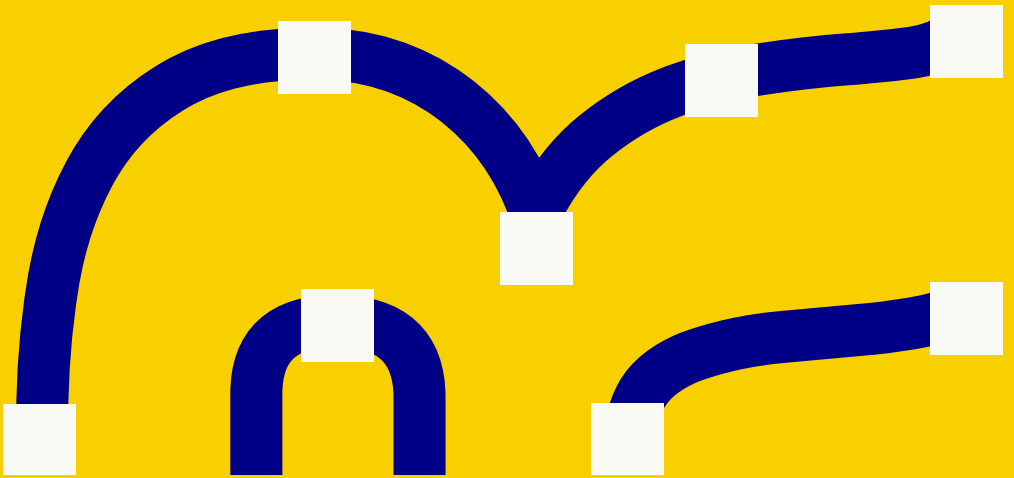


TO GET THERE: DESIGNING TOGETHER

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Foresight by design

Supporting
strategic
innovation with
systematic
futures thinking

Jörn Bühring, Jeanne Liedtka

Abstract

This conceptual paper draws attention to the growing need for organisations to meet the demands of rapid social and technological changes, and to practice foresight at the front end of innovation. While most product or service innovations focus on meeting current market needs (typically over a 1–3-year time period), there is still precious little real understanding in how designers and interdisciplinary innovation practitioners learn to navigate disruption, make sense of complexity, and deal with uncertainty of social and technology environments over the medium and long-term time horizon (5–15 years). Acknowledging the complexity of socio-technological systems, stakeholders in design innovation have to work together to envisage higher order, more innovative, and sustainable solutions that will yield the greatest economic and social benefits (Buhning, 2017; Heskett, 2009; Hines & Zindato, 2016; Liedtka, 1998; Meroni, 2008; Slaughter, 2002). In this paper, we review the strategy, design and foresight literature at both macro and micro levels, with emphasis placed on how interdisciplinary innovation practitioners may engage with the future in order to explore the challenges to decision-making they highlight (Ferraro & Cassiman, 2014). From this review, and a series of facilitators identified by our own design and foresight field research, critical perspectives are presented that illustrate how foresight by design can inform decision-makers of the innovation challenges and opportunities that will emerge over the medium and longer-term time horizon. Consequently, optimising foresight as a core capability may strengthen the organisation's sense of direction and its capacity to innovate in the face of social and technological uncertainties (Kock, Heising, & Gemünden, 2015). Derived from these insights, we set out some hypotheses around the broader role of the strategic design conversation to include systematic futures thinking as a common language and transformational approach to producing visions of preferable and desirable futures. Practicing systematic futures thinking, we argue, will foster sustainable innovations by detecting early warning signals of change and giving deeper insights into the phenomenon behind these signs. Subsequently, applying systematic futures thinking could become concrete knowledge and processes for strategic innovations in product and service industries. This conceptual approach, moreover, will offer important considerations that may help overcome weaknesses in the alignment

of visions between strategy, innovation and foresight functions, which is the purpose of design thinking and practice.

Theme: Innovation

Keywords: strategic innovation, foresight, futures thinking, managing uncertainty, preferable futures

1. Introduction

In this more competitive second decade of the 21st century, meeting the demands of rapid social, technological and environmental change is forcing continued attention to the organization's vision and strategic direction of dealing with uncertainty (Hamel & Valikangas, 2003). Global economic integration (or globalization) is only one of the many challenges facing organizations in an ever-more interconnected social, technological and environmental world, where no firm can retain a competitive edge independently of others (Ireland & Hitt, 1999). Derived from comprehensive research into the drivers of uncertainty involving business leaders (see Ferraro & Cassiman, 2014), Cassiman (2015) argues that the drivers of uncertainty (globalization, digitization, communitization and politicization) have a direct impact on the innovation eco-system.

Indeed, across the literatures of strategic management, foresight and design, extensive references have been made to the external business environment as a major source of uncertainty for strategic decision-making (Hamel, 2002; Heskett, 2009; Hofer & Schendel, 1978; Rohrbeck, Battistella, & Huizingh, 2015; Slaughter, 2002). In business, the purpose of strategic planning is to assess a current status against a set of environmental factors, thus determining an organizational roadmap (mission goals) based on a vision for the future (Kaplan & Beinhocker, 2003). The success of a strategic plan is reliant on adequate information that informs the objectives, strategies, decision-making, and measuring of results against a set of goals (Miller & Cardinal, 1994). The lack of certainty is derived from a state of having limited knowledge over the existing externalities, the future outcome, or possible outcomes (Simon, 1955). Furthermore, the limitation of strategic planning is often based on strategic decisions, which are primarily derived from interpreting information about the past and present (Mintzberg, 1994).

Developing an organization's strategic innovation direction against a rapidly evolving business environment, might pose further challenges;

for example, Clark and Fujimoto (1991) have argued that the process-driven approach to strategic planning can impose constraints on creativity and imagination of new innovations. Comparably, studies in the field of strategic management have identified that strategic planning and strategic thinking are two distinct thinking modes. That is, strategic thinking is intuitive, experimental and disruptive, and applied to create scenarios which help formulate a vision of where the organization should be heading (Heracleous, 1998; Liedtka, 1998). Hence, creativity and imagination ought to be considered as important factors when the objective is to detect emerging opportunities, or threats, resulting from macro drivers of change in a company outside environment.

Across nearly all sectors of the economy, the axiom is that organizations have to respond to change in fundamental new ways if they are to be successful in the future. Irrespective of a disciplines' spoken language: Designers speak of solving "wicked" problems, biologists talk of complex adaptive systems, behavioural economists focus on evolutionary growth theory; "...behind all of these differences in nomenclature lies a wide-spread suspicion that the mechanisms that ensured survival and indeed prosperity in a stable and predictable world – ones based largely on hierarchical control – are likely to be ill-suited to an increasingly complex and uncertain new one" (Liedtka, 2017, p.23). In spite of the wide-spread acknowledgement of growing uncertainty over the rapidly changing external macro-business environment, however, a certain consensus seems to exist that most product or service solutions continue to be informed by current market needs, and over the short-term (1–3 year) time horizon (Heger & Rohrbeck, 2012; A. Wilkinson, Mayer, & Ringler, 2014).

More recently, this development has prompted a call for business leaders and educators to become more forward-thinking, and to develop the organization's innovation and creative capabilities to remain feasible in the long-term (Kock et al., 2015; Koen et al., 2002; Van der Laan & Yap, 2016). That is, making decision based on simply projecting today's market trends into the future is no longer possible (Saritas & Smith, 2011; Vecchiato, 2015).

In this paper, we review the literature spanning a diverse set of disciplines at both macro and micro levels, with the emphasis on how innovation stakeholders may engage with the future in order to explore the challenges to decision-making they highlight. From our review, purposefully across design and foresight disciplines, we draw attention to our limited understanding of how designers and interdisciplinary innovation

practitioners learn to navigate disruption, make sense of complexity, and deal with uncertainty to envisage the medium and longer-term futures (5–15 years) of social and technology environments (Figure 1). Derived from our own previous design and futures thinking field research, key conceptual foresight facilitators are identified, which form the basis for systematic futures thinking approaches directed at the front end of innovation.

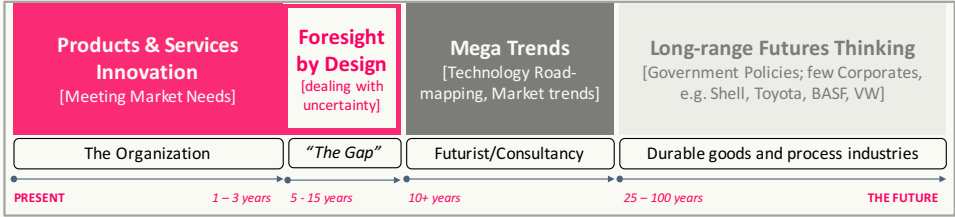


Figure 1. “Foresight by Design” – addressing the ‘systematic futures thinking gap’ across the medium to longer-term time horizon

2. Foresight by design - context and definition

The contribution of our conceptual paper is to stimulate awareness of the strategic and collaborative function of “foresight by design”, which we define as systematic futures thinking of preferable and desirable futures, thus embracing uncertainty with action-provoking synthesis (futures scenarios) envisaged from the dynamics of society and technological advancements (Buhring, 2017; Buhring & Koskinen, 2017; Liedtka, 2017). We deliberately used the term “futures thinking” to embrace a common language between multi-disciplinary stakeholders applying design thinking methodologies to problem-solving, and foresight techniques designed to inform strategic opportunities for innovation that build on shared visions of preferable or desirable futures.

Specifically, we argue that the decision-making process applied to the front end of innovation can benefit from systematic futures thinking across the medium and longer-term time horizon (5–15 years). That is, dealing with uncertainty by collecting intelligence and analysing choices to minimize the risks inherent in the innovation process (see Simon, 1955), also presents opportunities for systematic futures thinking of alternative futures that are sustainable in the face of social, technological, and environmental challenges in this 21st Century. In this context, futures thinking can be seen as types of activities focused on detecting medium to longer-range opportunities and possibilities for strategic innovation,

as the ‘results from foresight [deliver] an important feed into the innovation process’ (Rohrbeck, 2012, p. 445).

3. What is the role of Design in business and innovation?

Though originally focused on the new product development field, the role of design in business has gradually expanded beyond merely creating and communicating better products and services. Design is now being understood by its totality of activities in form of competencies and capabilities that span across the entire innovation eco-system, involving interdisciplinary stakeholder teams responsible for creating sustainable value propositions that ensure the organization’s future (Bohemia, Rieple, Liedtka, & Cooper, 2014; Buhring, 2017; Heskett, 2001; Lojacono & Zaccai, 2004). The expansion of design as a strategic capability in business and innovation, is often addressed through strategic (or advanced) design activities which enable the designer to consider hard constraints imposed by an organization (internal environment), against ecological and social impacts, and the cultural sensibilities and symbolic meaning that inform scenarios of external environments in a rapidly changing society (Daalhuizen, Badke-Schaub, & Batill, 2009; Meroni, 2008).

Strategic design, for example, has played a key role in Product Service Systems (PPS), shifting the innovation focus from product design to an integrated product-service solution (Manzini & Vezzoli, 2003). More recently, globalization, technological advancements and increasing business complexity have placed new demands on strategic design to go beyond satisfying short-term innovation goals (Manzini & Meroni, 2007). Design principles applied in the development of an organization’s future-orientation, have positioned strategic design as an organizational competence that looks beyond one-time creative outputs (products or services), toward design as an organizational activity that can lead to sustained innovation and competitiveness (Boztepe, 2016; Heskett, 2001; Mozota, 1998). In related research (Buhring & Koskinen, 2017), we identified specific design practices developed to deal with the future. These, for example, build on studies of extreme users inspired by von Hippel’s notion of lead users (Djajadiningrat, Gaver, & Fres, 2000), practices in crowd-sourcing (Kurvinen, Koskinen, & Battarbee, 2008), and experience prototyping techniques (Buchenau & Suri, 2000). A recent trend in design is also propounding fiction as a way to envisage or create futures (Bleecker, 2009; A. Dunne & Raby, 2013).

Concurrently, progressive organizations over the past two decades have noted the favourable use of design principles applied to problem-solving, sparking the popularity of design thinking processes and applications toward transformative innovations in a global economy (D. Dunne & Martin, 2006; Liedtka, 1998; Oster, 2008). Indeed, while the value of design thinking is almost always seen to be improvements in the creativity and usefulness of the solutions produced, the methodology has further potential for unifying interdisciplinary stakeholder conversations that enhance a collective's ability to align, learn, and change together (Liedtka, 2017). In coupling these perspectives, the hypothesis is that systematic futures thinking activities can offer decision-makers a holistic view on looming issues. The role of design, particularly its creative thinking, scenario building, visualization and prototyping competencies, may help produce tangible images that further advance collective visions of futures as preferable and desirable (Buhring, 2017; Buhring & Koskinen, 2017; Heskett, 2001; Koh, Slingsby, Dykes, & Kam, 2011; Manzini & Vezzoli, 2003). That is, the advantages of futures thinking applied at the front end of innovation, can lead to the creation of future value, and the development of perceptions about futures that may inform decisions or strategies needed to prepare for alternative possibilities. While most organizations fail to look beyond a narrow set of factors, evidence suggests that firms who have recognized the powers of futures thinking and strategic design approaches as an important resource in the innovation process, are indeed those who achieve sustainable competitive advantages (Grant, 2010; Heskett, 2009; Mankoff, Rode, & Faste, 2013; Martin, 2009).

4. What is the role of Foresight in business and innovation?

The foresight discipline encompasses a wide range of approaches and activities designed to help business stakeholders deal with uncertainty (Inayatullah, 2008). Slaughter (2002), in Voros (2003, p.4), positions foresight applied in business as a pragmatic approach to addressing the strategic questions of how to survive in an increasing competitive environment. Foresight methodologies use techniques such as macro trend analysis and expert knowledge to explore alternative futures (Figure 2) and classify them into *possible*, *plausible*, *probable*, and *preferable* (Hancock & Bezold, 1993; Voros, 2001).

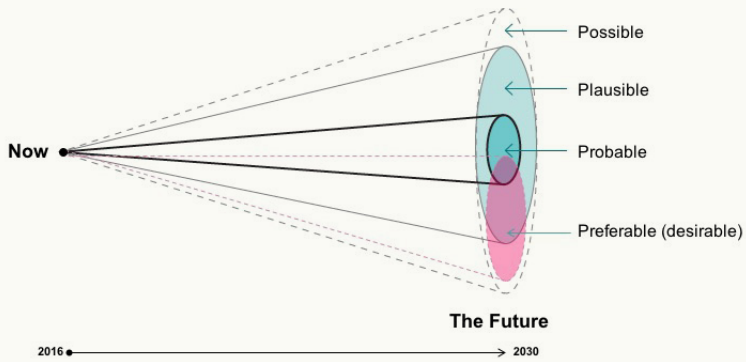


Figure 2. The “future cone” – adapted from Hancock and Bezold (1993)

The very objective of foresight is to consider different ways (alternative futures) in which the external environment may evolve over the next 5–15 years, or even longer (Dator, 2009; Slaughter, 2002; Voros, 2003). To illustrate its significance, designers and interdisciplinary innovation stakeholders may ask, “what would the response to uncertainty have to be if a future were to unfold that was distinctively different from the one anticipated in the current strategic innovation plan”? Foresight methodologies express these type of inquiries in form of futures scenario statements that help prepare for, or actively shape the future, and these methodologies are usually qualitative rather than quantitative in nature (Cuhls, 2003).

The practice of foresight is effective when decision-makers let go of their subjective views of reality (i.e. emotions, personal judgement), and align these more closely between the objective reality (fact-based, measurable and observable) and possible futures (Mietzner & Reger, 2005). In other words, thinking about different possibilities through futures scenario building, allows decision-makers at the strategic end of innovation to envisage different futures possibilities and outcomes. Consequently, a systematic approach to futures thinking is based on futures scenarios that explore holistic, integrated, and alternative futures, enriched through design as tangible images of how preferable and desirable futures might be shaped. Contrary to the conventional practice of extrapolating trends from the present (i.e. forecasting), futures scenarios are speculative images of preferable and desirable futures that form a necessary foundation of the scenario planning process (Slaughter, 2000; L. Wilkinson, 1997).

Consequently, combining design and foresight principles may help decision-makers deal with the uncertainties through futures scenarios and tangible images based on different possibilities, and then selecting and integrating the most preferable and desirable futures in the strategic innovation planning process.

5. Design and foresight as an evolving relationship

In seeking opportunities to link futures thinking capabilities to strategy and innovation, scholars have identified parallels in the fields of design and foresight (see Buhring & Koskinen, 2017; Evans, 2012; Hines & Zindato, 2016; A. Wilkinson et al., 2014). Describing such parallels between the foresight and design disciplines (Hines & Zindato, 2016), Hines (a futurist) and Zindato (a designer) identified and analysed the common use of scenario building practices in anticipating alternative futures. In design practice, typically, scenarios are developed to communicate, validate and endorse design decisions about user actions in the micro scale product and service development context (Evans, 2003; Martin, 2009). Comparatively, in foresight, scenarios are developed as stories about alternative futures at macro scale, or across whole systems (Hines & Zindato, 2016; Rasmussen, 2005).

In design practice, more commonly the use of scenarios at varying stages of the innovation process is closely aligned with detecting insights from users addressing their current needs (Martin, 2009). While in foresight practice, scenarios are used to create stories about how futures might or could develop, and what should be done to prepare for these eventual changes in the organizations' surrounding environment (Chan & Daim, 2012; Slaughter, 1995). This can also be visualized based on the aforementioned future cone (Hancock & Bezold, 1993), where the design thinking realm is concerned with scenarios based on identifying current user needs (1–3 year time horizon), while futures thinking is needed anticipating future scenarios based on opportunities that may inform consumer needs they cannot articulate – or may not yet know they want and desire (Figure 2).

Consequently, across both fields an obvious relationship evolves around the use of scenarios as evidence-based narratives, which are ultimately designed to help innovation teams, and their organization, identify and make better informed choices. To this end, the linkage between foresight and design principles become hybrid futures thinking

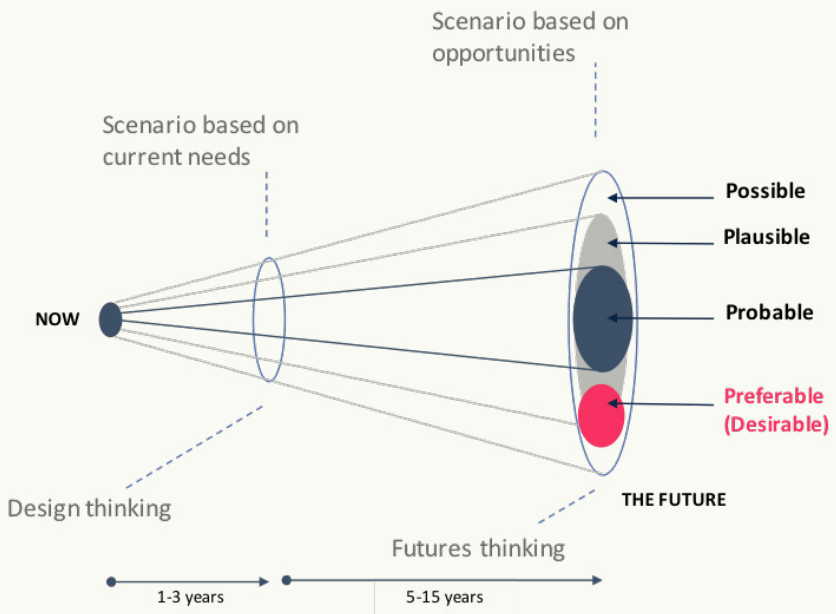


Figure 3. Design and futures thinking scenario transitions along the “future cone” – adapted from Hancock and Bezold (1994)

techniques that inform both the “what?” is changing over the medium to longer-term horizon (5–15 years), and the “how?” this may translate into creative and innovative images and narratives of possible futures.

As design and foresight are growing closer together (Buhring, 2017; Evans, 2012; Hines & Zindato, 2016), a deeper understanding is needed in how designers and interdisciplinary innovation team may apply, and benefit, from systematic futures thinking (approaches, tools, and techniques), and how inter-disciplinary innovation teams may collaborate with overlapping disciplines in framing desirable and shared visions of futures (plural = many possibilities).

6. Key conceptual futures thinking factors

Derived from cross-disciplinary insights, and our own research in design and foresight studies, the hypotheses around the broader role of the strategic design conversation, is to include systematic futures thinking as a transformational approach to producing visions of desirable futures. Resulting from theoretical and applied field research, a series of conceptual “high-level” futures thinking factors were identified:

6.1 Achieving insight and alignment around current reality

Though the future might appear to be the most logical initial emphasis in foresight work, one contribution of strategic design to foresight is to insist on grounding discussions of the future in an immersion in the reality of today, with a focus on both gaining deep and novel insights into today's challenges and customer pain-points, and establishing alignment across critical stakeholders about key elements of the present situation. This aims to accomplish two ends. The first is to facilitate reframing of the initial question, by challenging decision-makers to examine the assumptions they are bringing into the definition of the problem itself. The second is to work towards aligning the views of key stakeholders around critical design criteria that describe the ideal future.

Case study example: In a recent 2030 futures study involving a heterogeneous group of industry experts in the financial services sector (Buhning, 2017), the Delphi method was used as a basis for foresight. In the first Delphi survey round, the objective was to ignite a conversation around the prevailing innovation system, and probe deeper into what defines the current “status quo”. Data analysed at the end of this survey round provided important insights as to which products and services are considered as drivers of continues growth. Similarly, the data highlighted that the focus was placed on innovations addressing current customer needs. Due to the diversity of participants in both their backgrounds, perspectives, and experiences, a broad range of opinions were recorded as to what are the signs of change that would have impact on the organization. Hence, establishing what is going on today, and aligning the perspectives across relevant stakeholders in the innovation eco-system, befalls as an important factor in initiating and practicing futures thinking (see Curry & Hodgson, 2008; Morrison & Wilson, 1997).

6.2 Facilitating a productive design conversation

An important goal of the design conversation is emergence: the development of previously unseen *possibilities* that emerge when a group of stakeholders with diverse perspectives is involved in a generative conversation, in contrast to an evaluative one where the starting point is a set of existing identifiable options. In order to accomplish this, the conversation must achieve two things: (1) finding a blend of inquiry and advocacy

and (2) leveraging the diversity within the conversation to produce higher order solutions rather than divisive debates. The two are closely related. The way to turn theoretical diversity into actual creativity is to change the nature of the conversation itself to incorporate an increasing role for dialogue as well as debate, for inquiry as well as advocacy. Participants in such conversations listen to understand rather than argue and listen for possibilities rather than weaknesses. Design thinking's tools for collaborative problem solving can assist the search for higher-order solutions by offering a structured process in which that dialogue and inquiry occurs, and where divergent views are surfaced and explored, rather than relying solely on the skills of the leader of the conversation.

Case study example: Resultant from the aforementioned 2030 futures study (Buhning, 2017), a series of futures scenario statements were produced as consensus toward the Delphi panels' combined vision of preferable or desirable futures. From this research, a subsequent study phase was initiated to expand on the stories and narratives contained in each scenario at a deeper level, thus moving the design conversation from information gathering, to processing the inherent cues for specific potential new futures. A key observation in this study phase was noticed by designers and interdisciplinary innovation practitioners who questioned the dominant business logic, which in context of the traditional financial services business and operating model, was considered in conflict between the embedded present and these imagined futures.

6.3 Specifying a portfolio of desirable futures

Whereas scenario building might tend to focus on possible and plausible futures, design brings a strong emphasis on specifying a set of preferred futures. In this way, its intent lies more with shaping the future than merely responding to it. Like scenario planning, the emphasis is on optionality – specifying a range of different future options. Design also suggests that new futures, in order to become realities, must be *experienced*, rather than merely *thought*: they must be more than cognitive, they must be vivid, personally meaningful, and compelling to the members of the organization who must adopt new behaviours in order to execute them. The idea of experiencing a new future in an emotional as well as cognitive way is grounded in an interpretive, socially constructed

perspective, rather than an objectively rational one. One core dilemmas in moving an organization into a new future, then, is how to make new ideas tangible. Architects build models, product designers construct prototypes – but prototyping a new future is more challenging to envision. This is where design’s emphasis on visualization tools like storytelling contribute to foresight work.

Case study example: An enterprise software firm used design thinking to explore and discuss potentially disruptive changes in their industry. The company melded design thinking’s emphasis on visualization and storytelling with traditional approaches to strategic foresight in order to compose and communicate new strategies. Carefully constructed prototypes told the story of the strategic imperative they faced at varying levels of detail – from the high-level warning of the potential obsolescence of their core capabilities to the plight of a salesperson responding to a customer’s pricing request. From executive dashboard to salesperson’s inbox, the connections were illuminated. The prototypes not only engaged; they clarified, allowing people at different level to better understand the specifics of how the new futures impacted their roles and activities.

7. Conclusions

Practicing systematic futures thinking will foster sustainable innovations by detecting early warning signs of change and giving deeper insights into the phenomenon behind these signs. Thus, applying systematic futures thinking could become concrete knowledge and processes for strategic innovation in product and service industries. However, as we have highlighted in this conceptual paper, there is still precious little real understanding in how designers and interdisciplinary innovation practitioners learn to navigate disruption, make sense of complexity, and deal with uncertainty to envisage the medium and longer-term futures (5–15 years) of social and technology environments.

The conceptual approach of “futures thinking” at the front end of innovation, may also offer important considerations that can help overcome weaknesses in the alignment of visions between design and foresight functions applied to innovation, which is the purpose of design thinking and practice. Consequently, we acknowledge the ever-growing need for innovation, design, and foresight stakeholders to work closer

together to both envisage higher order, more innovative and sustainable solutions that will yield the greatest economic and social benefits (Buhring, 2017; Heskett, 2009; Hines & Zindato, 2016; Liedtka, 1998; Meroni, 2008; Slaughter, 2002).

To this end, we have put forward some hypotheses, which suggest that systematic futures thinking activities can offer decision-makers a holistic view on looming issues, and that the role of design (creative thinking, scenario building, visualization, and prototyping competencies), offers a transformational approach to producing tangible images (visions) of preferable and desirable futures. While there are many methods in design and foresight disciplines relevant to opportunity identification, the value of systematic futures thinking is based on the strategic use of producing visions of preferable and desirable futures (scenarios), which can help inform decision-makers of the innovation challenges and opportunities that will emerge over the medium and longer-term time horizon (Buhring, 2017; Buhring & Koskinen, 2017; Kock et al., 2015).

The review of the design and foresight literature, and knowledge gained from our own applied field research, have identified key conceptual futures thinking factors that can assist interdisciplinary innovation stakeholder teams integrate systematic futures thinking at the front end of innovation process. At a conceptual level, the determining factors are based on “current reality”, “design conversations”, and “establishing new futures”, which will enhance the active experimentation and execution stages at the strategic end of innovation.

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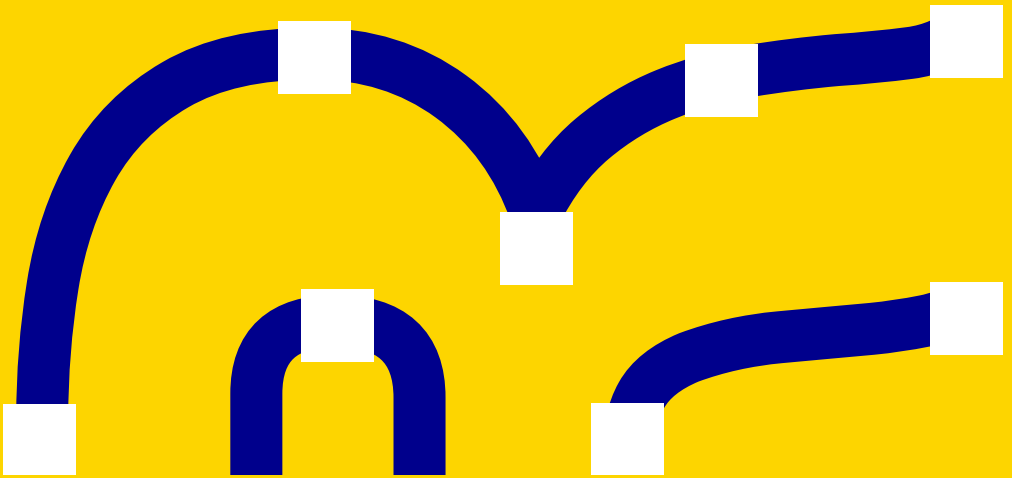
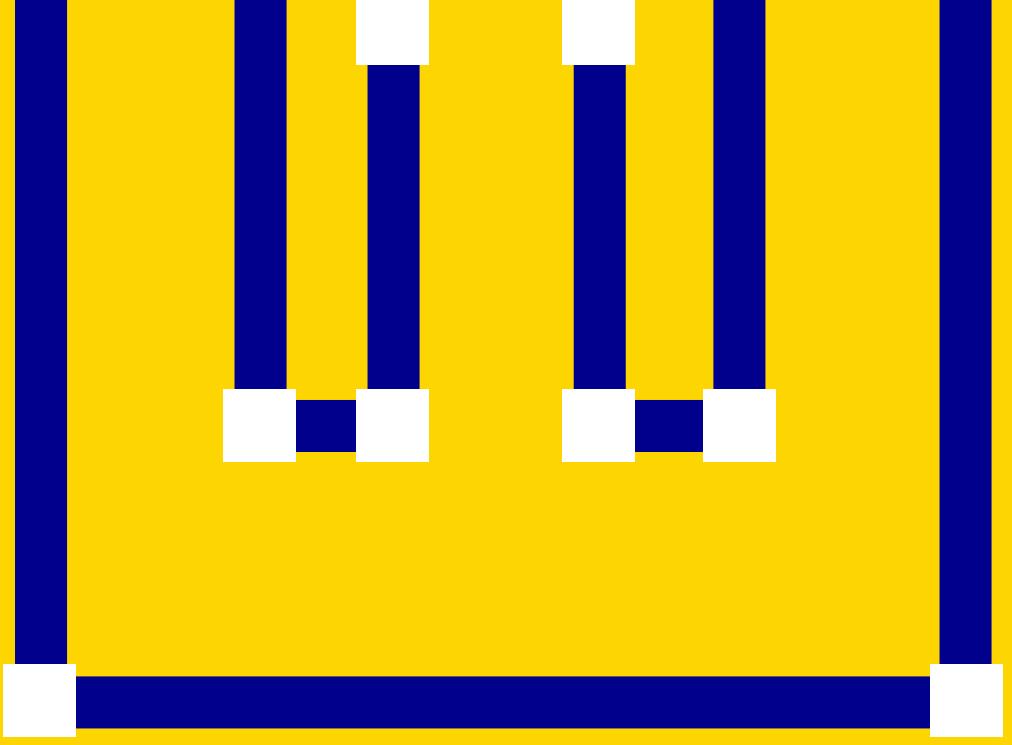
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