

# Design Thinking and Human-Centered Design - Solution-Based Approaches to Innovation and Problem-Solving in Social Environment

Design Thinking is widely regarded as critical for companies committed to building a more creative and innovative company culture. Two components are key to this new approach - Design Thinking and Social-Centered Design (SCD), which are both built on and derived from human-centered design (HCD). In HCD-based Design Thinking, the focus is on a more collaborative and iterative style that combines creative design approaches to generate empathic, human-centered innovation processes. One aspect that is of particular importance to this approach is reframing from the perspective of user experience (UX). Moving from the individual user's perspective to that of the social environment as a whole, SCD retains the HCD while applying it to the broader social environment in which the user lives and functions. In this context, social environment business models and social experience (SX) play an integral role.

In this paper, we will look at how SCD fits into the overall concept of Design Thinking and how these concepts can be integrated into corporate culture and innovation processes to create a more dynamic, forward-thinking, and socially aware company optimally positioned to meet the needs of its customers.

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## 1. Introduction

In recent years, a growing number of companies have incorporated the methodology of human-centered design (HCD) into their design matrix in order to develop easy-to-use products and systems. Surprisingly, however, conventional HCD has not always lived up to its promise, often failing to lead to innovation in many cases. This has motivated more and more companies to introduce the concept of Design Thinking based on HCD. By challenging the precepts underlying HCD, Design Thinking offers a practical, yet radical, approach that has proven successful in generating innovation in the development of products and services.

To help companies understand and benefit from this new approach to innovation, the Japanese Ministry of Economy, Trade and Industry established a committee tasked with promoting the use of Design Thinking and studying how best this approach could be integrated and employed by companies.

Design Thinking and traditional HCD have many aspects in common, as well as many differences. One of the key points differentiating the two, and one which we will focus on here, is the creative design approach. Central to Design Thinking's creative design approach is "reframing," which by helping the

design team to shift perspective and examine problems from a new angle, jumpstarts the creative process and stimulates more innovative solutions.

While the end-user must always remain the final arbiter of a product's success, social and environmental issues have come to play an ever-greater role in determining the appropriateness and true value of product. Many customers today are increasingly concerned with such issues as environmental impact, social utility, and inherent value, taking all of these elements into consideration when choosing a product. Social-Centered Design (SCD) is a variation of HCD that takes the customer's overall social environment into consideration, using social environment business models and social experience (SX) to support and facilitate the design process.

In this paper, we will look at the overall concept and approaches of Design Thinking and HCD, and then more details of SCD and HCD.

## 2. Design Thinking and HCD

### 2.1 Design Thinking

Put simply, Design Thinking is an approach to prob-

lem-solving that applies the creative principles used by designer to a variety of fields in order to help individuals and businesses take innovation to a higher level. A typical case example of Design Thinking is Bank of America's Keep the Change program. In this case, by studying and observing their customers, Bank of America was able to discover their intrinsic values and create a new service based on those values. When the service was introduced, it immediately attracted attention, resulting in a significant increase in new customers. The concept itself is simple, but extraordinarily powerful. Whenever a customer purchases a product using their Bank of America debit card, the charge is rounded up to the nearest dollar, and the difference automatically deposited in the customer's savings account.

As is evident in this case, the concept of HCD - in which a product or service is designed based on user values - remains at the heart of Design Thinking. Important also is to take a creative approach rather than a strictly nuts-and-bolts problem-solving approach. IDEO, the company that originally formulated and promoted Design Thinking, has set forth a methodology comprised of five steps: "Understanding" "Observe," "Visualize," "Evaluation and Revision," and "Implement," using tools for fieldwork, prototyping, user testing, and brainstorming.

In this paper, we define Design Thinking as the utilization of HCD-based creative design approaches in a wide range of fields, not just design. This means applying the principles and techniques that form the core of Design Thinking to fields as diverse as corporate strategy, service planning, product planning/development, market creation, business process improvement, and research planning.

In practice, Design Thinking creates a culture of innovation that not only helps in the development of new products and services for customers, but also new strategies and concepts for organizations. While the principles of Design Thinking and HCD have much in common, one key point that distinguishes the two is that Design Thinking focuses on a creative design approach.

## 2.2 Utilizing Design Thinking

The creative design approach requires a different set of assumptions than conventional approaches, or rather it requires jettisoning those assumptions altogether. The key to this is what is called "reframing." Normally, as we go about our lives, we automatically frame our experiences in a certain way so as to make sense of them. This "framing" is second nature to us, so habituated to it are we that we are scarcely aware of how we view the world. "Reframing" is a way of shaking loose our ordinary perspective and consciously looking at the world from a new point of view.

For example, in conventional framing, you would regard

Table Examples of reframing approaches.

	Framing	Reframing
Content: Change the meaning while keeping the context the same.	A folding table is put away when it is not used.	A folding table is displayed when it is not used.
Context: Change the context while keeping the meaning the same.	A bicycle saddle is used for a bicycle.	A bicycle saddle is used as a seat.

your alarm clock as a tool to wake you up at certain time in the morning; on the other hand, in reframing, you could see as something that helps you wake up in a comfortable and pleasant way. That is, rather than thinking of the alarm clock as a tool to help you get up on time, you can think of it as a device that makes waking more pleasurable.

As shown in the **Table**, reframing is composed of two forms - content (or meaning) reframing and context reframing. In content reframing, when you force a change in the semantic perspective, you change the meaning of the specific situation you are contemplating. For instance, while conventional framing might make you feel annoyed because the train is late, content reframing could lead you to feel lucky not to have had an accident, even though the train is late. Thus the same situation can be viewed positively or negatively, depending on how you choose to frame it. Context reframing, on the other hand, is, when you force a change in the contextual perspective, changing the situation itself without changing the meaning. For example, while normally you might worry because your alarm clock is always losing time, context reframing might suggest that you should just use this alarm clock on the weekends precisely because it always runs slow.

Even when reframing is understood intellectually, it is often difficult to put it into practice and force a shift in perspective. One effective way to take advantage of reframing, however, is to shift to the perspective of user experience (UX). We will discuss this method in detail below.

## 2.3 Reframing Approaches

In reframing from a UX perspective, you would perform reframing by taking advantage of a UX with a different frame from your own. For example, if you were going to plan and design a kindergarten, you would develop your plans by shifting your perspective to that of a child.

Below, we discuss methods for applying reframing approaches that take into consideration the three main facets of the UX - the time axis, the environment axis, and the human axis.

### 1) Contextual alteration on the time axis

Reframing is possible from the perspective of changes in the user's situation and experience on the time axis. For example, conception by utilizing the experience

map, which is a visualization of UX on the time axis, is a way of understanding contextual alteration on the time axis (Fig. 1).

**2) Axis of diverse environments**

Here, reframing is performed from a perspective in a different context. For example, the conception of Achille Castiglioni, a representative designer from Italy, in which he used a bicycle saddle for a chair, is an example of reframing from the perspective of the axis of diverse environments. Changing the point of view between macro and micro perspectives can also lead to reframing.

**3) Axis of various users**

Reframing is also possible by shifting to the viewpoints of various users and cultures. For instance, the Lead User method can be seen as reframing approach that uses such a user viewpoint. Conception while empathizing with users using the Persona method is also reframing from the viewpoint of various users.

**3. SCD and HCD**

In conventional HCD, design is human-centered and focuses on users. In the Vision-Proposal Design method and the Business Model Generation method, both users and businesses are taken into consideration. In the past few years, society and

environment have come to exert a greater effect on customers and businesses, not only shaping their values, but imposing various restrictions or demands upon them. Customers also now place greater value on the roles played by society and environment, which can have a more determinant effect on buying decisions and so on. To deal with these changes, HCD approaches have been modified to take account of the social environment.

**3.1 Positioning of SCD**

Over time, the research themes focused on by the Japan Ergonomics Society's Ergo-Design Section have transitioned from GUI design methodology, which studied how best to control hardware via software-mediated interaction, to universal design methodology, which investigates how to solve problems from the viewpoint of usage by diverse people, and Vision-Proposal Design methodology, which looks for solutions to current problems and proposals for the future. Derived from universal design methodology and Vision-Proposal Design methodology, SCD is now achieving prominence as a powerful solution-based approach capable of dealing with today's most urgent issues.

As shown in Fig. 2, the framework of the Vision-Proposal Design methodology for future proposals is composed of a user viewpoint in the upper section, a business viewpoint in

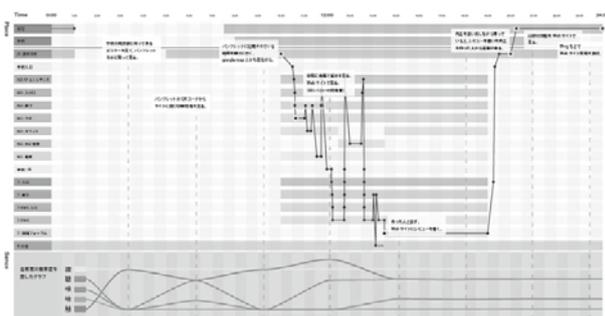


Fig. 1 Experience map example.

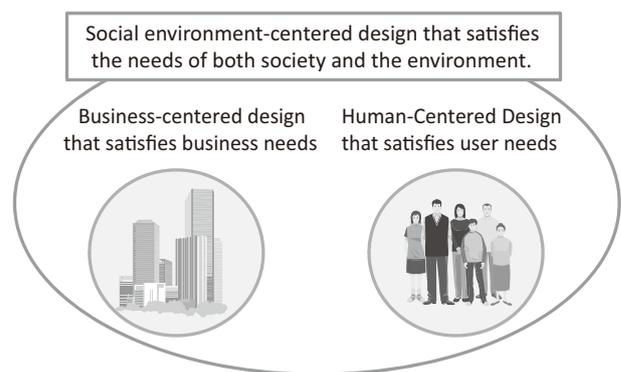


Fig. 3 Social-centered design.

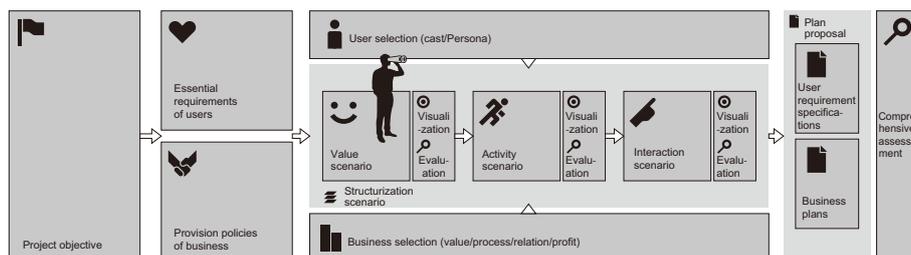


Fig. 2 Vision-Proposal Design methodology.

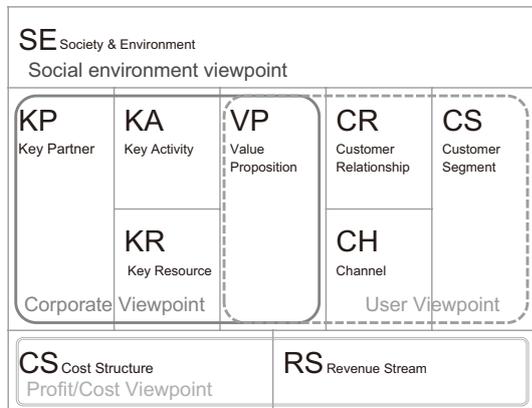


Fig. 4 Business model with social environment perspective added.

the lower part, and a structural scenario method in the middle part, which is the core of this design methodology. There is no specific positioning for society and the environment in this methodology; rather, it is included in the user viewpoint or positioned in the business viewpoint.

### 3.2 What is SCD?

Here, SCD is defined as a design approach in which a social environment perspective is added to a user perspective and business perspective (Fig. 3). The user viewpoint is positioned as human-centered design (satisfies user needs), while the business viewpoint is positioned as business-centered design (satisfies business needs). The new social environment perspective is a social environment-centered design that satisfies the needs of society and the environment.

Here, social environment means a point of view that takes into account both society and the environment. “Society” includes sustainable society, social value, socioeconomic and social environments. “Environment” includes cultural environment, regional environment, and global environment.

### 3.3 SCD Approach (Social Environment Business Model)

When society and environment included in the conception process, the social environment perspective is added to a business model conscious of customer value. One method that embodies this design approach is the Business Model Canvas. The Business Model Canvas enables easy-to-understand utilization of a business model, with separate templates each from a different standpoint - user, business, and profit/cost. As shown in Fig. 4, the addition of a social environment block above these templates makes the model more closely reflect a social design approach. The values of customers and businesses relevant to society and the environment, as well as social and environmental trends, can be described in the social

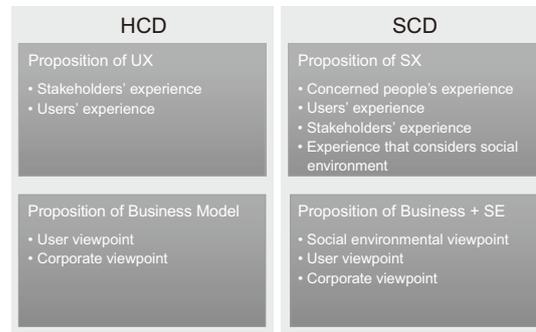


Fig. 5 HCD and SCD in the future.added.

environment block. This business model can be called a social environment business model.

### 3.4 Social Experience Approach

When taking an SCD approach to Design Thinking, a social experience perspective is required. As shown in Fig. 5, the HCD approach requires two propositions; one from a user viewpoint (proposition of UX) and another from a business viewpoint (proposition of a business model). The SCD approach adds on another two propositions also from a user viewpoint and a business viewpoint; the former is “proposition of SX” and the latter is “proposition of social environmental business (Business + SE) model.” In other words, SX not only includes UX, but also incorporates the experiences of concerned people and stakeholders and the overall social environment that individuals and groups operate in.

## 4. Conclusion

In conclusion, in today’s complex, deeply interwoven world, where each individual is tightly integrated in a seamless social and environmental web that shapes his or her values and is in turn shaped by the actions of many individuals, Design Thinking must go beyond conventional HCD approaches. Design Thinking and SCD based on HCD can propel innovation in a fast-changing world. Techniques such as reframing from the viewpoint of UX, social environment business models, and SX are also essential to achieve Design Thinking and SCD, which are powerful and effective tools for implementing solution-based concepts to solve problems and develop new products.

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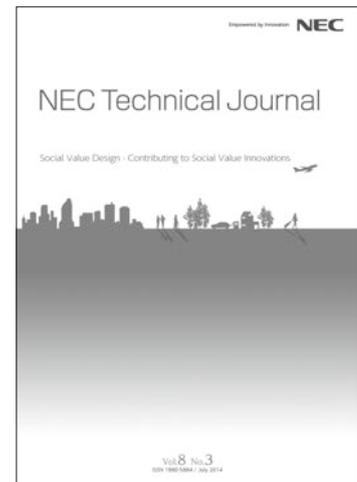
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#### NEC Group's Approach to Social Value Design

Social Value Design Promotion Activities in NEC



Vol.8 No.3

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Special Issue TOP