When Human-Centered Design Meets Social Innovation: The Idea of Meaning Making Revisited

Jin Ma(✉)

College of Design and Innovation, Tongji University, Fu-Xin Road 281, Shanghai 200092, China
majin.poly@gmail.com

Abstract. Facing the challenges of sustainability, while design is seeking to play an important role in social innovation, human-centered design (HCD)—one of the most important philosophies of design—somehow appears to be fading out of the major research agenda. Based on a review of the limitations of HCD, this paper looks into the capability of the theoretical underpinning of HCD to support its potential development in social innovation from two aspects: (1) the connection between human-centeredness and the social dimension; (2) emancipating HCD from the asserted limitation of its role in innovation. The phenomenological perspective is used to support and broaden the worldview of HCD. Built upon this, the idea of meaning making is revisited to account for both questions. In addition, a preliminary framework of meaning making is proposed as a HCD tool that aims to facilitate the complex interaction in social innovation. It is argued that design as meaning making with a combined interest in exploring human experience will open up new opportunities for HCD.

Keywords: Meaning · Human-centered design · Social innovation · Phenomenological perspective · Hermeneutic spiral

1 Introduction

Ancient Greek philosopher Protagoras once said: "Man is the measure of all things." This ethos is implicitly or explicitly practiced by designers and culminates in human-centered design (HCD) practice. Facing the challenges of sustainability, however, while design is seeking to play an important role in social innovation, HCD—one of the most important philosophies of design—somehow appears to be fading out of the major research agenda.

This paper begins with a review of the limitations of HCD, particularly situated in the sustainable context where the movement of social innovation grows as an important response to sustainability challenges. Based on this review, the capability of the theoretical underpinning of HCD to support its potential development in social innovation is investigated from two aspects: (1) the connection between human-centeredness and the social dimension; (2) emancipating HCD from the asserted limitation of its role in innovation. The phenomenological perspective is used to support and broaden the worldview of HCD. Built upon this, the idea of meaning making is revisited to account

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for both questions. At the end of the paper, a preliminary framework of meaning making is proposed as a HCD tool that aims to facilitate the complex interaction in social innovation.

2 Challenges to Human-Centered Design

According to Don Norman, HCD involves a range of methods that bear "a common framework: an iterative cycle of investigation—usually characterized by observations, an ideation phase, and rapid prototype and testing [1]," and this framework hinges on the understanding of the needs, desires, and limitations of end users of the product. HCD is a value-laden approach that has great impact on design as a means of humanizing technology by placing products in their situations of use. It points our attention to "the experience that human beings have of products—how they interact with products and how they use products as a mediating influence in their interactions with other people and their social and natural environments [2]." HCD is, however, facing increasing challenges toward its underpinning worldview, its emphasis on the notion of 'end user' that has been blurred by people's participation in design, its methods and process controlled by design professionals; and its role in design innovation.

2.1 Anthropocentric Worldview Vs. Sustainability

Although the far-sighted understanding about HCD sees products as the mediation of the interaction between people and that between people and the social and natural worlds, the emphasis on human needs and aspirations has been long overriding the care for the relationship between human beings and the world. Designers used to indulge in an anthropocentric worldview. Without seeing human beings as part of the natural, social, and economic eco-system, HCD approaches such as the "useful, usable, and desirable" principle [2] are used to stimulate endless human wants and material consumption beyond what this planet can offer.

The idea that the resources on this planet are limited was not relevant forty years ago when Victor Papanek first published his provocative book *Design for the Real World* [3] but has become a burning issue facing humanity today. Advancements in science and industry achieved in modernity have fostered Western resource-intensive consumption pattern and lifestyles that are deeply grounded on material beliefs [4]. The predominating pattern of design encourages and in turn benefits from consumerism, which speeds up the exploitative economic growth. HCD to a certain extent legitimates this circle. As a result, the current rate of production and consumption simply cannot be sustained and thus gives rise to severe environmental and social-economic ramifications. It is further expanded through globalization.

When sustainability becomes the proposition of this time, human needs that should be addressed by design have changed. The mission of HCD today is shifting beyond satisfying individual human beings' endless desires at the cost of exploitive consumption of resources. For the humanity to survive and prosper, it is necessary to move

beyond the anthropocentric view of HCD. We have to ask, in which context a product is useful, usable, and desirable?

2.2 Human-Centered Design Vs. Participatory Design

HCD and participatory design [5, 6] share a fundamental emphasis on people, i.e., getting close to people and observing and analyzing their needs, but diverge at the point where the idea of "user" is delimited. For traditional HCD, users are treated as either the object or the context of design, and then absorbed into the design process as the passive information carriers for designers to dig out opportunities, collecting data, recruiting feedback to evaluate the proposed solution prototypes [7]. In vivid contract, participatory design emphasizes the need to rethink the roles of the participants, especially those who are known as users and to include users as active actors of design [8, 9]. The increasing practice of including people's participation across various stages of the design process has an impact on the conventional HCD process. The later replacement of the term "user-centered design" by "human-centered design" reflects such an impact, which renders the activity of design a democratic sense. However the conventional HCD practice remains rather conservative in terms of social inclusion.

2.3 Conventional Framework of Design Vs. Social Innovation

Design is shifting its attention from physical products design, firmly rooted in mass production rationalized for efficiency, to system design that is related to new ideas and values. For example, cities that used to be part of developed industrialized economy are suffering from long-term economic stagnation, unemployment, and the problems of aging population due to globalization and the local industrial transition. Problems of such a vast scale and complexity—sustainability, economies, politics, and overall social well-being—would not be regarded as design problems decades ago but now become burning issues, in which design is actively engaged.

While sustainability is becoming a value of necessity for the humanity to sustain, social innovation emerges as an alternative approach to address the environmental, social, and economic challenges [10]. Design for social innovation can be seen as social-purpose directed participatory design with a sustainable goal. To play an active role in social innovation, design now is seeking alternative patterns to facilitate the rich interactions inherent in the open process. However, HCD, the once prevailing design approach, is vanishing from this agenda. A significant reason rests upon the incompatibility between HCD's typical iterative investigation process controlled by professional designers and social innovation's more open and flexible process that engages various flows of active roles of designing.

The challenge to HCD's flexibility in adapting to this open and dynamic frame is great. Social innovation involves three kinds of possible processes: top-down, bottom-up, and hybrid [11]. Design culture (including the process, core competencies, knowledge, technologies, behaviors, values, dogmas) [12] burgeons from inside-out or outside-in the community, or in a combined way of the two. When design becomes "a

constellation of initiatives geared toward making social innovation more probable, effective, long-lasting, and apt to spread [11]," the process is characterized by people's rotating role of designing through various phases of the process, no matter they are from inside or outside of the community. The complexity of human interaction radically grows; the boundaries between designers, users and stakeholders are blurred; the design process opens up and is no longer an iterative prototyping process neatly controlled by the designer. This shift impels the designer to work on innovation projects actively, for the frame of 'Design' is no longer given.

2.4 Incremental Improvement Vs. Radical Innovation

The literature on innovation studies divides innovation into two categories: incremental and radical. The former denotes local optimization—"improvements within a given frame of solutions"; and the latter "a change of frame." HCD is regarded as a typical approach to incremental innovation capable of enhancing the quality and value of the product in the current domain; but is claimed to have little position in radical innovation—to innovate by introducing new domains and new frames [1, 13]. Given the focus on user needs, HCD (or UCD) is believed to "be pulled by user requirements or observation [13]." A key argument for this statement is, users' interpretations are merely in line with what is happening today, how could the existing allow the designer to leap into solutions for the future? HCD tends to be seen as grounded on research in marketing, consumer behaviors, and anthropology of consumption. For example, Verganti relates market-pull (or equivalently termed as user-centered) strategy to the incremental improvement among other innovation strategies. In parallel to this view, Don Norman also illustrates HCD as a form of hill-climbing only suited for incremental innovation and having no way of informing the climber of where even higher hills might locate [1]. Hence, the repeating and testing until satisfied process is extracted as the hallmark of HCD. It further reinforces this one-sided role of HCD in innovation. In contrast with HCD's capability in incremental improvement, radical innovation is generally believed to be driven either by technology changes or by meaning changes. Apparently, in this view HCD is alienated from meaning-driven innovation.

The review of the current understanding of HCD addresses two aspects: the underlying worldview and the methods and process of HCD. The implicit anthropocentric worldview is revealed by contrasting prevailing HCD practice to the backdrop of sustainability. The iterative, well-structured design process that is predominantly controlled by the designer is challenged by the growing participation of people. Social innovation provides an even dynamic arena, which leaves little place for HCD that does not readily accommodate people's changing role of designing, the design process opened up, and complex human interactions outside of any given frame.

Given the limitations, it is pertinent to ask, is there still any possibility to develop HCD for system design as complex as social innovation? This review brings the focus of my inquiry to the potential capability of the theoretical underpinning of HCD. It can be further phrased as: (1) Is it simply impossible to grasp the big (e.g. environmental, social, and economic) context of design if individual human being is placed at the centered of design inquiry? (2) Is there any perspective that is able to open up new

opportunities of HCD's role in innovation? These questions will be address through the phenomenological perspective and the idea of meaning making.

3 The Phenomenological Perspective

Phenomenology is helpful in its attitude toward the relationship between individual human being's sphere and the social sphere. According to Sokolowski, "phenomenology is the study of human experience and the ways things present themselves to us in and through such experience [14]." "Things" means everything in the world and therefore includes objects, people, environments, and activities. That is to say, even if human being's experience is personal and idiosyncratic, there is still a public realm of experience, where personal sphere is connected with the social sphere.

To understand this stance, several fundamental conceptions in phenomenology are important. First, all consciousness is consciousness "of" something. Therefore, the mind is always directed outward. In phenomenology, mind and body, subject and object of experience are united. Second, anything that is experienced is inseparable from the way it is experienced. "I" see the world through the relationship between the world and "I." Third, based on these two, our life of perception, reasoning, and knowing share a common basis, because our mind is not locked in an individual body and is not merely directing individual actions. It is possible to understand the other's experience by understanding self's experience. There is a public realm of experience, because each individual shares this fundamental relation between the world and "I" in common; and because it is the same world that we live in and interact with [15].

Therefore, there is nothing wrong with placing human at the center of understanding and designing the world, because our being in the world serves as a fundamental vehicle for us to understand the world.

The public realm of experience is where empathy comes in. Take the development of empathic design for example. Empathic design first began as the interpretive exercise of users' emotions, then moved from user-centered approach toward the co-design process centering around the concept of empathy, and is now taking an artistic and expressive turn to include empathy in design imagination [16]. This trajectory of empathic design mirrors the growth of HCD because the former is built on a long history of HCD [16]. The biggest challenge to empathic design is what HCD is facing too—how to adapt the established process and tools to design for networks and organizations that deliver services; how to expand the methods and politics to incorporate design that occurs in large systems and communities. In short, the challenge is to develop appropriate approaches to link personal-sphere based design inquiry with the processes, and methods needed by design at a social scale.

4 Meaning Making Revisited

There is a small yet increasing body of discussion on the notion of meaning in design research. Klaus Krippendorff's proposition that "design is making sense (of things) [17] " signals a meaning turn in describing the nature of design. Following this

inspirational definition, design is viewed as a form of meaning making [18, 19]. Nevertheless, meaning is a word that has many meanings, whose origins can be traced back to a wide range of domains, varying from psychology to linguistics.

While Verganti addresses radical innovation driven by changes in meaning, meaning is seen as a set of emotional and symbolic values that triggers users' personal and sociocultural needs. For example, "designers give meaning to products by using a specific design *language*—that is, the set of signs, symbols, and icons (of which style is just an example) that delivers the message [13]." However, this is just one way of understanding meaning and it is symbolic (i.e., the to-be conveyed value is extracted as physical signs and symbols, and the interpretive process of meaning making is totally overlooked). To investigate whether HCD has possibilities to create significant meanings that lead to radical innovation, it would be useful to examine the notion of "meaning" and its various origins and doctrines that are influential to, or in, design.

4.1 Distinct Origins of "Meaning"

The underlying stances behind the varied understandings about meaning are described as follows.

A major strand of design studies on meaning is built upon conventional semiotics, which studies meanings *in* objects. Meaning is used "as if it were independent entity that could be attached to objects or contained in containers. [20] " Thus, it is not a coincidence that designers and design researchers, influenced by this stance, tend to turn meanings into attached properties, qualities, or attributes of things. By doing so, things do not stand in their own right, but are deprived of their original existences and extracted as *meaningful* symbols or signs. Verganti's conception of meaning is rooted in this tradition.

Cognitive Science treats human cognition as a mental process in terms of knowing, learning, and understanding. Meaning, as the product of such a process, is defined as "a thought induced in the receiver, which is originated by the contact with a design [product]. [18] " As opposed to one extreme that design is seen as artifact-centered, this view tends to ascribe the foundation of design to the faculty of the mind. In this approach, the mental process is often taken to be the entirety of a design experience.

According to Blumer's critique, meaning in its conventional psychological and sociological sense is either: (i) bypassed by merely focusing on the initiating factors (e.g. stimuli, attitudes, motives, cognition in psychology; social position, status demands, social roles, and values in sociology) and on resulting human behaviors; or (ii) is regarded as an unimportant link between the two ends and is swallowed by the initiating factors [21]. In this way, meaning is either deemed as an intrinsic part of the thing and therefore any process involved in its formation is denied; or is regarded as an expression of the elements of a person's mind (e.g. sensations, feelings, ideas, memories, motives, and attitudes), which are lodged in the psychological processes of coalescence of these elements in a person. This stance resonates with the aforementioned definitions—in conventional semiotics and cognitive science—of meaning as either attributes in objects or as mental constructions.

Meanings, in the context of symbolic interactionism, are seen as social products that arise in the process of interaction between people; instead of being established

entities, meaning involves an interpretive process in its formation and it in turn shapes human action. Herbert Blumer maintains that: (i) meanings are the basis on which human beings act toward these things; (ii) the source of meanings is the process of interaction between people; and hence (iii) meanings are engaged in an interpretive process by the person who is interacting with the encountered things [21]. Symbolic interactionism provides an important perspective to contemporary interaction design.

Product semantics focuses on the communicative function of product, i.e., "what user expects the object to do [22]." In this doctrine meaning is defined as "a cognitively constructed relationship. It selectively connects features of an object and features of its (real environment or imagined) context into a coherent unity [22]." While greatly enabling designers to communicate their design intentions, the theory of product semantics, however, carries some inconsistencies in its stance toward meaning. On the one hand, it maintains that meaning is not fixed and that making sense goes around a hermeneutic circle; on the other hand, product semantics neglects personal process of meaning making, because human experience, in this approach, is viewed unable to be shared for its subjectiveness. As a result, meaning adopted in semantic theory tends to be oversimplified, as it does not account for how the object points to meaning that it "simultaneously contains and conceals [23]."

Different lines of inquiry into human experience (e.g. Dewey's analysis of the structure of an experience [24] and Polanyi and Prosh's theory on tacit knowledge [25]) indicate that meaning is related to thinking, reflecting, understanding, and knowing, and that the substrate of the meaning making process is human experience. There is an emerging body of research on experiential knowledge in the recent decade [26]. Informed by seeing experience as the basis of knowing and regarding human experience as an organic unity, meaning examined in this area carries more dynamic features of knowledge-in-action. A very important insight is: inquiry into meaning needs to restore meaning into the rich relations contained in human experience. However, one of the challenges facing this area is how to link the personal dimension to the public space so as to allow the socially relational dimensions to be revealed.

To expand the understanding of meaning by exploring the tacit and embodied dimensions of design also becomes a growing focus in phenomenological studies. For example, in order to facilitate designers to articulate more about their experiences, Jin Ma maintains that meaning provides a relational perspective, revealing both particular aspects of the world and the designer's judgments, feelings, attitudes, actions, and understandings through a hermeneutic circle [15]. Figure 1 illustrates how individual

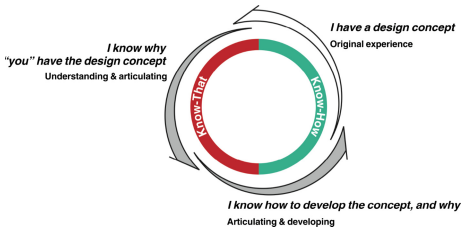

Fig. 1. The hermeneutical circle in having a design concept. (Copyright © 2013 Jin Ma)

experience can be broadened into a public dimension: meaning could be a product of co-creation arising from the interplay between constructing and reconstructing. Located in the business and social context, Marcus Jahnke develops an understanding of the contribution of design practice to innovation from the hermeneutic perspective [27]. Jahnke's study supports the idea that meaning making sits at the heart of innovation involving multi-disciplinary engagement beyond both the individual and the designerly spheres.

4.2 Positioning the Underpinning Domains of Various Conceptions of Meaning

Different studies on meaning are positioned in Fig. 2, in terms of the stances of inquiring into meaning from inside or from outside of individual experience, and approaches that focus on relations (holistic) or elements (analytic) [15]. Based on this map, relations and distinctions between the discussed research areas on meaning are further clarified. Obviously, in comparison with the other three quadrants, the upper right corner of the map remains loosely occupied. There is a limited body of studies on meaning, which is based on the structure of human experience and focuses on relations rather than elements. Especially the explorations of relations that bridge personal and social facets of meaning are scanty now.

4.3 Insights

Mapping out the landscape of studies on meaning allows us to notice the convergence of the relational nature of meaning and the personal, experience-based starting point where meaning arises. This is the area that is compatible with the ethos of HCD and may potentially bring in new dimensions to its traditional design approach.

Norman and Verganti are right in saying that meaning has not been well studied as an approach to innovation. However, their observation is flawed in that they overlooked the rich relationaility that meaning may provide when grounded on the exploration of the relational structure of human experience, and in that they did not see

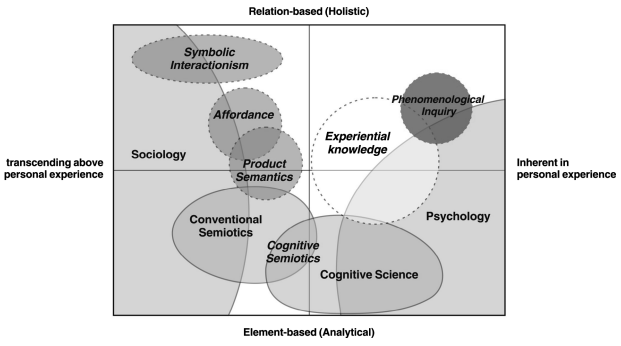

Fig. 2. The remapped landscape of research areas on meaning. (Copyright © 2014 Jin Ma)

that meaning making is an interpretative process from where new meaning may arise (e.g., it is claimed that "customers hardly help in understanding possible radical changes in product meanings as they are immersed in a sociocultural context that leads them to interpretations that are in line with what is happening today" [13]).

Meaning making involves a hermeneutic circle, or more precisely, a hermeneutic spiral [28], which intrinsically is open to something new. According to Janke's analysis on Ricoeur's critical hermeneutics, hermeneutic spiral opens up to "the 'excess of meaning' of the world, rather than locking meaning to established history and tradition;" and "'distancing' is viewed as a prerequisite for interpretation [28]." In parallel, Ma's study indicates that an experience of making sense of a design concept begins in "wonder," which presents surprisingly related things in juxtaposition to the designing person and implies the potential inclusion of the unknown. This also echoes the suggestion of Buchanan, that experience and environment are places where continuous reconstruction happens, which integrates the pluralism of past life and future possibilities in the moving present [29]. In a nutshell, grounding meaning making on human experience enables us to move beyond the claimed predicament of HCD by virtue of the fusion between the known and the unknown where new meaning emerges.

5 A Preliminary Conception on the Framework of Meaning Making

For a framework of meaning making that combines HCD with design for social innovation, two issues are considered: (1) whether the interaction between personal and social dimensions can be grasped; (2) in which way HCD can be integrated into the framework and opened up for more relational and dynamic process and social innovation. The studies on meaning with an experiential turn serves as an opener for this ongoing inquiry for its capability in accounting for both issues. They look into meaning from a holistic view and consider the human-world interactive process of meaning making process as an indispensible part of meaning study. These relationality-focused and experience-based studies provide a good starting point for seeking a way of capturing the rich meanings arising from where HCD and social innovation meets. The following is a brief description about a preliminary conception of such a framework.

While exploring the bottom line of sustainability, Stuart Walker proposes three levels of meaning: practical, social, and personal [4]. These three denote our responses respectively to environment, to other people, and to our inner self. Each level is rooted in various worldviews including modernity, postmodernity, and traditional. They together comprise a meaningful whole when sustainability issues are under considerations. This proposition nicely bridges the personal and social dimensions and links them to the world where sustainability matters occur.

Dewey in his analysis of the structure of an experience identifies three intertwining layers of an experience: practical, emotional, and intellectual, although they interdependently constitute a unity. The practical layer refers to the doing phase of an experience; the emotional refers to the undergoing phase; and the intellectual "simply names the fact that the experience has meaning [24]." Inspired by Dewey's insights,

	Practical (Environment)	**Social** (Community/Organization)	**Personal** (Self)
Knowledge	*Natural* *Societal* *Economic* *Political*	*Sociocultural* *Organizational* …	*Tacit* *Experiential* ...
Process	*Creating business model* …	*Building the network* *Changing the organization* …	*Turning self into a member of the community* …
Value(s)	*New local livelihoods* *Less deterioration of land* …	*Better care for the aging* *Local economic revival* …	*Self-Actualization* *Spiritual growth & Wisdom* …

Fig. 3. Meaning Making Matrix as a HCD tool to facilitate the interaction in social innovation

I propose the process, value(s), and knowledge as three dimensions that describe the experience of design for social innovation.

The preliminary framework of meaning making is a matrix of the environmental, social, and personal aspects of meaning and the knowledge, process, and value(s) of the experience of design (see Fig. 3). By environment, here it means not only the natural world, but the surroundings/conditions, both natural and artificial, that enable the aimed changes to occur. Moreover, this Meaning Making Matrix (MMM) is intended to be used by individual persons, who are playing distinct roles in the design initiative of social innovation, as a way of articulating, reflecting, and understanding meanings arising from their own experiences in the process of social innovation. It is a tool that would facilitate the interaction between different people engaged in the process seeking a more synergistic relationship. Therefore it is fundamentally a HCD tool that allows individual participants (including designers, people from the community, or stakeholders) to voice out the meanings derived from their experiences. In particular, these meanings will by no means be limited to either personal or sociocultural sphere, and the interaction between different MMMs will introduce new meanings as well as new rounds of interpretive process.

As part of an ongoing study, the MMM requires further consolidation, modification, and evaluation through insights from concrete cases. Practical knowledge may be related to natural, societal, economic, and political environments; social knowledge may include sociological and cultural knowledge, and organizational change; personal knowledge refers to tacit knowledge or life/work experiential knowledge of that very person. Practical process (for example, if it is the designer who is using MMM) may create the business model that energizes the local resources; social process may engage people and stakeholders into a synergetic network; and personal process may include how the designer turns him/herself from the outsider into the insider of the community and brings in design culture to the community, etc. The contents of MMM vary from person to person, role to role, and case to case, especially the values. To be a usable and useful tool, relevant hermeneutic sub-categories within the matrix need to be further identified and modified.

6 Concluding Remarks

Sotamaa advocates in *The Kyoto Design Declaration*: "human-centered design thinking, when rooted in universal and sustainable principles, has the power to fundamentally improve our world. It can deliver economic, ecological, social and cultural benefits to all people, improve our quality of life and create optimism about the future and individual and shared happiness [30]." Design begins to play an active role in facilitating and enabling social innovation, in a way that is significantly different from how it contributes to consumerism culture within the traditional organizational structure and managing process. While design shifts its mission from satisfying human needs rooted in the unsustainable pattern to meeting needs of humanity for a sustainable future, conventional HCD needs to be reenergized with a consistent approach.

Seeing human beings as the measure of the artificially shaped world is still a vital perspective, however, a new set of graduations capable of capturing the previously glossed over dimensions of the world needs to be developed. Design as meaning making with a combined interest in exploring human experience will serve as an opener to address this task. The framework of meaning making proposed here is a preliminary step of an ongoing inquiry. It aims to be a tool for different roles engaged in design for social innovation to understand and to articulate their experiences, and therefore to facilitate people's interactions. This tool will open up new opportunities for HCD when situated in the contemporary sustainable challenges.

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