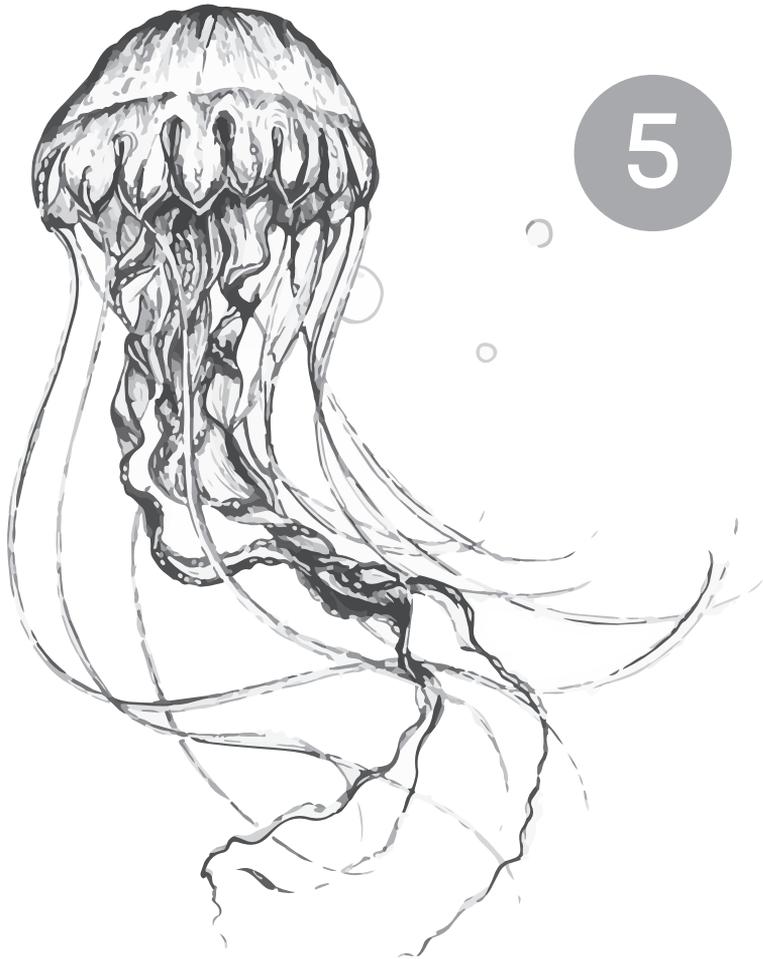




DIVE



**Development of a
design-led futures
technique for SMEs:
DIVE**



5. Development of a design-led futures technique for SMEs: DIVE¹

In Chapter 3, we found that concept cars are experimental artifacts of the future, that put the company's vision into action. These artifacts are made using a hands-on process that uses visual synthesis and prototyping. This vision of a preferable future is defined by a team of designers, engineers, and communicators in accordance with the context factors and the corporate values. After iterating several ideas, the team makes a refined prototype, which renders the concept car, and a video, which displays the interaction between the users and the artifact in the future context. Both manifestations, which can be experienced by different people inside and outside the company, spark discussions about the speculative future helping them make better decisions about the world as it is, such as defining the design language of a family of new products.

Subsequently, Chapter 4 identified that this design-led futures technique is not for the exclusive use of automakers, as different corporations in other industries also make and share concept cars, products, and services, called vision concepts by Keinonen and Takala (2006). Because this design-led futures technique is often a time-consuming and expensive practice, only large corporations use these artifacts to assertively guide their innovation. In view of this limitation, we also identified lessons from critical design and design fiction. Both techniques taught us that there is a way to use fewer resources, less money and time than techniques used by large corporations; effectively use rough prototypes and simple videos to trigger reactions and spark conversations; and create more radical concepts, which challenge the present situation and propose a large change for a broad range of topics, from social to environmental, including technological issues.

Through these two chapters, we covered most of the design-led futures techniques, gaining a complete view of this approach to look at the future. Although these techniques promise value for smaller players, none are specifically adapted to fit the characteristics of SMEs.

This chapter then develops a design-led futures technique for SMEs to contribute to answer the design question G formulated in Chapter 1.

¹ This chapter is based on the paper: Mejia, J. R., Pasman, G., Hultink, E. J., & Stappers, P. J. (2017). Developing DIVE, a design-led futures technique for SMEs. In C. Vogel & G. Muratovski (Eds.), *Proceedings of the IASDR Conference Re:Research* (pp. 770–787). Cincinnati, Ohio, USA.

Section 5.1 consolidates the insights of Chapter 2, 3 and 4 and the author’s experience with SMEs to define the characteristics of the design-led futures technique by a preliminary iteration with the medium-sized enterprise Marliöü. It is followed by Section 5.2 which describes the technique, named DIVE: Design, Innovation, Vision, and Exploration, and its components, defined by a second iteration with the small-sized enterprise Continental Boilers. Both iterations illustrate how the characteristics of these SMEs influenced the development of the technique.

5.1. Consolidation of previous insights

As mentioned in Chapter 1, SMEs are characterized by having limited resources when compared to large corporations and a hands-on approach with regard to these kind of explorations, thus we consider that DIVE must be “*a rapid, inexpensive, and practical design-led technique to support designers and business people who run SMEs in exploring and communicating speculative futures to boost their innovation capabilities.*” Rapid in view of the limited time available to involve high-level SMEs’ employees, inexpensive considering the tight budgets for this kind of explorations, and practical with regard to their work style.

Iteration 1: The Alchemist Club 2025 for Marliöü

This value proposition clarifies the way in which the value –or benefit– will be delivered and experienced by the SMEs. Combining it with the insights from concept cars, vision concepts, critical design, and design fiction, we collected and defined initial ideas in an ad-hoc iteration with Marliöü: a Colombian medium-sized enterprise focused on hair care products. In this iteration, summarized in Figure 5-1, the author acted as the designer.

Iteration 1	Enterprise	<i>Marliöü</i>
	Product	<i>Hair care products</i>
	Participants	
	Company representatives	<i>Without company representatives</i>
	Designers	<i>1 senior designer</i>
	Tools	<i>DIVE 0.0</i>
	Duration	<i>40 hrs.</i>
	Location and date	<i>The Netherlands, 2015</i>
	Case web-page	<i>http://pktweb.com/dive/</i>



Figure 5-1. Summary of Iteration 1.



To explore the future of Marlioü, the author followed the futures techniques' main activities listed in Chapter 2 –(i) setting the domain and time frames, (ii) analyzing the context factors, (iii) envisioning the alternative futures, and (iv) mapping the preferable future– and used the specific tasks to make and share vision concepts discussed in Chapter 4.

As part of (i) *setting the domain and time frames* of this exploration, the author had to understand the company first, for which he used a tool he created several years ago: *Strategic PES*. This tool was selected because it is coherent with the value proposition mentioned earlier and the author has extensive experience with it. While tools such as SWOT analysis and Business Model Canvas can give a clear overview of different businesses, Strategic PES is a rapid, inexpensive, and practical design-led tool specially developed for SMEs. Therefore, Strategic PES is better suited for this inquiry.

Strategic PES deconstructs SMEs to identify their values and know-how, products and services, facilities and stakeholders, and end-users, through a workshop (Mejia & Parra, 2014). It builds on the similarity between a company and a living being: a fish², whose goal is to survive and reproduce in a body of water. Following this metaphor, the fish embodies the company, the river, lake, or ocean symbolizes the context in which the company delivers value, and the adaptation to the context's change implies the innovation. Only those fishes that survive a changing context – through innovation– can grow up and reproduce. Since 2011, the author has applied this tool in twenty-five projects with SMEs, and around eighty workshops with more than four-thousand business people in Colombia and Suriname. It proved to be effective in disentangling the business people from the company and facilitating a more objective diagnosis of the firm's condition. Furthermore, participants can see the company as a whole, understand its complexity and recognize the relationships among the company, external stakeholders, and the context, as well as the internal relations (Mejia & Parra, 2014).

More information about Strategic PES in Mejia, Jimenez, and Chavarria (2014), and Mejia and Parra (2014) .

In this iteration, Strategic PES revealed that “Marlioü is a two-headed trout, living in a peaceful pond”. Living in permanent service to the community, the trout changed, and sprouted a second head; as the family enterprise is handing down the business to the third generation, the company seems to move in two opposite directions at the same time. One head, the incoming director, wants to move to an unexplored small pond, a high-income market where the company can use information technologies; the other head, the outgoing director, is focused on the current pond, where the fish is already well known by many low-income users. Marlioü needs a new vision of a preferable future, genuinely informed by its beliefs, that blends the desires of the relevant heads, the family members.

² In Latin America ‘pez’, which means fish in Spanish, is pronounced PES.

After (ii) *analyzing the context factors*, which included products, trends, and users' expectations, the author defined a vision for 2025, part of (iii) *envisioning the alternative futures*, in which “Marlioü wants to reinforce its presence in the low-income market by offering a personalized care service via a network of beauty consultants, who are fully supported by information technology, helping them to identify users' needs.” With that vision, the author sketched the service offered by the consultants and the equipment they needed. With these sketches, he made rough cardboard prototypes of various initial ideas of products and mobile apps, and then tested these in a role play with two designers (see Figure 5-2).



Figure 5-2. Image of an external designer role playing with the rough prototypes. Source: the author.

This exploration resulted in a vision concept: The Alchemist Club 2025 shown in Figure 5-3 as part of (iv) *mapping the preferable future*. It is a network of beauty consultants assisted by a kit of hair products; an input device which interact with tablets and cellphones to measure, compare, and experiment with the hair products; and a do-it-yourself apron. All elements are supported by a mobile app, which trains the beauty consultants and collects insights from the clients. Finally, the author developed a sequence of screenshots of a Twitter account to share the vision concept. The sequence of tweets presents the story of a fictional beauty consultant, part of The Alchemist Club, in 2025.

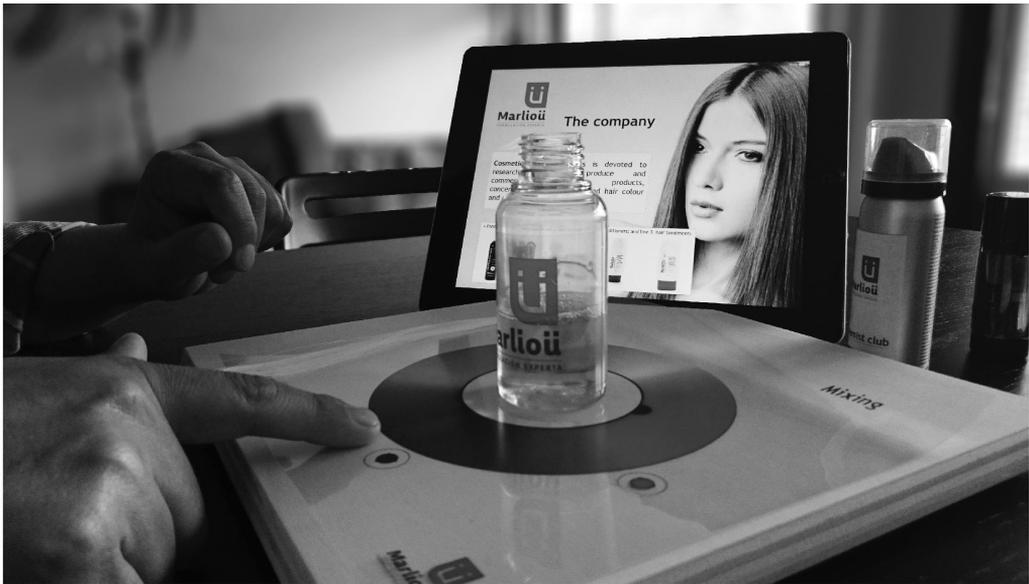


Figure 5-3. Above, a picture of the final prototype including the tablet Alchemist Board and the app Alchemist Lab. Below it, the screenshots of the Twitter account. A detailed description of this iteration online <http://pktweb.com/dive/2017/08/04/the-chemist-club-2025/>. Source: the author.



In this iteration, the author examined how to align the conflicting visions of the incoming and outgoing directors, and the company values. The vision he came up with shows how the company can use information technology to improve client contact. It also identifies how the company can engage with beauty consultants to reinforce Marliou's presence in low-income markets.

This iteration demonstrated that the futures techniques' main activities were sufficient to make the vision concept for Marliou. The author incorporated Strategic PES, a simple tool guided by an easy to understand metaphor that, with little time, brought many insights about the company for (i) *setting the domain and time frames*. However, a visual aid is needed to reinforce this metaphor. A simplified trend analysis, the STEEP analysis (social, technological, economic, environmental, and political) was sufficient for (ii) *analyzing the context factors*. After that, again with little time, the author tested the initial idea using rough prototypes in a role play as part of the (iii) *envisioning the alternative futures*. It is useful to take this leap out of the abstraction of the domain and time frames, and the context factors into the



vision concept, at the earliest phase of the process, as it gives time to reflect on the experimental artifacts and the service, the vision concept, and therefore, collect more ideas about its context, the future. However, we needed a closing activity for *(iv) mapping the preferable future*, in which the designer shares the vision concept with the company representatives, and the recommendations emerge in consensus with them, instead of just from the designers. This iteration only required a few resources: forty hours of a senior designer.

At a content level, this iteration provided evidence that this design-led futures technique starts by analyzing the company values and continues by identifying the values of the people, who are or will be related to the enterprise. The technique ends with a vision concept, an artifact that explores the desirable interactions, informed by those values, between the company and these people in the speculative future.

5.2 DIVE: Design, Innovation, Vision, and Exploration

Based on the lessons from this iteration, we developed the first version of DIVE (see Figure 5-4) by extending the metaphor of Strategic PES into a more complete analogy. The technique consists of a quick dive into the speculative futures and a swim back to the world as it is. During this journey, designers act as instructors and the company representatives as scuba divers. Initially, underwater, the company is seen as a fish that swims in calm or troubled waters. Instructors then accompany the divers in envisioning future waters and defining a vision. Using this vision as an inspiration, instructors and divers draw, make prototypes, and create stories to setup the vision concept, resulting in a rough prototype and a video. Finally, on land, the instructors use these artefacts to spark a conversation among several people about the future of the fish, shining light on the decision-making in the present.

DIVE is a design-led futures technique that assists designers in making and sharing vision concepts with company representatives for SMEs. As in the case of the other design-led futures techniques explained in Chapter 3 and 4, DIVE is developed to be used by a team which includes –up to six– *external designers* and –no more than three– *company representatives*. The former should have expertise in design research and communication, and the latter, are the experts of their own business experience. In this preliminary version of the technique, the making and sharing of the vision concept takes forty hours in total, which includes forty hours of the designers' time and ten hours of the company representatives' time.

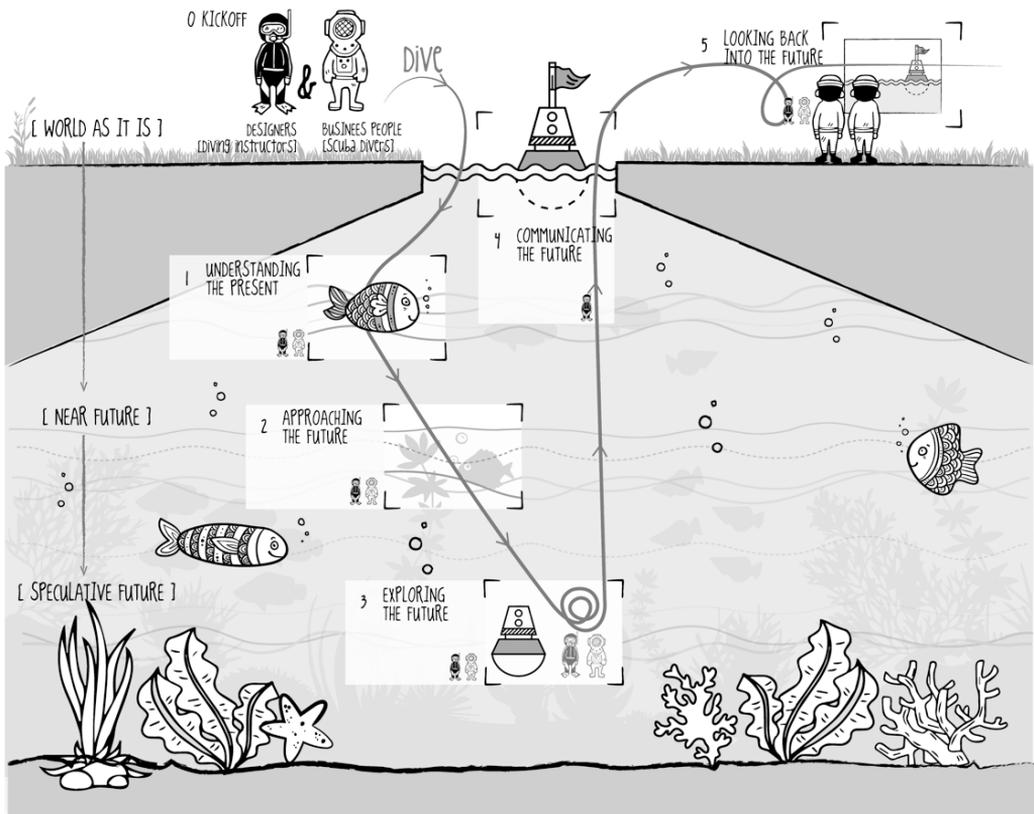


Figure 5-4. DIVE's blueprint, including a path that guide designers and the company representatives exploring and communicating the depths of speculative futures. Source: the author.

As Figure 5-4 shown, DIVE follows a path along five activities:

1. *Understanding the present*: the designers apply Strategic PES with the company representatives to set a domain and a time frame. As described in Mejia, Jimenez, and Chavarria (2014), the company is rendered as a fish that is divided into four parts: its head describes the company's know-how; the tail shows the users as a rudder that steers the company; the back displays the company's infrastructure; and the belly plots the products and services. Hekkert and van Dijk (2011) discuss how the domain delimits the focus area of the process in which designers aim to contribute, "acting as a [path] that guides [the] exploration of the context and the factors to be taken into account. [It is] (preferably) a particular area in life." Moreover, as we defined in



Chapter 2, the time frame is an interval of time which moves from the world as it is to the speculative future, to help companies map change when they think about the future.

2. *Approaching the future:* the designers conduct desk research and field work to collect context factors. As defined in Chapter 2, these context factors are the changing trends and developments and the stable states and principles. These factors are descriptions, which include observations, thoughts, theories, beliefs, or assumptions, of world phenomena (Hekkert & van Dijk, 2011) as they emerge. With this picture of the future, they cluster these factors with the company representatives to define a vision, which captures what the vision concept should do and be before it is made. The vision consists of a statement describing what the designers want to offer people within the domain, including a definition of the interaction qualities (Hekkert & van Dijk, 2011).
3. *Exploring the future:* following the vision, the designers make multiple prototypes: sketches, diagrams, and mockups, which are useful to, as discussed by Sanders and Stappers (2014), imagine, experience, test, select, transform, develop, and complete early ideas. By the end of this activity, they will have a collection of information that describes the vision concept: a concept product, service, or product-service system.
4. *Communicating the future:* the designers make a rough prototype and create visuals and a narrative to share the vision concept. The last two elements support the prototype, placing the vision concept in an image of the future, complete with people, context, and their relationships. This support is important because, as Stappers (2013) argues, rough prototypes are physical manifestations of ideas or concepts that only give the overall idea, to evoke discussion and reflection.
5. *Looking back into the future:* the designers facilitate a conversation with the company representatives and other stakeholders to map the company's future. The designers use the vision concept, embodied in the prototype, the visuals, and the narrative, to help participants express their thoughts, feelings, and ideas about the company's future. Along the conversation, the designers make a roadmap with strategic recommendations for the SME's near and speculative future.



Following the insights of the previous iteration, we developed a toolkit, DIVE 0.1, consisting of three tools: a *booklet* that gives theoretical background and instructions about the activities, and fifteen *worksheets* and two *canvases* to visually record the activities and outcomes.

The *booklet* (see Figure 5-5), developed to be printed in a small format (A4), gives a brief theoretical summary of design-led futures techniques, including examples such as concept cars, concept products, critical design, and design fiction. It ends with an overview of DIVE and a detailed explanation of the activities. It aims to support the researcher in explaining the technique and its antecedents to the designers and company representatives.



Figure 5-5. Image of the booklet. Source: the author.

The fifteen *worksheets* (see Figure 5-6), three per activity, were developed to be printed in A4 and support the designers in documenting the activities. These small formats help designers to consolidate the results after each activity and they work as the deliverable for the company representatives who can collect all the findings of the exercise.

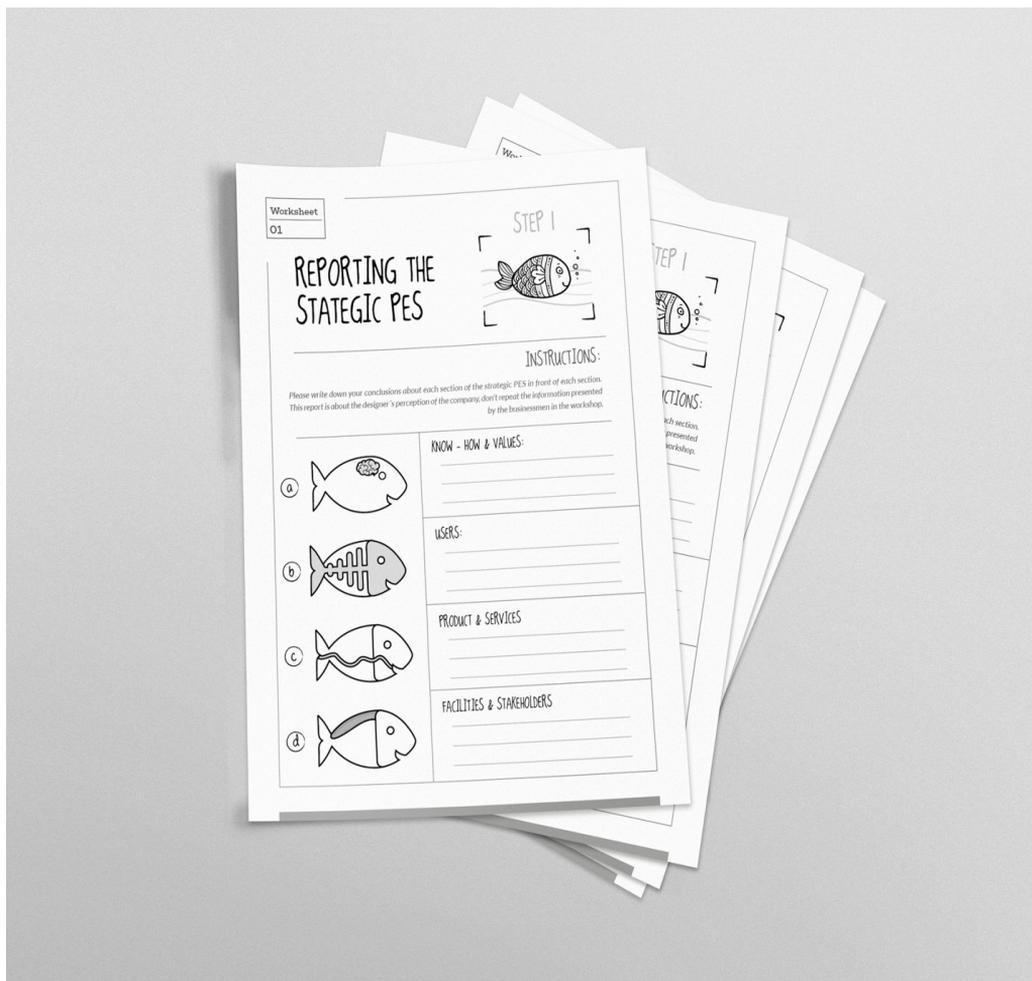


Figure 5-6. Image of some of the worksheets. Source: the author.

The *canvases*, developed to be printed in large formats (A0), are useful to hang on the wall and support designers in collecting insights when facilitating the first two activities. Both canvases include a large illustration at the top with sufficient space to write down the insights and comments during the workshop, and a strip on bottom, which includes a tag to identify the canvas and the keys of the large illustration. *Canvas 1* (see Figure 5-7) helps designers through Strategic PES. The illustration of the fish includes four letters to connect with the keys that explain the four parts of Strategic PES using an image of each part and some keywords per part.

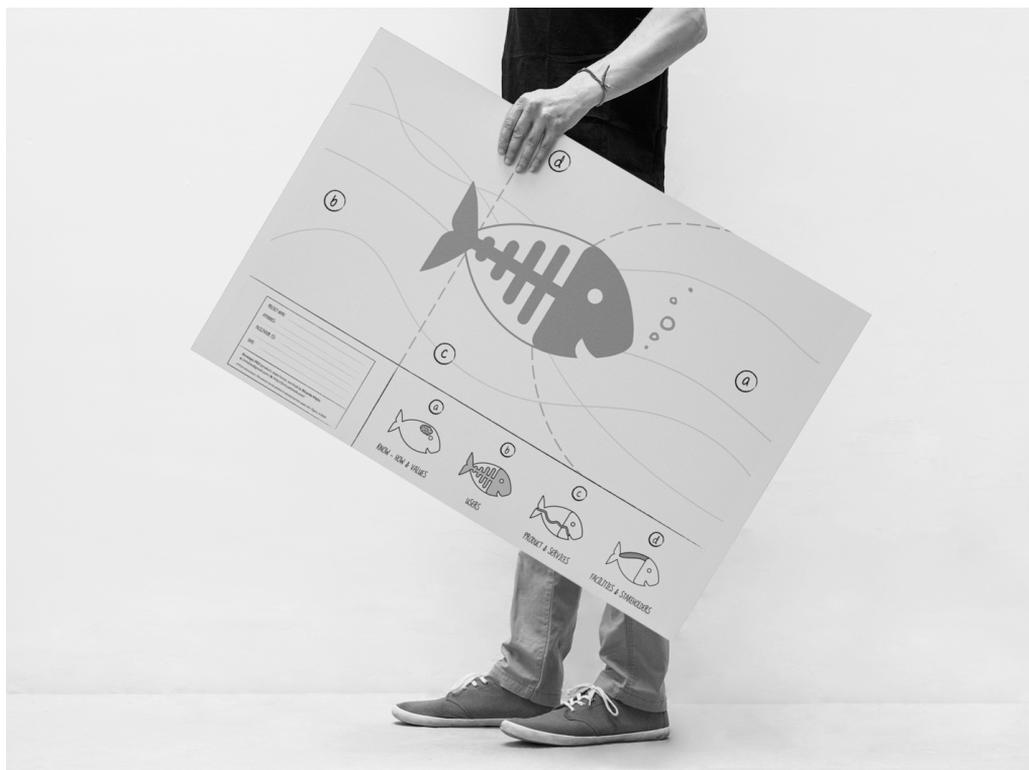


Figure 5-7. Canvas for Strategic PES. Source: the author.

Canvas 2 (see Figure 5-8) reports the different changing and stable context factors using different waves. It also has a quadrants chart to cluster these factors and define a vision. As in the previous canvas, it also includes a strip with the keys connected with the letters of the top illustration.

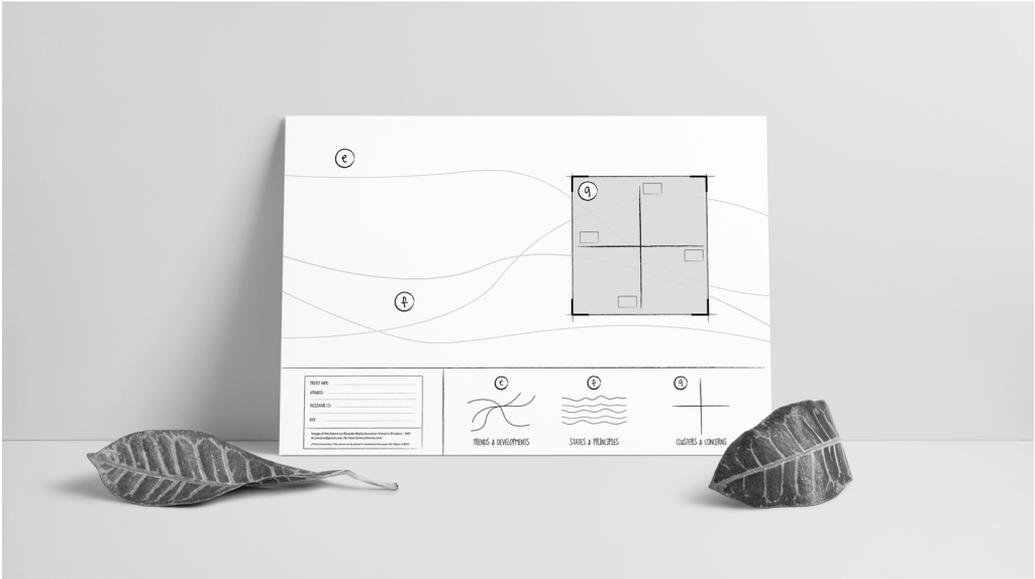


Figure 5-8. Canvas for the context factors. Source: the author.

Iteration 2: Continental Energy 2030 for Continental Boilers

The author, in collaboration with two senior designers, ran this second iteration (see Figure 5-9) with Continental Boilers, a small-sized family enterprise focused on the production and delivery of steam boilers, hot water systems, and heat exchangers.

Enterprise		<i>Continental Boilers</i>	
Iteration 2	Product	<i>Steam boilers, hot water systems, and heat exchangers</i>	
	Participants	Company representatives	<i>Managing director, Innovation manager, and Marketing and sales manager</i>
		Designers	<i>3 senior designers</i>
	Tools	<i>DIVE 0.1</i>	
	Duration	<i>40 hrs. (25% of collaborative working)</i>	
	Location and date	<i>Colombia, 2015</i>	
	Case web-page	<i>http://pktweb.com/dive/</i>	




Figure 5-9. Summary of Iteration 2.

Through Strategic PES, part of *Activity 1*, we found that “Continental Boilers is a salmon with small fins –products with minimal turnover, long life-cycles, and inexpensive maintenance– and it is swimming against the current.” To survive in the river, the salmon either needs to grow the muscles of its fins or find an alternative



way to swim, for instance, by introducing new products or another business model. As part of *Activity 2*, we conducted a simple STEEP analysis (social, technological, economic, environmental, and political), in which several context factors were organized in a 2X2 matrix in which a vision emerged: “Continental Boilers wishes to provide steam and hot water to factories within industrial parks through a service that follows the client’s needs, being at the forefront of the environmental regulations.”

After several iterations, part of *Activity 3*, which included sketches of new services and products, we created the vision concept: Continental Energy 2030, a service that includes the selling of steam and hot water and the renting of portable boilers and heat exchangers. To support this service, the company will offer the client a mobile app to control its consumption and receive technical support.

Following this ideation, as part of *Activity 4*, we produced a simple video of a fictional client, an industrial laundry, in need of steam and hot water for its washers and dryers to help reduce its energy consumption. Through the video (see Figure 5-10), we introduce the main features of the 2030 service.

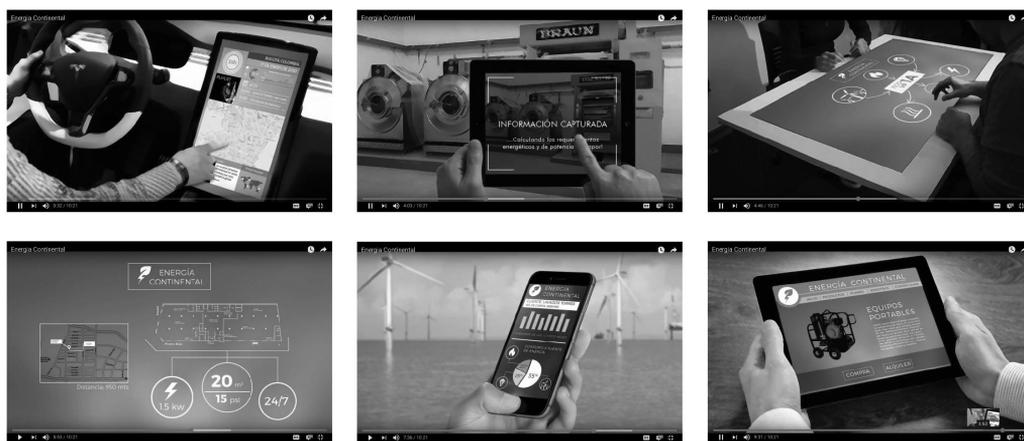


Figure 5-10. Frames of the video *Continental Energy 2030*. Source: the author. A detailed description of this iteration and the full video (in Spanish) online <http://pktweb.com/dive/2017/08/04/continental-energy-2030/>



As part of *Activity 5*, we arranged a workshop with three company representatives: Managing director, Innovation manager, and Marketing and sales manager (see Figure 5-11). We used the video to stimulate a conversation about the Continental Boilers’ desirable futures. Based on this conversation, we formulated a series of recommendations setting a track between the present and the future, explored by the vision concept.



Figure 5-11. Picture of the final workshop where designers and company representatives sketch a roadmap of the futures. Source: the author.

This iteration explored how Continental Boilers might increase its business with a solution that is aligned with its values on sustainable development. The vision concept describes a transition from a product-driven business to a product-service system model and portrays the potential allies that can help this transition.

This iteration was useful to consolidate the DIVE's activities and the technique's resource: forty hours of the senior designers' time and ten hours of the company representatives' time. Although this iteration needed an extra activity and more resources than the previous one, the consolidated activities were sufficient to make and share the vision concept within the limitations of an SME.

Both the initial analysis and making the video took longer than expected, but the video proved essential in sharing the vision concept and its context to effectively stimulate the conversation with the company representatives in the closing activity.

According to the designers, standards by which they could judge the quality of the outcomes are needed; they additionally suggested templates to document the process. Considering that not all designers have the same skills facilitating workshops, they also proposed incorporating recommendations on how to deal with the company representatives, who tend to talk mostly about the present instead of the future, especially during the closing activity.

The company representatives were positively surprised by the way the designers incorporated the company values within the vision concept, and the insights delivered by this exercise that they described as "design for strategic innovation." They considered DIVE to be beneficial to identify short-term challenges; some of them related to the product, such as the question raised by the Managing director: "how do our boilers adapt to different types of energy?"; and other challenges, related to the general business strategy, such as the value proposition formulated by the Marketing and sales manager: "I don't sell boilers, I sell energy solutions." Having identified these challenges, company representatives put them on the agenda, stimulating their feeling of urgency, motivated by the way the 'world as it is' is changing. They also identified potential alliances and allies that could help the enterprise face this change.



The Managing director summarized the DIVE experience as the “first moment, in a long time, that [they] had the chance to look at the future.” According to him, they are “so involved in the daily life –[they] have been doing the same for 48 years– that it’s difficult to think ahead”. However, he identified that “it’s hard to manage change within the enterprise’s culture, in particular when it involves family members’ interests. But this exercise was useful to see the company in the light of international trends and understand their potential effect on the business.” He also mentioned that “it was nice to see a concrete example of our environmental values in practice and guiding our future actions.”

5.3. Discussion

Throughout the development of DIVE, in particular during both iterations, it became clear that design can be a powerful instrument to get representatives of SMEs thinking, talking, and acting about their company’s future. DIVE seems to be well suited to the preferences and idiosyncrasies of this particular type of enterprise. It is compact, both in terms of time and money; it has a hands-on character, as it involves making prototypes and videos; and it emphasizes concrete outcomes on a human-scale rather than abstract strategies.

By turning concepts into simple physical prototypes and visual narratives, DIVE makes it easier for participants to understand and adopt a future vision that fulfils their expectations. While these vision concepts may be less ‘showy’ than high-end concept cars, their down-to-earth qualities and unfinished nature make them accessible for discussion and reflection. Even though the making of these prototypes and videos takes up a considerable part of the available resources, its application is essential and should therefore be included in a design-led futures technique.

While DIVE certainly shares elements with other techniques that apply co-creation principles, its novelty is in its visionary character and the value it puts on the making of a realistic vision concept. The experiences from both iterations indicate that this forward-thinking exercise provided the participants with some new horizons as well as specific directions for their company’s future. More development is needed, however, to tailor these aspects further.

Finally, DIVE has so far been evaluated mainly in settings in which the author acts as the leading designer and facilitator. The next challenge will, therefore, be to put DIVE out in the field, to be able to evaluate how it will stand up on its own.