REVISTA DESIGN & TECNOLOGIA
ISSN: 2178-1974
2019, Vol. 09, No. 19
DOI 10.23972/det2019iss19pp01-17

PGDESIGN
www.pgdesign.ufrgs.br

Prospective Research and Design Management: Fostering Meaning-Driven Innovation

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ABSTRACT

This paper presents an exploratory and descriptive study on the use of prospective research applied to design management to generate meaning-driven innovation. Innovation has been used as a key strategy for continued corporate growth in the competitive market. However, in most cases, innovation is usually the result of either technological change or traditional market research. The former requires substantial time and investment, while the latter relies only on the needs articulated by today's consumers, which limits innovative outcomes. An alternative but strong approach to producing innovation is the use of prospective research since it anticipates future consumers' needs. Designers, however, lack of information on how to manage their work in order to foster meaning-driven innovation, and they must seek out emerging opportunities using prospective research. Therefore, this study proposes guidelines to improve corporate design through the use of prospective research to foster meaning-driven innovation. This study includes a literature review with systematic and unsystematic phases, followed by an analysis that resulted in a set of preliminary guidelines. The Delphi method was then applied with questionnaires sent to specialists and experts in order to validate the findings from the literature review. Based on these preliminary results, a list of guidelines was established for the strategic, tactical-functional, and operational levels of design management and are offered herein in the hopes of improving the ways in which prospective research is used within design management to generate meaning-driven innovation.

KEYWORDS

Design Management;
Product Design Innovation;
Meaning-Driven Innovation;
Prospective Research

Estudos Prospectivos e Gestão de Design: Busca por Inovação Guiada por Significado

RESUMO

Este trabalho apresenta um estudo exploratório e descritivo sobre o uso da pesquisa prospectiva aplicada à gestão do design para gerar inovação orientada pelo significado. A inovação tem sido usada como uma estratégia chave para o crescimento e manutenção de empresas no mercado competitivo. No entanto, na maioria dos casos, o desenvolvimento da inovação é geralmente baseado na mudança tecnológica ou na pesquisa de mercado tradicional. A primeira necessita de investimento consistente e tempo e a segunda depende apenas das necessidades articuladas pelos consumidores atuais, o que limita os resultados inovadores. Nesse contexto, como abordagem alternativa, a pesquisa prospectiva é considerada uma estratégia em potencial, pois antecipa as necessidades futuras do consumidor. No entanto, visando o trabalho do designer, há uma falta de informação sobre como gerenciá-lo para promover a inovação de significado, buscando oportunidades emergentes por meio do uso de pesquisas de prospecção. Assim, este trabalho visou uma proposta de requisitos para aperfeiçoar a gestão do design nas empresas, utilizando-se de pesquisas prospectivas para fomentar a inovação guiada pelo significado. Primeiramente, a pesquisa foi realizada por meio de uma revisão bibliográfica, com fases sistemáticas e assistemáticas, seguida de sua interpretação e análise, que resultou em diretrizes previas. A partir delas, um método Delphi foi conduzido com especialistas, gerentes e designers, para validar a revisão. Confrontando os resultados anteriores com a visão dos especialistas, o trabalho propõe uma lista de requisitos para os níveis estratégico, tático e operacional da gestão de design. Eles pretendem fomentar o uso de pesquisas prospectivas dentro da gestão de design para gerar inovação guiada pelo significado.

PALAVRAS-CHAVE

Gestão de Design;
Inovação em Design de Produto;
Inovação de Significado;
Estudo Prospectivo

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1. INTRODUCTION

This study presents a set of guidelines for the inclusion of prospective research to support meaning-driven innovation in design management. Innovation is currently a frequent topic in political and economic debates and one of the only defenses against fiercer competition (HAMEL, 2012). Furthermore, companies must have the ability to adapt and progress, because innovation is now the basis for change (TROTT, 2012), and "without ceaseless innovation, success is ephemeral" (HAMEL, 2012, p.51). Moreover, design management seeks to integrate design as a core competence within companies (KISTMANN, 2001) and as a way to enhance competitiveness through added value (MOZOTA, 2003).

As other authors have argued, a necessary consequence of innovation is consumer acceptance of new products or services (HAMEL, 2012; TROTT, 2012). According to Norman and Verganti (2012), people select products and services not only for their usefulness, but also for emotional, psychological, and sociocultural reasons. The social and symbolic values of products are therefore highly relevant. Ideas such as these show that the concept of innovation can be much more comprehensive than simply new technologies and the functionalities arising from them.

These nuances of innovation represent one of the issues for which designers assume an essential role, since design professionals are responsible for the intangible aspects that lead to meaning-driven innovations for consumers (KISTMANN, 2001; NORMAN, VERGANTI, 2014; RONCALIO, 2015; FIALKOWSKI, KISTMANN, 2016; VERGANTI, 2018).

In this respect, a potential way to translate the intangible, which the consumer does not typically articulated in traditional market research, is through the study of consumers' less explicit needs and aspirations (VERGANTI, 2008; VERGANTI, 2018). In order to forecast new trends in consumer behavior, it is important to build knowledge and link it to supporting market research data on consumer behavior in order to better understand the forces guiding the future. These types of findings on consumer behavior can support decision-makers in developing innovation-based strategies (MARGOLIN, 2007; SANTOS et al., 2010).

The information necessary to foster innovation can be obtained through prospective research, which provides a way for consumers to provide suggestions and for designers to anticipate consumers' future lives, styles, and behaviors. Prospective research may indicate future scenarios that can generate conclusions in the present, which can then be reflected in design solutions for the future (MARGOLIN, 2007; BURDEK, 2006; JAYME, 2009). Thus, design and innovation are connected by prospective research, because these factors converge to the same point: consumers, and, more specifically, the translation of their latent and non-articulated needs into innovative ideas driven by meaning (MOZZOTA, 2003; MENDES et al., 2016).

Design management, meanwhile, is concerned with the planned implementation of design as a formal program of activities within a company, in order to "promote understanding of the relevance of design to achieve long-term corporate goals and the coordination of design resources on all levels of corporate activity to achieve its goals" (MOZOTA, 2011, p.95). As companies come to understand the potential of design for innovation, they see design management as an important resource for building a sustainable competitive advantage (ibid.).

Verganti (2008; 2018) demonstrates the ways in which the design process contributes to the innovation of meaning, to which prospective research can also contribute. He sees innovation as a cultural creation based on latent consumer yearnings (2008). Verganti and other authors (VERGANTI, 2008; NORMAN, VERGANTI, 2014; RAMPINO, 2011) say that design-driven innovation generates new meanings for consumers and occurs when designers have an understanding of the dynamics of socio-cultural models, which are themselves the roots of behavioral trends. Designers purpose the interpretation and production of a new and significant consumer experience. Thus, companies that are truly innovative take a broader perspective by imagining a new context of use; instead of focusing on the product itself, they consider the type of experience that consumers expect or hope to obtain (NORMAN, VERGANTI, 2014).

However, professionals have not been well prepared to think beyond consumers' current needs or how to create future meaning (VERGANTI, 2018). Designers require early warning systems to alert them to social trends, which may affect their developments, and they need the intellectual tools required to reflect on the meaning of these trends. Furthermore, there is a little in the design curriculum that prepares students to imagine such future scenarios (MARGOLIN, 2007). Moreover, the vast majority of discussions on design-driven innovation are based on the analysis of case studies, rather than on theoretical or practical tools or methods that could aid in the proposal of new meanings using design management (RONCALIO, KISTMANN, 2014).

Despite the importance of adopting new methods to achieve meaningful innovation through design and despite the utility of prospective research to this end, few studies address the relationship between innovation, design, and prospective research. Fialkowski et al. (2018) discuss the application of trend research to design in order to generate innovation. Among the shortcomings presented, they show prospective research is rarely considered in the design process. Although they recognize the importance of this relationship and understand designers as agents of change, research on the systematic use of trend research in design management has been limited.

Therefore, if competitive advantages are only truly sustainable when innovation occurs systemically within an organization, the concept of design in this context should encompass practices that allow for and encourage innovation within design processes (in other words, practices in innovation is incorporated into management processes). More broadly, innovation occurs only when it is intrinsic to the organizational process and is part of a predictable method that is capable of generating profitable growth and sustainable development (HAMEL, PRALAHAD, 1995; TROTT, 2012; HAMEL, 2012).

In this context, the current study sought to establish the most productive guidelines for the use of prospective research in design management to foster meaning-driven innovation. To do so, we first performed a literature review on prospective research and the innovation of meaning within the context of design management; we then created preliminary theoretical guidelines based on the information obtained in the literature review; next, we validated the preliminary guidelines by sending questionnaires to design specialists and designers based on the Delphi method; and finally, we established the final standards/guidelines on how to apply prospective research to design management to foster meaning-driven innovation .

The findings of this article contribute to the understanding of some of the current challenges faced in the field of design management and may be used to improve professional practices involving the innovation of meaning and the systematic use of prospective research as a tool to achieve innovation.

2. USING PROSPECTIVE RESEARCH IN DESIGN MANAGEMENT TO ACHIEVE MEANING-DRIVEN INNOVATION

The systematic and non-systematic literature reviews performed herein considered the topics of design management, prospective research, and the innovation of meaning. Similar reviews addressing at least two of the three topics of interest were also sought. The review of the topics needed to be successfully systematized and the results needed to be analyzed from the point of view of design management. The purpose of the literature reviews was therefore to establish a conceptual foundation to be able to propose general guidelines for the innovation of meaning using prospective research.

As noted previously, the innovation of meaning requires an understanding of the values circulating in the society, in the culture, and in the minds of consumers (CARREIRA, 2016). For this, innovation is established through work that is responsive to trends, which good companies are perceptive to (KELLEY, 2001; DAROS, 2013). Liebl and Schwarz (2010) also considered these topics together and stated that innovation and the study of trends are factors required to gain and maintain a competitive advantage.

It is understood that both innovation and prospective research depend on the market and on consumption habits. Innovation is only achieved when it is enabled and recognized by the market; meanwhile, prospective research seeks to understand the spirit of the current market and consumption habits (SALERNO, 1999; QUANDT et al., 2015). Many authors also agree that attending to the market and differentiating the company within the market are the ultimate goals of the innovation process, and that the consequence of successful innovation is a stronger guarantee of the future of the organization and its success (CASENOTE, VAN DER LINDEN, 2017; CELI, RUDKIN, 2016; RUFF, 2015; FRANZATO, 2011; MONÇORES, MENDONÇA, 2015; PETTERMAN, 2014; CELASCHI et al. 2011; DAROS, 2013; FRANZATO, 2011; JAYME, 2009; MUIR WOOD et al., 2008; BACK, 2008).

It is important to note that the innovation of meaning can be considered to be "market-less," since it is the result of neither consumer requests nor consumer needs. Design-driven innovation processes are therefore not aimed solely at solving specific market problems, but are instead driven by a company's desire to innovate and do not normally translate into a clear and objective request (CELI, RUDKIN, 2016, FRANZATO, 2011).

Thus, it is important that design management be linked to prospective research, with the monitoring of trends and their strategic applications. In this way, it is possible to identify business opportunities and to plan for future products, steps which are ideally involved in brand management and innovation processes (CALDAS, 2004), all of which can lead to the innovation of meaning.

Although strategic design is a larger part of the meta-project phase (SCALETSKY, 2016; LOCKWOOD, 2009; ALBUQUERQUE, 2016; MOZOTA, 2003), it is also crucial in tactical-functional and operational phases to support the objectives of the strategic level.

2.1 From the Strategic Point of View

From the perspective of the strategic level of design management, prospective research and the innovation of meaning converge toward the same horizon, and both contribute to the formation of the central competence (MOZOTA, 2003, KISTMANN, 2001, LOCKWOOD, 2008; MAGALHÃES, 1997). The systematic review sought out similar models and determined that, for the design process to generate innovation, strategic design is crucial; many authors argue that the involvement of the designer in essential in this process (CASENOTE, VAN DER LINDEN, 2017; RUFF, 2015; FRANZATO, 2011; MONÇORES, MENDONÇA, 2015; PETERMAN, 2014; CELASCHI et al. 2012; DAROS, 2013; FRANZATO, 2011; JAYME, 2009; BACK, 2008)

On the strategic level, the designer's role is to promote innovation based on prospective research in a way that supports the corporation's strategic decisions. The process must include interpretation, prediction, and the creation of possible future scenarios from which innovated meaning may emerge (FIALKOWSKI, KISTMANN, 2018; JAYME, 2009; BACK, 2008; CELI, RUDKIN, 2016; CASENOTE, VAN der LINDEN, 2017; FRANZATO, 2011; MOZOTA et al., 2011; JAYME, 2009).

When designers reflect on social trends, on the world as it is, and on the world that could be (MARGOLIN, 2007), their conclusions impact new products, and create new social values, abstractions, and mental syntheses (POMPEU, 2016; MARQUES, 2014; LIEBL, SCHWARZ, 2010; JAYME, 2009; KELLEY, 2001); essentially, designers help to create the *zeitgeist*. Pompeu (2016) and Mozota (2003) emphasize that current market research relies on designers' consequent interpretations and management since designers must ultimately infer trends from changes of consumers' behaviors and attitudes. Thus, designers should be attentive to the classification of tendencies throughout their life cycles (LIEBL, SCHWARZ, 2010) and must be able to detect the transgression phase that occurs before normalization: it is in this initial phase that designers can generate innovations that competitors may not have detected yet.

It should be noted that macro-trends and, in particular, foundational trends and megatrends, should be in the focus of the strategic data used in design management, since they are broad and long-lasting movements that both reflect and create strong sociocultural currents, which ultimately influence societies, culture, and consumption (RUFF, 2015; MONÇORES, MENDONÇA, 2015; PETTERMAN, 2014; BACK, 2008; CALDAS, 2004). Micro-trends, meanwhile, must also be closely monitored: they are sometimes initial signs that can gain space and evolve to an important macro-trend.

Few companies have personnel or departments that perform prospective research. Examples include the Shell Planning Group, Deutsche Bank Research, Toyota Gendai, Strim of Daimler and Volkswagen Future Research (RUFF, 2015). Small prospective research departments are often linked to marketing departments through terms such as "innovation" or "future design." Because it requires more robust and certainly more costly structures, prospective research is not widely used by organizations (ibid.). Regardless of organizational complexity, prospective research is a source of rich material for designers and their creative processes, especially from the point of view of strategic design.

In this context, it is important to understand the technique of constructing future scenarios for detecting and subsequently applying the results of prospective research, thus creating possible visions of the future for strategic decisions. In this way, designers play a key role in product development because they can use possible scenarios to generate strategic proposals and construct them in practice, generating solutions involving products and services (CASENOTE, VAN DER LINDEN, 2017; CELI, RUDKIN, 2016; RUFF, 2015; FRANZATO, 2011; CELASCHI et al. 2012; DAROS, 2013; FRANZATO, 2011; JAYME, 2009; BACK, 2008). Franzato (2011) also points out that the construction of scenarios allows us to identify possible new trajectories for innovation, and it is through these techniques that design concepts are conceived. Therefore, designers can

create visualizations and proposals involving artifacts, which are valuable contributions to innovation processes. Designers and their work improve the innovation itself and increase its chances of success when it is implemented (DAROS,2013).

Existing trends research processes vary in their depth and results (FIALKOWSKI, KISTMANN, 2018a; RIOS et al., 2011; VIDIGAL, NASSIF, 2012; CALDAS, 2004). In most cases, the process involves information on macro-trends and the creation of future scenarios, strategic activities in which the designer must actively participate (BURDEK, 2010). Many authors define the phases in this research as information gathering, the editing of the material, interpretation, and analysis, the development of trend forecasts, and the communication of trends (GONÇALVES, 2012; KIM et al., 2011).

In the case of innovation of meaning, which involves a more distant future, these data are obtained from groups of people who are always attentive to innovations: those known as trend followers and early mainstreamers. In addition, trendsetters, also called trend creators, are considered to be the people who inspire this group, because they do not care about other people's opinions (VEJLGAARD, 2008).

As mentioned previously, an innovation of meaning is not normally pulled by the market, as it is not based on explicit needs. Moreover, within the divisions proposed by Schiffman and Kanuk (2000), "meaning-driven innovation is neither company-oriented nor product-oriented, but rather consumer-oriented. Thus, the innovation of meaning does not have well-defined starting points or orientations. It depends on interpretations and understanding of the subtle dynamics that occur in sociocultural models, resulting in the proposition of new meanings." It can be said that, depending on sociocultural models, such innovation depends directly on prospective research, since it is based on exactly that understanding.

As far as technological innovation is concerned, it has been seen that technology alone is not a determining factor for the innovation of meaning, nor is it a direct response to any trends that may be detected. Consumers never demand the replacement of technology and instead demand solutions to new or latent needs; technology is simply one way to meet these demands and is sometimes necessary to overcome certain barriers (VERGANTI, 2009, 2011, 2012, 2016, 2018; FIALKOWSKI, KISTMANN, 2018b).

Interdisciplinarity is a key factor in corporate strategic design management, as it fosters possible visions for the future. These visions aid in the innovation of meaning, since to innovate is to create new scenarios (KISTMANN, 2014). Thus, meaning-driven innovation emerges when design is strategically placed within a company's management system (KISTMANN, 2001; MOZOTA, 2003; BURDEK, 2010; ALBUQUERQUE, 2016). Interdisciplinarity goes beyond commercial, financial, and technical aspects, and involves dimensions such as strategy, culture, organizational structure, and processes (QUANDT et al, 2015).

The topics considered herein (prospective research, design, and innovation of meaning) are closely connected and are only possible when they are strategically implemented in an organization (KISTMANN, 2001; MOZOTA, 2003; LOCKWOOD, 2009).

Another important fact to mention is that designers themselves may also increase the strategic value of a company, since designers can bring together the identity, goals, and values of the company and serve as entrepreneurs of future innovations (in which case, they may be referred to as strategic designers) (ALBUQUERQUE, 2016). However, some authors (VERGANTI, 2008; CASENOTE, VAN DER LINDEN, 2017) note that it is important to identify preliminary opportunities for new ideas, but also report that the literature on this topic is limited. It can be argued that the potential for innovation of meaning lies at the very beginning of the product development process, which is more focused on intangible and abstract issues (BURDEK, 2010, RAMPINO, 2011, VERGANTI, 2012, DAROS, 2013, RONCALIO, 2015). Therefore, design management should focus on meaningful innovation early in the process. Likewise, Celaschi et al. (2011) and Celi and Rudkin (2016) defend this idea of innovation in the early part of the design process, which they refer to as advanced design (ADD).

ADD is understood as a branch of design that guides and utilizes the designer's conventional tools, practices, and knowledge in long-term projects, or projects directed toward a distant future. According to the authors, ADD concentrates its attention on projects that do not have a specific client and, therefore, seeks stimuli for innovation from extreme situations or far from the project's objective. ADD also focuses on continuous innovation processes in which the designer is not the only creative actor involved and often only helps to chart the path of innovation (CELI, RUDKIN, 2016, CELASCHI, CELI, 2015). ADD is used to anticipate needs and tendencies, to visualize scenarios, and finally, to create a possible solution (CELI, RUDKIN, 2016).

The fuzzy front-end (FFE) or front-end innovation (FEI) are concepts that refer to the pre-initial phase of product development projects that involve processes such as ADD. FFE is the combination of different skills, disciplines, resources, and related knowledge to gain insights to inspire and help to shape a new product or service by adding value. It also involves making sense of the competitive environment, social and individual constraints, and facilitators that foster the acceptance of new products, services, and business models (FERNANDES, 2017).

FFE and ADD can serve as steps in the design process, which is geared toward creating products and services for the future. These products and services are created through the involvement of large groups of people, experts from diverse fields, consumers, and designers. Those who request the project often are often not linked to their own productive sectors. Rarely do these pre-projects have a target market, an industry reference, or a particular customer (CELASCHI, 2000; CELI, RUDKIN, 2016; FERNANDES, 2017).

Therefore, since this study considers the use of prospective research as the main input for designers in the innovation process, an understanding of the professional's role in the early stages of the project, as in FFE and ADD, is essential. Design-driven process management combines a business mindset and a creative mindset (LOCKWOOD, 2009; ALBUQUERQUE, 2016), which allows for pragmatism to be aligned with a search for opportunities while at the same time presenting a creative and entrepreneurial attitude. Thus, design-driven organization is one that facilitates innovation through its management systems, accepting exposure to risks and valuing both experimentation long-term results (MOZOTA, 2011, VERGANTI, 2011, CHRISTENSEN, 2003, KELLEY, 2002).

Finally, in addition to prospective research, this study assumes an understanding of weak signals (or anticipatory signs) market research data and similar terms (competitive intelligence, anticipating strategic intelligence, business intelligence and strategic business intelligence), technological prospecting, and information derived from a large volume of market-based data, such as large datasets (RIOS et al., 2011, VIDIGAL, NASSIF, 2012, JANISSEK-MUNIZ et al., 2006).

2.2 From the Tactical-Functional Point of View

In design management on the tactical-functional level, the role of the designer can be seen as that of a participatory leader in the formation of the knowledge stemming from prospective

research and its possible future scenarios. Designers often serve as integrating and interdisciplinary agents between several areas of the company, and outside the company as external agents. In this way, the decisions made on the strategic level flow to the planning of actions on the operational level (FIALKOWSKI, KISTMANN, 2018; MOZOTA et al., 2011, JAYME, 2009, BEST, 2010; LOCKWOOD, 2009; MOZOTA, 2003). Design on the tactical-functional level largely involves the internal processes developed within organizations, to implement the strategies established and the innovation that was originally sought out (MOZOTA et al., 2011; LOCKWOOD, 2009; MOZOTA, 2003).

Many authors (TIDD et al., 2008; CARVALHO et al., 2011; CASENOTE, VAN DER LINDEN, 2017; FIALKOWSKI, KISTMANN, 2017) understand innovation as a process and refer to this process as "innovation management." In this context, management is understood as an organized set of activities within design, the main result of which is innovation. Bonsiepe (1999) also describes design as a dimension within innovation management. Therefore, design on the tactical-functional level of management shall serve to control and foster the processes involves in prospective research.

Although innovation management theories aid in the organization of innovation-driven activities, they do not describe exactly how preliminary opportunities for these activities are identified, a process which forms the scenarios required for the generation of ideas and concepts (CASENOTE, VEN DER LINDEN, 2017). Instead of putting prospective research on the strategic level, some companies acquire research and ready-made trend books from other companies. It is important to note that, when companies purchase this material and when designers use it as input and inspiration for the generation of future concepts, it usually leads to only incremental innovations. Color notebooks, textiles, materials, samples, patterns that are already in use in certain sectors (fashion, ceramics, beauty, interiors, furniture) are even less relevant. These materials come with major conceptual baggage and trend-based references; the information has already been "decoded" by research suppliers and adapted to the sector in which the material is to be commercialized (JAYME, 2009).

Therefore, the conceptual results and references that underpin the information generated by research institutes and even internally in some companies are that the information is most relevant for design management. The objective of the material is to transmit key concepts and topics resulting from a collection of macro-information on the social, cultural, economic, political, and artistic level (GONÇALVES, 2012).

For radical innovations in which the innovation of meaning is usually embedded, a more flexible management system, referred to as "the third generation," is needed; it relies on parallel steps and does not depend on a sequential structure and (CASENOTE, VEN DER LINDEN, 2017). Research performed collectively is the most suitable for this type of innovation (VERGANTI, 2008; VERGANTI, 2018). Consequently, we can understand that the practices of open innovation and multi- and interdisciplinarity within design management are even more important when it comes to innovating meaning.

It is crucial to recognize the importance of new or more advanced processes in design that use prospective research to support the development of disruptive innovations. Monçores and Mendonça (2015) and Petterman (2014) all discuss the importance of the design process foreseeing prospective research and emphasize that the literature on this topic is lacking. Casenote and Van der Linden (2017) argue that new product development and innovation are inextricably linked. This connection requires that innovation specialists be experts not on a specific product or field, but rather in the design process itself. Franzato (2011) also notes that the process must be fluid, since the phases are closely related. Research and design are inseparable in the meta-project. Celi and Rudkin (2016) state the need for more advanced design processes that can be used in the innovation of meaning. According to these authors, the innovation of meaning often occurs outside the usual productive spheres and in different geographic or cultural contexts.

Studies on medium- and long-term change regard the inclusion of prospective research in design processes as important (LIEBL, SCHWARZ, 2010). Future developments and new offerings, which are the concrete results of innovation, shape companies' identities, which are ultimately defined and decided upon by consumers (MOZOTA, 2003; KISTMANN, 2004). However, although the literature has also identified a relationship between change, prospective research, and innovation, no specific methods have been provided (FIALKOWSKI et al., 2017).

In research on emotional design, Norman (2008) leads us to understand that recognitions of innovations are present on the three levels of affection, behavior, and cognition, which are the visceral, behavioral, and reflective levels. The innovation of meaning is recognized on the behavioral level and, particularly on the reflexive level of consumer perception. It is on this reflective level where consumers grasp the meaning that products represent and determine whether they value the experience. It can also be understood that prospective research works on this level, since it requires an understanding of subtle psychosocial dynamics. These two topics seem to be in ever more frequent collaboration, though there are few academic studies on these relationships in the literature (Fialkowski et al., 2017).

2.3 From the Operational Point of View

On the operational level, it can be understood that the role of the designer is to transform strategic sets and to translate tactical processes into a communicative action through products and/or systems. In this way, the ideas generated on previous levels are made tangible, guaranteeing the operationalization of concepts or meta-concepts involved in the innovation of meaning based on prospective research (FIALKOWSKI, KISTMANN, 2018b; MOZOTA et al., 2011; JAYME, 2009).

To this end, the visual rhetoric (BONSIEPE, 2015, MOZOTA et al., 2011) can be very useful when included in ADD (CELI, RUDKIN, 2016; CELASCHI, CELI, 2015), since possible innovations of meaning can be easily visualized and "tangibilized" through the semantic vision that the designer can express. Design management on the operational level should therefore also involve the appropriate use of creative tools, such as sketches, diagrams, storyboards, mood boards, and mockups, to defend and support ideas given to the company, especially at this stage of the project.

Considering the fact that each level requires its own strategies and tactics, design on the operational level is improved by the use of prospective research within the scope of the project, guaranteeing the progress of the project (or meta-project) toward innovation. On this level, the designer is understood as the executor of design concepts that are consistent with the results of the prospective research and the strategic decisions made based on them. These design concepts can be introduced into the future market or can even be used to create new markets.

Considering the fact that the consumer's perception of the innovation of meaning is mainly on the reflexive level (NORMAN, 2008), it is important to guarantee the realization of the sense of identity and the meaning of the concept of design.

A person's sense of identity in terms of a product is established on the reflective level, and is demonstrated by the pride (or shame) of owning or using that product. Thus, we can understand that the perception of a given product's value is modified by the meaning that it represents. The consumer's attachment is not really with the thing, it is with the relationship, the meanings, and the feelings that the thing represents. In an intentional or subconscious way, self-image is defined through these choices.

3. PRELIMINARY PROPOSAL

Design cannot be understood solely as isolated product design, but more broadly as systematic thinking and actions (BURDEK, 2010); the benefit to this definition is that the organization of design management within companies should can corporate business strategies. When design management is applied to generate innovation of meaning based on prospective research, management must be analyzed through these prisms.

The overall objective here was to define guidelines that enable the use of prospective research within design management to foster meaning-driven innovation. A list of preliminary guidelines was created (Table 1) and validated in order to establish a final set of guidelines.

Table 1 Preliminary guidelines for using prospective research in design management for meaning-driven innovation

STRATEGIC DESIGN	TACTICAL-FUNCTIONAL DESIGN	OPERATIONAL DESIGN
REFLECTIVE OBSERVATION (SEE AND PREVIEW)	ABSTRACT CONCEPT (INTERPRET)	ACTIVE EXPERIMENTATION (SEE)
Corporate dimension: Unique strategic planning, along with **corporate** strategy (MARGOLIN, 2007; LIEBL, SCHWARTZ, 2009, FRANZATO, 2011; JAYME, 2009). *Role of the designer:* The designer serves as a s**ynthesizer** of prospective research and of the knowledge generated by market research and blue skies research. External partners provide knowledge, solutions, new arguments, and interpretations in an iterative and continuous interactive dialogue to achieve innovation of meaning (CASENOTE, VAN DER LINDEN, 2017, FRANZATO, 2011, SCALETSKY, 2016). *Process:* **Transform** the design process following the FFE of the design management system proposed in order to incorporate prospective research in the innovation of meaning. (CELI, RUDKIN, 2016, CELASCHI et al., 2012, VERGANTI, 2012) Insert strategic design into the **strategic** planning of the company using inputs from prospective research to generate innovation of meaning (MARGOLIN, 2007; LIEBL, SCHWARTZ, 2009, FRANZATO, 2011; JAYME, 2009). Focus on a **visionary** corporate culture based on an architecture that may be permeated by continuous input from prospective research and market research. (JAYME, 2009; MOZOTA, 2011; RIOS et al., 2011; VIDIGAL, NASSIF, 2012; JANISSEK-MUNIZ et al., 2006) Align the strategic level of the company with the **qualitative** nature of prospective research and innovation of meaning; the focus shifts from risk management to opportunity management. (MOZOTA, 2011; VERGANTI, 2011; CHRISTENSEN, 2002; KELLEY, 2002; ISAZA, 2018) Continue to **monitor** future signals and weak signals using the tools of prospective research, whether by purchasing material (such as trend notebooks) from third parties or by performing research internally. Market research data can also be used. (BACK, 2008; CALDAS 2004; RIOS et al., 2011; VIDIGAL, NASSIF, 2012) (*) Understand that, although purchasing material from research institutes is less expensive, prospective research developed internally always differentiates said company from the competition. (LIEBL, SCHWARZ, 2010) Distinguish between macro-trends, micro-trends, and counter trends. (MARQUES, 2014; CALDAS, 2004; GONÇALVES, 2012) For the development of innovation of meaning, focus on **macro-trends**: technological, social, behavioral, cultural, economic, environmental, political, and demographic and sustainability. (CALDAS, 2004, BACK, 2008, PETTERMAN, 2014) The results of the prospective research may show the possible meanings that emerge from each trend on the reflective level of future consumers' emotional perceptions. (CELASCHI, DESERTI, 2007, DE MORAES, 2010, SCALETSKY, 2016) **Reflect** upon the results of the prospective research in order to predict the potential of each possible trend and define **future scenarios** within the **meta-project** phase. (NORMAN, 2004, CELASCHI, DESERTI, 2007, SCALETSKY, 2016, TAMEKUNI, 2014) In reflective observation of the meta-project, one must link the information on the macro-trends detected to information on the future environment of the organization (SWOT) to recognize the company's **strengths, weaknesses, opportunities, and threats**. (REYES, 2016, TAMEKUNI, 2014, CELASCHI, DESERTI, 2007, DE MORAES, 2010) Recognize the life cycle of trends and work to detect them before the normalization phase. (MARQUES, 2014; CALDAS, 2004; GONÇALVES, 2012, JAYME, 2009) Create a product roadmap with the strategic department using prospective research, leaving a space for the "market-less" projects that the research will ultimately produce. (CELI, RUDKIN, 2016, VERGANTI, 2012) (*) Be aware of the **socio-environmental and ethical impacts** of strategic decisions based on prospective research. (MARGOLIN, 2007; DAROS, 2013; ALBUQUERQUE, 2016; RUFF, 2015; CELASCHI, CELI, 2015)	*Business size:* Design planning for the implementation of **business** strategies. (MAGALHÃES, 1997; MOZOTA, 2003; LOCKWOOD, 2009) *Role of the designer:* the designer serves as a **participatory leader** in the formation of the knowledge produced by prospective research and in the interpretation of the scenarios constructed. Thus, the designer also serves as an integrating agent, or "hinge," between several departments within the company, which reflects the designer's interdisciplinary and extra-organizational role herein. (JAYME, 2009, CELASCHI, 2008, CELI, RUDKIN, 2016, DAROS, 2013) *Process:* **Coordinate the design process** in order to incorporate the prospective research to obtain the innovation of meaning based on the meta-project. (CELASCHI, DESERTI, 2007; LOCKWOOD, 2009; MOZOTA, 2003) **Coordinate** human, financial, material, and time-based resources within the scope of the business in order to determine the feasibility of meta-concepts. (KISTMANN, 2001, BACK, 2008, DANTAS, 2005) Continue the process by joining the strategic level with the meta-concepts based on interpretation and prediction to be able to plan actions on the operational level, thus generating meta-concepts of innovations of meaning. (FIALKOWSKI, KISTMANN, 2018a) **Interpret** research trends from major research institutes in a qualitative and quantitative way and define possible **meta-concepts**. (POMPEU, 2016; CALDAS, 2004; HINES, BISHOP, 2015; BURDEK, 2006; ALBUQUERQUE, 2016; CELI, RUDKIN, 2016) Continue monitoring by correlating visual information, product language, and environment in a creative way. (JAYME, 2009) (3) Within the scenarios constructed, understand the **meanings** that the future consumer will value and establish which meaning (s) the innovation will seek to represent. (MARGOLIN, 2007, SKALETSKY, AMARAL, 2016, CELASCH, DESERTI, 2007, FRANZATO, 2011, REYES, 2016) Continue the project based on strategic decisions and the scenarios constructed, generating innovative concepts to be developed on the operational level. (MARGOLIN, 2007, CELASCH, DESERTI, 2007, FRANZATO, 2011, REYES, 2016) Interpret trends in form, style, and technology, integrating them into the company's technology, development, production, marketing, and design departments in order to manage them with the help of other agents within the organization. (VERGANTI, 2008; FIALKOWSKI, KISTMANN, 2017; COOPER et al., 2001) Recognize relationships, interdependencies, and influences of related sectors to determine possible influences on future projects. (JAYME, 2009, MOZOTA, 2003) Understand that technological trends can generate innovation but that **social and behavioral trends** are factors for social acceptance and can configure meaning-driven innovation. (POMPEU, 2016; MARQUES, 2014; DE MORAES, 2010; DANTAS, 2005; JAYME, 2009) Understand that style trends play an important role in accepting disruptive innovation and should not be used to "intimidate" the consumer in the face of novelty. (JAYME, 2009, WOOD et al., 2008)	Dimension of the project and subsequent project: Operation of the design to guarantee the progress of the **meta-project and the project itself**. (MOZOTA, 2003; MOZOTA et al., 2011; LOCKWOOD, 2009; JAYME, 2009) *Role of the designer:* the designer serves as the **executor** of concepts of innovations of meaning based on prospective research. (FIALKOWSKI, KISTMANN, 2017, MOZOTA et al., 2011) *Process:* Develop actions and solutions and **carry out the design process** to follow the macro model proposed in order to incorporate the prospective research to obtain innovation of meaning. (MOZOTA, 2003; MOZOTA et al., 2011; LOCKWOOD, 2009; JAYME, 2009) Achieve operationalization through the **organization and control** of personnel, financial, material, and time-based resources within the scope of the project in order to accomplish the meta-concept of the design. (MOZOTA et al., 2011, MOZOTA, 2003, RONCALIO, 2015) **Execute the meta-concept** of the design based on the scenarios constructed, generating concepts guided by the innovation of meaning. (FRANZATO, 2011; REYES, 2016; BURDEK, 2010) Develop the **meta-concept** of the design and actively experiment using the scenarios constructed and with the strategic vision of the organization for the future. (MOZOTA et al., 2011; VERGANTI, 2011; CHRISTENSEN, 2002; KELLEY, 2002) Review material from other departments and to adopt new concepts and technologies ("**cross-pollination**") in order to establish the meta-concepts of innovation of meaning. (KELLEY, 2001) Use tools to **anticipate** tests and results. These include mockups, 3D printing, and ergonomic tests in order to anticipate possible problems and speed up experimentation. (CELI, RUDKIN, 2016) (4) Consider the symbolic aspects, social modifications, and lifestyles within the target scenario. (CARRERA, 2016; VERGANTI 2011, VERGANTI, 2012) Use elements of design, such as shape, function, aesthetics, quality, raw materials, ergonomics, color, usability, packaging, surface, technology, brand, communication, and distribution, to achieve the desired meaning. (JAYME, 2009, WOOD et al., 2008) The consumer is seen as an actor in this process—a **co-creator**—the concept is designed in such a way that it can also be "designed" by whoever consumes it. This continues the active experimentation. (VERGANTI, 2011; CHRISTENSEN, 2002; KELLEY, 2002) Consider the meta-concept of the design as a possessor of meanings involving sustainability and ecology for the consumer. (DAROS, 2013, MARGOLIN, 2007) Adopt the meta-project in an **interdisciplinary and multifunctional** way, bringing together people from different cultures, creating interactions between functions, and encouraging internationalization, all of which are seen as rich sources for the process. (BURDEK, 2010, MOZOTA et al., 2011, DE MORAES, 2010, RUFF, 2015, CELI, RUDKIN, 2016) Exhibit **flexibility** to engage with and mediate between the various stakeholders involved in the meta-project. (CELI, RUDKIN, 2016, CELASCHI, DESERTI, 2007)

4. DELPHI WITH DESIGN SPECIALISTS

In order to meet the proposed objective of this study, the Delphi method was used to consolidate the intuitive judgment of a group of participants (WRIGHT, GIOVINAZZO, 2000) regarding the guidelines elaborated. The Delphi method is considered to be a useful tool to accelerate the researcher's learning process, and is particularly productive in cases in which the researcher needs the internal and external validation of the results (WRIGHT, GIOVINAZZO, 2000; SANTOS et al. 2017) as the case when the topic is not fully addressed in the literature.

Figure 1 shows the overall concept of the research and how the Delphi was applied.

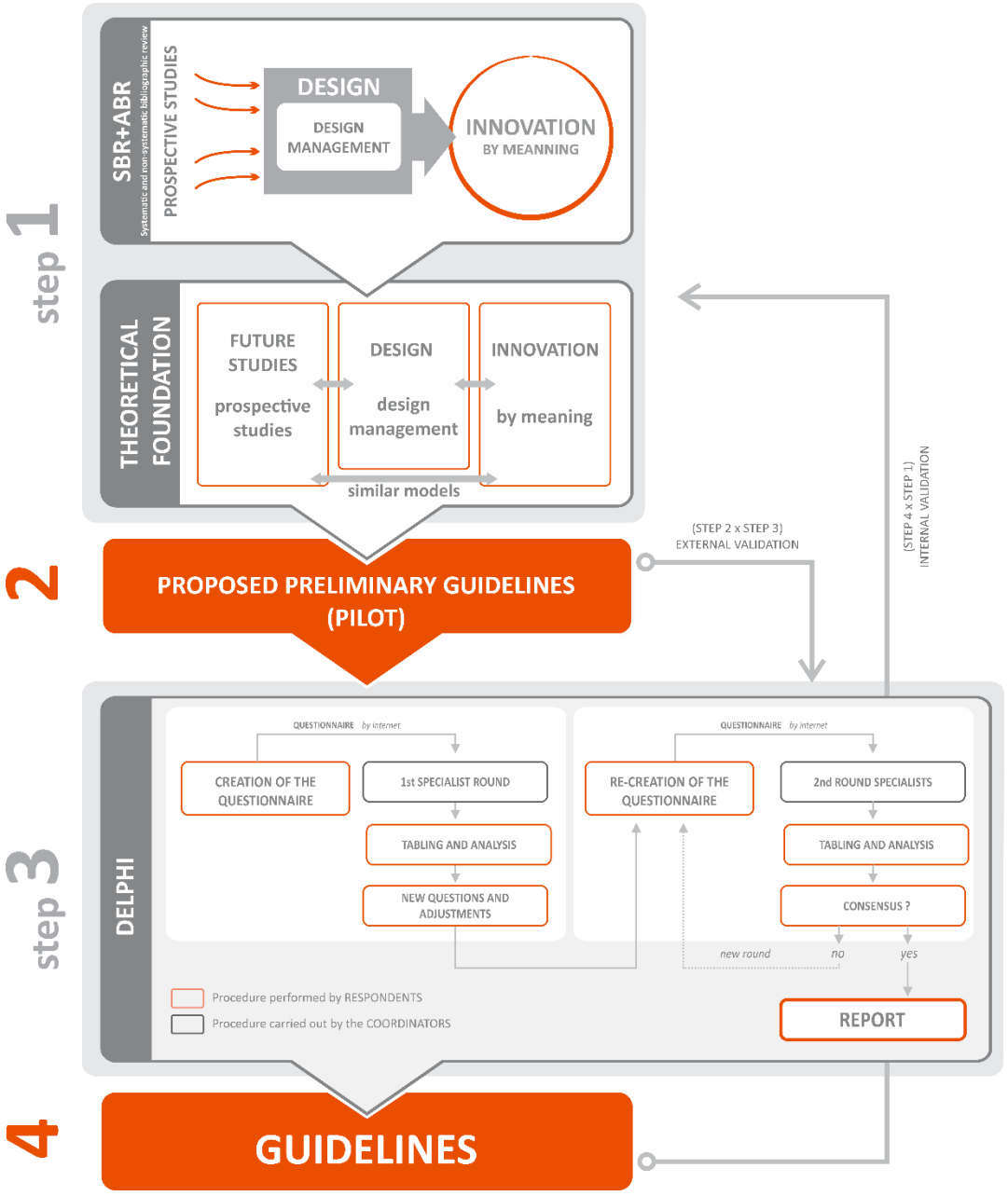


Figure 1 Outline of the research steps.

4.1 Planning the Delphi Method Process

In the Delphi method, the literature suggests that a heterogeneous group of experts guarantees a broad knowledge base and gives higher quality to the results (WRIGHT, GIOVINAZZO, 2000), so that initially, 30 professional design specialists who were involved in innovation were selected from several fields. The professionals selected included academics, designers, employees from multinational companies, professionals from Brazilian companies, self-employed professionals, and teachers.

In order to guarantee the necessary diversity, the participants were divided into groups according to the market in which they operate and the nature of their occupations. Their names were replaced by codes for anonymity. These groups were organized according to four criteria: professionals from Brazilian companies (Group N); professionals from multinational companies (Group M), professionals involved in predominantly academic work (Group A), and professionals who work in or run their own design offices (Group E). Table 2 below shows the profiles of the interviewees.

Table 2 Profile of the participants.

PARTICIPANT	PARTICIPANT'S MARKET	TYPE OF INSTITUTION	EXPERTISE
N1	Brazil	Brazilian company | academic	Education and product design management
N2	Brazil and Latin America	Brazilian company |design research	Design management and branding
N3	Brazil	Brazilian company | academic	Education and product design management
M1	Brazil and Latin America	Multinational company | academic | design office	Product, graphic and service design management
M2	Brazil and Latin America	Multinational company	Product and graphic design management
M3	Brazil and Latin America	Multinational company	Product and graphic design management
M4	Latin America	Multinational company	Product, graphic and UX design management
M5	Brazil	Multinational company	Product design management
M6	Brazil and Latin America	Multinational company	Product, graphic and UX design management
M7	Sweden	Multinational company	Graphic and UX design management
M8	Brazil	Multinational company	Surface design management
M9	Netherlands	Multinational company	Graphic and UX design management
M10	Brazil	Multinational company	Product and graphic design management
M11	Brazil and Italy	Multinational company	Product and graphic design management
A1	Sweden	Academic | Multinational company	Teaching and design management
A2	Brazil	Academic	Education and design management
A3	Brazil	Academic	Education
A4	Brazil	Academic	Education
A5	Brazil	Academic | Multinational company	Education
A6	Brazil and Italy	Academic	Education and design management
A7	Brazil and Italy	Academic	Education and design management
A8	Brazil	Academic	Education and design management
A9	Brazil	Academic	Education
A10	Brazil and Europe	Academic | Design office	Education and design politics management
E1	Brazil, Latin America, US, and Asia	Design office	Product, graphic, and UX design management
E2	Brazil	Design office	Product and graphic design management
E3	Brazil	Design office	Product and graphic design management
E4	Brazil	Design office	Graphic design management
E5	Brazil	Design office	Surface design management
E6	Brazil and Latin America	Design office |Multinational company	Design management and branding

Delphi was applied online (WebDelphi) to collect data more impersonally and precisely. Many respondents are reluctant to give up time to engage in research, so, a closed-ended questionnaire with optional comments was chosen. Because this type of questionnaire is not complex or time consuming, interviewees are less likely to be intimidated or to drop out. A 5-level Likert-type scale was applied. This was easy for researchers to prepare and interpret and easy for respondents to complete (HAIR et al., 2005).

Instead of a long series of questions, the preliminary guidelines were condensed into twenty naturally flowing affirmative statements to be presented to the respondents.

The analysis criterion considered a question relevant when 80% of the answers were "completely agree" or "partially agree" (VARGAS NUNES et al., 2018). Anything lower was considered dissident and would be used to the detriment of the consensus imperative, according to Santos et al. (2010).

There were also two rounds of pilot tests together with five professionals within the profile sought. The results of the pilot tests established the validity of the instrument and led to the decision to make the questionnaire simpler and shorter.

The project was approved by the Ethics Committee for Research on Human Subjects from the Department of Health Sciences of the Federal University of Paraná (UFPR) under decision number 2742126 on 06/28/2018. The respondents who were invited to participate in the study signed an informed consent form.

Twenty-eight of the 30 professionals contacted were willing to participate in the survey. Next, the link to the questionnaire was sent via Google Forms that gave access to the first round of questions. Nineteen participants completed the first round of questions.

After tabulation of the environment and first round data, participants received a preview of the results of what they had already answered and with the link to answer the second round of questions. Fourteen participants completed the second round of questions. After the two rounds, a satisfactory result was obtained, and based on the Delphi method, a new round was not required.

4.2 Results

The results of the questionnaire revealed useful information on and reinforced the relevance of the participants' views prospective research, innovation, and design management, as well as on their markets. Eighteen of the nineteen respondents (94.7%) stated that the organization in which they work considers prospective research and trend research in product development.

Below, Figure 2 illustrates how the respondents responded to the questionnaire.

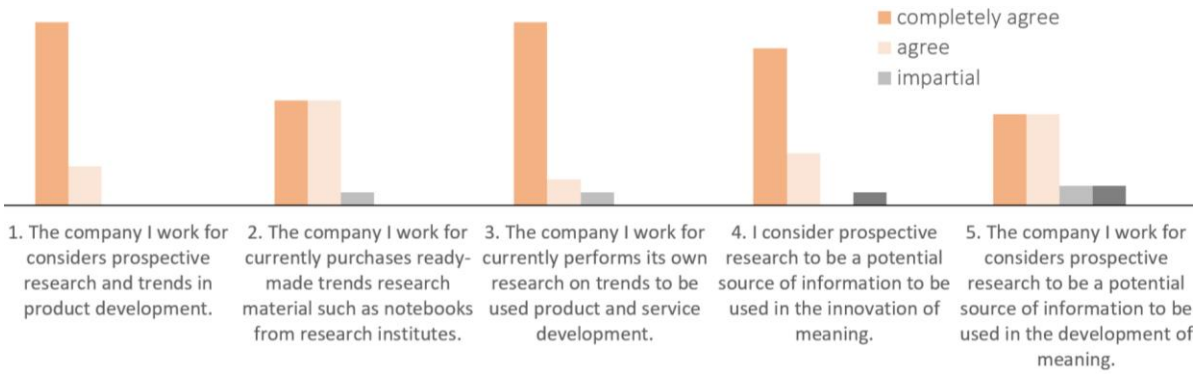


Figure 2 Statements and results of the questionnaire.

4.3 Round 1

According to the metrics adopted in the analysis of the first round of questions, only one question (10A) was automatically rejected, as it did not reach 80% acceptance (completely agree / agree in part). These eleven issues from the first round were divided based on the three levels of design management (strategic, tactical-functional, and operational).

Figure 3 below illustrates how the respondents responded to the first round of questions.

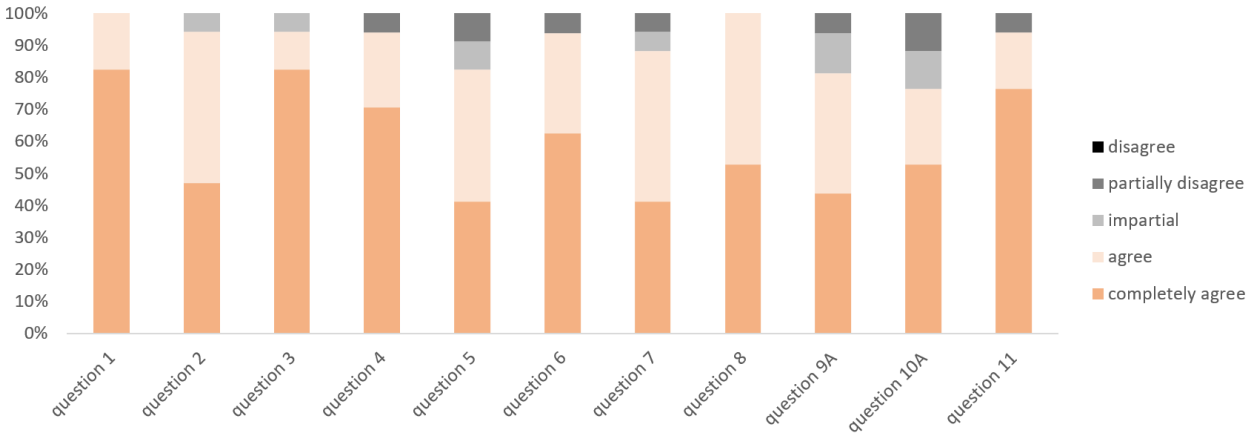


Figure 3 Percentage result of the first Round questionnaire.

4.4 Round 2

All of the questions in the second round were approved because they met the stipulated acceptance criteria (at least 80% of answers were "completely agree" or "partially agree").

Figure 4 below illustrates how respondents answered the second round of questions.

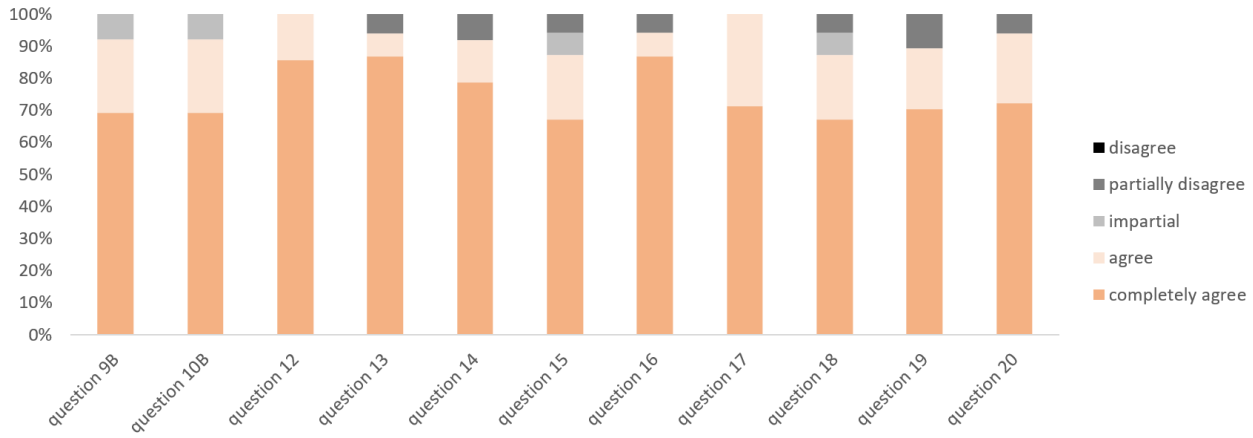


Figure 4 Percentage result of the questionnaire of the 2nd Round.

Only a few of the preliminary guidelines from both rounds had their wording changed based on the comments from the participants, but their meanings did not change.

In addition to the second round of questions, this step also evaluated the remaining two questions from the first round (9B and 10B) that had not yet been approved following the change in their wording. After their reassessment, these issues were also approved.

Thus, a third round was not necessary, and the Delphi was completed and textual feedback was sent to the participants regarding their responses.

4.5 Summary of the Results

Table 2 below illustrates all twenty of the statements included in the questionnaire and the guidelines pertaining to each of them. Table 2 also demonstrates the result for each question in each round and whether or not it was necessary to reword the guideline.

Table 2 Evaluation in each round.

			1st Round			2nd Round		
	QUESTION NUMBER	GUIDELINE	Acceptance of the question	Rewording	Approved Guidelines	Acceptance of the question	Rewording	Approved Guidelines
STRATEGIC	1	1 | 4	X		1 | 4			
	2	2	X	x	2			
	3	9 | 10	X	x	9 | 10			
	4	11	X	x	11			
	5	5 | 6	X		5 | 6			
	12	3 |8 |12 |7				x	x	3 |8 |12 |7
	13	13				x	x	13
TACTICAL	6	1 | 5 | 9	x	x	1 | 4			
	7	3 | 4 | 12	x	x	3 | 4 | 12			
	8	2 | 11	x	x	2 | 11			
	14	7 | 10				x		7 | 10
	15	6				x		6
	16	8 | 13				x		8 | 13
OPERATIONAL	9	1 | 2	no	reworded	no	x	x	1 | 2
	10	5 | 3 | 4	no	reworded	no		x	5 | 3 | 4
	11	13 | 15	x		13 | 15			
	17	7				x		7
	18	8 | 11				x		8 | 11
	19	9 | 10						9 | 10
	20	6 | 12						6 | 12

Based on the corrected and adjusted statements, a new summary view of the guidelines was created, since each sentence condensed one to four different guidelines, as Table 3 shows.

5. DISCUSSION AND FINAL GUIDELINES

The theoretical concepts were submitted to the specialists participating in the Delphi method step of this study. In this case, the respondents were treated as practical validators their of the theories proposed and of the preliminary guidelines. In light of the participants' responses, the preliminary guidelines, which were derived from the theories, was discussed. After this step, the wording was adjusted to generate the final guidelines, the main objective of the study.

Respondents who did not work as academics were the ones who provided the most comments and explanations for their choices. The findings demonstrate both the importance of the topics considered herein and the lack of tools in the available to design professionals to address and utilize prospective research to generate innovation, although all professionals and academics demonstrated this concern. In the second round, the group of participants from multinational companies were most likely to fail to continue the questionnaire (4 respondents out of 11), which may indicate a theoretical deepening that no longer interested these respondents or an inability to continue due to professional demands. At that time, the major focus of the comments was also on operationalization.

5.1 Design Management on the Strategic Level

It is important to note that the guidelines from the strategic level were generally accepted; they were approved in their original wording. The main topic on this level was the need to transform the design process in order to insert the continued monitoring of the signs of the future based on the meta-project phase, as has been demonstrated in the literature (CELI, RUDKIN, 2016; CELASCHI et al., 2012; VERGANTI, 2012; MOZOTA, 2011; VERGANTI, 2011; CHRISTENSEN, 2002; BURDEK, 2010; KELLEY, 2002; ISAZA, 2018; CALDAS, 2004; BACK, 2008; PETTERMAN, 2014; MARQUES, 2014; GONÇALVES, 2012, JAYME, 2009; MONÇORES, MENDONÇA, 2015; PETTERMAN, 2014; CASENOTE, VAN DER LINDEN, 2017; FRANZATO, 2011).

The main shortcomings that the participants reported were the statements regarding the interdisciplinary role of the designer and the designer's inability to utilize prospective research to generate innovation. Such comments were consistent among the respondents and, although the question of interdisciplinary work has been addressed by many authors in more theoretical works (CELI, RUDKIN; 2016; FRANZATO, 2011; RUFF, 2015; CELASCHI et al., 2012; CELASCHI, 2008), the question of the training for designers has not been considered.

Another issue observed was the statement regarding the designer's intuitive abilities in the construction of future scenarios. This ability is utilized during certain activities in

designers' routines, and the statement was not based on the simple and direct observation of the results of prospective research, requiring a less obvious and more supported analysis based on each participant's personal experience. Two authors (CELASCHI et al., 2012; MARGOLIN, 2007) explicitly corroborate this fact.

Table 3 The guidelines.

STRATEGIC DESIGN	TACTICAL-FUNCTIONAL DESIGN	OPERATIONAL DESIGN
REFLECTIVE OBSERVATION (SEE AND PREVIEW)	ABSTRACT CONCEPT (INTERPRET)	ACTIVE EXPERIMENTATION (SEE)
(1) Design on this level should be planned based on corporate strategy and should reply on prospective research inputs to foster innovation of meaning. (2) The designer here serves as a synthesizer of prospective research, market research, and blue skies research, encouraging a continuous dialogue and providing arguments and new interpretations with the goal of generating innovation of meaning. (3) The designer should reflect upon prospective research, realizing the possible meanings that emerge from each trend and helping to create future scenarios. (4) The designer, in reflecting upon prospective research, should collaboratively help to build future scenarios consistent with the organization's internal and external environment (strengths, weaknesses, opportunities, and future threats). (5) The designer should help align the company's strategy with the nature of prospective research in order to build a business culture that is visionary and permeable to the continuing drive for forward-looking research. (12) On this level, the designer must transform the design process by continually monitoring of future signs with the help of specialists in prospective research (via research institutes, trend books, etc.), realizing the macro-trends, the types of trends, and life cycles of trends in the meta-project phase . (13) The designer should also participate in the strategic creation of the roadmap (future line of offers in the market) in light of the future scenarios constructed so as to leave a space for currently market-less projects with future prospects that are not yet clear.	(6) On this level, the business strategy should be incorporated into the scope of the design using the scenarios constructed in order to plan actions that, on the operational level, enable the innovation of meaning. (7) The designer here should serve as a coordinator of the process and the design resources (be they human, financial, material, or time-based) and must treat the social and behavioral factors of trends as the main inputs in the innovation of meaning. (8) The designer must serve as an interdisciplinary collaborator in the formation of knowledge derived from the relations between sectors both inside and outside the company in order to manage the results of the prospective. (14) It is the designer's responsibility to continuously follow and interpret trends, integrating visual information, product language, technology, style, and environment into the respective areas of technology, development, production, and marketing. (15) The designer should take on the role of interpreter of future trends and scenarios in a qualitative, quantitative, and aesthetic way by creatively integrating information in order to define the meta-concepts. (16) The designer must establish the meanings that the innovation will represent out of the scenarios constructed. The designer must understand the meanings that the future consumer will value and that stylistic trends play an important role in the acceptance of disruptive innovations.	(9) On this level, the role of the designer should be that of prospector and multidimensional proposer of innovations of meaning, starting with the incorporation of prospective research into the meta-project phase. (10) The designer must develop meta-concepts that contribute to the operationalization of the personnel, financial, material, and time-based resources allocated to the project to achieve innovation of meaning. (11) The designer here should serve as mediator in the innovation of meaning by acting in a flexible, interdisciplinary and multifunctional way between the departments involved in the meta-project. (17) The designer must observe other departments and sectors outside the organization to establish new ideas, concepts and technologies (a process called cross-pollination) as a potential tool for achieving meta-concepts in the innovation of meaning. (18) The scenarios constructed in the strategic vision must be made more concrete through active experimentation with anticipation tools (such as mockups, 3D printing, and ergonomic tests.), and the consumer should be brought on board as a process actor (co-creator). (19) The designer should consider the symbols, social aspects, and lifestyles within the scenario established to determine the elements of design (form, function, aesthetics, quality, raw materials, ergonomics, color, usability, technology, etc.). (20) The designer must make the meta-concept a reality while understanding that it is the bearer of meanings, including the sustainability of the project.

5.2 Design Management on the Tactical-Functional Level

The tactical-functional level guidelines were accepted overall and were approved the first time they were submitted as the affirmative statements in the first and second rounds.

The main emphasis observed on this level was on the importance of the designer's interpretation of prospective research to understand and generate the meanings that the consumer will value in the future. It was a consensus among the specialists interviewed, and was also recurrent in the literature on this question.

Another highlight was the agreement that designers must be properly trained to be able to work with so many different sectors or to serve in an interdisciplinary way or as a facilitator of the project's fluidity in a company. The frequency of this issue in the participants comments raises the question of whether designers' training and education prepare them for this required multidisciplinary work.

The participants also revealed a lack of consensus in their understanding of the limits and activities of tactical design management. This inconsistency was also found in the literature. This is the most controversial level of design management because of its transience and continuity. It may be concluded that some authors in the literature and many participants in this study would prefer that this level be "embedded" or "diluted" into other levels.

In addition, the participants disagreed over the extent to which designers can manage the resources of a project. Many participants argued that designers cannot be responsible for financial resources or time, while others argued that they can. This fact reflects a diversity in designers' roles and performance in different sectors and departments within companies; there is clearly no standard. Thus, the convergence model, of which designers are capable of implementing, forces designers to work with different in accordance with the context of each organization.

5.3 Design Management on the Operational Level

The operational level guidelines focused on prospective research for the innovation of meaning and received the most commented in the Delphi method process. It is important to note that the two questions that had to be rewritten and re-evaluated in the second round were from this level.

The main emphasis on this level was on the importance of designers observing other sectors and departments as part of the cross-pollination process (KELLEY, 2001). Most respondents reported seeing this process as a rich source of innovative ideas.

Another important issue is the designer's role in bringing together the interests at stake for all of the agents involved in the project, a role which again reflects the importance of designers' interdisciplinary skills and their task as mediator to facilitate the progress of the meta-project (CELI, RUDKIN, 2016, FRANZATO, 2011, RUFF, 2015, CELASCHI et al., 2012, CELASCHI, 2008).

The main issue on this level involves the healthy and desired continuity of the meta-project in the hands of a single design workgroup, with no clear separation between the team that creates the meta-concepts and the team that implements them. There were no studies in the literature that specifically addressed this operational issue.

5.4 Research Gaps

Considering all of the results, it was considered useful to include the comments provided on the questionnaire that were not addressed in the literature, that were only briefly mentioned in the literature, or that differed from opinions in the literature. This information may reveal other gaps in scientific research, as well as discrepancies between academic and practical perceptions. These additional issues have been grouped together within the levels of design management in Table 4 below.

Table 4 Outline of the issues not mentioned or beyond the scope of the study or the literature.

STRATEGIC DESIGN	TACTICAL-FUNCTIONAL	OPERATIONAL DESIGN
Lack of training for designers on how to deal with strategic issues. Lack of training for designers on how to deal with prospective research. Intuition as an important factor for the construction of future scenarios; this task is based on a less direct analysis of prospective research. Often, the design is not satisfactorily integrated by professionals who must act in an interdisciplinary way, especially on the strategic level (*the most consistent viewpoint among the participants that operate in the market). When taking on future meta-projects without a current market, both individual designers and companies as a whole should implement risk management activities (opportunity management) as part of the process.	Lack of consensus in understanding the limits and activities of this level of tactical-functional design management. Lack of understanding of the role of designers in managing resources (financial resources, time, etc.), reflecting the diversity of their performance and their need to work within the context of each organization (*the most consistent viewpoint among the participants that operate in the market). Again, there is a lack of training for designers on how to deal with the interdisciplinarity required to work with prospective research.	The need for project continuity by the same working group involved in the other levels. Therefore, there should be no clear separation between who creates and who executes the meta-concepts. The importance of the designer in observing other sectors and departments (cross-pollination) to help in the generation of innovation of meaning. A lack of interdisciplinary skills was also emphasized here. Designers are seen as those who bring together the interests at stake among the agents who participate in the process.

6. FINAL CONSIDERATIONS

This study provides guidelines for the use of prospective research in design management to foster meaning-driven innovation. In light of the results of and the discussion generated by the questionnaire applied herein, the preliminary guidelines were adjusted and modified based on the participants' contributions.

Table 5 below shows the list of the final guidelines that are meant to help designers and design specialists to manage meaning-driven innovation.

In practical terms, these guidelines can be applied in corporations and can help make different types of organizations more competitive through the flow of ideas and the detection of future opportunities when the company seeks to innovate meaning in the market.

More structured interviews could help to clarify the points that the participants addressed and which were not addressed in the literature or to delve into topics more deeply.

Another point that could be explored further (since it was raised by the experts but is rarely considered in the literature) is on the role of designers' intuition and experience when constructing future scenarios. Because designers are understood as "constructors of the future," it is important to consider the role of intuition in this construction process. Studies on this topic could also reveal ethical and sustainability issues, which could be seen as a reflection of the designers' decisions.

Future research may consider specific prospective research and attempt to use it to foster the innovation of meaning as part of a design process supported by the literature and participants.

Market research data could be better understood as a promising source of future studies.

One limitation of this study was that it focused on the secondary sector of the industry. The question of intangibles (such as the generation of service or PSS systems) was not the focus of this research, though the general results may be applicable to these areas of study. Thus, future studies could apply these guidelines to the tertiary sector so that they may be adapted or so that complementary guidelines can be established.

Table 5 Guidelines for the use of prospective research in design management to foster meaning-driven innovation.

On the **strategic level of design management,** the design process should:

1. Incorporate strategic planning into corporate strategy.
2. Allow the designer to assume the role of synthesizer of prospective research, market research, and Blue skies research, in which external partners provide knowledge, solutions, new arguments, and interpretations in an iterative and continuous interactive dialogue to achieve innovation of meaning.
3. Follow the FFE to incorporate prospective research to achieve innovation of meaning.
4. Insert strategic design into the strategic planning of the company using inputs from prospective research to generate innovation of meaning.
5. Focus on a visionary corporate culture based on an architecture that may be permeated by continuous input from prospective research and market research.
6. Align the strategic level of the company with the qualitative nature of prospective research and innovation of meaning; the focus shifts from risk management to opportunity management.
7. Continuously monitor future signals and weak signals using the tools of prospective research, whether by purchasing material (such as trend notebooks) from third parties or by performing research internally. Market research data can also be used.
8. Distinguish between macro-trends, micro-trends and counter trends.
9. Focus on macro-trends (technological, social, behavioral, cultural, economic, environmental, political, and demographic and sustainability) for the innovation of meaning,
10. Recognize the life cycle of the trends and work to detect them before the normalization phase.
11. Reveal the possible meanings that emerge from each trend on the reflective level of future consumers' emotional perceptions.
12. Allow designers to reflect upon the results of the prospective research in order to predict the potential of each possible trend and define future scenarios within the meta-project phase.
13. Link the information on the macro-trends detected to information on the future environment of the organization (SWOT) to recognize the company's strengths, weaknesses, opportunities, and threats.
14. Create a product roadmap with the strategic department using prospective research, leaving a space for the "market-less" projects that the research will ultimately produce.

On the **tactical-functional level of design management,** the design process should:

1. Implement the business strategy within the scope of the design.
2. Allow the designer to serve as a participatory leader in the formation of the knowledge produced by prospective research and in the interpretation of the scenarios constructed. Thus, the designer also serves as an integrating agent between several departments within the company, which reflects the designer's interdisciplinary and extra-organizational role herein.
3. Allow the designer to coordinate the meta-project design process to incorporate prospective research to obtain the innovation of meaning.
4. Allow for the coordination of human, financial, material, and time-based resources within the scope of the business to determine the feasibility of meta-concepts.
5. Continue the process by joining the strategic level with the meta-concepts based on interpretation and prediction to be able to plan actions on the operational level, thus generating meta-concepts of innovations of meaning.
6. Allow the designer to interpret research trends from major research institutes in a qualitative and quantitative way and define possible meta-concepts.
7. Allow for continued monitoring by correlating visual information, product language, and the environment in a creative way.
8. Indicate the meanings that future consumers will value and establish which meaning(s) that innovation will seek to represent within the scenarios constructed.
9. Based on strategic decisions and the scenarios constructed, generate innovative concepts to be developed on the operational level.
10. Interpret trends in form, style, and technology, integrating them into the company's technology, development, production, marketing, and design departments to manage them with the help of other agents within the organization.
11. Recognize relationships, interdependencies, and influences of related sectors to determine possible influences on future projects.
12. Recognize the fact that technological trends can generate innovation but that social and behavioral trends are factors for social acceptance and can configure meaning-driven innovation.
13. Recognize that style trends play an important role in accepting disruptive innovation and should not be used to intimidate the consumer in the face of novelty.

On the **operational level of design management**, the design process should:

1. Implement the design to guarantee the progress of the meta-project and the project itself.
2. Allow the designer to serve as the executor of concepts of innovations of meaning based on prospective research.
3. Enable actions and solutions and carry out the design process to follow the macro model proposed in order to incorporate the prospective research to obtain innovation of meaning.
4. Operate through the organization and control of personnel, financial, material, and time-based resources within the scope of the project in order to accomplish the meta-concept of the design..
5. Execute the meta-concept of the design based on the scenarios constructed, generating concepts guided by the innovation of meaning.
6. Allow the team to develop the meta-concept of the design and actively experiment using the scenarios constructed and with the strategic vision of the organization for the future.
7. Review material from other departments and to adopt new concepts and technologies (cross-pollination) in order to establish the meta-concepts of innovation of meaning To use tools to anticipate tests and results such as mockups, 3D printing, ergonomic test, etc. in order to anticipate possible problems, speeding up experimentation.
8. Use tools to anticipate tests and results such as mockups, 3D printing, ergonomic test, etc. in order to anticipate possible problems, speeding up experimentation.
9. To consider, regarding the elements related to the symbolic aspects, social modifications, and lifestyles within the target scenario.
10. Use elements of design, such as shape, function, aesthetics, quality, raw materials, ergonomics, color, usability, packaging, surface, technology, brand, communication, and distribution, to achieve the desired meaning.
11. To view consumers as co-creators, so that the project can be "designed" by the consumer through active experimentation.
12. Consider the meta-concept of the design as a possessor of meanings involving sustainability and ecology for the consumer.
13. Adopt the meta-project in an interdisciplinary and multifunctional way, bringing together people from different cultures, creating interactions between functions, and encouraging internationalization, all of which are seen as rich sources for the process.
14. Be flexible so that the designer can engage with and mediate between the various stakeholders involved in the meta-project.

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