

DESIGN OF VISION CONCEPTS TO EXPLORE THE FUTURE:

NATURE, CONTEXT AND DESIGN TECHNIQUE

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ABSTRACT

Industrial firms face a constant dilemma: they must have a vision and be ready for the future, while at the same time they must act within the current situation and exploit their current products efficiently. This research investigates visions that embody future ideas, “vision concepts” such as concept cars and concept kitchens. We studied five cases of vision concepts to unravel the nature of the design techniques behind these vision concepts. Our findings present a comparison of similarities and differences in nature, context, and design techniques. The key contributions of the study center on a new understanding of the sharing context that distinguishes concept visioning from other types of new product development. We lay out the groundwork for a concept visioning design technique by introducing a framework with significant implications for industrial firms.

Keywords: *Vision concepts, Concept visioning, Concept cars, Concept kitchens, Sharing context, Design technique.*

INTRODUCTION

Industrial firms need to be ready for the future even as they are forced to adapt their operations according to the current situation. Organizations need to be both efficient (*productive*) and different (*innovative*) in order to survive in complex contexts (Cornella, 2013). Authors such as Lubatkin et al. (2006) and Schreyogg and Kliesch-Eberl (2007) claim that organizations have two main needs: *exploiting old ideas* that have already been converted into products and services to make money today in order to ensure survival in the present, and *exploring new ideas* to make money tomorrow to have opportunities in the future. This constant dilemma, termed *organizational ambidexterity*, is described by Im and Rai (2008) and Cantarello, Martini, and Nosella (2012), among others, as an organizational *capability*; firms with this capability “are able to deploy both exploration and exploitation strategies at the same time” (Gupta, Smith, & Shalley, 2006).

In a way, the concept cars of automotive firms can be seen to combine these two aspects through showcasing future exploration in a “vision concept” for today’s marketplace. Although the automobile industry has created concept cars since the late 1930’s¹, this phenomenon has not yet been studied in-depth. A few studies can be found on concept cars (Berlitz & Huhn, 2005; Santamala, 2006), and even less literature can be found with regards to the use of “vision concepts” in other industries (Keinonen & Takala, 2010; Buijs, 2012).

¹ first in America with the Buick Y-Job, designed by Harley Earl in 1938, and then in Europe in the late fifties by the Italian car design studio's like Pininfarina (Buijs, 2012).

Research on having a vision for future products has been executed in the stream of *innovation management* (Lynn & Akgun, 2001; O'Connor & Veryzer, 2001; Backman & Börjesson, 2006; Backman, Börjesson, & Setterberg, 2007; Tassarolo, 2007; Reid & Brentani, 2012). These studies have shown that product visions exert a large influence on a new product's success (Lynn & Akgun, 2001). Empirical evidence also suggests that a clear and shared product vision in the front end of innovation (FEI) can subsequently enhance and speed up new product development (NPD) (Tassarolo, 2007; Simonse & Perks, 2014). Yet, little is known about how product visions are conceived and shared in the organizational context that frames the concept visioning.

In the stream of *design*, scholarly work highlights the use of dedicated design techniques that provide opportunities to explore the future, offering designers a means to explore new ideas (Buijs, 1987; 2012; Keinonen & Takala, 2010; Hekkert & van Dijk, 2011). However, little is known about design techniques that lead to concept cars and the like, particularly with respect to whether they are conceived with general design methods or require dedicated design techniques and whether the techniques used to design concept cars are comparable and transferable, in a more generic sense, to vision concepts in other industries. Overall, there is a lack of understanding on how vision concepts explore the future through the embodiment of ideas and how designers share their visions.

The aim of this paper is to add a theoretical contribution from a design perspective to the initial scholarly work on vision concepts. We studied the way that industrial manufacturers of automotive and consumer lifestyle products apply to design vision concepts. We investigate the nature and organizational context of sharing and the design techniques behind five cases of vision concepts that embody future opportunities and idea sharing. We carried out qualitative inductive research using a multiple case analysis method to investigate a rich collection of video and documented case material. To the initial scholarly work on concept visioning, this paper makes three contributions. First, it provides a grounded definition for the *vision concept*. Second, it reveals characteristics of the sharing context that distinguish concept visioning from other types of NPD processes. Third, it lays out the groundwork for a concept visioning design technique. Finally, this paper provides directions for further research to test the framework and extends the findings with additional exchanges between practitioners and scholars.

In the next section, the paper discusses the theoretical background in regard to product visions and vision concepts; then, it describes the method of comparative case analysis used for the five vision concepts, followed by the presentation of the results in a comprehensive table, and proposes an initial framework for a concept visioning design technique. Finally, we discuss directions for future research on vision concepts.

THEORETICAL BACKGROUND

In general terms, a *vision* is described as “conditions as we would like them to be” (Stokes, 1991, p. 118). Recent scholarly work in the stream of innovation management has further operationalized both market visioning (Reid & Brentani, 2015) and technology visioning (Reid, Roberts, & Moore, 2014); hence, product visioning has been relatively unexplored, apart from a prior study in which six patterns of product visioning were revealed (Simonse & Perks, 2014) and some earlier studies that mainly

investigated the relation between product visioning and NPD performance. These studies found that product visions exert a large influence on a new product's success (Lynn & Akgun, 2001; O'Connor & Veryzer, 2001; Reid & Brentani, 2012). Empirical evidence also suggests that a clear and shared product vision in the front end of innovation (FEI) can subsequently enhance and speed up functional integration during NPD (Tessarolo, 2007), whereas a weak product vision can lead to time-consuming efforts to integrate disparate functions. Similarly, Kessler and Chakrabarti (1999) suggested that a lack of shared vision can result in ambiguity and greater speculation among functions about what should be developed, often leading to conflict and delayed/unsuccessful new products.

The innovation management literature dedicated to automotive firms shows that the creation and use of concept cars are to some extent related to the future strategy and the vision. Buijs (2012) defines a concept car as "a tangible full-scale look-a-like of the future car". It looks as realistic as possible to get a kind of reality checks with the general public about their new product ideas. It also intends to demonstrate a new technology, to show a new form language, and to share new views about safety and use.

Concerning the design of concept cars, different scholars express different views. Styhre, Backman, and Börjesson (2005) and Santamala (2006) mention that concept cars are developed in a simplified NPD process. On the other hand, Berlitz and Huhn (2005) and Lv and Lu (2012) consider the development of a concept car as a conceptual exploration process that brings conceptual solutions. They locate the concept car exploration in the FEI. Overall, the framing of the activities differs if concept cars are conceived with a general design process (Santamala's view) or require a dedicated design process (Berlitz and Huhn's view). More in-depth research is required to solve these contradictory views and compare the activities to vision products in other industries.

In further investigating product front end activities across different industries, research has suggested that a collaborative approach is important to the product/market vision. O'Connor and Veryzer (2001), for example, espoused the importance of a shared mental model of the potential future product/markets before the NPD process itself starts. We are beginning to know more about what this *sharing* process is. For example, Reid and Brentani (2012) found empirical support for the proposition that resource dedication, allowing for the timely dissemination of information to appropriate people, supports strong visions. To enable this, it is suggested that vision development should be shared between individuals and organizational systems (Stacey, 2001). Within organizations, the individuals typically engaged in envisioning are designers, and design techniques might facilitate the vision sharing. Yet, the study of concept visioning in an organizational context and from the designers' perspective has been limited. There is a lack of in-depth knowledge on the complex interplay involved in conceiving product visions and the organizational context that frames the concept visioning.

In this study, we elaborate on this and focus on *tangible product visions*, so-called "vision concepts." We investigate the nature of the tangible vision concepts, the context of sharing and the design techniques behind cases of vision concepts that embody future opportunities and idea sharing.

DESIGN CONTEXT AND TECHNIQUES OF VISION CONCEPTS

Design, as a discipline, is closely linked to the exploration of the future in different ways: designers may act as “futurists; futurologists in the field” (Evans, 2011) and the design process can provide opportunities to explore “what is possible tomorrow” (Buijs, 1987), formulate a vision (Hekkert & van Dijk, 2011), or create the future “when it anticipates experiences” (Morello, 2000). “Designing is per definition an activity which result is something that does not exist in reality yet. It is always about something in the future” (Buijs, 2012).

Several design methods to creating new products are available. One is the Vision in Product design method – ViP (Hekkert & van Dijk, 2011), which is human-centered, context-driven, and interaction-based. It is divided into two moments, the first for preparation, *I. deconstruction of the present*, and the second for the design work itself, *II. design of the future*. The second moment is based on an in-depth understanding of the needs of people and the awareness of -future- context factors. These elements are key to proposing a vision of what the future product should do and be before it has been conceived, including its reason for existence (*raison d'être*). In ViP, the vision consists of a statement that describes what the designer wants to offer people, within a particular domain. It should also include a definition of how this goal is to be attained through specified interaction and product qualities. Despite the future orientation of the design moment, design research techniques to explore future experiences are not a distinct part of the ViP approach.

When we take a closer look at the design literature with this research and exploration focus on future situations, we can see that some attention has been given to the phenomenon of vision concepts. Keinonen and Takala’s (2010) research classified concept products in three categories. The first is *product development concepts*, which are used to unlock the problem in the NPD process as the basis for “the decision to go ahead with the detailed design”; designers use these concepts to “define the design challenge and map the alternatives.” The second is *emerging concepts* that support the learning and decision-making process with regards to future product generations within the product portfolio, drawing on a research and prototyping project. The third is *vision concepts* used “to go a stage further”; these are made to support the company’s strategic decision-making beyond the scope of product development. In this paper we focus in particular on the third category.

Concerning the design technique of concept cars, two contradictory views were identified. One view, represented by Styhre, Backman, and Börjesson (2005) and Santamala (2006), holds that concept cars are designed through an elementary NPD process. The other view, Berlitz and Huhn (2005) and Lv and Lu (2012), claims that concept cars use a tailored exploratory process, positioning it within the FEI.

In sum, the design techniques that explore the future and lead to concept cars, and the like in other industries, are contradictory and relatively unexplored, particularly with respect to whether the *vision concepts* are conceived with general design methods or require dedicated design techniques, and whether the techniques used to design concept cars are comparable and transferable, in a more generic sense, to vision concepts in other industries.

Overall, both in the stream of innovation management and the stream of design, there is a lack of understanding on how vision concepts explore the future through the embodiment of ideas and how designers share the vision concepts.

Therefore, in this paper we investigate the following research questions:

- *What is the nature of a vision concept?*
- *How is the vision concept shared in the organization context?*
- *How is a vision concept designed, that is, what is the design technique?*

METHOD

MULTIPLE CASE ANALYSES

We chose to employ qualitative inductive research (Eisenhardt, 1989) to unravel the nature, context, and design techniques of the vision concepts. Five cases were analyzed with the aim of understanding the nature of vision concepts from the perspective of their producers, and thus identify how companies design and share them in the organizational context. We collected the cases from two economic sectors that have a long tradition in using this kind of design technique to explore the future, which are the automotive and the consumer lifestyle industry. The cases comprise a sample that includes vision concepts produced by different brands that were launched in different years and developed for diverse segments. To facilitate the comparison between the concept cars (that were all luxury cars) and the concept kitchen products are designed for the same context, the kitchen, and with the same purpose, to cook food. All of these vision concepts are already finished internally and exhibited externally.

The multiple case analysis involved several steps. We began with the collection of qualitative data documented by videos and additional documentation from multiple sources. Then, we compared iteratively the documented experiences with the videos. Finally, we generated a construct definition, characteristics of the sharing context, and an initial framework for design technique by induction (Eisenhardt, 1989; Pratt, 2008).

DATA COLLECTION

A rich collection of video and documented case material provided the backbone for the extraction of qualitative data. Tables 1 and 2 show the characteristics of our sample, including video and concept documentation. The qualitative data analysis of these cases is based on internal information provided by the companies in their web pages and press releases, which include text, images, and videos; external reviews from specialized magazines and blogs; and related research papers published in scientific journals. After selecting the cases, the companies' web pages, the concept's press releases, the specialized magazines, and the papers were analyzed.

	Concept cars		Concept kitchens		
	Your Concept Car 2004 by Volvo	Citröen-Lacoste 2010 by Citröen and Lacoste	Mercedes-Benz F 015 Luxury in Motion by Daimler AG, 2015	Concept Kitchen 2025 by Ikea	Bio-digester kitchen island, part of the Microbial Home by Philips, 2011
Narrative (video)	Video: "Volvo YCC - Your concept car"	Video: "Citröen-Lacoste concept car"	Video: "World premier of the Mercedes-Benz F015"	The company produces a set of separated videos for each part of the system. This analysis is about "the table for living"	The company produced a general video with all the components of the Microbial Home
<i>Storyline</i>	The video presents a set of interviews with the designers about the user's wishes and feelings. It includes a sequences of images of the car features.	The video presents a group of young friends enjoying a sunny day at the beach.	The video shows a car that is on hold, till a businessperson call it, and then, the self-driving car drives the person through a road crossing a desert. During the drive, the person interacts with several touch-screens at the side panels, controlling some features, and with other people within the car.	The video presents the interaction between a user and the table during the process to cook a recipe.	The video shows an overview of the project with an emphasis on Microbial Home as a potential solution. The Microbial Home is presented as a system including a summary of all the components and the interaction between the users and each element.
<i>Characters</i>	Designers: the design team	Users: 2 young women and a young man	Users: 4 businesspeople	Users: someone cooking and a child playing.	User: a group of people cooking
<i>Main messages</i>	(1) Design intentions explained through the interviews with the design team. (2) Product features presented by a voiceover and showed using shots of some details of the car.	(1) The lifestyle of a group of young friends, who use the car -and other Lacoste products- as a mobile platform to enjoy life. (2) The interaction between people, who are sharing in the car. (3) A place that is beautiful and enjoyable.	(1) The interaction between the user and the car, between the car and pedestrians, and between people within the car. (2) The movement of the car, externally over the road, and internally, using the interface. (3) Several images of the brand.	(1) The interaction between the user and the product, in some cases including a prop (cellphone and tablet).	(1) An overview of the system of products and the components, with a sequence of steps of the cooking process. (2) The interaction between the users and the components. (3) The research project context, opportunities and research question.
<i>Settings & Background</i>	Interior: studio	Exteriors: a beach	Exteriors: a road in the desert	Interior: several illustrations of the concepts and top views of the prototype	Interior: several illustration of the system to illustrate the sequence. The video is filmed in the place where the prototypes are exhibited.
<i>Costumes</i>	Does not apply	Lacoste polos, sunglasses, jeans	Semi-formal dress	Does not apply	Does not apply
<i>Props</i>	Does not apply	Camera and Lacoste accessories	Cellphone	Cellphone and tablet	Does not apply
<i>Soundtrack</i>	Voiceover and direct voice during interviews	Music	Music: Empty beaches, night traffic	Voiceover	Music
<i>Film length</i>	03:45	00:48	01:53	02:36	06:50
Source	Volvo (2006). YCC -Your Concept Car [Video]. Retrieved from: http://youtu.be/XX4xFjZPezA	Lacoste (2010) Citröen-Lacoste Concept Car [Video]. Retrieved from https://www.youtube.com/watch?v=iFbEelEotyw&index=35&list=PL1Mmw93_pO4i5vuVHZdNwOogo6ODVePNj	Mercedes-Benz (2015). Mercedes-Benz TV: World premiere of the Mercedes-Benz F 015 Luxury in Motion research vehicle [Video]. Retrieved from https://www.youtube.com/watch?v=DYTV4d-Gn0s	Ikea (2015) Concept Kitchen 2025 [Video]. Retrieved from https://youtu.be/qD60cBQOABY	Philips (2013). Microbial Home [Video]. Retrieved from http://youtu.be/dM0WYdkKlu8

Table 1. Characteristics of the sample – video documentation

Concept cars | Concept kitchens

	Your Concept Car 2004 by Volvo	Citröen-Lacoste 2010 by Citröen and Lacoste	Mercedes-Benz F 015 Luxury in Motion by Daimler AG, 2015	Concept Kitchen 2025 by Ikea	Bio-digester kitchen island, part of the Microbial Home by Philips, 2011
CONCEPT SUPPORTING DOCUMENTATION	<p>- Volvo Car Corporation (2004). Volvo Press Release. Volvo Communication Centre. Retrieved from: http://www.volvoclub.org.uk/press/pdf/presskits/YCCPressKit.pdf</p> <p>- Volvo (2015). Concept Cars, This is Volvo. Retrieved from: http://www.volvocars.com/intl/cars/concept-cars</p>	<p>- Citroën (2015). Citroën Concept Cars. Retrieved from: http://www.citroen.co.uk/about-citroen/concept-cars</p> <p>- Citroën Lacoste (2015). Citroën Lacoste - Spontaneous, laid-back and sophisticated. Retrieved from: http://www.citroen.co.uk/about-citroen/concept-cars/citroen-lacoste</p>	<p>- Mercedes-Benz Cars Research & Development Communications Centre (2015). World premiere of the Mercedes-Benz F 015: Luxury in Motion at the CES. Retrieved from: http://media.daimler.com/dcmmedia/0-921-1775416-1-1778134-1-0-1-0-0-1-12639-1549054-0-1-0-0-0-0-0.html?TS=1430124188873#</p>	<p>- Ikea (2015). Concept Kitchen 2025 How will we behave around food in 2025? Retrieved from: http://www.conceptkitchen2025.com/index.html</p>	<p>- Philips (2011). Bio-digester island. Retrieved from: http://www.design.philips.com/philips/sites/philipsdesign/about/design/designportfolio/design_futures/bio-digester_island.page</p>
REVIEW DOCUMENTATION	<p>- The Economist (2009). What Are Automakers Doing for Women? [Webpage]. Retrieved from http://www.edmunds.com/car-safety/what-are-automakers-doing-for-women-part-iii-volvo-has-its-designs-on-women.html</p> <p>- Men and Motors (2013). Volvo YCC Concept Car [Video]. Retrieved from: https://www.youtube.com/watch?v=y-m3yjJTga0</p> <p>- Car design online (2015). Volvo monitoring and concept center [Webpage]. Retrieved from http://www.carsdesignonline.com/design/case-studies/volvo-concept-center/</p>	<p>- Autocar. (2010). Paris motor show 2010: Citroen Lacoste. Retrieved September 23, 2015, http://www.autocar.co.uk/carnews/paris-motor-show/paris-motor-show-2010-citroen-lacoste</p> <p>- Lacoste. (2010). Lacoste Press Kit. Retrieved September 23, 2015, from http://lacoste.com/library/contents/press/pdf/LACOSTE_presskit_en.pdf</p> <p>- Yatzer. (2010). Citroën Lacoste Concept Car. Retrieved September 23, 2015, from https://www.yatzer.com/citroen-lacoste-concept-car</p> <p>- Lookcycle (2015). News: Look dedicates its expertise to the Lacoste Lab. Retrieved from: http://www.lookcycle.com/en/uk/look-cycle/actualites/look-dedicates-its-expertise-to-the-lacoste-lab.html?__from_store=en</p>	<p>- Mercedes Benz (2011). Mercedes-Benz F 125! Concept. Retrieved from: http://www.carbodydesign.com/2011/09/mercedes-benz-f-125-concept/ https://www.youtube.com/watch?v=4hVBBUljOts</p> <p>- Autoweek (2015). Mercedes-Benz F015 Concept. Retrieved from http://www.autoweek.nl/nieuws/32289/mee-gereden-mercedes-benz-f015-concept</p> <p>- Mercedes Benz (2015) F015 Luxury in Motion: design videos [Videos]. Retrieved from: http://www.carbodydesign.com/2015/01/mercedes-benz-f-105-luxury-in-motion-design-videos/</p> <p>- Mercedes Benz (2015) F015 Luxury in Motion. Retrieved from: http://www.carbodydesign.com/2015/01/mercedes-benz-f-015-luxury-in-motion/</p>	<p>- The Economist (2011). The secret of IKEA's success [Webpage]. Retrieve from http://www.economist.com/node/18229400</p> <p>- Ikano group (2014). Facts and figures 2014 Ikano. Retrieved from https://www.ikanogroup.com/uploads/files/Ikano%20Fact%20and%20Figures%202014.pdf</p> <p>- Ideo (2015). Envisioning the Future Kitchen [Webpage]. Retrieved from https://www.ideo.com/work/envisioning-the-future-kitchen</p> <p>- TUE (2015). Ikea students TU/e present Concept Kitchen 2025 [Webpage]. Retrieved from https://www.tue.nl/en/university/departments/industrial-design/news/06-05-2015-ikea-and-students-tue-present-concept-kitchen-2025/</p>	<p>- Flippetti, J. Design Boom (2011). Philips eco friendly microbial home [Webpage]. Retrieved from http://www.designboom.com/design/philips-ecofriendly-microbial-home/</p> <p>- n.a. [Creative Community, KTN]. (2012). Philips Design Probes [Video]. Retrieved from https://vimeo.com/37957899</p> <p>- Wagner, P. (2012). Innovation & Technology: Philips Design Probes. Retrieved from http://www.wgsn.com/blogs/innovation-technologyphilips-design-probes-by-philippa-wagner/</p> <p>- Philips, Circular economy brochure (2014). Retrieved from http://www.philips.com/philips/shared/assets/global/sustainability/downloads/circular-economy-brochure.pdf</p>
PROCESS AND CONTEXT DOCUMENTATION	<p>- Volvo (2015). Concept Cars. Retrieved from: http://www.volvocars.com/uk/top/about/corporate/pages/default.aspx</p> <p>- Volvo (2015). Concept Cars, This is Volvo XC60. Retrieved from http://www.volvocars.com/intl/cars/new-models/xc60</p>	<p>- Citroën UK (2015). Retrieved from: http://www.citroen.co.uk/home</p>	<p>- Daimler (2015). Mercedes-Benz Concept Vehicles – The Shape of the Future. Retrieved from: http://www.daimler.com/dccom/0-5-1280234-1-1280303-1-0-0-1302140-0-0-135-0-0-0-0-0-0-0-0.html</p> <p>- Daimler (2015). Innovations for the mobility of the future. Retrieved from: http://www.daimler.com/technology-and-innovation/insights-into-research-and-development</p>	<p>- Ikea (2015). An exploration of life in and around the kitchen. Retrieved from: http://ikeatemporary.com/</p>	<p>- Philips (2015). Philips Design [Webpage]. Retrieved from: http://www.design.philips.com/</p>

Table 2. Characteristics of the sample – concept documentation

DATA ANALYSIS

The data analysis included the coding of the texts and the audiovisual material. All the videos selected are part of the material used to share the concept products on the web pages of the companies. For the analysis of the videos, the method of Garcez, Duarte, and Eisenberg (2011) was used. First, the videos, one for each concept product, were watched several times to analyze the general structure of the storyline; then they were divided into units of analysis to code the narrative elements (locations, characters, storyline), which were identified and clustered on a timeline. We analyzed the similarities and differences of concept visioning in the web documentation along with the three aspects of our research question: the nature of a vision concept, the organizational context of concept visioning, and the design technique used to envision concepts. As a starting point, we consult the available literature on product visions and vision concepts for comparable findings. Then, we identify patterns throughout the cases and match them to the respective aspects of concept visioning. We tabulated these findings and formulated analytical statements, and illustrate them with individual examples and data from the cases (Miles & Huberman, 1991). The results of the analysis of the text and videos are arranged in the table in the result section, and the conclusions are reported per research question.

RESULTS

Tables 3, 4, and 5 present the results of the multiple case analysis of the five vision concepts, three concept cars in the automotive industry (the Your Concept Car 2004 by Volvo, the Citroën Lacoste 2010 by Citroën and Lacoste, and the Mercedes-Benz F 015 Luxury in Motion by Daimler AG, 2015), and two concept kitchens/products in the consumer lifestyle industry (the Concept Kitchen 2025 by Ikea, and the Bio-digester kitchen island, part of the Microbial Home by Philips, 2011), which also enables the comparison of the ways in which automotive and consumer lifestyle product manufacturers design and share vision concepts.

The table 3 shows the five vision concepts and describes their nature, table 4 presents the sharing context in concept visioning, and table 5 plots their design technique.

Concept car
Your Concept Car 2004 by Volvo



Outcome

A non-working prototype and a press kit (18 pages long document, six pictures, and a video).

Description

It is a four seat coupé concept car “targeting the most demanding premium customer: the independent, professional woman”.

Exploration

In Volvo "concept cars function as a test bed for new ideas and thereby also as a means for experimentation" (Backman, Börjesson, and Settenberg, 2007).

Concept car
Citröen-Lacoste 2010 by Citröen and Lacoste



Outcome

A non-working prototype and a press kit, which includes several pictures, sketches, and a video.

Description

It is a crossroad super-mini SUV with an off-beat sporty design “where the car meets fashion and sports”.

Exploration

Citröen states that concept cars are “laboratories for new ideas, which [they] share with the public at major international motor shows”. Concept cars reflect their “ambitions, values and imagination”. According to Lacoste the "Lacoste Lab -concept-products" represent the future of the brand, “giving it a head start by identifying tomorrow's products”.

Concept car
Mercedes-Benz F 015 Luxury in Motion by Daimler AG, 2015



Outcome

A fully working prototype and a press kit (text, 31 pictures, and two videos).

Description

It is a self-driving luxury saloon car "designed for the far future".

Concept kitchen
Concept Kitchen 2025 by Ikea



Outcome

A non-working prototype and supporting material for the exhibition (videos, images, text, and posters).

Description

It is a system of products for the kitchen, including a dining table, the “heart of the kitchen”; a pantry, which “makes food visible”; a composting and

waste system; and a “mindful design” sink, which informs about how to use water.

Exploration

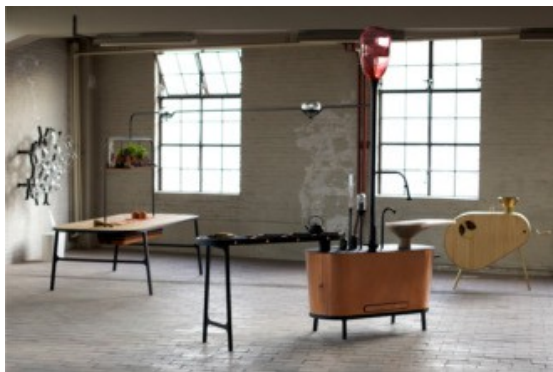
The F015 is presented as a “research vehicle” with the question: “how to enable people to do what they want or need to do?” Daimler defines four different kind of concept cars: research vehicles, technology demonstrators, experimental vehicles, and design studies. Research vehicles “combine a variety of boldly innovative technologies in a form which can be visualised, driven and readily evaluated”.

Exploration

Ikea and the external stakeholders have developed this “investigation” around the question “how will we behave around food in 2025?”

Concept kitchen

Bio-digester kitchen island, part of the Microbial Home by Philips, 2011



Outcome

A non-working prototype and supporting material for the exhibition (a video, images, and text).

Description

It is a repositionable kitchen island that is the central hub in the Microbial Home system. The island consists of “a methane digester that converts waste into methane gas that is used to power a series of functions in the home”.

Exploration

Philips has developed this project “to ask questions about the viability of biological processes in our home and places of work”.

Table 3. The nature of vision concepts

THE NATURE OF VISION CONCEPTS

Companies name their vision concepts in diverse ways. Except for Daimler AG, which calls the F 015 Luxury in Motion a “research vehicle,” the other automotive firms call their vision concepts “concept cars.” Ikea describes the output of the project as the “Concept Kitchen 2025,” and Philips uses the name “design probe,” which according to the design department is part of the design futures portfolio (see Table 3).

The analysis reveals that the automotive firms presented the three vision concepts as products (vehicles), unlike the consumer lifestyle industries, which displayed the vision concepts as systems comprising several products and the relationship between all the components that form the system. For instance, the Concept Kitchen 2025 by Ikea is a system of products for the kitchen (a dining table, a pantry, a waste system, and a sink).

All the companies deployed the vision concepts as prototypes, 1:1 models that present the main features of the concept. Most of them are non-working prototypes, like the Concept Kitchen 2025, a set of full-size mockups describing the components of the system of products. Through these mockups, the design team demonstrates the key elements of the product-user interaction, for instance “the system to recognize objects and their movement and to project a display through the camera and projector positioned above the table” (Ikea, 2015), but they are not suitable for use in cooking. Distinctively, Daimler AG presented the F 015 Luxury in Motion through a fully working prototype that was given a test drive. In addition to prototypes, companies produce a set of supporting material that includes descriptive texts, a comprehensive set of images, and videos, which round up a communication system.

Companies describe vision concepts as a way to test and present new ideas. For instance, Volvo says that “concept cars function as a test bed for new ideas,” Citroën states that concept cars are “laboratories for new ideas,” and Daimler AG claims concept cars are one way to have a “dialog with [their] customers.”

A vision concept is the outcome of a research project that explores research questions. For example, the question formulated by Ikea was how will we behave around food in 2025? Daimler AG’s question was how can we enable people to do what they want or need to do?

Concerning the nature of a vision concept, the research question about exploring the future seems to be inherently related to how a vision concept is different from NPD prototypes. The embodiment of the concept in a 1:1 prototype can be similar, but the -future- narrative about envisioned interactions with the product in the future is different. Quite strikingly, Philips explicitly wants to make it clear that the vision concept “is not intended as a production prototype nor will it be sold as a Philips product.”

	Your Concept Car 2004 by Volvo	Citröen-Lacoste 2010 by Citroën and Lacoste
PURPOSE	YCC main focus is communication (Styhre, Backman, & Börjesson, 2005). The YCC concept was developed to communicate that the company has a special consideration for women as employees and customers. The company states that “the female perspective was at the core of the YCC project from the outset and that was exactly the way Volvo Car Corporation wanted it to be. A concept car project started, inspired and managed by women. One in which women always had the final say”.	Citroën is “exploring the future of driving” through concept cars, and Lacoste Lab, which is based on co-creation between Lacoste and several partners, use -concept-products to “hold shares, exchange of ideas and talent and brings together expertise in design and technological innovation”. The Citroën-Lacoste concept car was communicated as an “alternative option” with strong emphasis on the lifestyle.
PUBLIC SHARING	The concept car was showcased externally to specialised journalists in a press conference and to the general public at the Geneva International Motor-Show, in 2004. It was also used within the company through several presentations. 272 articles and press clipping covered the concept car in 20 countries (Backman & Börjesson, 2006) representing more than 2.5 millions of euros in advertising.	The concept car was unveiled at the Paris Motor-Show in 2010 to specialised journalist and the general public.
IN-COMPANY SHARING	Additionally, it was used internally in 50 presentations to Volvo employees.	
Lead owner	Volvo Car Corporation that is a Swedish premium automobile manufacturer.	This project is a co-branding experiment between two French companies, the automobile manufacturer Citroën and the apparel corporation Lacoste.
Portfolio strategy	Concept cars are in a separate portfolio, which is part of the cars division, under the motto “show, don’t tell...”.	Due to the special condition of this concept car, it is part of two portfolios: the Citroën separated portfolio of concept cars, which includes twelve concepts; and the special portfolio of Lacoste Lab’s -concept-products, which includes a bicycle, a motorcycle helmet, a surfboard, among others.
Division	Volvo has a specialised division called Volvo Monitoring and Concept Centre, which creates concept cars and acts as a monitoring centre as well. “Its explicit objective is to carry out concept development, and it has an internal reputation based on creativity, design skills and holds a sort of flashy image” (Backman, Börjesson, and Settenberg,	The Automotive Design Network, a Citroën division, which is responsible to design concept cars and commercial vehicles, joint the “Lacoste Lab, innovation and reinvention” program. It is a special program responsible to arrange “collaborations between Lacoste and different partners with which design department shared ideas and talents”.
TEAM SHARING	A team of nine women, two managing the team as project managers, supported by an extra technical project manager, and a design team.	A joint between the Citroën design team and the Lacoste Lab was responsible to design this concept.

Table 4. The sl

Concept Cars | Concept Kitchens

Mercedes-Benz F 015 Luxury in Motion by Daimler AG, 2015	Concept Kitchen 2025 by Ikea	Bio-digester kitchen island, part of the Microbial Home by Philips, 2011
<p>The main purpose of this concept is to declare that Daimler is innovating about autonomous-drive cars. Daimler says that concept cars feature innovative technology that “sets industry trends, in some cases preparing the way for market adoption of novel vehicle concepts”, and “enter into a dialog with customers”, giving inspiration to the market and sound out customer interest.</p>	<p>According to Gerry Dufresne, Range Manager, Kitchen and Dining, IKEA of Sweden, the main purpose of this project is “to inspire ourselves and inspire people around us” through “a tangible communication of what are the behaviours of the future and what is the kitchen looks like in 2025”.</p>	<p>This concept is intended “to stimulate discussion around waste and how we deal with it”, the concept is “testing a possible future – not prescribing one”. Philips states that “it is not intended as a production prototype nor will it be sold as a Philips product”. Probes projects “are intended to understand future socio-cultural and technological shifts” and test possible outcomes, culminating in “a ‘provocation ‘designed to spark discussion and debate around new ideas and lifestyle concepts’”. Insights gained from debate around the concepts feed into future innovation for the company, “improving the innovation hit rate”.</p>
<p>The concept car was presented by the CEO in a press conference to specialised journalists and showcased to the general public, including a test drive, at the International Consumer Electronics Show in 2015.</p>	<p>The concept kitchen was demonstrated to the general public at IKEA Temporary at Milan in 2015. Through several workshops, people could interact with the prototype directly and identify the key elements of the product interaction.</p>	<p>The concept kitchen was exhibited to the general public at the Dutch Design Week in 2011. Additional to the exhibition the Philips foresight initiative was developed through the webpage http://designprobes.ning.com/</p>
	<p>During the process several presentations were arranged with different employees of IKEA.</p>	<p>Additional to the exhibition and the webpage a comprehensive report that “captures all the concepts, though processes and intellectual property ideas”, was used as the input of several workshops within the company.</p>
<p>Mercedes is the luxury division of the German manufacturer Daimler AG.</p>	<p>IKEA is a multinational group of companies that design and sell ready-to-assemble furniture, appliances, motor vehicles and home accessories.</p>	<p>Philips is a technology company focused in the areas of electronics, healthcare and lighting.</p>
<p>Concept cars are in a -research- portfolio named “Mercedes-Benz Concept Vehicles – the Shape of the Future”. The “F Series research vehicles” are part of this portfolio since 1991 with the F100.</p>	<p>Concept products are special projects under the supervision of specific departments. IKEA only has a commercial product portfolio.</p>	<p>Thirteen projects (Design Probes) are arranged in a specialized portfolio called Design Futures. These “far-future concepts explored what could potentially shape our lives in years to come”</p>
<p>Mercedes has a division responsible to design concept cars and commercial vehicles named Advanced Design Department.</p>	<p>The project was a collaboration between Kitchen and Dining, a division of IKEA of Sweden, and external partners: IDEO, a global design company, and two universities (Eindhoven University of Technology and Lund University).</p>	<p>The company developed the “Philips Design Probes Program” from 1996 till 2012. This program “creates concepts based on research into emerging ‘societal signals’ and technologies” looking far into the future.</p>
<p>A special team arranged between the Advanced Design Department and the Engineering and Construction Department composed by “designers, engineers and marketing experts jointly draw up the technical specifications for [this] new research car”.</p>	<p>Depending on the stage of the project special teams were arranged including -senior- designers from IDEO and design students. In total 54 students and professional designers were working together in 27 sub-projects.</p>	<p>The design team includes designers with "a wide range of design competencies, such as product design, interaction design, data visualization, service design and communication design".</p>

haring context in concept visioning

SHARING CONTEXT IN CONCEPT VISIONING

In regards to the sharing context, the purpose of concept visioning is quite clear in terms of exploring the future and communicating a message to a broad audience, which is constituted by the general public and the -internal- innovation community (See Table 4). The exploration inspires researchers and designers, and such communications seek to state a strategic intent to the audience, stimulating discussions and dialogs with various stakeholders. That is the case with the Concept Kitchen 2025, whose central goal is “to inspire ourselves and inspire people around us” by tangibly communicating “the behaviors of the future and what the kitchen will look like in 2025,” as the Ikea manager explains. In the case of Daimler AG, the intention of the vision concept is to “enter into a dialog with customers.” Also, vision concepts stimulate the creation and exchange of new ideas based on the understanding of future changes, “improving the innovation hit rate.”

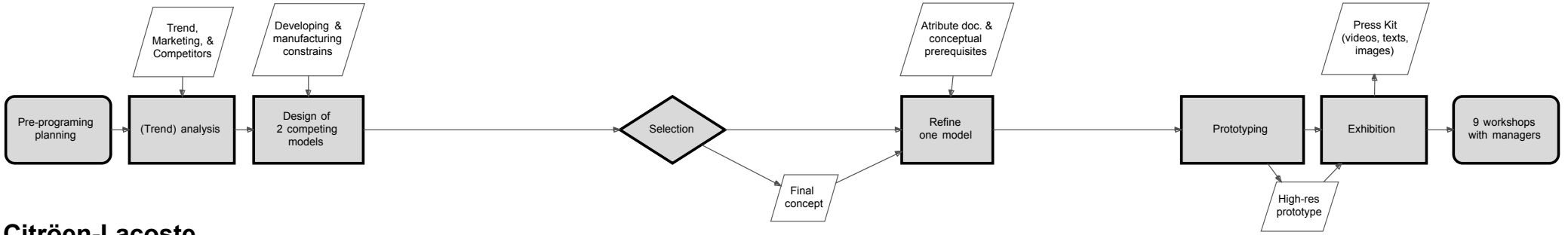
Concerning how the vision concept is shared in the organizational context, our analysis reveals three types of sharing (public, in-company, and team). Public sharing and in-company sharing of the final tangible prototype are distinctive and typical of vision concepts; the prototypes used in FEI or NPD projects are usually kept confidential from the outside world.

In regards to public sharing, all of the studied vision concepts were showcased at international events. Interestingly, the Mercedes-Benz F 015 Luxury in Motion was presented at the Consumer Electronics Show (CES) exhibition 2015 in Las Vegas instead of at a motor show. It was a working prototype and selected members of the public, journalists, and stakeholders were given the opportunity to take it for a test drive. The other two concept cars were exhibited at international motor shows, the Volvo in Geneva and the Citroën Lacoste in Paris; however, both concept cars were only presented, with no test drives. The two concept kitchens were demonstrated at international events. The Ikea concept kitchen was showcased at an independent exhibition (#IKEAtemporary) in Milan including several workshops, and the Philips Bio-digester was presented at the Dutch design week in Eindhoven. It was used in several workshops and interestingly, also in a dedicated foresight initiative, a “far-future research dialogue by Philips Design to track emerging developments in politics, economics, environment, technology and culture.”

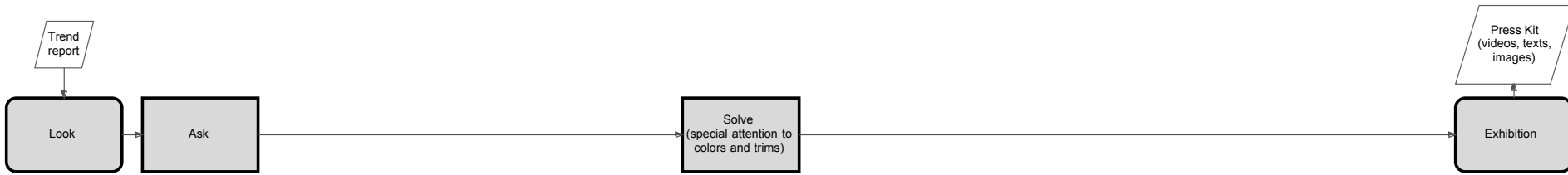
With respect to, in-company sharing, Volvo, Ikea, and Philips use the vision concept in several workshops and presentations. Philips also includes a report that “captures all the concepts, thought processes and intellectual property ideas.” The strategic choice for a concept cars is part of a dedicated vision concepts portfolio (e.g., the Mercedes-Benz Concept Vehicles portfolio, first created in 1991), and the concept kitchens are part of particular innovation programs, such as the Philips design probes program that ran from 1996 to 2012. Only Citroën Lacoste differs a bit by positioning the concept car as a strategic alternative instead of as the main direction of its strategic vision.

In-company and team sharing is only exclusive in the Volvo case where a dedicated (future) monitoring and concept center unit was established. In all other cases, joint management of tangible vision concepts and commercial prototypes is practiced across different departments. In most cases, special teams co-created the vision concept. In the case of Ikea and Citroën, the teams had external designers as members.

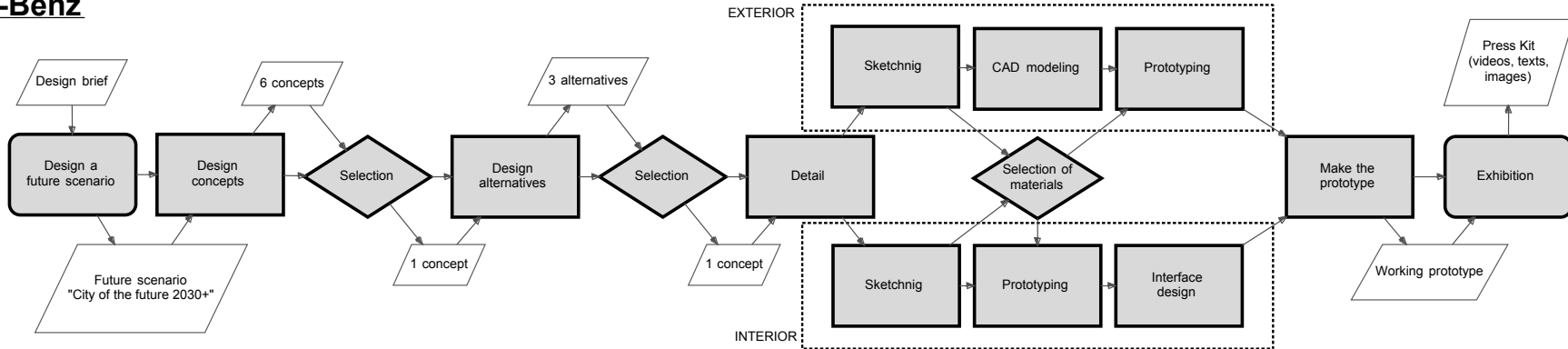
Volvo



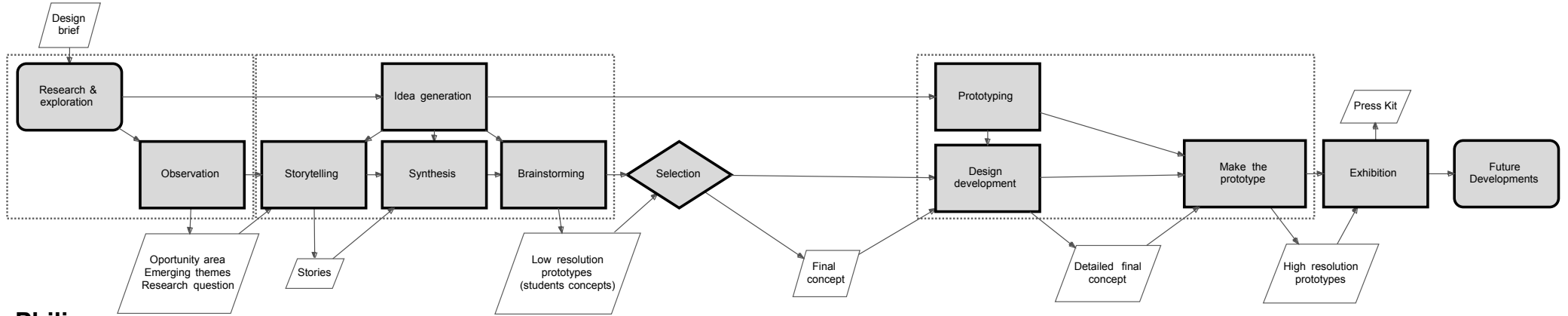
Citröen-Lacoste



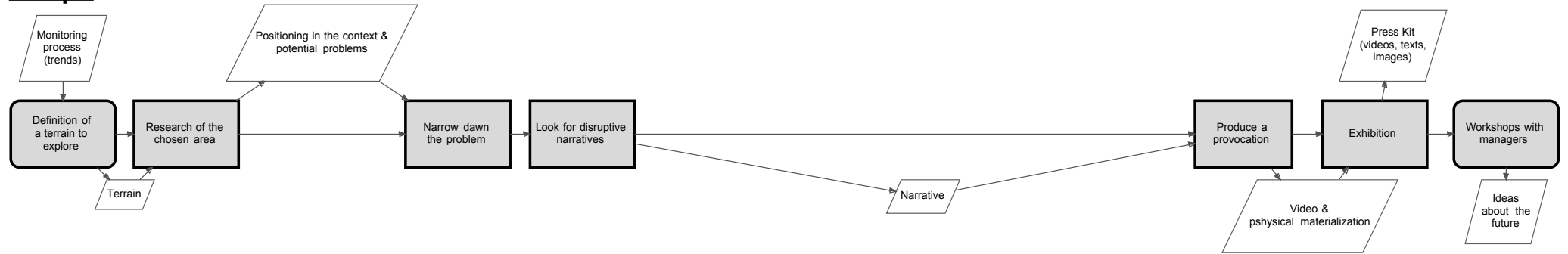
Mercedes-Benz



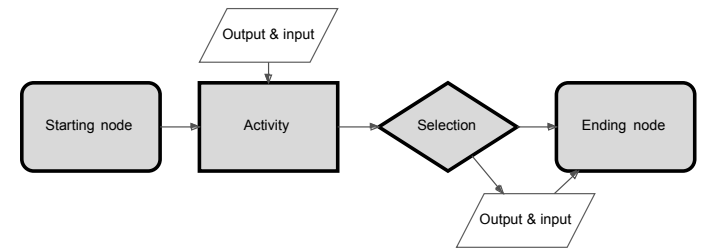
Ikea

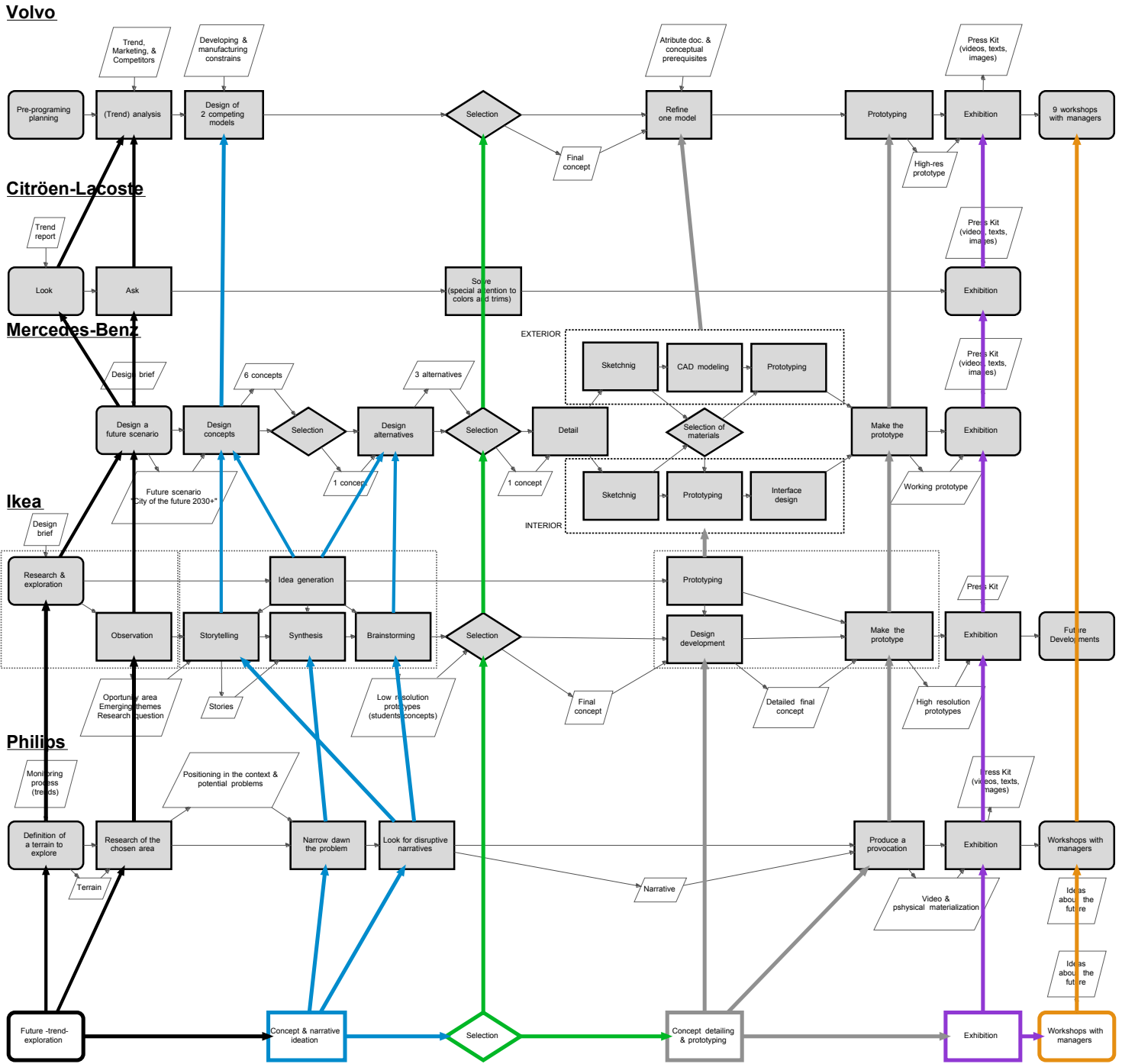


Philips



Conventions





Comparison

THE DESIGN TECHNIQUE OF CONCEPT VISIONING

In Table 5, the analysis reveals the techniques used to design vision concepts with particular attention to the staging of activities, the inputs-outputs, and the role of the designers within the team.

The multiple case analysis results in the identification of six activities to design a vision concept: (i) the future exploration, (ii) the concept and narrative ideation, (iii) the selection, (iv) the concept detailing and prototyping, (v) the exhibition, and (vi) the workshops with managers.

The analysis shows that, in most of the cases, the design team starts with future exploration. To set up this exploration, the team defines a research question (e.g., Ikea defined the question “how will we behave around food in 2025?”), and an “opportunity area,” which is an area of interest that includes the people who are within this area. Then, the design team conducts activities to explore this “opportunity area,” identifying opportunities and trends. Philips, for instance, starts with the “definition of a terrain to explore [and then] researches the chosen area to position this problem in context.” Concerning the methods of exploring the future, also called futures studies, Volvo, Citroën Lacoste, and Philips monitor trends as a way to understand external factors, whereas Mercedes-Benz uses future scenarios. Ikea opts to use observation to gain insights from the users whereas Philips employs expert interviews. Through the exploration, designers define a vision of the future. Mercedes-Benz, for instance, defines the future scenario “City of the Future 2030+.”

Then, in the second activity, all the companies use an iterative way to generate, select, and refine ideas. Through this iteration, they create a concept supported by a narrative. All the companies indicate that they use sketching and prototyping as the method of generating ideas. The team produces sketches and mock-ups as a result of several creative activities. Unlike the other companies, the three automakers sketch the exterior and the interior separately and make scale models of the exterior to generate and then select ideas. Additionally, Philips “looks for disruptive narratives that connect the issues” and Ikea uses storytelling “to turn stories into concepts.”

At the end of this activity, the team selects the final concept, details it through CAD models, and makes a final prototype. Unlike the other companies, Philips says that they “produce a provocation in the form of a video and a physical materialization.”

All the companies exhibit the vision concepts to the public at external shows. All of the design teams produce press kits for journalists. The kits include texts, images, and video(s) that present the vision concept in its context. According to Philips, “an exhibition can stimulate debates and generate ideas.”

Volvo, Ikea, and Philips use the vision concepts in private workshops and presentations with managers. Ikea is the only company that mentions another phase where they “take forward these ideas” for use in “product development for the future.”

DISCUSSION

Our findings show that vision concepts are tangible prototypes and future narratives used for exploration by sharing. To research and discuss new strategic ideas for innovation in the future with an internal and external community. These concept prototypes with a future narrative, as outcomes of design research about the future, are part of a dedicated portfolio outside of the commercial portfolio. The concept prototype is not intended as a production prototype nor will it be sold.

Concerning the purpose of the vision concepts, the findings suggest that they are a way to stimulate the creation and exchange of ideas with consumers, opinion leaders and innovation team players inside and outside the company, which insight adds to the initial identification by Stacey (2001) and Reid and Brentani (2012) in regards to the importance of sharing visions. Showcasing the vision concept also aims to contribute to a positive brand image regarding a specific brand value.

Vision concepts are shared at three different context levels, public, in-company, and team. Unlike commercial products, which are part of a NPD project that is kept confidential from the public, the tangible prototypes of vision concepts are shared both in-company and with the public on shows and on-line videos.

According to our evidence, this process of future exploration is led by a research question and developed by a highly skilled team. Designers were part of all concept visioning teams and in some of them also a brand and communication professional and an engineer were involved.

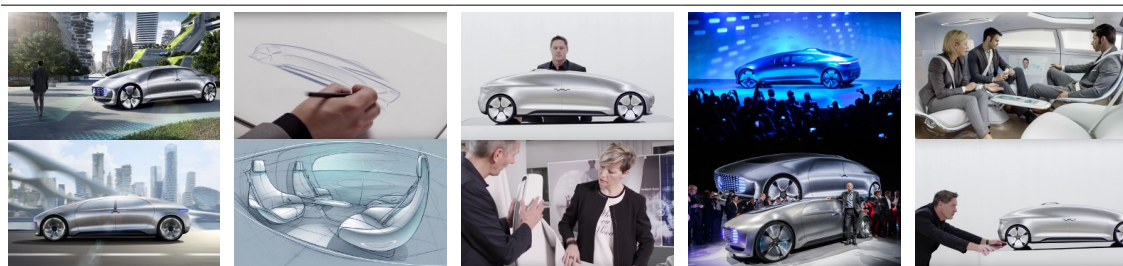
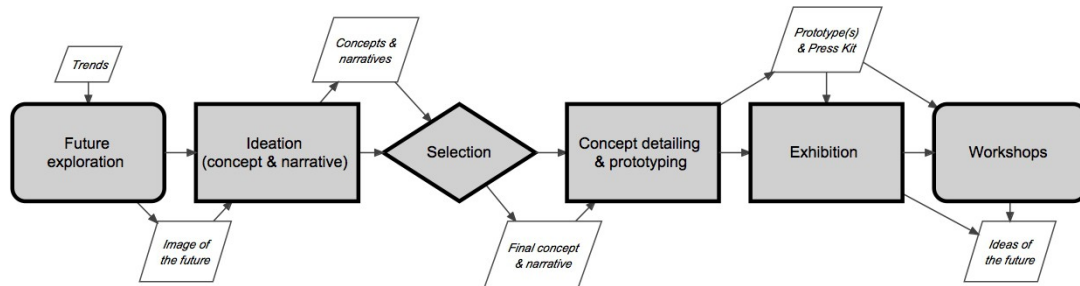
Grounded in our evidence, we suggest that the design of a vision concept is not a simplified NPD process for full-scale production, as Styhre, Backman, and Börjesson (2005) and Santamala (2006) suggested. Instead, the design process appeared to be part of a special exploration project that yields a conceptual solution, as Berlitz and Huhn (2005) and Lv and Lu (2012) stated, and has a strong focus on communication.

As a first guiding principle for the design of vision concepts, we suggest dividing the process into five activities. The diagram below presents the concept visioning process, including the purposes, the activities, and the inputs and outputs.

In the first part of the process, the *(i) future exploration*, the design team conducts an inquiry through interviews, focus groups, and observations to uncover trends and then create an image of the future. Through these activities, designers identify future opportunities and risks, define a domain, and formulate a research question. This is similar to the first part of the ViP method (Hekkert & van Dijk, 2011) that includes the design of the future context by establishing a domain and timeframe, generating context factors, structuring the context, and defining a vision statement.

In the second part, the *(ii) concept and narrative ideation*, the design team creates several ideas through sketches and short storylines, which are based on the output of the first step, the image of the future. Then, the team *(iii) selects* one concept and narrative from this initial idea, one that fits well within the predefined domain. The design of the narrative is somewhat distinctive, especially because the story is about the future vision

and not just about the description of the product. In some way, this step is similar to the definition of a vision statement proposed by Hekkert and van Dijk (2011). The statement explains the desired relation between the product(s), people (including users and other stakeholders), and their context.



Purpose

<p>The goal of this step is to identify – future– context factors (e.g. trends, emerging themes, etc.).</p>	<p>The aim of this step is to design the vision concept (the -system of- products and the interaction between the users and the products).</p>	<p>The goal of this step is to make the prototype(s) and a press kit.</p>	<p>The aim of this step is to showcase the vision concept externally in a show.</p>	<p>The goal of this step is to conduct workshops to stimulate the debate between different stakeholders of the future.</p>
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Activities

<p>Exploring the domain to (i) define context factors and to (ii) identify opportunities and risks inherent to these factors.</p>	<p>(i) Narrow-down the problem and develops a desired vision as a narrative. Based on the narrative, (ii) exploring a series of ideas through sketches and prototypes and then, (iii) select the final concept.</p>	<p>(i) Making the prototype(s), and (ii) designing and making the press kit (texts, images, and video).</p>	<p>Showcasing the prototypes and the press kit in exhibitions.</p>	<p>Use the prototypes and the press kit, internally, in workshops.</p>
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Deliverables

<p>An image of the future.</p>	<p>A narrative and a refined prototype of the -system- of products.</p>	<p>The final prototype(s) and the press kit.</p>	<p>The exhibition.</p>	<p>A report from the workshops.</p>
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Figure 1: Framework of the design process of vision concepts

The third until sixth part of the process concern the distinctive parallel design of the vision concept and the brand value narrative. Based on the concept and narrative, the design team (iv) *details the concept and makes the prototype(s)* and the press kit, which includes several texts, images, and videos of the vision concept. The prototype and the press kit are then (v) *exhibited* and (vi) *used in workshops* with the managers or other stakeholders.

In sum, the design of vision concepts is a future exploration that closes the loop between two moments in time by two transitions (see Figure 2). The two moments are the present and the future, and the two transitions are the forward loop and the backward loop.

The first activity, (i) the future exploration, corresponds to the *forward loop*; the next two activities, (ii) the concept and narrative ideation, and the (iii) selection, are related to the *future*; the (iv) concept detailing and prototyping activity is related to the *backward loop*; and the last two activities, (v) the exhibition, and (vi) the workshops with managers, are part of the *present*. The moments and the forward loop are equivalent to the ViP (Hekkert & van Dijk, 2011), but the backward loop is distinctive.

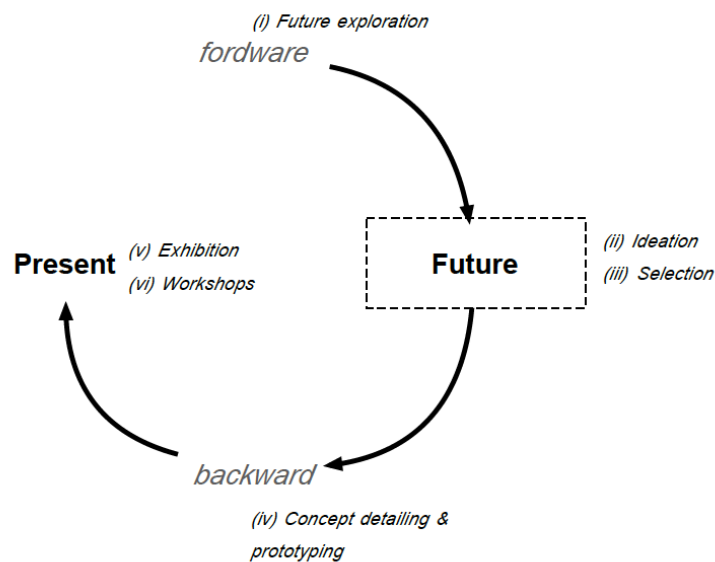


Figure 2. Design principle of vision concepts, future exploration by forward loop, and vision concept creation by backward loop

With the information provided by this study, managers, who work in the field of design and innovation management, can consider concept visioning as a technique to explore the future. Through the application of this technique, companies can acquire capabilities that allow them to be ambidextrous, reaching the ideal balance between exploiting old ideas and exploring new ones.

Managers need to consider that the implementation of this technique requires a highly-skilled team of designers and a substantial investment of resources, but they will obtain a tangible future image, which can help in the discuss of the company’s strategic direction.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This study was limited to five cases in two economic sectors and used documented case data collected online from large industrial companies. To test the framework and extends the findings with additional exchanges between practitioners and scholars in more economic sectors and at small and medium sized companies, for future research we recommend, survey research and additional in-company and public event case research, with interviews.

CONCLUSION

To the initial scholarly work on product visioning, this paper makes three contributions. First, it provides a grounded definition for the vision concept. Second, it reveals characteristics of the sharing context that distinguish concept visioning from other types of concept and new product development. Third, it lays out the groundwork for a concept visioning design technique by introducing a framework. Finally, this paper provides directions for further research to test the framework and extends the findings with additional exchanges between practitioners and scholars.

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