

PLAY IT FORWARD

A Game-based tool for Sustainable Product and Business Model Innovation in the Fuzzy Front End

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Abstract

Dealing with sustainability in the fuzzy front end of innovation is complex and often hard. There are a number of tools available to guide designers, engineers and managers in the design process after the specifications of the product or service are already set, but methods supporting goal finding for sustainable innovations are rare (Hassi et al., 2009)

The business game 'Play it forward' (Jansen et al., 2010), is a tool for understanding and implementing sustainability in the early stages of an innovation process. The players have to deal with People, Planet, Profit issues on product and business model level, and with the 'big picture' forces of change, represented as a set of STEEP (Social, Technological, Economic, Environmental, Political) (Fleisher and Bensoussan, 2003) innovation cards. A market-driven team is challenging a technology-driven team. Which team can come up with the most profitable and sustainable business model and convince all the stakeholders in the end?

The 'Play it Forward' board game is a co-creation of the research group 'Design for Sustainability' at Howest and three industrial partners: Pantopicon, Beco and Smidesign.

The scope and theory behind the different levels of the 'Play it Forward' game are described in this paper together with the experiences and gained insights in several business case studies.

Keywords

Sustainable product innovation, Business model innovation, Fuzzy Front End, Game-based learning.

1 Introduction

With an overpopulated planet, hungry for electricity and resources, sustainability will be one of the biggest challenges in the future. Companies can play an important role in the transition process towards a sustainable world. Focusing on sustainable product development will not be enough. We will need powerful new business models, with a rich playground for visionary ideas, products and services. Sustainability as the ultimate fuel for long-term growth. But how do you find the right business model to launch an innovative sustainable product or service idea? And how do you get the right ideas?

It is often stated that to produce sustainability, incremental product improvements will not suffice: reducing unsustainability is not the same as creating sustainability (Ehrenfeld, 2008). Radical or systemic innovation is needed but also a change in the pattern we search for new solutions. This requires stepping away from the old path, or as Ehrenfeld (2008) illustrates, we should not be “the drunk who lost the car keys but kept looking for them under the street lamp because that is where the light was.”

To be able to step out of the ‘beam of the street light’ when searching for sustainable innovations, the business model needs to be designed accordingly and the innovation team at the fuzzy front end of the innovation process needs to be equipped with appropriate tools and methods. There is abundant literature demonstrating *why* corporations should go beyond compliance when it comes to sustainability (Elkington, 1998, Hawken, 1994) as well as *how* to design this commitment into products and services e.g (Brezet and van Hemel, 1997) (Diehl and Crul, 2006), (Tischner, 2000). The challenge lies in getting from ‘why’ to ‘how’: *who* is making it happen and *what* are the products and services that will be produced? (Figure 1). The *who* and *what* have received far less attention than the *why* and *how*; (Boks, 2006) being one of the notable exceptions regarding the organizational side and (Wever et al., 2008) regarding the goal finding.

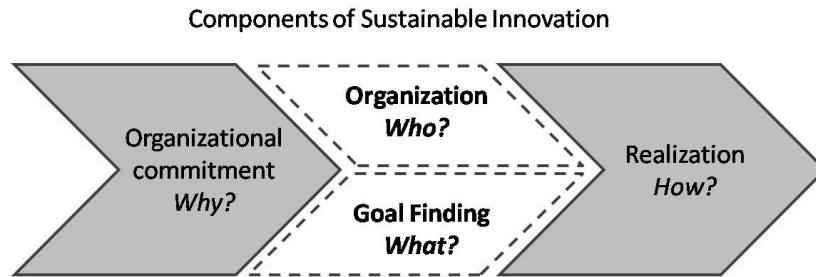


Figure 1: The 'why' and 'how' are extensively addressed by existing literature. 'Who' and 'What' remain still ill-addressed. (Hassi et al., 2009)

What comes to the 'How', there is an array of existing tools that guide the innovation team in the design process. However, these tools are meant for a phase in the design process where the idea and specifications for the product or service have already been decided, and only incremental changes regarding the sustainability can be made (Wever et al., 2008, Ölundh and Ritzin, 2004). Therefore, it is crucial to take sustainability into consideration already in the early phase of the design process, often referred to as the fuzzy front end (FFE) (Buijs, 2003). It is at this FFE phase that the company generates ideas, identifies opportunities, and develops a concept of the product/service idea. Possibilities for sustainable innovation need to be identified here. The FFE still remains ill-addressed in the existing sustainable design literature (Wever et al., 2008). Methods to identify opportunities for sustainable innovation in the FFE need to be created.

If we accept that sustainable innovation involves moving from the design of individual products to the design of whole systems, it can involve new mixes of products and services, new patterns of ownership, or shared/communal use of products. It might involve replacing physical products with a 'dematerialized' service or even questioning the extent to which a product or service is really necessary. For this approach, we need to rethink our product-portfolio (What?), but also the Business Model.

How do we move beyond the current status quo? The current technical 'eco-efficiency' approach to sustainability is more likely to be adopted in the short and medium term. What however is needed is an organizational change that allows a move to radical, socio-technical sustainable innovations.

The business game 'Play it forward' (Jansen et al., 2010), is a tool for understanding and implementing sustainability in the early stages of an innovation process. Sustainability is

presented in the board game as a driver for innovation and value creation, instead of merely a boundary condition. The tool can assist companies in answering the question ‘*What can we do to create sustainability?*’ in a manner that increases the value recognized and received by the end user, the stakeholders and the company itself. A well thought-out sustainable business model is a crucial part in the game. The players have to deal with People, Planet, Profit issues on product and business model level, and with the ‘big picture’ forces of change, represented as a set of STEEP (Social, Technological, Economic, Environmental, Political) (Fleisher and Bensoussan, 2003) innovation cards. Market-driven teams are challenging technology-driven teams. Which team can come up with the most profitable and sustainable business model and can convince all the stakeholders in the end?

The ‘Play it Forward’ board game is a co-creation of the research group ‘Design for Sustainability’ at the University College of West-Flanders (Howest) and three industrial partners: Pantopicon, Beco and Smidesign.

The scope and theory behind the different levels of the ‘Play it Forward’ game are described in this paper together with the experiences and gained insights in several business case studies.

2 Play it Forward

The business game ‘Play it Forward’ (Figure 2, Table 1) is a game tool for describing, analyzing, discussing and designing sustainable products & services in a business context. A team, preferably with different backgrounds, from inside and outside the company, work together in this (minimum half) day interactive game. Market-driven teams are challenging technology-driven teams. The teams compete to come up with the most profitable and sustainable business model to convince the stakeholders. ‘Play it Forward’ game moderators inform, encourage and inspire the teams while making sure the event runs smoothly.

Table 1: 'Play it Forward' Characteristics

Play it Forward	
Online	www.businessmodeldesign.be
Authors	Jansen, Bart (Smidesign) van Lieshout, Michael (Pantopicon) Dewulf, Kristel (Howest, TUDelft, UGent) Schillebeeckx, Simon (BECO)
Published	April 2010, Belgium
Language	English
Board Dimensions	100 x 100 cm
Tool	Business game, Board game
Keywords	Sustainable Business Model Innovation, Sustainable Product Innovation
Objective	Learning the basic principles of designing a sustainable business model. Combining sustainable product/service innovation with business model innovation.
Duration	4 till 8 hours
Participants	6 up to 100
Contact	info@businessmodeldesign.be



Figure 2: 'Play it Forward' Business Case Study

2.1 Play it Forward Innovation Teams

How does innovation happen? It happens when people with different backgrounds interact and their passions and skills intersect. The study of high-performing teams seems to fascinate a lot of businesses and academics. Over the years, a lot of research has been done on the issue of optimal team size and creativity. There are several interesting findings pertaining to various business situations. Going through several research studies done in this field (Katzenbach and Smith, 1993, Useem, 2006, Robbins and Judge, 2010, Klein and Lim, 2006, Kelley and Littman, 2005), we can abstract that there is no general rule to determine the optimal number to have on each team, there is not such a thing as a magical number. Large teams have always been considered ineffective while small teams are perceived to be better at delivering results. Teams with over eight people risk the breaking down into sub-teams (Klein and Lim, 2006). It can be a good thing in some situations, but this is not the case for Play it Forward, where the team has to work as one group to a final result. There is also a sense that as a team gets larger, other group mechanisms can show up, such as 'Group Think' and 'Social Loafing'. Group think is the phenomenon where the team members tend towards consensus rather than exploration of diverse ideas.

Social Loafing is a condition where a group or team tends to "hide" the lack of individual effort. Ringelmann's famous study on pulling a rope, often called the Ringelmann effect, analyzed people alone and in groups as they pulled on a rope. He discovered that the more people who pulled on a rope, the less effort each individual contributed. Ringelmann attributed this to what was then called "social loafing" (Knowledge@Wharton, 2006).

If the team becomes too large it becomes difficult to maintain the focus and to have a constructive interaction.

Size is not the only consideration when putting together an effective team. The skills, quality, capability and attitude of each member of the team also counts. The team composition, the team's task and the roles each person plays can play a dominant role in team performances. The value of diversity in a team is a confusing area. Various studies suggest that diversity leads to conflict and poor integration, while other studies suggest just the opposite (Knowledge@Wharton, 2006).

The size of a 'Play it Forward' innovation team consist of 3 up to 7 players, we strive to have multidisciplinary teams in which members from various departments with different age, gender, specializations and professional backgrounds play together. We have the experience, through several business cases, that multidisciplinary teams works best for the

'Play it Forward' game. At least for us, diversity gives a richer playground for creativity and inspiration, with more ideas and better solutions, and a better understanding of the business model.

2.2 The 'Play it Forward' game board

This paragraph will give information on different aspects of the 'Play it Forward' game board and the theory behind.

The 'Play it Forward' game board is inspired on the Business Model Canvas (Figure 3) developed by Alexander Osterwalder and Yves Pigneur. The Business Model Canvas exist out of nine basic building blocks, showing the rationale of how an organization creates, delivers and captures value. The canvas covers the four main areas of a business: customers, offer, infrastructure, and financial viability. Every building block on the canvas defines, represents or describes a different topic of the business model (Osterwalder and Pigneur, 2009):

- *Customer Segments*: The different groups of people or organizations an enterprise aims to reach and serve.
- *Value Proposition*: The bundle of products and services that create value for a specific Customer Segment. Value may be quantitative (e.g. price, speed of service) or qualitative (e.g. design, customer experience).
- *Channels*: How a company communicates with and reaches its Customer Segments to deliver a Value Proposition.
- *Customer Relationships*: The types of relationships a company establishes with specific Customer Segments.
- *Revenue Streams*: The cash a company generates from each Customer Segment.
- *Key Resources*: The most important assets required to make a business model work. Key resources can be physical, financial, intellectual, or human.
- *Key Activities*: The most important things a company must do to makes its business model work.
- *Key Partnerships*: The network of suppliers and partners that make the business model work.
- *Cost Structure*: All costs incurred to operate a business model.

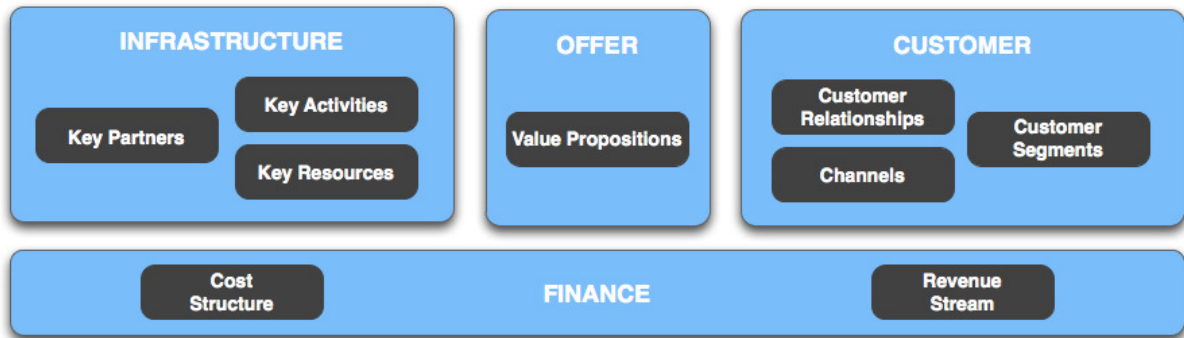


Figure 3: The Business Model Canvas (Osterwalder and Pigneur 2009)

We extended the Business Model Canvas developed by Osterwalder and Pigneur for the ‘Play it Forward’ game with a new area ‘People & Planet’ and two new building blocks: ‘Societal Costs’ and ‘Societal Benefits’ (Figure 4).

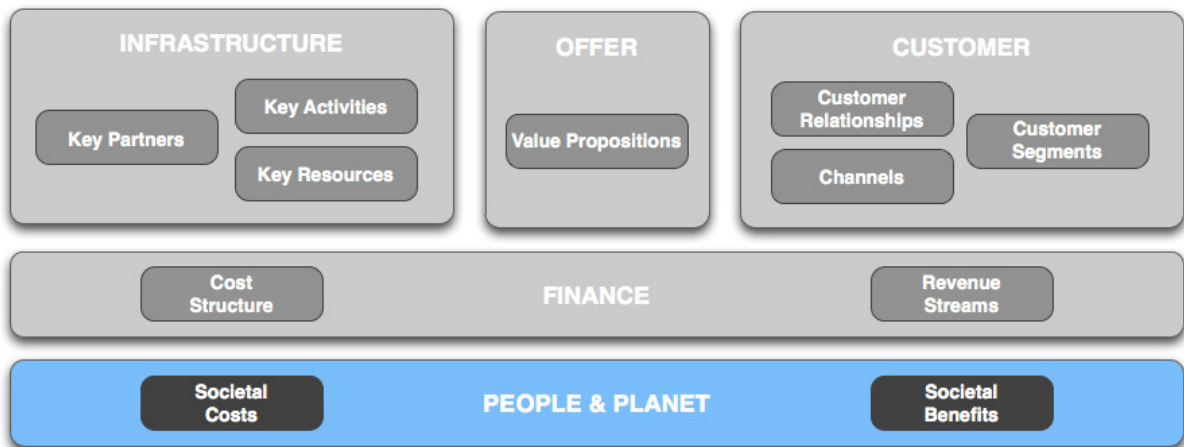


Figure 4: ‘Play it Forward’ Extended Business Model Canvas

The people and planet area represents, together with the finance area the triple bottom line of sustainability: people, planet, profit. A sustainable business model describes to do “the right thing”, besides “doing things right”, balancing people, planet and profit issues.

The ‘Play if Forward’ game board (Figure 5) is a visual template preformatted with the eleven building blocks of the extended Business Model Canvas.

Every building block comes as a puzzle cut. Each team gets a new building block on fixed times during the game. This time pressure encourages the players to take decisions and to concretize the business model fast. The sequence of the puzzle cuts (Figure 6 and 7)

depends on the team you are playing in, either market driven or either technology driven. Players use markers and Post-Its® to visualize their ideas on the game board formed by the puzzle cuts. This jigsaw puzzle draws up the brand new business model in the end.

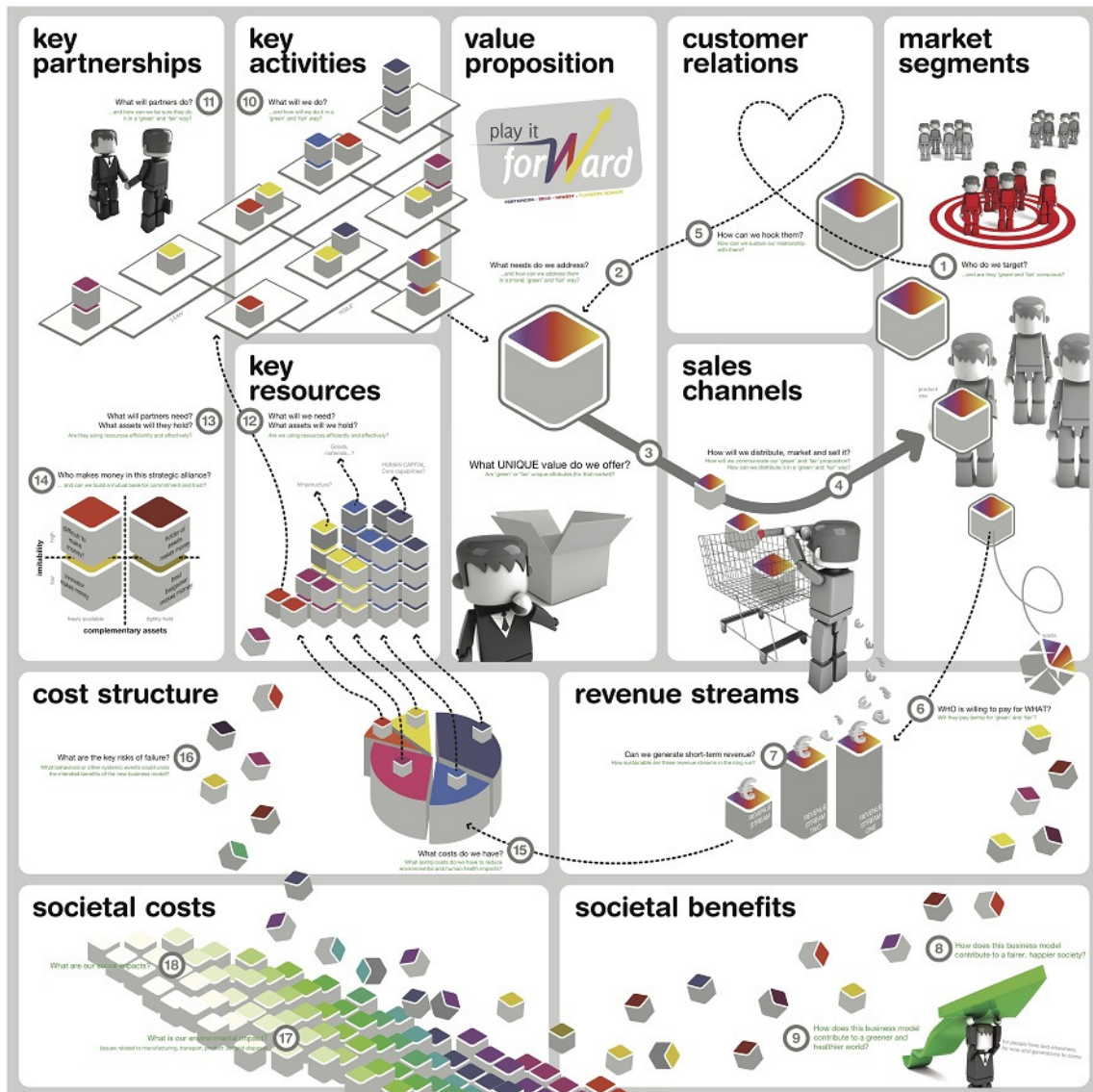


Figure 5: Game Board 'Play it Forward'

Market-driven teams are challenging technology-driven teams. A market-driven team starts from the market demand, and tries to find innovative solutions. On the other hand, a technology-driven team departs from the product technological know-how of the company and looks for alternative applications.

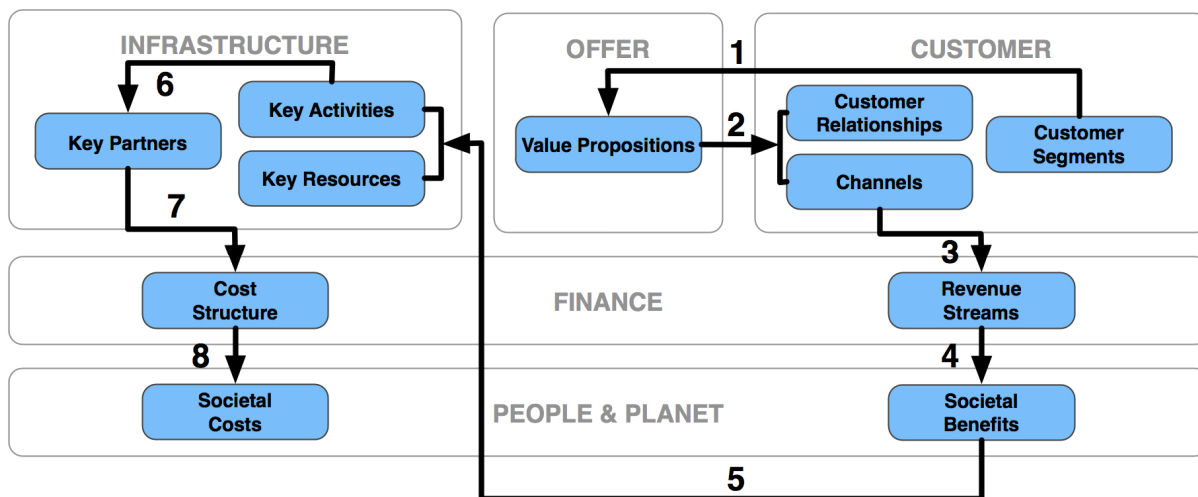


Figure 6: 'Market Driven' flow chart

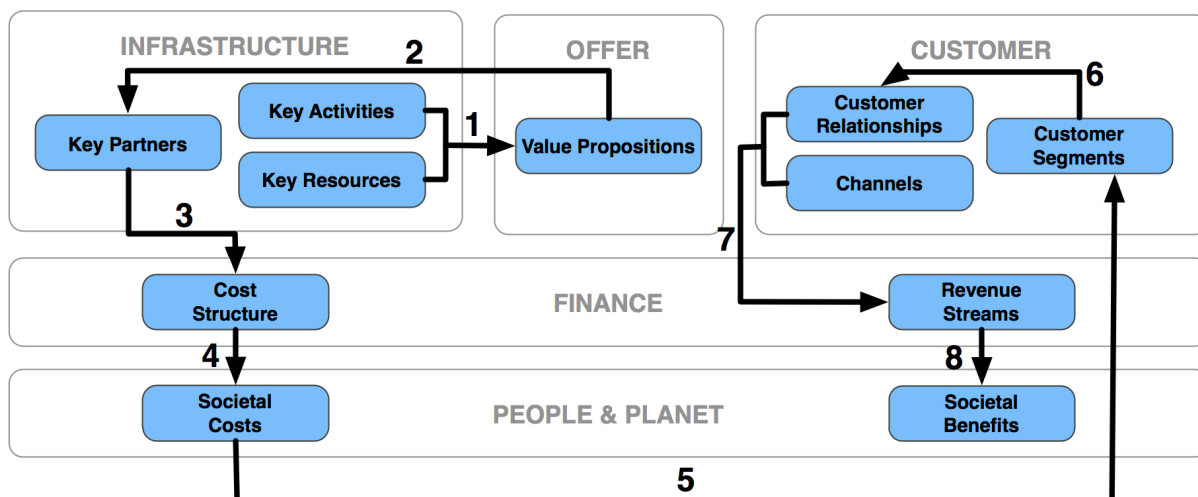


Figure 7: 'Technology Driven' flow chart

2.3 STEEP Innovation Cards

A business environment is not a static arena. We live in a world where the only constant is an ever-increasing rate of change. Public or private organizations can only be successful when they evolve along with their changing context (Baerten, 2009). Establishing an ongoing, scenario-based strategic thinking process enables a business to plan for change achieving optimum performance (van der Heijden et al., 2002).

The '*Play it Forward STEEP Innovation Card Set*' is a tool to evaluate various external factors impacting a business or organization. Next paragraph will go deeper into detail how the cards came about.

Analysts commonly divide the organizational environment into three distinct levels: the internal environment, the operating environment and the general environment.

The internal environment includes all the internal activities of a firm: production, marketing, etc. The major components of *the operating environment* are customers, suppliers, competitors, partners and global/international issues surrounding these stakeholders groups. The internal and operating environment can be controlled or influenced, at least to some extent, by individual organizations. The internal and operating environment is represented in the eleven building blocks of the 'Play it Forward' game board (Figure 4 and 5).

Companies are embedded in a wider macro environment. As they are not a closed system, a broad range of outside inputs and influences can significantly impact their business and competitiveness. Here we enter *the general environment*. One effective sub categorization of the general environment is known as STEEP. This acronym stands for social, technological, economic, ecological, and political or legal aspects. Table 1 shows several key variables that would be present under each individual STEEP factor.

Table 2: Key STEEP Variables (Fleisher and Bensoussan, 2003)

Social	Technological	Ecological	Economic	Political/Legal
Ideological characteristics	Patents held	Air and water quality	GDP growth rates	Policies of political parties
Types of union organizations	R&D budgets	Recycling capacity	Exchange reserves	Activism of regulatory agencies
Income gaps among social segments	Number of colleges and universities in region	Sources of power	Rate of inflation	Presence of property protection laws
Percentage of population in economic and social segments	Pace of technological change	Stage of evolution in product life cycle	Income distribution levels and bands	Ability to influence political decision making
Value systems for social classes	Presence of technology clusters	Pollution levels	Interest rates	Voting rates and trends
Cultural background of citizens	Pace of process or product improvements	Substitutability of raw materials	Small business lending levels	Nature of power and decision-making structures
Birth and death rates	Bandwidth capacity	Level of environmental regulation	Balance of payments	Public opinion

The STEEP domains are not rigid boundaries, the lines remain fluid. Unlike the internal and operating environment, the general environment is usually understood to be beyond the direct influence or primary control of any single organization (Fleisher and Bensoussan, 2003). There is, for example, little you can do to change a demographic trend such as the ageing of the population or a widespread shift to digitalization.

The ‘*Play it Forward Innovation Cards*’ are based on this five STEEP categories. They push the players to evaluate various possible external factors impacting their business model. Each card comes with a proposition, followed by a question (Figure 8). Has the business model enough resilience to survive this event? Can they react fast to their own advantage in a sustainable way? Or, even better, did the team already anticipate on this possible scenario from the beginning? The set of ‘*Play if Forward Innovation Cards*’ is not generic, it is in fact custom-made to the business or organization. The card sets are created in advance by the ‘*Play if Forward*’ core team by exploring emerging trends and how they can impact upon the clients business. The game moderators decide, at various moments, depending on the duration of the game and the energy-level of the team, when the innovation cards are distributed.



Figure 8: 'Play it Forward' Innovation Cards (Example)

2.4 Scoring

A small group of stakeholders (about two or three internal and/or external persons of the company) is doing the evaluation in the 'Play it Forward' game. Stakeholders have three tasks: answer questions during the game, provide qualitative feedback, and point out a winner at the end of the game.

Every team can ask the stakeholders information during the game. Unfortunately, this takes a while, so there is less time to develop and improve the ideas and the business model. In the meanwhile other teams cannot ask for information.

The stakeholders provide qualitative feedback to improve the ideas in the interim evaluation round. They give a relative score on a scoreboard (equal – worse – better) (Figure 9) in three categories: people, planet, profit, comparing the ideas and the business model versus the current business. Feedback is visible for all the other teams.

Each team presents its idea and business model to the whole group at the end. Stakeholders rates the concepts with an absolute score: very bad – bad – sufficient – good – very good, or 'little room for improvement' – 'lots of room for improvement'. *People, planet, profit scorecards* guide the stakeholder again in his evaluation process, in order to make sure that sustainability is fully covered.

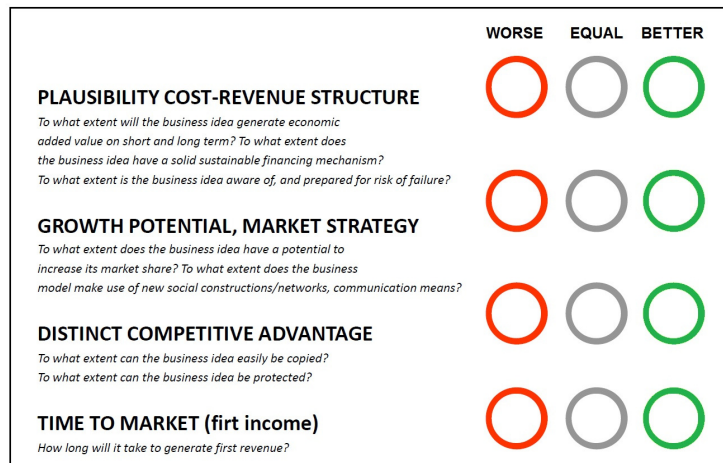


Figure 9: Example Scorecard 'Profit'

After the evaluation of all teams by means of the scoreboards, the stakeholders can award the teams with two kinds of coins. Green coins are given to those teams that score best on the people and planet issue, represented by the societal cost and revenue structure on the extended business model canvas game board. Blue coins are earned by teams with the best cost and revenue structure. The team with the most green/blue balanced treasure is the overall winner. The use of coins has the advantage to provide all the participants of the game a visual image of the end result.

3. Conclusions and Insights

This paper described the scope and theory behind the different levels of the business game 'Play it Forward'. This paragraph aims to provide a qualitative overview of gained knowledge and major insights, about integrating sustainability in the fuzzy front end of product and business model innovation by using the board game 'Play it Forward'.

This knowledge comes from designing the game, by doing several business case studies, and lastly by the feedback and critical comments from the user groups.

- The game structure and the huge amount of information made the first 'Play it Forward' prototypes too complex. Dealing with complexity and having fun is not self-evident. Complexity is a fun and creativity killer, and it's hard to get the players motivated. Keep it simple, without oversimplifying the complexities of sustainability and business model innovation.
- Thinking through a new business model is the perfect kick-off for an new sustainable innovation project.

- Working with small teams (< 8 team members) gives the players a real work out. Everyone plays a significant role during the game.
- Game moderators are very much needed to ensure a smooth game-play and to safeguard the quality of the game. Selling the game as a stand-alone box should be avoided.
- This face-to-face method of gaming encourages and stimulates the cross departmental communication. A digital version of the game would lose this advantage.
- By playing this (half-a-)day game, one learns the fundamentals of sustainability and business model innovation on a very short time.
- For most people, it was the first time they had to translate an idea into a business model. The building blocks, 'societal cost' and 'societal revenue', were also new for the more experienced business modelers.
- External people are an added value for the team, but talking about strategic decisions can be delicate.
- Although the first impression of the game might seem complex, the game is intuitively understandable by the stepwise flow of the building blocks.
- Using qualitative evaluation forms instead of numerical score engage discussions, which leads to enhanced communication on the subject.
- Diversity in teams (age, gender, specialization, professional background...) gives a richer playground for creativity and inspiration, with more ideas and better solutions, and a better understanding of the business model.
- Who says "Don't mix business with pleasure"?

4. Acknowledgments

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