Sustainability Management for Start-ups and Micro-Enterprises: Development of a Sustainability Quick-Check and Reporting Scheme

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Abstract

For enterprises of all sizes, sustainability is becoming increasingly important. Accordingly, there has been a noticeable increase in academic literature in the field of sustainability management and related tools and approaches. While the academic and practical contributions are growing in this field, it appears that literature has overlooked certain type of enterprise, namely the micro-enterprises, including normal startup companies. Nonetheless, mounting evidence places emphasis for the inclusion of startups and micro-enterprises in the sustainability debate. Therefore, the aim of this paper is not only to close the theoretical gap on appropriate sustainability measures for startups and micro-enterprises, but also to propose a conceptual framework for an IT-supported analysis and reporting tool for sustainability in micro-enterprises and startups. Based on previous research on sustainability management tools in SMEs as well as sustainability software applications, the paper proposes the contents and layout of a web-based tool for startups.

Keywords: *Sustainability Management; Start-ups; Micro-Enterprises; Software; Web-based tools.*

1.   Introduction

For enterprises of all sizes, sustainability is becoming increasingly important. Accordingly, a noticeable increase in academic literature has emerged regarding effective management approaches and tools for business sustainability, also known as sustainability management [27]. While much of the focus of sustainability management research is placed on large enterprises, a shift has occurred to include small and medium-sized enterprises (SMEs) as well as social and sustainability entrepreneurs [12, 26].

Accordingly, there has also been an increase in scientific contributions for the development and implementation of IT-based environmental and social management applications in companies of all sizes (see [17] for an overview of various applications of IT-solutions for large companies and SMEs). However, most academic publications dealing with software and web-based applications are usually focused on particular aspects of sustainability, such as energy and resource efficiency [e.g. 1] or sustainability reporting [28]. A company-wide, holistic approach embracing all aspects of business sustainability has been practically observed in large companies [19], but not examined in the academic literature.

With few exceptions [e.g. 33], previous research has not proposed company-level tools for sustainability management in micro-enterprises and particularly start-ups. While some research does exist on sustainable business models and plans [e.g. 3], these models are more focused on sustainable innovations versus the core business itself. Such business models are difficult for most start-ups to implement because they mainly revolve around new business units than the core

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message of a new company. These business models also do not provide tools for a comprehensive sustainability evaluation and reporting system [21].

Furthermore, IT-solutions have not considered the early stages of business creation from the actual start-up of a company to its further development as a micro-enterprise. In fact, it appears that literature has overlooked certain category of businesses in the sustainability management context. According to the European Commission this category includes micro-enterprises with less than 10 employees and no more than 2 million Euro annual revenue.

However, mounting evidence suggests that start-ups and micro-enterprises should be considered in light of sustainable development for several reasons. First, sustainability is relevant for all companies in every industry of every economy [24]. Secondly, sustainability will never be achieved if the smallest companies do not get involved [10]. Not only do micro-enterprises constitute a majority of all registered businesses, e.g. 2.8 million enterprises (ca. 80%) in Germany fall into the micro-enterprise range, they also feed many products and services into the larger companies as suppliers and service-vendors. Thirdly, while it could be argued that individual micro-enterprises transmit a puny, insignificant burden on the environment, it is their collective impact and spill-over into larger enterprises that raises major concerns.

Fourthly, besides the direct burdens placed on society and the environment, indirect effects can be attributed to the exemplary roles that entrepreneurs and owner-managers of small businesses hold in economies and societies that desperately look for heroes to right the wrongs of environmental degradation and intra-generational injustices through sustainability-driven goals and measures. When considering the good examples set by social entrepreneurs, such as Muhammad Yunus, and ecopreneurs, such as Klaus Hipp, new business founders need not just inspirational stories, but effective operational means and devices to steer their business endeavors into future-oriented sustainability enterprises [26].

Last but not least, start-ups generally do not remain small but rather are growth-oriented [8; 16; 32]. As the size of the enterprise increases, so too does the relevance and motivations for sustainability management [29]. In addition to well-known management problems of fast-growing enterprises [12; 18], small business managers must be informed about the increasing environmental and social demands that rise with increasing size. For example, in the future it is plausible that medium-sized enterprises starting with 100 employees will be mandated by corporate law to state their environmental and social impacts through annual sustainability reports [14; 31]. Those owner-managers that have addressed with sustainability issues from the beginning might achieve a competitive advantage over those that decide to wait it out. The challenges of sustainability management in start-ups and fast growing companies should be integrated so to avoid a lengthy, costly period of playing catch-up.

Thus, the questions are raised: why should a start-up or micro-sized enterprise wait to reach a certain size in order to measure, manage and report on its sustainability activities? How could such a sustainability management program be conceptualized? What benefits would it bring the enterprise? Lastly, how might IT-solutions provide simple yet effective means to accomplishing these goals?

The aim of this paper is, therefore, not only to close the theoretical gap on appropriate sustainability measures for start-ups and micro-enterprises, but also to propose a conceptual framework for an IT-supported application that allows a company to easily assess and report its sustainability activities. This conceptual model will hopefully set the foundation for further practical developments. Based on previous research on sustainability management tools in SMEs [13] and private households, this conceptual paper proposes the contents and step-wise process of

an IT-support tool for both start-ups and micro-enterprises. This tool, as we call the "Sustainability Quick-Check" (SQC) model, will be explained in the next section.

2.   IT-supported Sustainability Quick-Check

Many of the existing processes for the preparation of sustainability assessments and reports are complex and contain a variety of indicators and metrics. In turn, this provides no clear path or structure for intuitive handling. One possible reason may be attribute to the fact that software applications were intended to be sold with additional consulting services. The aim of this paper is to develop a manageable and straightforward tool with a clear structure and based on understandable steps for a start-up and micro-enterprise.

The development of the SQC model is broken down into three complementary and sequential stages. In the first stage, a systematic analysis of the existing sustainability management tools and software and tools were examined. Based on Johnson (2013), it is established that not all management tools are applicable even in small and medium-sized enterprises (SMEs) with 10 or more employees [13]. The most applicable tools for small businesses are those that correspond with well-established management practices, such as a quality management system, training and education on sustainability management, risk analysis, supply chain management and even an environmental management system.

In the second stage of analysis, several SME-friendly software and web-based applications, such as Avanti GreenSoftware (www.avanti-greensoftware.com/de/), CR-Kompass (www.crkompass.de/), KIM-Software from Sustainum (www.sustainum.de/index.html), N-Kompass (www.n-kompass.de/) and 360 Report (www.360report.org/de/) were closely examined. These software not only offer user-friendly, cost effective ways to analyze and report on sustainability management in SMEs, combined they provide a good overview of what criteria and indicators should be considered for sustainability management in small businesses. While these various applications offer great insights applicable topics and indicators for SMEs, it is still uncertain if these software packages and web-applications will be adopted by very small enterprises and start-up companies.

In the third stage, a grid was developed that allows a structured overview of sustainability topics and corresponding indicators for start-ups and micro-enterprises. The idea behind this structure was to combine the results from both the first and second stage of analysis with the ideas from business model canvas [19]. Suitable sustainability key performance indicators and metrics were classified into various SQC-categories, such as production, supply chain management, sales and marketing and administration and supporting business functions (including strategy and human resources), and further broken down into key activities, key resources and key partners from both environmental and social perspectives. Table 1 below depicts example of possible categories, fields and aspects for the SQC model.

Basic Structure of the *Sustainability Quick Check (SQC)*		Sustainability	
		Ecological Aspects	Social Aspects
SQC-Category	Assessment field	Example Criteria	
Production of Product / Service	Key Activities	Energy and Water consumption in production (i.A.a. G4-EN3/ EN8)	Adherence to working hours and und guarantee of workplace safety (i.A.a. G4-LA5 und LA6)

	Key Resources	Use of non-toxic and recycling materials and packaging (i.A.a. G4-EN1 und EN28)	Use of fair trade materials, incl. free from forced and child labor
	Key Partners	Selection of regional, sustainable production partners, i.a. avoidance of long transport routes (i.A.a. G4-EN17 und EC9)	Support of the disadvantaged, e.g. collaboration with disabled persons
Supply Chain Management, incl. Logistics and Procurement	Key Activities	Shortening transport routes	Supply chain code of conduct and enforcement (audits); Supplier Training
	Key Resources	Environmentally conscious procurement (guidelines) for sustainable and environmentally safe materials (i.A.a. G4-EN2)	Purchasing requirements for fair products
	Key Partners	Selection of regional, environmentally friendly partners	Supplier selection and negotiations for fair and safe working practices
Market incl. Sales and Marketing	Key Activities	Market analysis and promotion of environmentally friendly products and services	Fair Marketing; Ensure transparency of social standards in own production and supply chain
	Key Resources	FSC- or PEFC-certified printed ads; paperless-advertising	Partnerships with NGOs (e.g. Cause-Related Marketing)
	Key Partners	Selection of environmentally conscious buyers and distribution points	Socially conscious buyers
Firm Structure, Administration and Human Resources	Key Activities	Training and support on the ecological performance of employees	Pay attention to equality in the workplace; Guidelines for recruitment (G4-LA1)
	Key Resources	Energy efficient Administration building (i.A.a. G4-EN3)	Employees with fair wages (i.A.a. G4-EC5)
	Key Partners	Employee participation in environmental activities	Employee participation in firm-internal decisions as well as firm-external community engagement projects

The SQC model is based on some of the components of the aforementioned software, the value chain according to Porter [22]. and the business model canvas by Osterwalder et al. [20]. The value chain is the presentation and analysis of the primary (e.g. logistics, production or operations, sales and marketing) and secondary activities (e.g. administration, human resources, research and development) that support the primary activities, and together they bring value to a company's products and services [20; 22]. Similarly, this value chain has been used to assess environmental and social sustainability aspects along all these business activities [25]. Therefore, the value chain served as the basis for our selection of the four SQC categories, including production, supply chain, market and internal firm structure. Primary activities can be located in the first, second and their categories. For example, inbound and outbound logistics are combined with supply chain management and procurement into one category. The supporting activities provide an indirect but still supporting role in the production of products and/or services, and these are mostly located in the fourth category.

The business model canvas is a method of visualization of business models [19]. Business models describe the basic principles by which organizations create value, with the distinctions made between three aspects: the product-market combination, the configuration of value chains and main revenue mechanisms. For the SQC, the configuration of value chains is considered to be particularly important, since this the area where sustainability-related decision are made. Also, this part of the business model fits well with Porter's value chain [22]. A brief description of the product-market combination should precede the initial analysis, but it is actually not a part of the SQC since it is tailored for all kinds of startups and micro-enterprises. The environmental and social aspects of companies are already a part the business model, and they will be described separately in the product-market combination.

The business model canvas depicts a total of nine areas of a business model. The fields deemed particularly relevant for the SQC are the key activities, key resources and key partners. Key activities are those actions that are particularly important for a particular area of a business (in this case for each category, such as production of products and services). Key resources can be both physical and intellectual, human or financial resources. In addition, a sustainability management tool that carries information about desired sustainable processes, such as guidelines for environmentally conscious procurement and supply chains, can also be considered a key resource. Key partners considers essential partnerships into order to fulfill the key activities. Examples of partners are buyer-supplier relationships, and also strategic alliances with competitors and additional support organizations. This area ensure that sustainability issues are at the heart of cooperation, but partners must also be audited and consulted for conformity to an enterprises' sustainability goals.

These aspects should be monitored within each of the SQC categories to ensure that sustainability-related targets are meet, and that he enterprise has the proper resources and partnerships to fulfill these actions. The analyzed sustainability reports can then account on the three pillars of sustainability: economic, environmental and social aspects. Since the development and description of business models and the development of business plans – economic criteria are already involved with every environmental and social aspect of the SQC. Therefore, the economic aspects are not given an own column in the model.

By associating environmental and social areas of action in the SQC categories, each key area can be seen as an individual aspect that provides the basis for an overall combinative effort for sustainability in a start-up or micro-enterprise. These aspects are also related to core indicators found in the GRI reporting scheme. These indicators can thus be assessed within the framework of a software application as bullet points to cover or as questions that must be answered within a

project to establish sustainability criteria within a very small business. These core indicators selected were mostly confirmed through an overview of the new G4-criteria [9].

3.   Discussion and Further Developments

From this paper, the results provide both academic and practical implications. From an academic standpoint, the paper provides numerous points of departure for further interdisciplinary research. In the context of startup-related research, for instance, the IT-supported tool can be used as a basis for sustainability-centered business plans. From a practical perspective, this conceptual tool can encourage consultants of startups and software developers to include sustainability criteria in the creation of new software and further services. Based on this conceptual framework, mini-sustainability quick-checks and reports can be created as complementary parts of business plans and marketing-related activities.

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