

“But what does it mean for our business?”

Design Science Research to improve tool usability

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Extended abstract

Business model innovation can help businesses to remain competitive and tackle financial crises (Chesbrough, 2007) but it is also increasingly necessary to help companies in the transformation towards a sustainable economic system (Geissdoerfer, Vladimirova & Evans, 2018). Business model innovation for sustainability is therefore a growing research field (Lüdeke-Freund et al., 2018; Jonker & Faber, 2021). Business model tools help this innovation because they support changing existing practices (Velter, Bitzer & Bocken, 2021). They can help in the design of business models and take different forms, such as a canvas (Osterwalder, 2010), archetypes or typologies (e.g., Bocken et al., 2014; Lüdeke-Freund, Gold & Bocken, 2019). Existing business (model) tools for sustainability encourage incorporating sustainable value in a business model (e.g., Bocken et al., 2013) but often miss the larger vision of what far-reaching transformation is needed. The authors therefore decided to build on existing research and create a tool that challenges the understanding of business sustainability actions. The tool is based on the Hierarchy of SBM archetypes visual from Bocken and Short (2021) that identifies flourishing as the intended sustainability outcome (Ehrenfeld and Hoffman, 2013). Flourishing has also been found useful in revising existing business model tools like the business models Canvas into a flourishing canvas (Upward, 2016).

Following Gudiksen’s (2016) finding that “design games can be a beneficial way of combining various interests, challenging assumptions and creating those surprises that

might eventually lead to innovation” (p. 320), the tool “The Road to Flourishing” was conceptualized in the form of a board game. Since a recurrent limitation of tools is the lack of empirical testing with intended users (Baumann et al., 2012; Bocken et al., 2019), the Road to Flourishing tool was tested with future users and evaluated on whether it can affect the desired behavior change.

The creation of the tool followed a Design Science Research (DSR) methodology (Peffer et al., 2017). This approach has become popular in developing artifacts, such as tools, that support the sustainability transformation (vom Brocke, Hevner & Maedche, 2020). The DSR process followed the six activity steps suggested by Peffer et al. (2007). Since step 5, evaluation, is still underway, step 6 is not included in the present research overview.

Activity 1: Problem identification and motivation. The problem identified through a review of existing tools and literature was the need for more radical sustainable business models, for instance with a focus on sufficiency (Bocken, Niessen & Short, 2022). A solution should raise awareness of strongly sustainable business actions, ultimately aiming towards a vision of business for flourishing (Ehrenfeld and Hoffman, 2013). The selected solution was thus a business (model) tool that challenges assumptions about what actions businesses can (profitably) take for sustainability.

Activity 2: Define the objectives for a solution. The solution, our game-based tool, was intended to change behavior. We decided to set the objective that playing the game should change intended behavior and knowledge. Players should become familiar with efficiency, net zero, circularity, sufficiency and regeneration in business and understand the need to aim for strongly sustainable actions. This would be evaluated in a quantitative manner through surveys (see step 5).

Activity 3: Design and development. The Road to Flourishing board game was created in physical and digital form. The game was created with several requirements in mind (for details, see Niessen & Bocken, 2023). It was decided to create a short-duration, interactive game that can be combined with existing tools rather than replace them. As such, the game was designed as an opening activity to a strategy session or workshop. The game is quiz-based, with players answering questions from different levels. There is also an element of luck, as “event fields” can bring players forward or stall them. The game board, an example question card and an event card are visible in Figures 1-3.

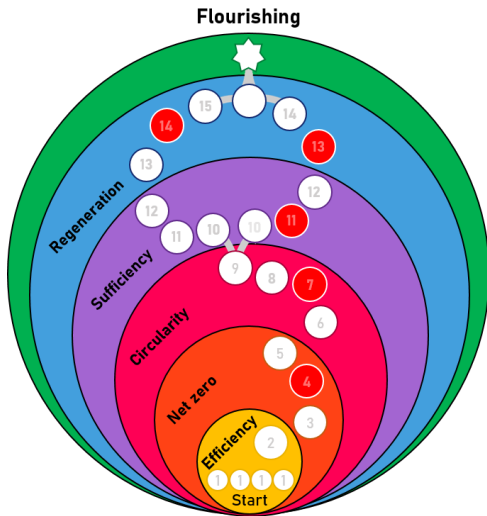


FIGURE 1 THE ROAD TO FLOURISHING GAME BOARD

<p>Brazilian business Natura states that without a living Amazon, there is no...?</p> <p>a) Profit b) Future c) Climate change</p> <p>b) Future</p> <p>Cosmetics brand Natura thinks its business depends on a healthy Amazon forest, so it contributes to conservation and research.</p> <p><small>Source: Natura (12.02.2019). AMAZÔNIA VIVA https://www.natura.com.br/blog/sustentabilidade/amazonia-viva</small></p>	<h2>Regeneration</h2>
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FIGURE 2 EXAMPLE QUESTION CARD

<p>Water in your area is scarce. Your company wants to drill a borehole but so do others. You meet and decide on maximum extraction volumes together. Amazing! You and another player you choose can move one field forward.</p> <p>Inspiration: Collaboration around water can be traced back as far as 5000 BC. Today, there are about 700 cross-border water agreements.</p> <p><small>Source: Global Commission on the Economics of Water (2023). The What, Why and How of the World Water Crisis. https://watercommission.org/publication/phase-1-review-and-findings/</small></p>	<h1>?</h1>
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FIGURE 3 EXAMPLE EVENT CARD

Activity 4 & 5: Demonstration & Evaluation. The game was tested in two rounds. The first round of trials was formative, improving the gameplay and adjusting rules. It was tested in five rounds, with a total of 20 participants, all working in sustainability research and education. Feedback was collected in person through participant observation during the play and immediate comments from the players. Fourteen players also filled in evaluation surveys afterwards, scoring the game on requirements such as fun and perceived duration (see Figure 4) and providing detailed open feedback for improvements. The game was continuously altered following this feedback. Alterations included shortening the duration, adding a timer to ensure fast answers and changing some of the gameplay that was based on luck.

FIGURE 4 RESULTS SURVEY FIRST ROUND GAME EVALUATION

	Strongly disagree -----Strongly agree				
I learned more about business sustainability through the game.	0	1	3	6	4
The game contents surprised me.	0	0	1	8	5
The game contents challenged existing assumptions I had.	1	2	4	5	2
The game was fun to play.	0	0	0	6	8
The game was too short.	3	7	3	1	0
The game was too long.	3	4	3	4	0
The game was relevant to my work on sustainability.	0	0	1	8	5

The second round of trials is ongoing and is intended for evaluation. As the objective of the tool was to change behavior of businesses towards more radical sustainability activities, players were asked to fill in an almost identical survey before and after gameplay. The survey utilized concepts from the Theory of Planned Behaviour (Ajzen, 1991). The hypotheses that are tested are that if they play the game, players will change their (1) attitude, (2) subjective norms, and (3) perceived behavioural control towards what (their) business can and should do for sustainability. This evaluation round started in November 2023 and included four trial rounds by end January 2024. These trials were played with academics (9 players), students of business and entrepreneurship (67 players) and business consultants (4 players). Further trials with students, consultants and businesses are scheduled for February and March. In addition to the survey data, the lead author collected feedback through participant observation and conversations with players.

Similarly to Ebel, Bretschneider & Leimeister (2016), the two trial cycles were intended to be first formative, then evaluative. Yet, we found that the second round of trials brought new feedback that could help to further improve the game. One reason for this new feedback was that the game was played with a new intended audience. Previously, it had been played by academics and students. In the evaluation round, it was also played by consultants. The game had been adjusted to the feedback of the academic and student audience, so it was not ideally suited to consultants and businesses. For example, the consultant players provided feedback that they felt the game lacked time to reflect on what each level means for a business (see our title). As a consequence, the authors decided to

create two distinct versions of the game, one for business players and one for students and laypeople. The two version are under development and are expected to be almost identical. The main differences will be that the business version will be shorter, include more specific business examples and give time for reflection and application of the different levels to the players' own business.

Through following the steps of Peffers et al.'s (2007) design science research methodology, we were able to continuously evaluate the usefulness of the tool and adjust it to suit the needs of its users. Similarly, the evaluation round will help to address the concern that tools often lack the data to prove their usefulness (Bocken et al. 2019). In the next steps, the tool will be further trialled and evaluation data will be collected. These will then be shared with academic audiences in activity 6 of the DSR approach: communication.

Keywords

Sustainable business; business tools; game-based tools; tool evaluation; flourishing

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