be in contradiction with the first requirement. However, initial tests with students at the University of St.Gallen³ are promising, especially with regard to the Venture ESG Model. The artefact conveys basic knowledge about existing ESG criteria in a way that enables students to pose concrete questions to stakeholders of scaling ventures and thus to initiate the evaluation of their ESG-related performance. This also applies to the Scale-up Navigator framework, although further reading of the companion book is required to conduct initial scale-up analyses.

The third requirement relates to the artefacts' visual implementation, which should reduce complexity. Both artefacts seem to meet this requirement due to the multiple iterations along the design science research-based process of developing the artefacts.

Nevertheless, there may be room for further improvement, as the evaluation of the following requirements shows. The fourth requirement aims at achieving a high usability of the artefacts for the target users (stakeholders of scaling ventures). Thanks to a clear structure and an appropriate size of the artefacts, which can be printed on either DIN A4 or DIN A3 posters, both artefacts generally fulfil this requirement. However, reducing the extensive content to

³ These tests were conducted with entrepreneurial students who are stakeholders of growing ventures in their positions as interns or working students.

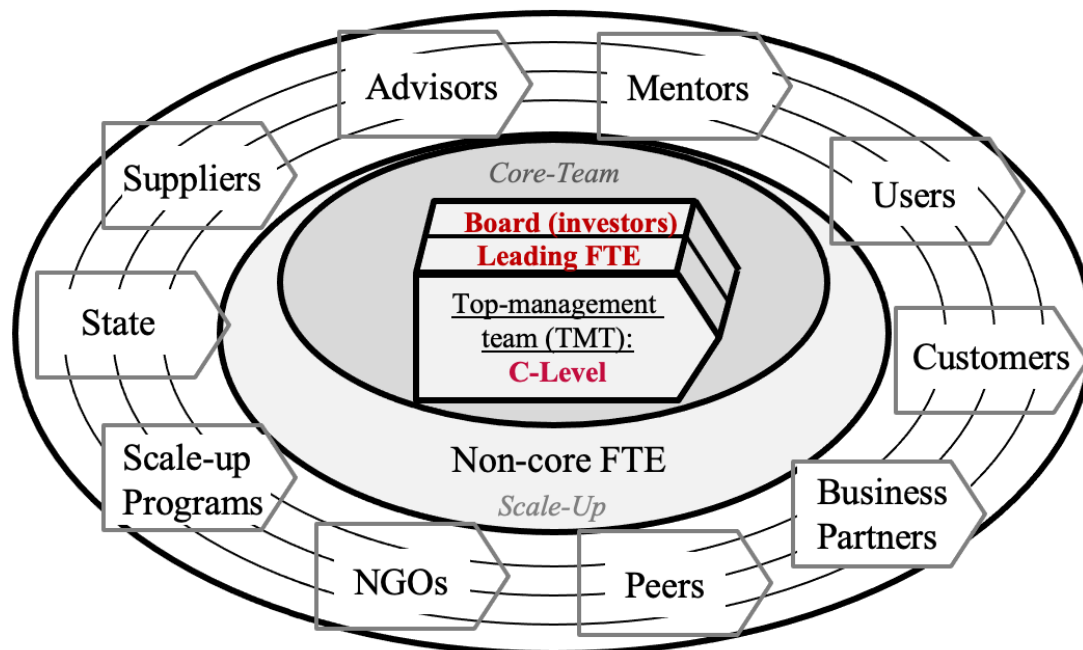
such a limited size means that both artefacts, in their static, paper-based form, lack adaptability. For instance, neither artefact allows users to write into the frameworks. Digitally modifiable and interactive versions could be created to increase the customisability and allow the artefacts to be adapted to the context of a particular venture.

5.2 Target audience, intended use and general significance

5.2.1 Target audience and intended use

The target groups of both artefacts are the stakeholders of scaling ventures. There are internal and external stakeholders (see Figure 5). Internal stakeholders include employees without significant management responsibility (non-core staff), and the core team, which consists of the following members: executives, the top management team (CEO and C-level executives) and board members (investors). This core team is essential for the success of a scaling journey. Following the list of external stakeholders of the St. Gallen Management Model, mentors, users, customers, business partners, governmental agencies, (public) scale-up programmes, suppliers and advisors also represent potential users of the artefacts.

Figure 5: Target audience of the artefacts developed



These internal and external stakeholders of scaling ventures are supposed to use both artefacts to scale their ventures successfully and sustainably. Specifically, the Venture ESG Model can support stakeholders on a daily basis in reflecting on and challenging decisions to be made – in particular, whether these decisions are ESG-compliant and in line with the

venture's ESG-related goals. The Scale-up Navigator framework, on the other hand, can provide ongoing guidance and inspiration to stakeholders on how to advance their scale-up journey in a sustainable way. In concrete terms, the scale-up due diligence could serve as an agenda for an annual strategy workshop with the core team, where scale-up gaps could be identified and future expectations clarified and benchmarked against the current state of the scale-up, before final scale-up goals are defined for the coming year(s).

5.2.2 General significance

At present, one might think that only a handful of scale-ups and unicorns meet ESG criteria. One might assume that ventures do not have time to worry about ESG, as successfully growing the company's revenues and meeting investors' financial expectations is challenging enough. However, ESG compliance is essential for founders, investors, advisors, and other stakeholders of scaling ventures today for five reasons: increasing compliance pressure (as discussed above, e.g. in Section 3.2.2), financial returns, funding opportunities, competitive pressure and urgency of action.

Management science has shown that companies that comply with ESG criteria have, on average, better financial performance than companies that do not (Whelan et al., 2021). Shopify, for instance, was prepared for remote working policies during the COVID pandemic and recent energy price rises thanks to its digital-/remote-first and carbon-neutral policies⁴.

There is also a positive relationship between ESG compliance and the initial valuation of a venture (Mansouri & Montaz, 2022). For many investors, compliance with ESG criteria has become a prerequisite. Large asset managers such as Blackrock are adjusting their investment strategies. These institutional, professional investors are highly relevant in a scale-up journey. Not surprisingly, early-stage VCs and business angels are also starting to address these dimensions in their due diligence. It may not be a red flag at the moment if a scale-up does not comply, but the time is not far off when it will become a decisive criterion. Larry Fink, CEO of the world's largest asset manager, Blackrock (with USD 10 trillion under management at the end of 2021), wrote in his 'Letter to CEOs' in 2022: *'[...] Few things will impact capital allocation decisions – and thereby the long-term value of your company – more than how effectively you navigate the global energy transition in the years ahead. [...] Every company and every industry will be transformed by the transition to a net zero world. The question is, will you lead, or will you be led? [...] The next 1,000 unicorns won't be search engines or*

⁴ www.shopify.com/climate

social media companies, they'll be sustainable, scalable innovators – startups that help the world decarbonise and make the energy transition affordable for all consumers. [...] We focus on sustainability not because we're environmentalists, but because we are capitalists and fiduciaries to our clients.'

A large number of ventures have already turned the ecological and social pressures into business opportunities. In recent years, successful founders have started to give back to society not just at the end of their entrepreneurial journey after a successful exit. In Europe, several scale-ups stand out. One of them is 'SumUp'. It provides on-site, point-of-sale card payment solutions to businesses of all sizes. Founded in 2011, SumUp has promoted SDG 8, 'Decent work and economic growth', from the very beginning, especially sub-target number 8.3 '[...] support entrepreneurship [...], and encourage the [...] growth of micro, small- and medium-sized enterprises, including through access to financial services'. Today, according to Crunchbase⁵, SumUp has raised a total of USD 1.4 billion and is valued at USD 22 billion according to Bloomberg (Gani, 2023).

Lastly, the energy consumption of a venture tends to go through the roof as it scales – be it a SaaS business, Legaltech, Spacetechnology, Foodtech and the like. The problem, however, is that according to the Intergovernmental Panel on Climate Change (IPCC), the United Nations body responsible for the scientific assessment of climate change, humanity should urgently limit global warming to 1.5° Celsius since the beginning of industrialisation (Allen et al., 2018). Experts believe that warming beyond this point would be irreversible and, therefore fatal ('tipping point'). It is important to remember that humans have benefited from a stabilisation of the temperature of our planet at about 15 degrees Celsius in the last 10,000 years. This period of temperature stability, known as the Holocene (Spratt, 2011), ended when humans began to emit enormous amounts of greenhouse gases since the First Industrial Revolution (150 years ago). Today's period of exponential growth in global temperature and other social-ecological trends, such as increases in global population, cultivated land and ocean fishing, has been called the 'Great Acceleration' and is proposed to usher in the so-called Anthropocene. There is no doubt in the scientific community that the industrialised countries have caused these increases, and that human energy consumption has been the main driver of carbon emissions. What is worrying is that the temperature increase was already around 1.15° Celsius in 2022 (WMO, 2023). To stay below 1.5° Celsius, 'global greenhouse gas emissions must peak by 2025 at the

⁵ <https://www.crunchbase.com/organization/sumup>

latest and be reduced by 43 percent by 2030' (IPCC, 2022). This leaves only seven years from the publication of this paper to halve net human carbon emissions.

5.3 Limitations and future research

This paper has two data-related limitations, which can be structured according to Peffers et al.'s (2007) artefact development process. First, there was a limited amount of previous research on which the authors could base the first version of the artefacts – particularly for the framework of the Scale-up Navigator. Therefore, subsequent interviews and workshops with experts resulted in significant further iterations of the artefact. In the case of the Venture ESG Model, integrating existing EU regulations was difficult, as collecting ESG information, particularly concerning the supply chain, is easier for large corporations with high market power compared to ventures. As a result, the Venture ESG Model does not claim to be exhaustive in terms of all ESG criteria mentioned in the EU regulation. Thus, its target users are not the ESG specialists who are responsible for reporting on their venture's ESG criteria, but rather the 99% of other team members who need to understand what ESG confirmative behaviour means in order to be able to incorporate it into their every day's decisions. Second, using successful scale-ups to test the framework had two drawbacks: it may have introduced a survivorship bias, and the limited interview duration of around 30 minutes allowed only a partial test of the framework per venture.

Future research can explore a variety of avenues in the context of both artefacts. The Venture ESG Model could be further tested and adapted across different venture sectors, industries and business models. For instance, it might be insightful and useful to differentiate between a hardware- and a software-focused ESG model. Furthermore, forthcoming legislation could be incorporated and tested against the ESG model. In addition, region-specific ESG models that have incorporated local legislation could greatly assist in scaling up, as they could relieve ventures from scrutinising local ESG-related requirements. The same applies to the Scale-up Navigator framework, which could potentially profit from region-, sector-, industry-, and/or business model-specific versions. There is also potential for highly specialised frameworks that focus on only one of the framework's themes, such as a scaling product and/or technology team. As discussed in the evaluation of the requirements met by the artefacts (see Section 5.1), digitally modifiable and interactive versions of the framework could also be of high interest to the target audience.

6. Conclusion

This paper explores the question ‘*What are application-oriented (process) models supporting stakeholders of ventures in scaling these sustainably?*’ by reviewing existing literature and conducting 25 workshops and interviews with investors, entrepreneurs, and lawyers of successfully scaling ventures. Based on the methodology of Peffers et al. (2007), two artefacts were derived from theory and practice, with a clear focus on their practical application. The Venture ESG Model covers ESG criteria relevant to scaling ventures, while the Scale-up Navigator framework is a process-oriented framework that guides stakeholders of such ventures through their scale-up journey. This framework has been expanded into a book that offers concrete guidance on how to address twenty key challenges by providing background knowledge, recommendations for action (so-called ‘playbooks’), (digital) tools and illustrative case studies.

The findings provide guidance to both stakeholders of scaling ventures and entrepreneurship researchers on what ESG variables exist today that might impact the scaling process of ventures today and in the future. They also highlight relevant issues during a venture’s scale-up journey and how to address them in an efficient and sustainable way. Thus, this paper points the way for future design- and sustainability-oriented scale-up research. The findings will be of particular interest to entrepreneurship scholars researching growing ventures and to practitioners navigating their ventures through a (pending) scale-up journey.

Appendix

A.1 ESG-related Artefacts

Figure 6: St. Gallen Management Model, original version (Ulrich & Krieg, 1974)

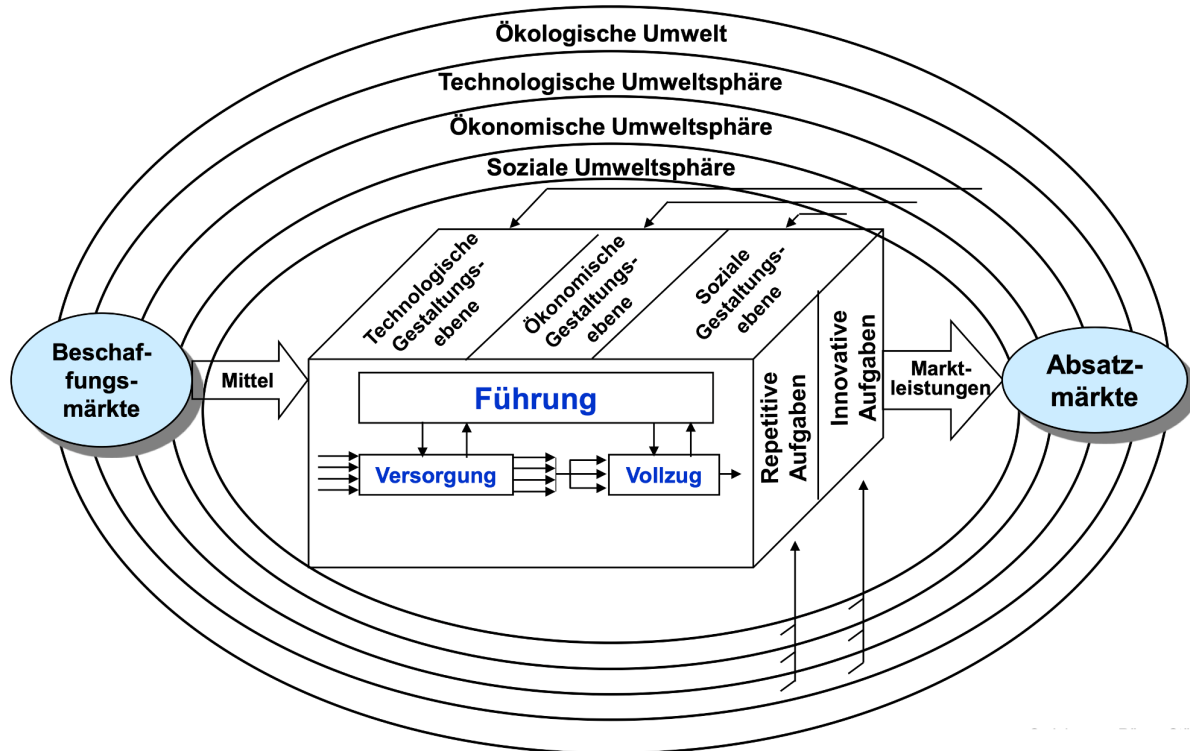


Figure 7: St. Gallen Management Model – ‘Führungswürfel’, original version (Ulrich & Krieg, 1974)

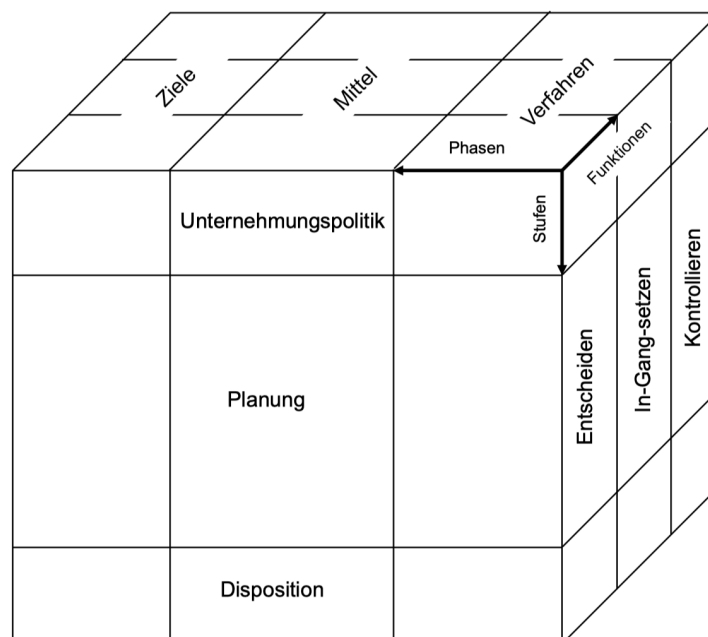


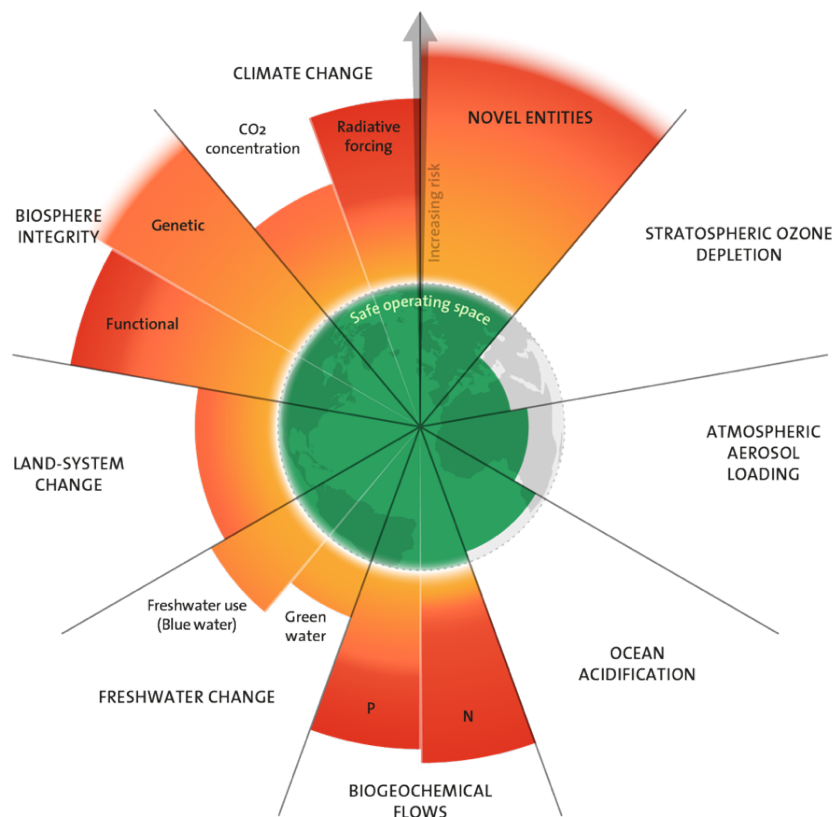
Figure 8: Sustainable Development Goals (SDGs)

Source: <https://sdgs.un.org/goals>

Table 11: Sustainable Development Goals – Allocation to ESG dimensions

Nr.	Sustainable Development Goal	ESG Dimensions
1	No poverty	Social
2	Zero hunger	Social
3	Good health and well-being	Social
4	Quality education	Social
5	Gender equality	Social
6	Clean water and sanitation	Social
7	Affordable and clean energy	Social, environmental
8	Decent work and economic growth	Social (+ economic)
9	Industry, innovation, and infrastructure	Social (+ economic)
10	Reduced inequalities	Social
11	Sustainable cities and communities	Environmental
12	Responsible consumption and production	Environmental
13	Climate action	Environmental
14	Life below water	Environmental
15	Life on land	Environmental
16	Peace, justice, and strong institutions	Social
17	Partnerships for the goals	Social

Figure 9: Planetary Boundaries



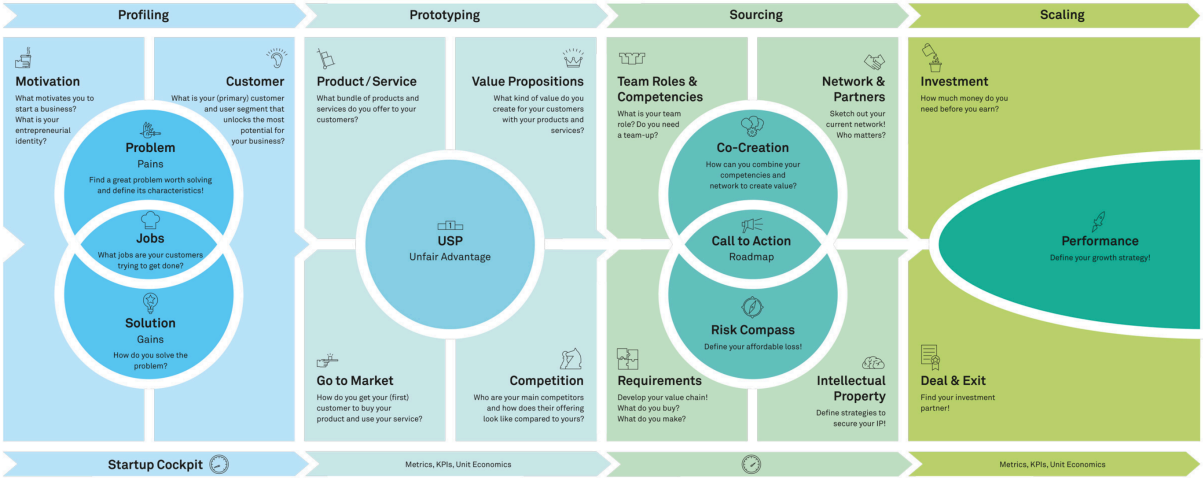
Source: Azote for Stockholm Resilience Centre, based on analysis in Richardson et al. 2023 (<https://www.stockholmresilience.org/research/planetary-boundaries.html>)

Figure 10: Doughnut Economics (Raworth, 2017)



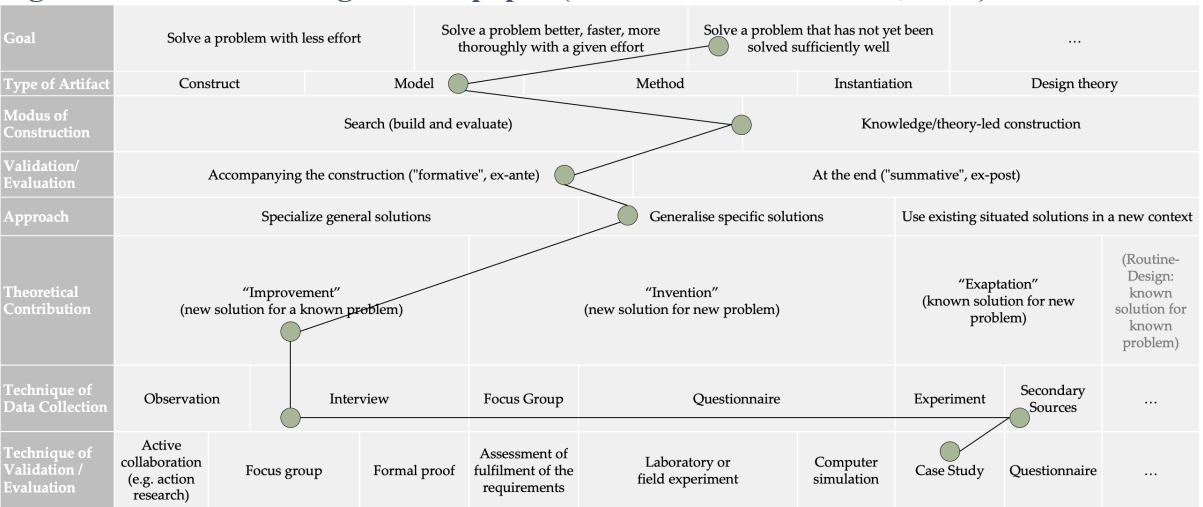
A.2 Scaling-related artefact(s)

Figure 11: St. Gallen Startup Navigator [Framework] (Grichnik et al., 2024)



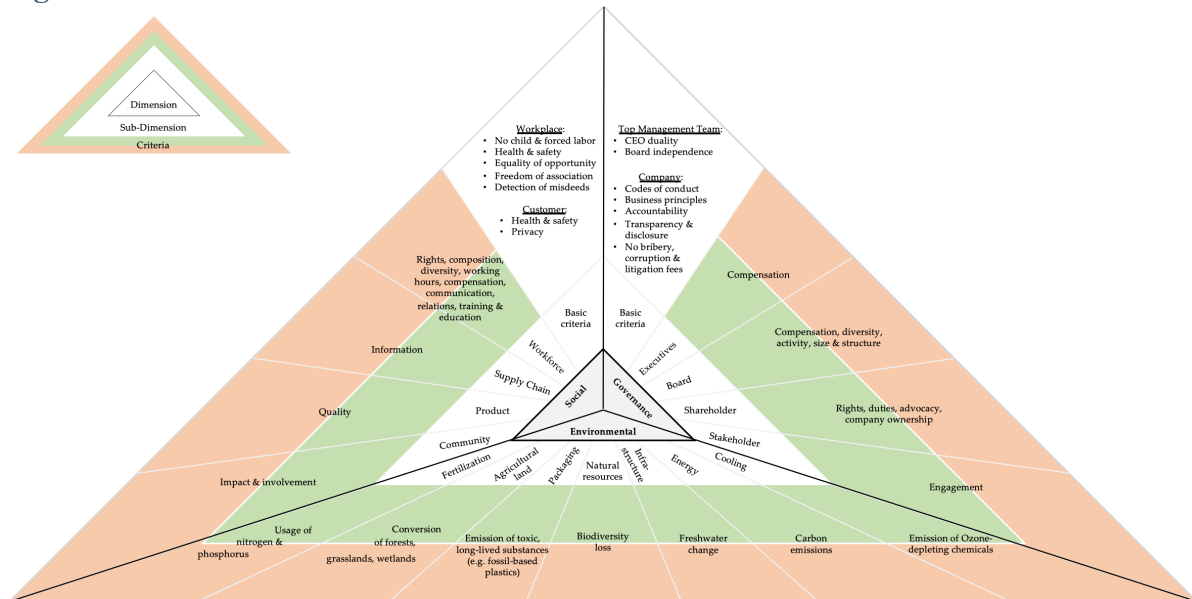
A.3 Methodology

Figure 12: Research design of this paper (based on Winter & Aier, 2019)



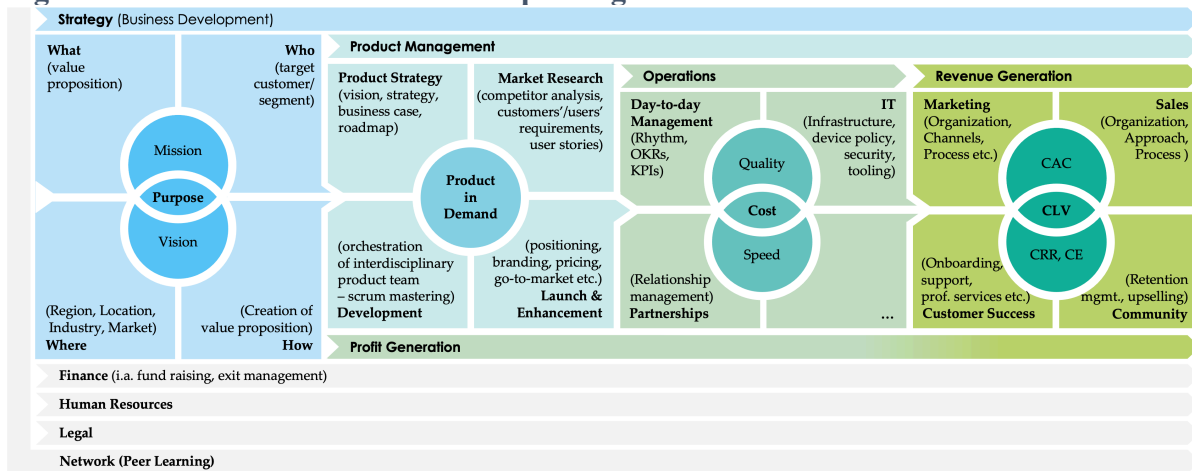
A.4 Development of artefacts

Figure 13: First version of the Venture ESG Model



Source: authors' illustration

Figure 14: First version of the Scale-up Navigator framework



OKR = Objectives & Key Results | CAC = Customer Acquisition Cost | CLV = Customer Lifetime Value | CRR = Customer Retention Rate | CE = Customer Engagement

Source: authors' illustration

References

Allen, M.R., Dube, O.P., Solecki, W., Aragón-Durand, F., Cramer, W., Humphreys, S., Kainuma, M., Kala, J., Mahowald, N., Mulugetta, Y., Perez, R., Wairiu, M., & Zickfeld, K. (2018). Framing and Context. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 49-92.

<https://doi.org/10.1017/9781009157940.003>

Cumming, D., & Zambelli, S. (2017). Due diligence and investee performance. *European Financial Management*, 23(2), 211-253. <https://doi.org/10.1111/eufm.12100>

Edmondson, A. C., & Bransby, D. P. (2023). Psychological safety comes of age: Observed themes in an established literature. *Annual Review of Organizational Psychology and Organizational Behavior*, 10, 55-78. <https://doi.org/10.1146/annurev-orgpsych-120920-055217>

European Commission. (2019, December 11). *The European Green Deal* [Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions]. Retrieved from: https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF

European Commission. (2023, December 22). Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting [*European Sustainability Reporting Standards (ESRS)*]. Retrieved from: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32023R2772>

European Parliament and the Council of the European Union. (2014, October 22). Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups [*Non-Financial Reporting Directive (NFRD)*]. Retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0095>

European Parliament and the Council of the European Union. (2019). Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector [*European Sustainable Financial Disclosure Regulation (SFDR)*]. Retrieved from: <https://eur-lex.europa.eu/eli/reg/2019/2088/oj>

European Parliament and the Council of the European Union. (2022, December 14). Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting

[*Corporate Sustainability Reporting Directive (CSRD)*]. Retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022L2464>

Fink, L. (2022). Larry Fink CEO Letter [Digital letter]. BlackRock. Retrieved from: www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter

Gani, S. (2023, December 11). Payments Firm SumUp Defies Fintech Slump With €285 Million Fundraising. *BLOOMBERG.COM*. Retrieved from: <https://www.bloomberg.com/news/articles/2023-12-11/british-payments-firm-sumup-defies-fintech-slump-with-285-million-fundraising?embedded-checkout=true>

Gillan, S. L., Koch, A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, 66, 101889. <https://doi.org/10.1016/j.jcorpfin.2021.101889>

Goeldi, A. (2024a). Sales. In Grichnik, D., Hess, M., Greger, M., Goeldi, A., & Schweitzer, F., *Scale-up Navigator: Das Handbuch für nachhaltig skalierende Startups* (in press, 1st ed., pp. 135-154). Wiley. www.stgaller-navigator.com

Goeldi, A. (2024b). Infrastruktur. In Grichnik, D., Hess, M., Greger, M., Goeldi, A., & Schweitzer, F., *Scale-up Navigator: Das Handbuch für nachhaltig skalierende Startups* (in press, 1st ed., pp. 185-196). Wiley. www.stgaller-navigator.com

Grichnik, D., Heß, M., Probst, D., Antretter, T., & Pukall, B. (2024). *Startup Navigator – Das Workbook zur Unternehmensgründung* (2nd ed.). Munich: Hanser. <http://stgaller-navigator.com>

Intergovernmental Panel on Climate Change [IPCC]. (2022, April 4). IPCC Press Release. *IPCC.CH*. Retrieved from: <https://www.ipcc.ch/report/ar6/wg3/resources/press/press-release>

Kaplan, R. S., & Norton, D. P. (2005). The office of strategy management. *Harvard Business Review*, 83(10), 72. Retrieved from: <https://hbr.org/2005/10/the-office-of-strategy-management>

Lagasio, V., & Cucari, N. (2019). Corporate governance and environmental social governance disclosure: A meta-analytical review. *Corporate Social Responsibility and Environmental Management*, 26(4), 701-711. <https://doi.org/10.1002/csr.1716>

Lewis, S. L., & Maslin, M. A. (2015). Defining the Anthropocene. *Nature*, 519(7542), 171-180. <https://doi.org/10.1038/nature14258>

Li, T. T., Wang, K., Sueyoshi, T., & Wang, D. D. (2021). ESG: Research progress and future prospects. *Sustainability*, 13(21), 11663. <https://doi.org/10.3390/su132111663>

Lindner, C. (2022, February 08). *Christian Lindner bei der Scale-Up Europe Conference* [Speech manuscript]. Retrieved from: <https://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Video-Textfassungen/2022/textfassung-2022-02-08-scale-up-europe-conference.html>

Mansouri, S., & Momtaz, P. P. (2022). Financing sustainable entrepreneurship: ESG measurement, valuation, and performance. *Journal of Business Venturing*, 37(6), 106258. <https://dx.doi.org/10.2139/ssrn.3997723>

Peppers, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of Management Information Systems*, 24(3), 45-77. <https://doi.org/10.2753/MIS0742-1222240302>

Raworth, K. (2012). *A safe and just space for humanity* [Oxfam Discussion Paper]. Retrieved from: https://www-cdn.oxfam.org/s3fs-public/file_attachments/dp-a-safe-and-just-space-for-humanity-130212-en_5.pdf

Raworth, K. (2017). *Doughnut economics: seven ways to think like a 21st-century economist*. Chelsea Green Publishing. <https://doughnuteconomics.org/about-doughnut-economics>

Richardson, K., Steffen, W., Lucht, W., Bendtsen, J., Cornell, S. E., Donges, J. F., ... & Rockström, J. (2023). Earth beyond six of nine planetary boundaries. *Science Advances*, 9(37). <https://doi.org/10.1126/sciadv.adh2458>

Rockström, J. (2010, August 31). *Let the environment guide our development* [Video]. TED Conferences. Retrieved from https://www.ted.com/talks/johan_rockstrom_let_the_environment_guide_our_development

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H. J., Nykvist, B., de Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., ... Foley, J. (2009). Planetary Boundaries: Exploring the Safe Operating Space for Humanity. *Ecology and Society*, 14(2). <http://www.jstor.org/stable/26268316>

Schweitzer, F. (2024). Technologische Ergänzung. In Grichnik, D., Hess, M., Greger, M., Goeldi, A., & Schweitzer, F., *Scale-up Navigator: Das Handbuch für nachhaltig skalierende Startups* (in press, 1st ed., pp. 248-249). Wiley. www.stgaller-navigator.com

Shepherd, D.A., & Patzelt, H. (2022). A call for research on the scaling of organisations and the scaling of social impact. *Entrepreneurship Theory and Practice*. <https://doi.org/10.1177/1042258720950599>

Sinha, R., Datta, M., & Ziolo, M. (2019). Inclusion of ESG factors in investments and value addition: A meta-analysis of the relationship. In *Effective Investments on Capital Markets: 10th Capital Market Effective Investments Conference (CMEI 2018)* (pp. 93-109). Springer International Publishing. https://doi.org/10.1007/978-3-030-21274-2_7

Spratt, D., & Sutton, P. (2008). *Climate code red*. Carlton North: Scribe Publications., 2008. <https://g.co/kgs/puvAx6>

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... & Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), 1259855. <http://www.doi.org/10.1126/science.1259855>

Stockholm Resilience Center. (2023). *Planetary Boundaries* [Web-based Introduction]. Retrieved from: <https://www.stockholmresilience.org/research/planetary-boundaries.html>

Tribolet, T. (2024). Sustainability Monitoring [ESG]. In Grichnik, D., Hess, M., Greger, M., Goeldi, A., & Schweitzer, F., *Scale-up Navigator: Das Handbuch für nachhaltig skalierende Startups* (in press, 1st ed., pp. 213-222). Wiley. www.stgaller-navigator.com

Ulrich, H., & Krieg, W. (1972). St.Galler Management-Modell. Bern, 1972. In *Das St.Galler Management-Modell im Überblick* [Lecture at the University of St.Gallen, 22.09.2014].

United Nations Framework Convention on Climate Change [UNFCCC]. (2015). *Paris Agreement* [Treaty]. Retrieved from <https://unfccc.int/documents/184656>

United Nations. (2016). *The Sustainable Development Goals Report*. Retrieved from: <https://unstats.un.org/sdgs/report/2016/the%20sustainable%20development%20goals%20report%202016.pdf>

United Nations. (2023). *The Sustainable Development Goals Extended Report 2023* [Report, Special Edition]. Retrieved from: https://unstats.un.org/sdgs/report/2023/extended-report/Extended-Report_Goal-3.pdf

Whelan, T., Atz, U., Van Holt, T., & Clark, C. (2021). *ESG & Financial Performance: Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015–2020*. Retrieved from: https://sri360.com/wpcontent/uploads/2022/10/NYU-RAM_ESG-Paper_2021-2.pdf

Winter, R., & Aier, S. (2019). *Forschungsmethoden für Geschäftsinnovation* [Lecture at University of St.Gallen].

World Meteorological Organization [WMO]. (2023, May 17). *Global temperatures set to reach new records in next five years*. WMO. Retrieved from: <https://wmo.int/news/media-centre/global-temperatures-set-reach-new-records-next-five-years#:~:text=There%20is%20a%2066%25%20likelihood,be%20the%20warmest%20on%20record>