Sustainability-Related Evaluation of Business Models

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Recent developments, such as climate change, demographic change and resource scarcity, have forced companies to turn towards more sustainable resources, processes and products. Thus, their business models should be developed in a way that meets social, ecological and economic challenges. A vital part of this development process is the evaluation of business models against the background of sustainability targets during different phases of this process.

Keywords: business model evaluation ; sustainability ; strategic management ; sustainable business models

1. Business Models, Their Development and Their Evaluation

Several authors have attempted to define the term *business model* [1][2][3][4] and several others reviewed the literature on these definitions [2][5]. With consideration of these comprehensive analyses, a business model is understood as the logic of how a business creates value and delivers it to customers [6]. Furthermore, it incorporates different elements [7] or components as well as linkages between them [4]. Business model concepts are often visualized based on Osterwalder and Pigneur's business model canvas (BMC) [7] (or, as first seen, a business model ontology suggested by Osterwalder [8]), e.g., by Wirtz [9] and Schallmo [2]. The BMC originally built on four main areas or pillars—namely, product (value proposition), infrastructure management, customer interface and financial aspects—that have been further developed to the BMC [7][8]. The nine business model elements in the BMC are customer segments, value proposition, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure [7].

One important question relates to how business models can be developed in a structured and efficient way. Quite prominent and similar perceptions of the *business model development process* have been presented by Schallmo and Wirtz [9][10]. This process can be divided into six steps: development of business model ideas (1), feasibility analysis (2), prototyping (3), decision making (4), implementation (5) and monitoring and controlling (6) [9][10]. In step (1), different (innovative) business model ideas and their potential are identified using creativity techniques. After sounding out the potential, the basic characteristics of the possible business models are set. The results can be visualized, e.g., in rough drafts of different BMCs. Following this, the business model ideas are analyzed regarding their position in already established or new industries and their strategic direction, allowing a preselection of business model ideas to be pursued (2). Based on this analysis, in step (3), the aforementioned selected business model ideas are elaborated as prototypes of business models, resulting in detailed concepts. To decide on the most suitable business model among the alternatives, step (4) includes an evaluation of profitability. Finally, the chosen business model is implemented (5), monitored and controlled (6). After every step, feedback loops are possible, changing the already designed business model elements or referring to an exit strategy in case a low potential of the business model ideas has been revealed based on the results of evaluations within the process.

The first rough evaluation is performed in step (1), where different business model ideas are weighed against each other [9], e.g., by using a list of criteria [10]. Another (explicit) evaluation is conducted within step (2), as the feasibility of the business model concepts is analyzed. This analysis can comprise the market, the industrial sector, the competitors and the environment, e.g., by using Porter's "Five Forces" [11], amongst others, and the environment [9]. In addition, step (3) comprises an evaluation of the developed prototypes [10], which can be conducted, e.g., by using a SWOT-Analysis [7]. Step (4) contains a more detailed profitability evaluation, e.g., by calculating a precise business plan for every alternative [9]. After implementing the chosen business model, it is assessed whether the goals regarding value proposition, customer needs and profitability are achieved [9]. On the one hand, this list shows that evaluations are suggested in every step of the development process, and on the other hand, the variety of criteria, approaches and instruments becomes clear. Beyond that, there are some evaluation methods suggested in the literature not linked to specific phases of the business model development process, as categorized by Tesch and Brillinger's literature review [12]. At the same time, they clearly emphasize there are still research gaps regarding the evaluation methodologies.

Strategic evaluations are highly relevant in the early phases of business model development; they are fundamental for setting the main characteristics of the business model as strategic decisions have to be made and not every element is thought out yet. One approach that seems suitable has been developed by Rehme et al., who suggested a strategic evaluation of business models based on criteria derived from the resource-based view [13]. This enables a structured analysis of business models. However, this evaluation approach is economic-oriented, without focusing on ecological and social aspects as well. Additionally, the approach refers especially to resources as the core of the resource-based view.

2. Sustainable Business Models, Their Development and Their Evaluation

The topic of corporate sustainability is becoming increasingly important, especially in corporate practice [14]. Nevertheless, the importance of sustainability depends on corporate objectives and the strategy from which the business model is derived. One well-structured systematization has been presented by Steger, who considers three different levels of integrating ecological goals into the corporate goals system [15], which can be extended to the social dimension of sustainability as well.

Thus, the first level, *sustainability as a constraint*, aims at economic profit and limiting activities towards ecological and social sustainability to an unavoidable minimum due to legal restrictions. The second level, *sustainability as a chance*, embraces the possibility of reaching higher economic profit by exceeding the minimum level of ecological and social activities, e.g., by corporate image improvement. Lastly, the level *sustainability as a corporate goal* assures acceptance of social and ecological responsibility, apart from the achievement of economic value. At this level, goals can be weighted differently, up to a dominance of social or ecological goals similar to non-profit organizations (NPOs). The second and third targets of conception are followed, otherwise (level one) the term “sustainable business model” or “business model towards sustainability” [16] would not be appropriate.

To contribute to corporate sustainability (levels two and three), an advancement of the foremost economic-oriented conventional business model development is inevitable [5]. A *sustainable business model* achieves economic viability through providing ecological and social benefits (level two) [14], or it creates value for the company, its customers and other stakeholders while saving, or at least not damaging, social and ecological resources (level three) [17]. In this regard, other forms of value beyond economic value are created, and furthermore, a broader range of stakeholders is considered [18]. A special type of sustainable business model is the circular business model, providing solutions for the circular economy. Circular business models aim at improving sustainability by minimizing the resource inputs into the organizational system, and the waste and emission coming out of it by closing resource loops, with that, transitioning from a linear into a circular flow [19].

The main question these definitions raise is how business models can be developed such that economic viability is pursued along with or through ecological and social aims. This, again, is followed by the question of how the sustainability of a business model can be evaluated and how potential for improvements can thus be identified. Therefore, a brief overview on existing business model development and evaluation concepts in the context of sustainability is given.

For *developing sustainable business models*, Bocken et al. [20] provide different archetypes, e.g., *creating value from waste* or *substituting with renewables*, to draw inspiration from when developing new business models. More specific, Kleef and Ropes investigate how to build circular business models for small- and medium-sized enterprises in the waste management industry [21]. Another way of considering sustainability in business models was proposed by Boons and Lüdeke-Freund [22]. They identified incentives for sustainable development in four of the generic (e.g., Osterwalder’s) business model elements: the *value proposition* balances social, ecological and economic needs in the interests of stakeholders beyond economic value. The *supply chain* is based on accepting responsibility for activities along the supply chain and not shifting social and ecological burdens upstream to suppliers. This involves incorporating all stakeholders into a sustainable supply chain management. Likewise, a shift in socio-ecological burdens downstream the supply chain is undue. Instead, *customers* and the focal company accept responsibility for consumption and production, respectively. The *financial model* ensures a fair distribution of costs and benefits among the supply chain and covers non-financial effects as well [22].

Another approach to embed sustainability into business model development is the use of a sustainable business model canvas, based on the BMC by Osterwalder and Pigneur [7]. There are various ways to adapt the canvas (or similar frameworks) towards a triple-bottom-line business model framework [23]. Regarding sustainable business model canvases, the following approaches exist: extending the canvas in terms of economic, ecological and social layers (one canvas each) [24]; incorporating the dimensions of sustainability in each of the nine elements [25] or adding and replacing single elements, such as ecosystem services or actors to the original canvas [26]. Osterwalder and Pigneur themselves

proposed to add the two elements of social and ecological costs and benefits to the original canvas to generate a triple-bottom-line business model [7].

One approach that enlarges the included aspects of sustainable business models was developed by Tewes et al. In their study, they draw the attention to the technical and social influences on business models in the present and in the future. Instead of adding social and ecological elements (or so-called building blocks) to the business model, they add an element called influences and subsume the influence of megatrends, such as social imbalance, responsibility (i.e., sustainable products and activities), urbanization or gender shift on the business model [27].

The specific development of circular business models is already discussed in the literature, presenting, for example, different strategies to move from a linear to a circular economy model [19][28].

The *business model evaluation* with regard to sustainability within the development process can vary, depending on the stage of development of the business model. In the following, different methods are considered. Existing approaches for assessing the economic, ecological and social or the integrated sustainability of other objects (e.g., products, processes) can be applied for the sustainability-related evaluation of business models; for an overview of such methods, see [29]. For *economic sustainability*, life cycle costing—especially the net present value method—seems to be suitable (the net present value method has already been applied to business models (e.g., by [13][25][30]). For assessing *ecological sustainability*, the life cycle assessment is an established method [31]. It has already been applied to business models as well (e.g., by [25][32]). The social life cycle assessment can be applied to assess the *social sustainability* of products [33]. It was already applied to business models by following the UNEP/SETAC guidelines [25]. However, these methods each refer to only one sustainability dimension (economic, ecological or social). Thus, methods to aggregate the single results to an integrated sustainability value should be used, e.g., the utility value analysis suggested by [34]. However, all these methods require data of a certain level of detail that are normally not given during the early phases of the business model development process.

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