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Design Foresight: A Design Approach that Marries the Futurization and De-Futurization

Article

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Abstract

Corresponding to the two methodologies of dealing with the future in the field of sociology, future-oriented design can also be divided into two categories: one pursues the exploration of possibility, and the other pursues the confirmation of achievability. Both contribute to shaping the future, but currently the two are cut off from each other. In this paper, a new design approach is proposed, which tries to simultaneously guarantee the possibility exploration and realizability implementation of the future, by considering multiple visions in the futures and selecting the preferable one, and further describing the path.

Keywords

Design Foresight, Design Method, Futurization and De-Futurization

Introduction

Sociological inquiry into the future has been hesitating between futurization and de-futurization methodologies. The former, represented by futures studies, believes that the futures are uncertain and unpredictable; its aim is to envision possibilities of the futures and to increase our reserves in the face of futures. The latter, represented by forecasting method, believes that the patterns of the future can be captured through the calculation of the variables, thus ruling out futures of low probability, i.e., reducing the options available in the set of future possibilities and helping people make decisions. Both methodologies have a common role in helping people to prepare for the future in advance.

There are two corresponding approaches in design for dealing with the future: one pursues the exploration of possibilities, and the other pursues the confirmation of achievability. Moreover, the two are cut off from each other at the moment. The former offers various visions of the futures but no path to the realization and is often criticized as merely an artistic expression that does not address reality. The latter, on the other hand, provides products or services that can be introduced to the market in 3-5 years but no planning of the long-term future, for which it often appears to be less creative or with little sense of responsibility for the future.

Therefore, the research aims to find a new design approach that will be able to unite futurization with de-futurization, to turn futures into a repository for people to make decisions on top of a thorough exploration of future possibilities, and to further describe the path to a preferable future.

The futurization and de-futurization with design

Design is always about the future. Design practices bring new things into a world that did not exist before. Policies, activities, products and services, no matter what we are designing, from the moment we identify a problem to the moment we implement a solution, time moves forward. In this sense, all design is for the future (Stuart Candy, 2020).

In the field of design, Tony Fry first introduced the concept of de-futurization in design ethics in 1999. In fact, the term “de-futurization” appeared much earlier in futures studies. After World War II, people tended to hold a pessimistic vision of the future. To reduce the horrific consequences of technological expansion and reduce uncertainty, Niklas Luhmann, a German system theorist, proposed the “de-futurization” technology aiming to effectively control the future orientation and reduce future possibilities by means of probabilistic calculations such as forecasting. According to him, negation is a necessary condition for selective decision; of all future possibilities, we may

only choose by negation (Niklas Luhmann, 1976). Under this concept, de-futurization is not opposed to futurization. Both of them are based on the purpose of helping people explore the future. The main difference is that futurization carries out the incremental process of future possibilities, while the other carries out the decrement process. This is a relatively broad definition of two concepts.

Fury's de-futurization, however, is more a reflection on the consequences of the design of the future that has already occurred. Though the two share some similarities in avoiding unaffordable consequences, Fury's de-futurization is to get more people thinking about the problems associated with the human-centered future logic of design, including: our design for the future denies the future of a non-human world; the world we are designing is to see destruction because of these designs. Different from the de-futurization carried out by forecasting, the de-futurization in the design proposed by Frey is not to reduce our imagination of the possible futures, but to ensure that the impossible futures are sufficiently examined and excluded in the design as a necessary behavior of active futurization. This is a relatively narrow definition of de-futurization.

In this study, the definition of de-futurization tends to be more broadly defined, that is, futurization is the process of establishing a diverse set of future possibilities, and de-futurization is the process of selecting a future (or a set of futures) through a certain screening method and making plans to approach the selected future. In design, the typical example of the former is Speculative Design or other thought experiments conducted through design, while the typical example of the latter are the videos showing the visions of the future launched by technology companies.

Since Herbert Simon defined the purpose of design as problem-solving (Herbert Simon, 1996), the mainstream design approach has taken the path of functionalism. In the development process of design, most of the conditions such as the object itself, human needs, market conditions and technical routes are controllable or predictable. Even before being produced, the results can be predicted to a certain extent. Thus, this kind of design takes on the form of convergence with the future possibility set (Fig. 1).

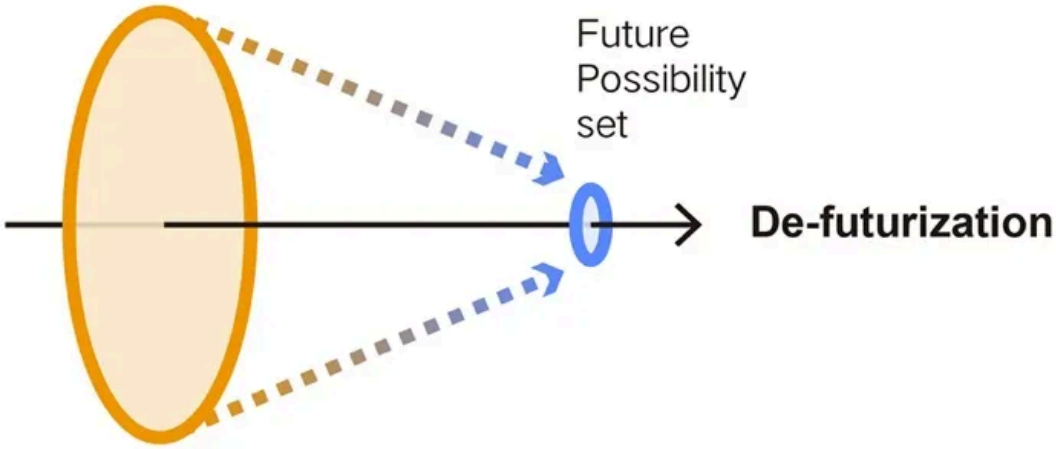

Fig. 1: The de-futurization with design

With the market economy becoming the prevailing standard in the world, design is also merged into the trend of neoliberal capitalism, and the realizability, a single-dimensional evaluation standard, gradually turns into the mainstream. Many designs that can't conform to the realizability and can't bring market benefits are generally assigned to the category of conceptual design, and they have the same principle of shelving reality, that is, the tendency to look for other existential possibilities than the future most likely to be derived from the present. Some are drawn from future-related cutting-edge design fields, such as Speculative Design, Design Fiction, Experiential Futures, etc., with strong possibility-driven characteristics: When faced with a specific problem, we go back to the root of the problem and imagine a seemingly inconceivable design that challenges the existing answer, rather than first choosing a solution that is more likely to be realized or has a higher market value. For the design itself, this approach means the incubation of many new possibilities, which is a kind of design response to the future of technology. Therefore, this kind of design presents the form of diverging with the future possibility set (Fig. 2).

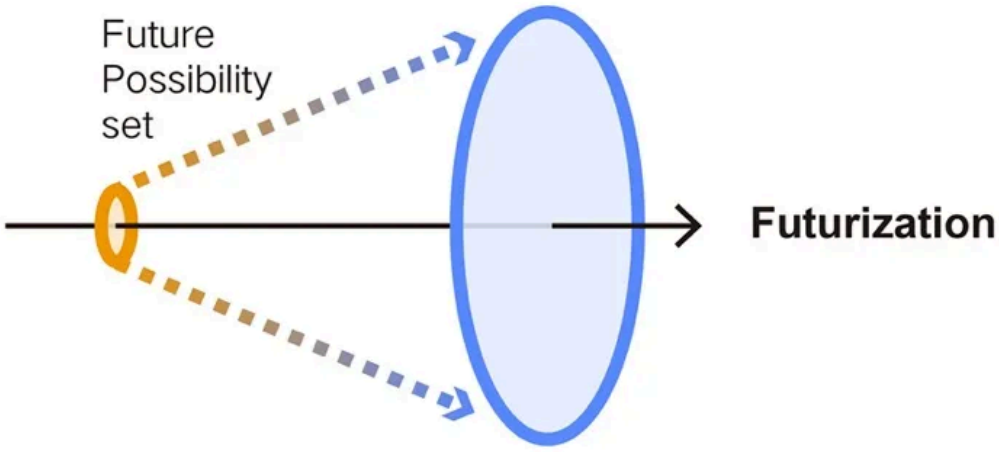

Fig. 2: The futurization with design

The de-futurization's conception of the future is based on the continuation of reality, pursuing a more perfect life under the background of the existence of reality. The futurization generally questions reality as the only solution and tries to find the existence of other possibilities beyond reality through the setting of the futures. The former is inward-looking, concerned with the intrinsic rationality and realizability of things, bearing the internal pressure of realization; The latter is outward-looking, seeking possibilities outside the current existence, facing discussion and review of society and other related factors, and bearing the external pressure of diversity. In a broad sense, among the two types, the latter carries out the futurization of design, that is, enlarging the options of the future, while the former performs the de-futurization of design, that is, reducing the possibility options or selecting one option of the future.

These two types of designs have irreplaceable value in the process of building the future. This study attempts to establish an approach that simultaneously guarantees the possibility exploration and realizability implementation of the future, considers multiple possibilities in the futures and selects the preferable future, and then returns to reality to seek the realization method of the selected one.

Foresight as an interdisciplinary field of futurization and de-futurization

In recent years, the scope of design has been expanding, from dealing with things to systems, and even to policies, reflecting cultural patterns and exploring philosophical paradoxes. With the wider range of space and time that design involves, the design research will inevitably interact with other future related researches.

At the macro level, futures studies and design can be regarded as isomorphic units with the same basic shape. Both of them implement iterative processes, with divergent (generation/exploration) and convergent (expression/realization) phases alternating (Zaidi, 2019). The former stage is essentially the exploration stage, generating and testing alternative paths; The latter stage is the implementation stage, where the selected path is decided and implemented. Therefore, futures studies and design are both practice-oriented and participate in the work of changing the world through expectations. In this context, futurists have always been designers and designers are also futurists, and design aims to explore the futures and futures studies focuses on design. Together, they consciously change the world.

At present, the design field is more and more integrated with the futures studies in research and practice, expanding its cognitive vision by accommodating the thinking and methods outside the field, as a source of inspiration and a communication tool for strategic purposes in the ideological world (Nigel Cross, 2010). This study seeks ways to understand, intervene and apply the futures in a broader research space by exploring the relevant fields of futures studies as a forward-looking activity like design, and explores the cognitive thinking, theoretical basis, thinking framework, methods and tools that are enlightening to this study in various fields.

In the relevant practice of futures studies, foresight is a typical representative of the comprehensive application of futurization and de-futurization. By adopting futures thinking, foresight serves the organization (society, enterprise) in the formulation of future strategies and decision-making development paths.

Technology foresight is a research direction that organically combines futures studies, strategic planning and policy analysis. It focuses on the medium and long-term future of 5-30 years. This field evolved from the technology forecasting activities centered on the Delphi survey. Its research originated from the science and technology planning activities of the US Navy and Air Force during World War II in the 1940s. Later, technology foresight entered the social field from the military field. In the 1970s, the field gradually began to use more qualitative research methods. By the 1980s, technology foresight based on the Delphi survey began to attract the attention of the government and academia (Rongping Mu, 2021). In 1984, the concept of foresight was first put forward by John Irvine and Ben Martin in the publication Foresight in Science: Picking the Winners. Currently, the governments of Japan, Germany, the United Kingdom and other countries, the United Nations Industrial Development Organization (UNIDO), the Asia-Pacific Economic Cooperation (APEC) and other organizations have continuously carried out the technology foresight activities.

The mainstream view holds that technology foresight is a step-by-step exploration process for the long-term future of science, technology, economy and society, aiming to select strategic research fields and general new technologies that may produce the greatest economic and social benefits

(Martin, 2000). Technology foresight can create better social, economic, environmental and other values in the future by identifying common new technologies, so as to make overall planning for the technological route, grasp the technological development trend and select the priority development fields or directions of science and technology, and support human decision-making. It pursues objectivity and truth in the scientific and technological dimension, and embodies democracy and value in the policy dimension. Foresight involves not only prediction, but also shaping and even creating the future we have chosen from infinite possibilities (Sibylle, 1996). Instead of using technology to forecast the future, technology foresight aims to gain insight into which technologies may bring greater value to the whole society. It can be considered that the research will carry out the futurization in the early and middle stages, and select the future in the later stages as the de-futurization, which is a process of "amplifying signals, deducing trends, and preselecting results". In the process, technology foresight implements the comprehensive application of futures studies and forecasting: Futures studies is used to create possibilities, while forecasting results and value orientation are used to select the possibilities.

Like technology foresight, strategic foresight is also a practical representative of applying futures thinking to specific fields. Compared with the former, strategic foresight applies to relatively micro objects. The role of strategic foresight is to consider the alternative futures, and to formulate the preferred future (plan) for the organization (Amara, Roy, 1974). Futures studies is more theoretical in point of view, analyzing the ontological and epistemological basis of future knowledge, while foresight takes an action-oriented perspective, using process exploration to show alternative future development and its consequences (Coates, Durance, and Godet, 2010), and planning for the organization to achieve one or more goals under uncertain conditions (Johnson, Scholes and Whittington, 2009). Compared with technology foresight, strategic foresight is more widely combined with the design in practical applications to visualize the futures for enterprises.

Combination of foresight and design

As early as the 1960s to 1970s, creative activities such as design have been applied in the field of foresight. Taking the future workshop methodology by Robot Kuhnt and Norbert Müllert as an example, the workshop uses creative methods to stimulate participants to imagine and design their own future pictures (Kuhnt and Müllert, 2006). Subsequently, the foresight action drew on the participatory design method and invited stakeholders to jointly find solutions to future problems (Ramos, 2017). At present, universities around the world have set up a series of courses combining design and foresight, including the master's degree in strategic foresight and innovation offered by OCAD University, and the course of strategic foresight offered by the California College of the Arts. Globally, there are also some professional design foresight institutions, such as Pantopicon in Belgium and Situation lab in Canada. The combination of

design and foresight has been conducted in the field of cutting-edge design theory and practice, verifying the rationality and effectiveness of this combination to a certain extent.

On this basis, this study intends to further explore a thinking mode and operation logic of design foresight based on the creativity and expressiveness of design and the framework of foresight, namely, a conceptual structure of design that can systematically include the cognitive methods of futures studies.

In this combination, foresight provides a framework for understanding and dealing with uncertainty and the future, and a systematic practical methodology of futures thinking. The foresight principle includes a series of methods and techniques such as macro trend analysis and expert knowledge to explore alternative futures, and considering the possible evolution of the next 5 – 15 years or even longer (Dator, 2009). The problems to be handled by foresight include “What direction of development may be in the future?” “Which direction of development should we choose?” “If the future development is different from the current choice and expectation, what is the response to uncertainty?” The foresight method aims to help prepare or actively shape the future situation (Bishop, Hines and Collins, 2007), closely consider the relationship between the objective reality (based on facts, measurable and observable signals, signs and trends, etc.) and the possible future, and make dynamic adjustments (Mietzner and Reger, 2005).

In design foresight, design provides a way to create and visualize future visions, and provides aesthetic support for foresight. Design is a problem-solving discipline (a few cutting-edge theories propose that design is also a problem-raising discipline, such as speculative design). It is positioned as an organizational ability that transcends creative output (products or services) and is also an organizational activity that can develop sustainable innovation and competitiveness (Boztep, 2016). As a problem-solving method, design leads the trend of change and innovation in the world (Dunne and R. Martin, 2006). It has the potential to further integrate interdisciplinary stakeholder dialogue, thus enhancing the collective coordination, planning and reforming ability. Now, design is understood as something running through all activities of the entire innovation ecosystem in the form of capabilities and methods, including leading interdisciplinary stakeholder teams, responsible for creating sustainable value propositions, and ensuring the future of the organization, society, and even greater interests (Bühring, 2018).

On this basis, for futures studies, design can be seen as an aesthetic process to cultivate a more inclusive and far-reaching “aesthetic foresight”. Voros once pointed out that a better future “is more emotional than cognitive” (Voros, 2003). Inayatullah, also expressed a similar view that futures thinking is a deeper level of thinking that should not only be reflected in the level of foresight skills but also enhance the confidence and security of creators to create the preferable future (Inayatullah, 2008). On the basis of traditional foresight, design can add complementary

“aesthetic” perspectives, expand its boundaries, and inspire emotional and stimulating visions of futures. In the relationship between design and foresight, from the perspective of materiality and concept expression, the design provides a way to reshape the material world; From the perspective of deep construction of content, the design provides aesthetic thinking for foresight.

Design Foresight: a new approach to designing futures

Instead of simply combining the methods of two domains, this study aims to seek a deeper integration of the two. Such integration manifests itself in the affinity between the foresight with possibility management and the design with innovation process based on the framework of futures thinking: On the preliminary stage, it sets up a background by different worldviews and maximizes possible solution sets of the problem, namely the process of futurization in the macro sense. On the later stage, it sets an evolution goal for the design by selecting a preferable future, and selects an appropriate carrier to materialize the vision by examining society and technology trends, namely the process of de-futurization in the macro sense (Fig. 3).

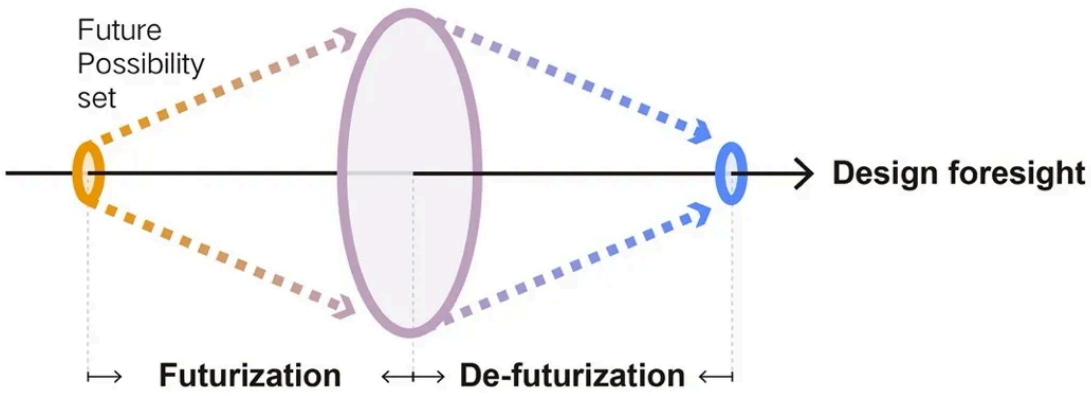

Fig. 3: The Futurization and De-futurization with Design foresight

As Design Foresight (DF) explores the way about future creations with the framework of futures thinking, it by nature follows the cognitive framework and logic of futures thinking. Namely, futures present numerous possibilities; futures are combinations of future alternatives: the possible, the plausible, the probable and the preferable; futures are open, dynamic and optional. On that account, DF neither deals with forecast nor predicts what kind of product or service to be realized in the future. Instead, it inspires us to choose a future from infinite future possibilities, so as to shape and even create the future. DF performs visual foresight by means of design, and helps designers settle on possible solutions to fuzzy and marginal problems in advance, imagine and visualize future possibilities, and select among various possibilities a preferable future to be materialized (Fig. 4).

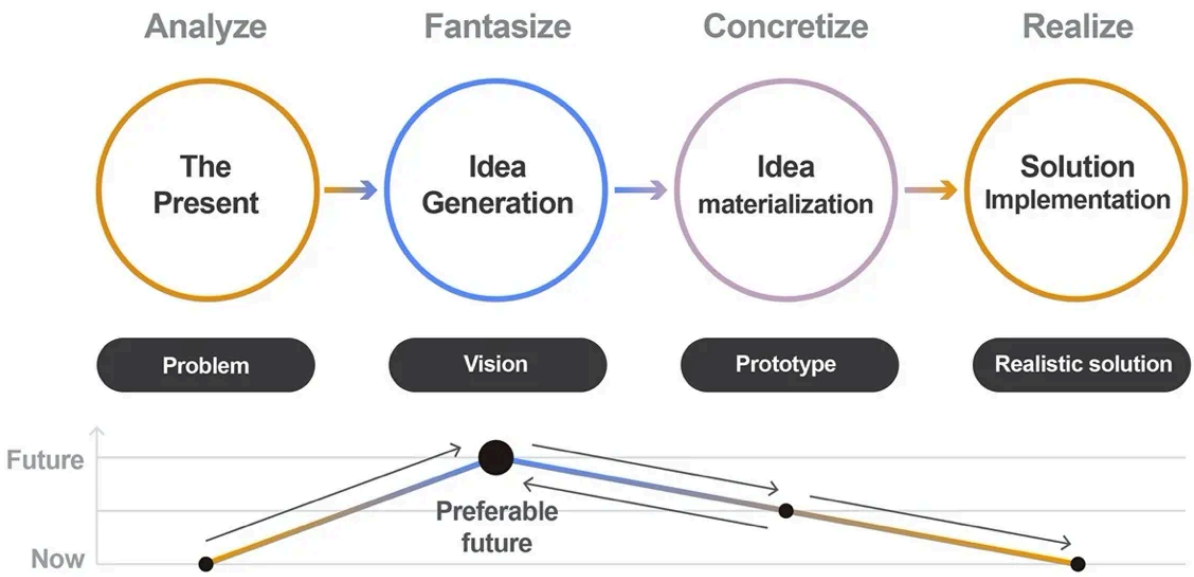

Fig. 4: The design process of DF

As an approach with a cognitive basis of futures thinking, DF explores future possibilities through the innovation process of design, presenting alternative futures through design carriers. In terms of the stages of future time, it consists of a backtracking process of “present – future – present”: In an effort to implement solutions in the short-term future based on a thorough consideration of future possibilities, this study uses the timeline dynamically, explores the vision in the long-term future, and then scrolls the timeline back to the mid-term future for materialization (Fig. 5).

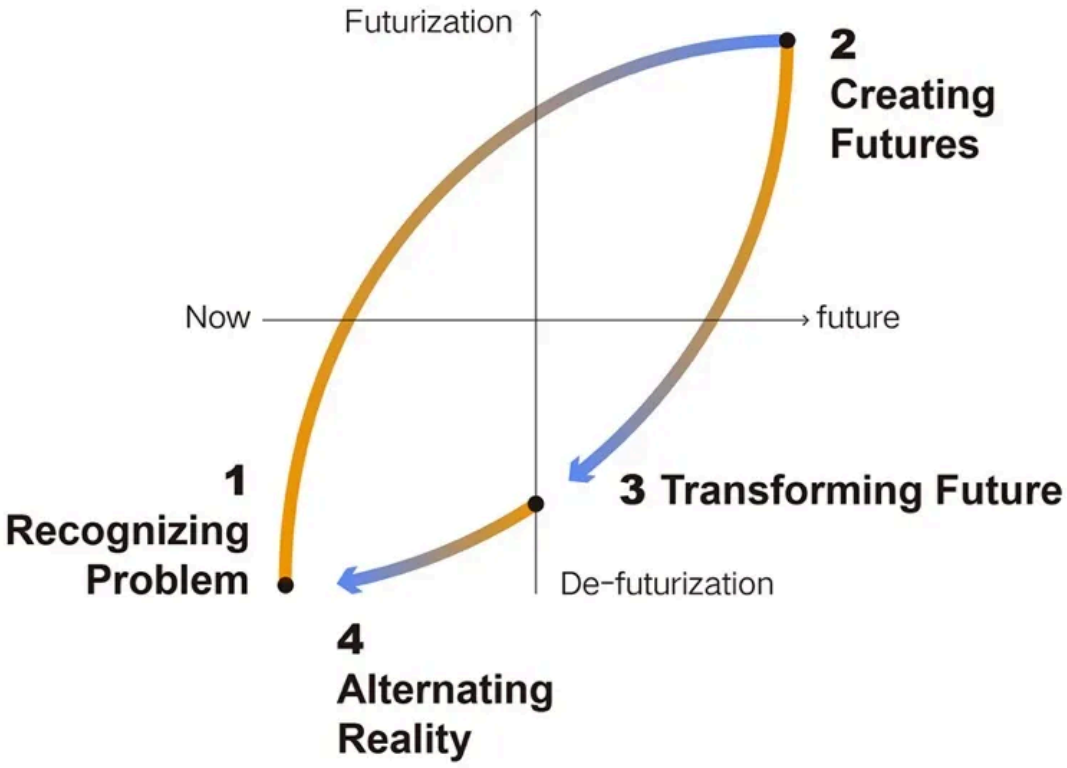

Fig. 5: The dynamic backtracking of DF

As a mindset, DF consists of three essentials. Firstly, it is future-driven, attaches crucial importance to the setting of future values and worldviews, and designs for the purpose of future visions. Secondly, it emphasizes that more possibilities should be incorporated into the design, so as to explore the futures to the utmost level. Thirdly, specific approaches shall be set up to achieve the chosen preferable future. Guided by the mindset, this study proposes various design tools to help advance the actual design, including Possession Tools which focus on constructing the humanized features of future design (Zhiyong Fu, Qing Xia, 2019), Symbiosis tools which focus on measuring people-object interaction density (Chiju Chao, Zhiyong Fu, 2022), and Envisioning toolkits which focus on infusing future visions into the design (Zhiyong Fu, Lin Zhu, 2020).

Possession Tool envisions a personalized assistant to help solve problems in the future whose personality and solutions are extracted and attached to a diegetic object. Such a process endows objects with a value orientation, personality, and unique problem-solving methods of humans. Symbiosis Tool is used to explore the design possibilities that may arise from different interaction intensities between humans and machines under the guidance of different world views. Vision is taken as the goal in this tool and different concepts are set as the background of design output, and then the interaction intensity between humans and machines is adjusted to produce a variety of designs as practical alternatives. The purpose of Envisioning Toolkits is to imagine a future

world comprehensively including people, stories, operating mechanisms, etc. The world in this tool is constituted from macro to micro to build a universe of long-term future, and guide designers to do their work under specific world views and narrative scenarios.

The DF tools above help designers anticipate the possible consequences of applying technologies through forward-looking thinking before turning ideas into products. We can take advantage of DF to explore and discuss the potential moral, cultural, social, and political implications of technologies for humans. The more we think, cover more social aspects, and explore more possible scenarios, the more room there will be for development in reality. Although the future cannot be fully predicted, we can set the factors that can increase the possibility of achieving the preferable future as the basis of the current background. Correspondingly, factors that may lead to unwanted future occurrences should be identified as early as possible so that they can be solved or at least limited.

The mindset of DF liberates designers from the user-oriented perspective to consider the long-term needs of people and their responsibilities for the world in which we live with a more essential sense and a broader range. It emphasizes the designer's own thinking about the possibilities of the product rather than relying on the user's feedback for design. This study intended to turn futures thinking into a basic cognitive logic of design to expand future design possibilities rather than being used for the promise of realizability. The purpose of the design in this study is to attract more forces to jointly create a preferable future by building future pictures and arousing discussion, and to help designs improve compatibility for the futures, thus adapting to various future changes.

Summary

There are two methodologies that could be used to deal with the future in the field of sociology—futurization and de-futurization. Similarly, the future-oriented design could also be divided into two types: the pursuit of the confirmation of the realizability and the exploration of the possibility. These two kinds of design could both contribute to the conception of the future. This study proposed a new design method to combine futurization and de-futurization, with the purpose of selecting an ideal future after fully exploring possibilities of futures and further describing ways to realize the preferable future.

In the futures studies field, foresight is a poster child for the integrated application of futurization and de-futurization. Taking futures thinking as the cognitive basis, DF combines design and foresight techniques to explore future possibilities through the creative process of design, and to express alternative futures with design carriers. On the basic, three design tools were proposed

under the mindset of DF, including the Possession Tool, the Symbiosis Tool, and the Envisioning Toolkits.

Limitations and Discussion

As a design method, instead of predicting which design would become a reality, DF places emphasis on helping designers find and express possible solutions. In this regard, this study is not aimed to answer such questions as “what would become mainstream” or “what kind of products would become reality in the next 5 years”, but to explore “what the undiscovered futures” and “how to realize the future we want “.

Meanwhile, the purpose of the construction of a design type and its tools is to solve a specific design problem. Unlike the Design Thinking or the Double-diamonds model, the design method proposed in this study could not guide the entire design process. Generally speaking, it was established be used to inspire design at the ideation stage and is especially effective in shaping futures thinking.

In terms of research content, this paper still needs to explore the characteristics of DF as a thinking mode and a design method, such as: 1) what are the components of DF and what features make it different from other future-oriented design methods; 2) How the process or stage of DF is composed, and what is the focus of each stage; 3) What is the input and output form of DF and what are its specific practice cases? The answers to these questions will help to further clarify the outer edge of DF and enrich its connotation.

DF is an experimental exploration of combining futures thinking and design methods. We hope it could draw forth innovative methods in two ways. First, expanding the library of future-oriented design methods and tools. Second, tapping the potential of designers in coping with uncertainties and creating a conversation space to drive people to ponder over “what kind of futures we want”. In this way, the goal of inspiring minds and changing behaviors with design could be achieved, which could help humans to create the preferable future together.

Acknowledgements

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