7. Inclusive Design

User-participatory design (also known as participatory design), in which the opinions expressed by users actively influence the development of products or systems, has received a lot of attention in recent years. However, it is quite often the case that users are simply interviewed about their needs before the actual design process has even begun, or are only invited in to check on the usability of products which have already been developed and thus cannot easily be modified.

Inclusive Design is a new design method which aims to imbue products or systems with more universal value by involving specific users as “lead users” throughout the entirety of the product development process; first by thoroughly examining those users’ individual needs, and then by developing, based upon these needs, “multiple scenarios” which can involve a variety of other users [1, 2]. To give a few examples of Inclusive Design in use, such products as a new package design for drinking water and an easy-to-use nail gun for do-it-yourselfers have been developed by observing situations in which people suffering from hemiplegia or rheumatism use such products [2]. One of the remarkable features of this new approach to design is the pro-active and deliberate inclusion of a wide variety of as lead users, such as elderly and disabled users or housewives, who had until now largely been excluded from the design process.

Of course, Inclusive Design is not merely a means of drawing out the needs of minorities. What matters most is the simple fact that users do not have on hand a clearly-defined, specific set of needs in the first place, much less the kind of vocabulary needed to determine or describe the value of, say, a new information service or piece of software that they’ve never before seen or touched. True innovation, that which is deeply involved in our society and in our lives, is the process through which users and system designers give shape to those needs which had not previously existed through collaboration.

7.1 User Participation in the Design Process

One well-known design model, called Universal Design, aims to create products which can be used by anyone, regardless of age, stature or the presence or absence of disabilities [1, 3, 4]. Examples of this design philosophy are already beginning to appear in such places as vending machines designed with coin slots installed at such a height as to make it easy for people of any stature to make purchases, or in the simple layouts of websites which anticipate the use of software which reads out onscreen text to visually-impaired users. However, while it’s all very well and good that products now exist which are easy for anyone to use, the fact that the overuse of the slogan “for anyone to use” often ends up confusing the people involved in product development has been cited as a problem with this approach. This is the reason why Inclusive Design, in which the design process begins by looking at the lifestyle of a single individual—the “life of John or Jane Doe,” if you will—has been receiving so much attention. The Design Age Network, which was founded in Europe in 1991 to research the efficacy of designs meant to accommodate aging populations, formed the nucleus of the Inclusive Design movement, which would go on to establish a world-class research center at the U.K. Royal College of Art in 1999 [4]. In Inclusive Design, new ideas are first worked out through the process of thorough and repeated interaction with and observation of individual users. Those ideas are then developed into multiple scenarios which anticipate situations involving a wide variety of different users. For this purpose, it is very important to engage in thorough dialogues with the individual users who participate as lead users. The fact that we as designers tend to overly rely on knowledge and previous information, while neglecting to lend an ear to the real voices of users, becomes incredibly plain and simple to us in Inclusive Design scenarios.

While we talk of making user-friendly products, the fact is that, in the world of engineering, where things have to be made according to concrete terms, we simply cannot rely on subjective terms like “easy-to-use.” While many people sympathize with the idea behind Universal Design, without a way to render concrete design procedures from it, it remains nothing more than an idealistic dream. In the 1980s, products began to be designed with a greater emphasis on ergonomics—that is, the study of the physical and physiological structure of human beings—including keyboards which minimize muscle strain and chairs which prevent lower-back pain. In the 1990s, with the increasing need for ease-of-understanding in computerized products, development began to focus mainly on designing products based on cognitive engineering, which focuses on the cognition and behavior of human beings. At present, the pro-active introduction of a systematized
method for both experts and users to evaluate products, called the usability evaluation, has ushered in an age in which products can be evaluated according to more subjective terms, such as usability or satisfaction. Research is currently being conducted into new methods of product development, such as the Persona Method, which create a virtual user, detail his or her virtual lifestyle, and then describe that user using products in various specific situations [1].

However, if we are too hasty in trying to translate this method into the lingua franca of the engineering world—efficiency—we may end up with nothing more than virtual users designed on the assumptions of experts, which can be a far cry from real-world user models.

In order to obtain a broader view of not only usability, but the meaning that products have in the lives of users, we must go beyond basic design, which aims to determine what consumers want, to a point where we can perceive what an effective, efficient, satisfactory product is in the first place.

Figure 7-1 indicates how, in a typical product design process utilizing User-Participatory Design, opportunities for user participation (Figure 7-1 white ovals) are limited to usability groups and the product refinement stage. However, in Inclusive Design, users are also given opportunities to participate in the early stages of the design process, such as field investigations and focus groups (Figure 7-1 gray ovals). The establishment of this method, allowing users to take part in the entire design process from beginning to end, is the reason why Inclusive Design has been getting so much attention.

However, due to the high level of expertise required, there have thus far been few successful examples of user participation in the stages of the design process which work out more minute details and consider manufacturing techniques. However, new techniques, such as Desktop Factory, which make manufacturing technology more accessible to consumers and non-specialists, are also currently under development [2].

In the realm of product and system development, there is now a pressing need for training people capable of understanding the Universal Design method and making proper use of concrete usability evaluation techniques. Then, by diversifying the ways in which users participate and perfecting the methodology of Inclusive Design, in which users’ opinions are directly linked to new and innovative designs, opportunities will arise to collaborate with users to establish as-yet unseen needs related to, for example, information services or software.

### 7.2 Awareness in Design Workshops

#### 7.2.1 The Inclusive Design Workshop Process
The main feature of Inclusive Design is that lead users can actively participate in the early stages of the design process, such as survey analysis and basic design [2, 5]. Figure 7-2 displays a simple outline of a typical, one-day Inclusive Design workshop, divided into four stages. Each design team is made up of a group of six to eight participants and there are four or five such groups, for a total of 30 to 40 participants in a workshop. People with various disabilities, such as those with visual or hearing impairments, hemiplegia or wheelchair users, as well as the elderly, are invited to act as lead users in each group. The remaining participants in each team include designers, engineers, researchers and students covering various fields of expertise. The participants include experts from a wide range of fields, with designers who are active in everything from product design to textile design and engineers who come from industries ranging from the basic manufacturing of automobiles or home appliances to information technology. The overall creativity of a workshop is directly related to the diversity there is in the expertise of the participants.

(1) The fieldwork stage (7-2a) is not limited to just conducting face-to-face interviews; everyday life situations, such as buying tickets at a train station or shopping for daily necessities, are shared by the members of a team in the real world. Each member is asked to take thorough notes on the things he or she notices. At this point in the process, every little awareness is simply put into words one after another, without regard for category or importance.

(2) In the idea sketching stage (7-2b), the awareness made during field work are collected, laid out and arranged on paper or white board. While quickly sketching out these observations, team members also develop them into more concrete sketches of ideas taking into consideration multiple scenarios which can involve various users. One of the main features of this approach is the generalization of user models based upon the degree to which needs are held in common.

(3) In the prototype production stage (7-2c), idea sketches are reproduced in as close to life-size as possible. Because it is more important for the members to discuss the functionality and structure of a prototype than it is for them to pursue accuracy in specific details, the key term here is “Quick & Dirty.” At this stage in the process, by making an idea into something with substance, physical and structural limitations make the parts of the idea which had been ambiguous more concrete.

(4) In the presentation stage (7-2d), each team is asked to make a presentation, which is intended to call attention to the relationship between the awareness made and the ideas subsequently developed, to the members of other teams. The very act of rearranging one’s own ideas, in the form of words used in a presentation, one can deepen one’s understanding of user needs. This stage is the act of logically arranging words into sentences and paragraphs which describe the entire process from beginning to end: from finding out the concrete needs of an individual user through dialog, to creating a generalized user model from the overlap of users’ needs, to coming up with an idea and making it concrete by observing its physical and structural limitations.

There is now a greater need for a participatory design format in which lead users can an even greater contribution to the product design process as fully-fledged members of design groups, by participating in focus groups from the basic design stage of development or by proposing specific design ideas alongside of developers and engineers. Through this kind of participatory design format, which is distinctive in that it involves users in the process in the same position as designers, it becomes possible to make expressions of user needs into something both more concrete and more positive.

7.2.2 Why Workshop?

A workshop is not a setting for its host to pass on information unilaterally; rather, it is a setting in which participants take center stage, participating actively not just to understand things on an intellectual or verbal level, but to learn things based on actual experience. In cases where a group of people who have never seen each other are gathered together, a workshop will usually start off with a small game, called an ice-breaker, to help everyone feel more at ease. Whether or not the gathered participants can open up to each other and strengthen their mutual sense of cooperation has a big impact on the success or failure of a workshop [6]. The person whose role is to lead the procession of a workshop, guiding the participants closer to discussions of core issues, is called the facilitator. It is necessary for the facilitator to dedicate himself or herself to relieving tension among participants and creating a friendly atmosphere, while also paying careful attention to the passage of time to ensure steady progress in keeping with the determined workshop
Figure 7-2  Stream of events in an inclusive design workshop

schedule. The facilitator’s skill in this is directly related to the depth of the participants’ learning.

Workshops are now used in various situations and for a wide range of purposes, such as formal education, business meetings or town-hall style citizen-participatory city development. It is especially important in workshops to dispel the tendency toward knowledge-ism—that is, placing too much value on the opinions of experts rather than the opinions of the people—and to get all of the participants to understand the importance of working together in a shared space to put into words what the people feel and want. It is not enough for elderly or disabled people simply to express their opinions; rather, what matters most is the putting into words of things which people had not previously been able to express by themselves. In a design workshop setting, this is accomplished through such universal activities as working together to create something that is concrete. One good example is a workshop in which nurses participated with the aim of designing better hospital slippers. In the course of the workshop, the participants realized just how ambiguous one simple phrase they’d been using, “take care to prevent patients from ‘falling down’ in the hospital,” could be. The nurses had thought that they all shared the same meaning when they said the words “fall down.” However, when attempting to apply their ideas about nursing care to a concrete design for hospital slippers, it became clear to them that they had actually only shared an ambiguous definition of “falling down,” with meanings varying from “stumbling and falling due to excess friction,” to “slipping and falling due to insufficient friction,” or even “losing balance and falling due to slippers coming off.” This is an example of just how ambiguous our human languages can be, and it also illustrates the necessity of discussing such minutiae in order to understand needs in concrete terms.

7.2.3  The Systematization of Workshop Management

The curriculum of a workshop depends to a great extent on the ability of the facilitator, who, for better or worse, runs the entire show. In order to provide participants with reliable learning experiences continually, and to encourage the more widespread use of workshop activities, it is necessary to run workshops systematically and, at the same time, to establish a method for accumulating workshop outcome case reports. It is also necessary to seek out the workshop formats which are the most effective for learning from among various examples, considering everything from the number of participants, the combination of participants' specialties, the amount of time and the theme of the workshop itself [1, 2, 5].
Table 7-1 illustrates seven real-world examples of workshop formats with varying lengths of time, design targets and user participation styles (WS-I to VII).

The themes of the workshops had been set in advance in WS-I, II, V, VI and VII; in WS-I, V and VI, they were related to product design, while in WS-II and VII, they were related to the design of information systems. Facilitators also varied; some were product designers, while others were graduate students who had majored in informatics.

In both WS-1 and VI, the lead users included people with cerebral palsy, wheelchair users and people with visual impairments and the target product was the kind of electric pot that we use in everyday life. For example, lead users in wheelchairs spoke of experiencing difficulty in using electric pots because the pour button was located too high up for them and the movable handle was too unstable to carry the pot into the kitchen to fill with water. Figure 7-3 illustrates an instance of an awareness made in WS-VI and an example of a design idea created from that need. For visually-impaired lead users, in order to plug a disconnected power cord into the pot’s connector, they had to feel around the base of the pot with their hands. At this point, the design team came up with the idea of fitting slit-like indentations around the base of the pot. By making the slits closer together the nearer one was to the connector, this idea made it possible to locate the connector easily just by rubbing the base of the pot. In addition, from the awareness of another visually-impaired lead user that the pour button was, regardless of the presence or absence of disability, difficult to press, the need emerged for an easier-to-press button. Also, from the awareness of a lead user with spina bifida, the need emerged for a lid opening and closing mechanism which required less upper-arm motion. Thus, by adding a big, easy-to-press button resembling a face and a clip in the shape of an ear to open and close the lid, the idea for the Pet Pot came to fruition.

WS-III and IV were longer-term workshops and took ample time for lecturing and guidance about Inclusive Design. The design target had not been set in advance and was determined through communication with people with disabilities over the course of the three-day workshop. For example, one
of the groups in WS-III observed that disabled people had trouble with video arcade games in which players compete using agility, such as fighting games or racing games. This awareness led that group to focus on more communication-oriented games, such as *purikura* photo booths in which people take pictures with friends. From there, the group took a step further and, anticipating the needs of visually-impaired players, suggested an idea for a rhythm harmony game which anyone could play. Another group suggested various ideas for coffee drippers which would make it easier to make drip coffee for visually-impaired users or those with the use of only one hand; for example, by designing one section of the coffee filter to be thinner. Each of these designs, which came about as the result of considering multiple scenarios, endows its target product with benefits which can be appreciated regardless of disability or lack thereof.

In WS-II and VII, visually-impaired people and wheelchair users were invited to participate as lead users and new devices using infrared sensors to detect one’s distance from the nearest wall and other such navigation systems were chosen as the design theme. For example, one observation was that, if a visually-impaired person were to get lost around buildings, he or she would have no way of knowing his or her location or of relaying nearby landmarks to somebody over the phone. From this awareness, ideas were suggested such as a portable device making use of GPS to allow one to share audio and visual information about nearby landmarks over the phone. However, participants found it difficult to share ideas about novel new devices that they had never before touched and information services that they could not see. Ultimately, this workshop left behind as an issue for future consideration the matter of how to work to bridge the gap between awareness and suggestions relating to systems.

### 7.2.4 Design Workshop Management

The outstanding characteristic of Inclusive Design workshop is involving, to the maximum possible extent, lead users in the entire design process from beginning to end. When it comes to designing an electric pot, working together with visually-impaired people and wheelchair users in actual product usage situations allows designers to understand how the difficulty of using such products is skillfully circumvented through difficult and painstaking motions in these users’ everyday lives. When it comes to designing of an information system, hearing-impaired users can help designers to realize that an information display terminal which is hard to follow with the eye is difficult for people to read, regardless of whether or not those people can hear. And by having actual designers and engineers present, it is safe to hope that suggestions for improvement will actually be applied in future product design.

At the same time, the process of designing products by collaborating with visually-impaired people or wheelchair users dispels preconceived notions on both sides and alters the mutual relationships between designers and lead users from being about designing products “for” disabled or elderly users to being about designing products “together with” disabled or elderly users. The flow of this kind of workshop management process is illustrated in Figure 7-4.

1. The design theme in workshop can be set to anything from concrete products, such as electric pots or umbrellas, to more abstract concepts, such as lifelong learning or playing. The easier the theme is to associate with something concrete, the easier it is for people to tackle the design process and to enjoy a sense of accomplishment. However, at the same time, because more abstract needs are difficult to work into design targets, there is a need to increase trial workshops which incorporate these themes in order to develop more innovative design systems.

2. Next, one must work to include as wide a variety of users as possible. In a workshop where the theme is umbrellas, normal umbrella usage will entail something entirely different for visually-impaired people than it does for wheelchair users, and their demands will of course be very different, as well. In a workshop where the theme is “bicycle policy,” the demands of elderly

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![Figure 7-4 Managerial flow of a design workshop](image)
cyclists will be completely different from those of mothers riding with infants. Increasing the number of lead user candidates gives us more opportunities to incorporate new points of view into the design process.

(3) When setting the date and time for a workshop, it is important to keep in mind that convenient times can vary from participant to participant and from weekday to weekend. When selecting the location for a workshop, sites where participants can experience the day’s design theme to the maximum possible extent are desirable. For example, if the design theme is electric pots, a site with a fully-outfitted kitchen is preferable; if the design theme is museum displays, a site inside an actual museum is preferable. It goes without saying that one must secure an adequately wide space for 30 or 40 people (including lead users) to be able to work while engaging in an open-minded exchange of opinions. When wheelchair users are involved in the workshop, the bare-minimum essentials include confirming the availability of handicap-accessible toilets and elevators and verifying that the site has an entrance ramp.

(4) Finally, one needs to have an advance mental image of what kind of prototypes are to be made at the end of the workshop in order to select the appropriate materials for making mockups. If the theme is some kind of large home appliance, one may use Styrofoam boards or cardboard to create models in as close of an approximation of life size as possible. If the theme is website design, one can consider such options as whether to use PowerPoint or other PC-based presentation software or mockup software, or whether to use paper prototyping, in which participants create picture card style page views out of letter-sized paper. In addition to aiding in the dialog among lead users, designers and engineers, the act of making something take form before one’s own eyes is extremely important. Thus, the selection of mockup materials can affect whether or not the workshop succeeds.

7.3 Design Workshop Preparation and Step-by-Step Process

7.3.1 A Product Design Workshop Case File

First, as an example of a workshop in which the design theme is a concrete product, let us envision a product design workshop conducted with the design theme of umbrellas. When considering the design of an umbrella, first, if there existed one which was “large yet light when in use and could be quickly folded into a very compact form when not in use,” of course, who wouldn’t want such a wonderful umbrella? However, although these kinds of abstract needs may very well apply to a wide array of users, they cannot lead to concrete designs, and any ideas made will invariably end up being nothing more than daydreams. Through Inclusive Design workshops, we can look for solutions based on more concrete needs.

Imagine, for instance, a visually-impaired person or a wheelchair user participating as a lead user. For a visually-impaired user, there are several problems involved in using an umbrella. First, he or she must hold the umbrella with his or her non-dominant hand because he or she will be holding a walking stick with his or her dominant hand. Second, the sound of raindrops striking an umbrella makes it difficult to listen to the environmental sounds of his or her surroundings, which he or she usually relies upon when walking on roads. Wheelchair users also have several problems. Many of them prefer to use a raincoat instead of an umbrella because they cannot hold an umbrella and move at the same time and umbrellas aren’t big enough to cover an entire wheelchair. What’s more, because of the difficulty and annoyance involved in putting on a raincoat, many wheelchair users make every effort to avoid going out on rainy days altogether. Their need for an umbrella which can be used without using one’s hands is not a need limited to these lead users; it can also be a need for, say, people who want to bring their young children along when they go out.

Figure 7-5 illustrates scenes from an actual workshop held on the theme of umbrellas. Figure 7-5a displays a field work exercise in which a user with a walking stick recreates what it’s actually like to walk outdoors while carrying an umbrella. Figure 7-5b displays a mockup of a dual-structure vinyl umbrella designed to act as a sound suppressor in order to prevent environmental sounds from being drowned out by the sound of rainfall. In order to see concrete ideas for umbrellas bear fruit, it is very important here to prepare several inexpensive vinyl umbrellas in advance and instruct each group that they may work with them however they see fit. In workshop situations, the act of simply using one’s own hands to give shape to
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7.3.2 An Information-Based Navigation System Design Workshop Case File

Now, let us imagine a workshop in which the theme is an abstract information service, namely, “guidance.” It’s much easier for participants to make prototypes, and for lead users to recall individual experiences, when dealing with the design of something concrete. However, with every imaginable industry in this day and age making the switch to digitalization and information-orientation, most of the information services we’re used to have been replaced with things which can’t be seen or felt. Even when we try to incorporate the opinions of users in the design process, for a user who only uses a PC for simple word processing, or for a user who has never even touched a computer, the stream of technical terminology being spoken by IT system developers can sound like a foreign language. The creation of a new common vocabulary, which users, designers and engineers alike can use to express shared meanings, is one of the important, over-arching themes of Inclusive Design workshops.

Figure 7-6 illustrates scenes from an actual workshop on the theme of information navigation. Figures 7-6a and b display a test of an information service. The test envisions a situation in which a visually-impaired user has gotten lost and is receiving directions from a friend over a cellular phone. Here, an issue came to light—namely, that it is difficult for a visually-impaired user to actually ascertain the landscape of his or her surroundings in order to figure out his or her location. Much other valuable awareness was made during this test. For example, one awareness was that it is of great importance for a wheelchair user, when approaching a building, to know in advance whether that building has an access ramp or not. Another awareness was that, due to a wheelchair user’s lower line of sight, landscape features which another, taller, user could easily point out might be hidden from a wheelchair user’s view behind buildings or other obstacles.

Further, Figure 7-6c shows a mockup of a prototype computer-based service which gives verbal route information via an automated response system. One thing which was realized here was that, when one kindly attempts to provide a large amount of detailed information, those details lead to an explosion of information the second they are converted into writing. This kind of issue, which is related to our cognitive resources, is something which anyone, regardless of visual or hearing impairment, may encounter.

7.4 Design Workshop Analysis Viewpoints and Information Assurance

7.4.1 Viewpoints on Analysis

In approaching potential, latent needs, methods such as ethnography are useful. Here, we will introduce two examples of interview methods which are considered to be especially useful in Inclusive Design workshops [5, 7, 8].
Focus Interview

This method uses consecutive questions which gradually narrow the range of possible answers by shifting from unstructured questions, such as “Was there anything in this system which left an impression on you?” to more specific, semi-structured questions and, finally, moving on to structured questions, such as “Were you able to associate clearly the information you were provided with the next operation you should perform?”

Unstructured Interview

In this method, after giving an advance explanation about the interview and its purpose, one extracts answers through natural conversations with people one meets in the field. This is a method of determining, through descriptive and comparative questions asked during a friendly, candid chat, how an informant (information provider) views the world, what makes him or her happy, what kinds of actions he or she takes and, forming the background for all of this, his or her culture and the lifestyle he or she lives.

7.4.2 Viewpoints on Effective Information Sharing

What is important in managing a design workshop in which a wide variety of users are to participate is careful consideration regarding the facilities to be used; for example, one must take into consideration participants’ safety in traveling to and from the site, the ease of understanding where everyone is to assemble, the size of the site, the availability of handicap-accessible toilets and such. Also, one of the matters which requires the utmost care and attention when managing a design workshop is related to information assurance. That is, because a wide variety of people with various impairments, ranging from visual to hearing to physical impairments, are participating, it is necessary to maintain a dialog with the participants involved in workshop field work and to constantly make sure that everyone understands what is happening during design work. By making each participant in a design workshop personally aware of information assurance, it is possible for them to establish relationships on even ground with users, whom they can relate to as partners. However, when awareness have been collected and participants begin to sublimate them into ideas, it is easy for them to become absorbed in the process of coming up with ideas and, without being aware of it, become less sensitive to information assurance for users. Statements filled with demonstratives, such as “how about making it bigger here” or “let’s put this and this together,” only confuse visually-impaired users. Hearing-impaired users can be left feeling alienated by thelaughter of participants omitted from summary dictation notes. This is the kind of discrepancy in communication which can occur in situations in which any user, regardless of the presence or absence of disability, engages in information sharing with designers or engineers.

While information assurance is very important for visually or hearing-impaired people, its methods of providing information also raise some thought-provoking questions about effective techniques for sharing information. For example, in the case of computer dictation—in which a typist enters the words of a speaker into a computer as letters—a skilled typist who is able to enter about 50-60 words per minute is able to transcribe about 70 percent of what a slow-speaking speaker says. However, opinions were mixed when it came to “thorough information assurance,” that is, transcribing into letters, to the maximum possible extent, every sound which enters a typist’s ear, from idle chatter to statements relating to design ideas. Some users had positive things to say, such as, “I felt like I could fully participate in group activities.
from which I usually feel left out.” On the other hand, other people had more negative comments, such as, “It was like having movie subtitles appear right in front of my eyes. I feel like I understood what was being said, but my eyes got strained. Sign language interpreters are easier to understand because they know how to summarize properly.” This very thought-provoking example makes us realize that, for hearing-impaired people, simply transcribing everything into letters isn’t necessarily all that is needed for information assurance.

Discrepancies involved in communication, for example between experts and non-experts, will be discussed in detail in Outreach Communication chapter. For effective information assurance, it is necessary to consider in greater detail what one should try to convey and what is, in fact, conveyed to a recipient, and what this difference implies for both sides.

7.5 In Review

In this chapter, we introduced Inclusive Design as a technique for designing new products and systems, beginning by taking a deep look into the lifestyle of an individual user, expanding from there to include various other users in multiple scenarios and then applying what is learned to the design process. The process of making people’s ambiguous needs regarding never-before seen systems or services into something more concrete, and of doing so cooperatively through the mutual dialog between users, designers and engineers, is intimately related to the very process of creating innovation in our society and in our lifestyles.

Although the main characteristic of Inclusive Design is the pro-active inclusion of elderly or disabled people as lead users, it is not by any means simply design for the sake of minority users. Inclusive Design is receiving attention as a method for approaching more essential needs, those which involve a wider array of users. The term information assurance has a certain ring to it which gives it the tendency to be perceived as a term referring to users with sensory impairments. However, it is in fact an important element which is necessary to actively involve not only the lead users, but all of the other members involved in design work, as well. The endless stream of technical terminology coming from an expert in a certain field can end up being an impediment to most of the other participants, regardless of whether or not they can see or hear. In envisioning a situation in which one will welcome, as partners, as diverse a group of users as possible, information assurance is one of the most important things to consider for understanding what each design partner means by the words he or she speaks and how those words are perceived. Information assurance is also necessary in order to apply, to the maximum possible extent, the experience and knowledge of all the participants in a design workshop.

References


(Takayuki Shiose)