

UNIT 3: PARTICIPATORY DESIGN

Table of contents

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Major concepts of participatory design:
3.2	Characteristics of participatory design
3.3	Hybridism and the third space concepts of participatory design
3.4	Participatory design in HCI software development
3.5	Negotiation, shared construction, and collective discovery in pd and hci
3.5.1	Site Selection
3.5.2	Workshops
3.5.3	Narrative Structures
3.6	Games
3.7	Constructions
3.8	Brainstorming
3.9	Unresolved issues in participatory design:
4.0	Conclusion
5.0	Summary
6.0	Tutor Marked Assignment
7.0	Further Reading/References

1.0 INTRODUCTION

Participatory design is an approach to design that attempts to actively involve the end users in the design process to help ensure that the product designed meets their needs and is usable.

In participatory design, end-users are invited to cooperate with researchers and developers during a system interaction design process. They participate during several stages of the design process such as in the initial exploration and problem definition both to help define the problem and to focus ideas for solution. During development, they help evaluate proposed solutions. Participatory design can be seen as a move of end-users into the world of researchers and developers, while a move of researchers and developers into the world of end-users is known as empathic design. This unit looks at both as necessarily participatory design.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Know the meanings of user centered design, distributed participatory design, and ethnography
- Describe the characteristics of Participatory Design(PD)
- Understand Hybridism and the Third Space concept
- Explain the diversity of Participatory Design techniques operating in third spaces
- Appreciate the unresolved issues in Participatory Design
-

3.0 MAIN CONTENT

3.1 Major Concepts of Participatory Design:

User-design versus User-centered design:

There is a very significant differentiation between user-design and User-centered design.

There is an emancipatory theoretical foundation and systems theory bedrock on which user-design is founded.

In user-centered design, users are taken as centers in the design process, consulting with users heavily, but not allowing users to make the decisions, nor empowering users with the tools that the experts use. For example, most of the internet documentation and information content are user-designed. Users are given the necessary tools to make their own entries. While users are allowed to propose changes or have input on the design, a smaller and more specialized group decide about features and system design.

Ethnography and Participatory design

In participatory design, workers enter into design context while in ethnography (as used for design), the designer enters into work context. Both make workers feel valued in design and encourages workers to 'own' the products. The user is an active member of the design team.

Participatory design in software development

This is the user involvement in design, with more emphasis on the involvement of a broad population of users rather than a small number of user representatives.

Many groups and projects apply participatory design research methods on a regular basis, and, hence, are part of the development and appropriation of the methods, as well as of disseminating the methods to industrial practice.

Distributed participatory design

Distributed Participatory design (DPD) is a design approach and philosophy that supports the direct participation of users and other stakeholders in system interaction analysis and design work. Nowadays design teams most often are distributed, which stress a need for support and knowledge gathered from design of distributed systems. Distributed Participatory design aims to facilitate understanding between different stakeholders in distributed design teams by giving each the opportunity to engage in hands-on activities.

Ethics

The ethics involve a participatory socio-technical approach devised by Mumford.

It states that the system development is about managing change and that non-participants are more likely to be dissatisfied.

There are three levels of participation: consultative, representative, and consensus.

Design groups including stakeholder representatives make design decisions and job satisfaction is the key to solution

3.2 CHARACTERISTICS OF PARTICIPATORY DESIGN

Participatory design is context and work oriented rather than system oriented. It is collaborative and iterative.

Hence the unit focuses on participatory practices that share these attributes, including

(a) site-selection of PD work;

(b) workshops;

- (c) story collecting and story telling through text, photography, and drama;
- (d) games for analysis and design;
- (e) the correlation of descriptive and functional prototypes and
- (f) brainstorming, pencil and paper exercises

Participatory design (PD) is a set of theories, practices, and studies related to end users as full participants in activities leading to software and hardware computer products and computer based activities

The field is extraordinarily diverse, drawing on fields such as

- (a) user-centered design,
- (b) graphic design,
- (b) software engineering,
- (c) architecture,
- (e) public policy,
- (f) psychology,
- (g) anthropology,
- (h) sociology,
- (i) labor studies,
- (j) communication studies, and
- (k) political science.

Researchers and practitioners are brought together—but are not necessarily brought into unity—by a pervasive concern for the knowledge, voices, and rights of end users, often within the context of software design and development, or of other institutional settings (e.g., workers in companies, corporations, universities, hospitals, and governments).

This unit primarily addresses methods, techniques, and practices in participatory design, with modest anchoring of those practices in theory with the involvement of software professionals and the end users.

3.3 HYBRIDITY AND THE THIRD SPACE CONCEPTS OF PARTICIPATORY DESIGN

This is concerned with participatory methods that occur in the hybrid space between software professionals and end users.

Why is this hybrid space important? An influential argument was made that the border or boundary region between two domains, or two spaces, is often a region of overlap or hybridism—that is a "third space" that contains an unpredictable and changing combination of attributes of each of the two bordering spaces. In such a hybrid space, enhanced knowledge exchange is possible, precisely because of those questions, challenges, reinterpretations, and renegotiations.

These dialogues *across differences* and *within differences*—are stronger when engaged in by groups, emphasizing not only a shift from assumptions to reflections, but also from individuals to collectives.

Guides and Expectations of Hybridism or Third Space Concept

There is an overlap between two or more different regions or fields (inbetweenness)

It is not "owned" by any reference field but partaking of selected attributes is done in reference fields. Potential site of conflicts exist between or among reference fields, hence questioning and challenging of assumptions are unavoidable

Mutual learning and synthesis of new ideas are core benefits when agreed working language

among the participants is ensured.

When working assumptions and dynamics are ensured, understandings, relationships and collective actions emerge while dialogues across and within different disciplines exist.

Considerations in the design process:

What is considered to be data are posers

The rules of evidence may become challenges to overcome How are the conclusions drawn become issues to be resolved

Reduced emphasis on authority and increased emphasis on interpretation are norms

Reduced emphasis on individualism and increased emphasis on Collectivism result in Heterogeneity.

Organizations comprise multiple constituencies each with their own professional identities and views of others. By contrast, the methods

allow for the creation of new perspectives and new locations, and they acknowledge the possibility that each participant can make different choices at different moments about where to locate his or her perspective, standpoint, and thus, accountability.

There is a need for "a new set of skills and competencies that go beyond technical design skills to create conditions that encourage a collaborative design process and active reflection for working with groups. These push on the traditional boundaries between the users and designers"

A large part of the design process, especially in large-scale projects and organizations involving several actors, is not dedicated to analytical work to achieve a solution but mostly to efforts at reconciling conflicting [conceptual] frames or at translating one frame into another. Much work of the designer is concerned with defining collectively what the relevant problem is and how to evaluate such problem.

3.4 PARTICIPATORY DESIGN IN HCI SOFTWARE DEVELOPMENT

Participatory design desires to bridge the gap between two spaces—the world of the software professionals, and the world of the end users. Each world has its own knowledge, practices and well- defined boundaries. Movement from one world to the other is known to be difficult. This difficulty is manifested in our elaborate methods for requirements analysis, design, and evaluation—and in the frequent failures to achieve products and services that meet users' needs and/or are successful in the marketplace.

Traditional scientific practice in HCI has focused on instruments and interventions that can aid in transferring information between the users' world and the software world. Most of the traditional methods are relatively one-directional; for example, we analyze the requirements *from* the users, we deliver a system *to* the users, and we collect usability data *from* the users. While there are many specific practices for performing these operations, relatively few of them involve two-way discussions, and fewer still afford opportunities for the software professionals to be surprised—to *learn something that we didn't know we needed to know*. The PD tradition has, from the outset, emphasized mutuality and reciprocity—often in a hybrid space that enabled new relationships and understandings.

"The mutual validation of diverse perspectives": Floyd (1987) analyzed software practices into two paradigms, which she termed product-oriented (focused on the computer artifact as an end in itself) and process-oriented (focused on the human work process, with the computer artifact as means to a human goal). In her advocacy of balancing these two paradigms, Floyd noted

that the process-oriented paradigm required mutual learning among users and developers

Most of PD theories and practices require the combination of multiple perspectives—in part, because complex human problems require multiple disciplines (e.g., software expertise and work-domain expertise) for good solutions and in part because the workplace democratic tradition reminds us that all of the interested parties should have a voice in constructing solutions methods suitable for a software professional's organization with *concrete* methods suitable for work with end users.

Muller and colleagues elaborated on this taxonomic dimension by asking *whose work domain serves as the basis for the method*

At the *abstract* end of the continuum, the users have to enter the world of the software professionals in order to participate—e.g., rapid prototyping. At the *concrete* end of the continuum, the software professionals have to enter the world of the users in order to participate; for example, ethnography and end-user "design" by purchasing software for small companies

"What about the practices that did not occur at the *abstract* or *concrete* end-points of the continuum? *What about the practices in between?*" These practices turn out to occur in an uncertain, ambiguous, overlapping disciplinary domain that does not "belong" to either the software professionals or the end users (e.g., these practices occur in neither the users' turf nor the software professionals' turf). The practices in between the extremes are hybrid practices, and constitute the third space of participatory design.

3.5 NEGOTIATION, SHARED CONSTRUCTION, AND COLLECTIVE DISCOVERY IN PD AND HCI

This describes a diversity of participatory design techniques, methods, and practices that provide hybrid experiences or that operate in intermediate third spaces in HCI. Because the theme is hybridism, these descriptions are organized in terms, strategies, and moves that introduce novelty, ambiguity, and renewed awareness of possibilities, occurring at the margins of existing fields or disciplines.

A storytelling method provides a space in which people negotiate the naming and defining of workplace activities

3.5.1 Site Selection

One of the simplest parameters that can be manipulated to influence hybridism is the site of the work. There are two approaches to participatory design: (1) Bring the designers to the workplace or (2) Bring the workers to the design room at a site different from the work place. The selection of the site can be important in a discussion of participatory architectural practice,

Work place site selection

Being in a foreign environment and with other users, users will tend to take a more general view of things; however, when collaborating with users *in their work context*, users tend to feel more at ease as they are on their home ground—the designers are the visitors. Tools and environment are physically present and easy to refer to. This makes for a conversation grounded in concrete and specific work experiences. The idea was born to create a type of design event with activities in both environments and with two sets of resources to support design collaboration.

New site selection

In terms of hybridism, the selection of site can be a deliberate strategy to introduce new experiences and perspectives to one or more parties in the design process—a de-centering move that can bring people into positions of ambiguity, renegotiation of assumptions, and increased exposure to heterogeneity.

Site selection initially appears to be a matter of *moving across the boundary* between different work cultures, rather than *living within the boundary*. The use of *common design practices across sites*, however, makes those practices (and the membership of the design group) into a kind of movable third space. The practices and the group membership become stable features that persist across multiple sites. At the same time, the practices, and even the membership grow and evolve with exposure to new sites and new understandings. In these ways, the practices become an evolutionary embodiment of the knowledge of the learning of the group

Benefits of using new site:

- Improved learning and understanding.

It is a move from "symmetry of ignorance" toward "symmetry of knowledge" as diverse parties educate

one another through a "symmetry of learning"—and even a kind of "transformation" through exposure to new ideas.

The selection of site can also lead to the strengthening of the voices that were comfortable at each site.

- Greater ownership. The procedures could strengthen the user involvement in their projects. There would also be increases in commitment and ownership of the evolving knowledge and design of the group.

3.5.2 Workshops

Workshops may serve as another alternative to other site selection. Workshops are usually held to help diverse parties ("interested parties" or "stakeholders") communicate and commit to shared goals, strategies, and outcomes (e.g., analyses, designs, and evaluations, as well as workplace-change objectives).

Workshops are often held at sites that are in a sense neutral—they are not part of the software professionals' workplace, and they are not part of the workers' workplace.

More importantly, workshops usually introduce novel procedures that are not part of conventional working practices. These novel procedures take people outside of their familiar knowledge and activities, and must be negotiated and collectively defined by the participants. Workshops are thus a kind of hybrid or third space, in which diverse parties communicate in a mutuality of unfamiliarity, and must create shared knowledge and even the procedures for developing those shared knowledge.

The best-known workshop format in PD is the Future Workshop

A Future Workshop proceeds through three stages:

- (a) *Critiquing* the present,
- (b) *Envisioning* the future, and
- (c) *Implementing*, or moving from the present to the future. These three activities involve participants in new perspectives on their work, and help to develop new concepts and new initiatives.

A number of workshops have focused on simple materials and informal diagrams, rather than on

formal notations. The tools are simple diagrams or drawings with no special formalisms because staff members participating in the workshops, as well as those to whom the results are later presented, typically have no experience.

Using technical descriptions, a workshop is described as a family of "generative tools" of activities that are selectively combined into strategic design, under an overall conceptual strategy that combines market research ("what people say"), ethnography ("what people do"), and participatory design ("what people make").

The activities include the construction of collages focused on thinking (e.g., "how do you expect your work to change in the future?"), mapping (e.g., laying out an envisioned work area on paper), feeling ("use pictures and words to show a health-related experience in your past"), and story telling.

A type of storyboarding workshop format is described as that in which people create narratives using photographs, putting them in sequences and in many cases altering (typically through the addition of speech bubbles to show what people were thinking or doing).

The various workshop approaches have several commonalities. Each workshop brings together diverse participants to do common work, to produce common outcomes and to develop a plan of joint action. They are thus opportunities that require mutual education, negotiation, creation of understanding, and development of shared commitments. Each workshop takes place in an atmosphere and often in a site that is not "native" to any of the participants. Thus, all of the participants are at a disadvantage of being outside of their own familiar settings, and they must work together to define their new circumstances and relationships. The combination of diverse voices leads to syntheses of perspectives and knowledge.

Benefits. Advantages claimed for this type of hybridism include:

- Development of new concepts that have direct, practical value for product design
- Engagement of the interested parties ("stakeholders") in the process and outcome of the workshop.
- Combinations of different people's ideas into unified concepts.
- Production of artifacts that are the expected and useful "inputs" to the next stage of the development process

5.3 NARRATIVE STRUCTURES

Stories and Story telling

Stories and story telling have played a major role in ethnographic work since before there was a field called "HCI". . Stories have also had an important history in HCI.

Stories in participatory work may function in at least three ways. First, they may be used as triggers for conversation, analysis, or feedback. Second, they may be told by end users as part of their contribution to the knowledge required for understanding product or service, opportunities, and for specifying what products or services should do. Third, they may be used by design teams to present their concept of what a designed service or product will do, how it will be used, and what changes will occur as a result. Hypermedia technologies can be utilized to enable communities tell their own stories with the intention that "plurality, dissent, and moral space can be preserved. It enables multiple authors reuse community materials selectively, telling different stories within a common context.

The different accounts were organized according to themes, and laid out spatially on the image of a fictitious island for navigation by end users.

The work enters several areas or aspects of hybridism. First, the authors of the stories (e.g., community members) were using hypermedia technology for the first time, and were thus in the role of learners, even while they were the owners of the stories, and were thus in the role of experts. Second, the authors wrote from their own perspectives, which were sometimes in strong conflict with one another. Third, the authors could make use of one another's materials, effectively moving away from single-author narratives and into a kind of collaborative collage of materials, which conveyed interlinked stories.

Fourth, just as the community members were negotiating and defining their roles as learner-experts, the software professionals/researchers were negotiating and defining their roles as expert's facilitators- students.

Using Paper and Pencil to tell stories

A second line of practice and research has emphasized end users telling their stories using a system of paper- and-pencil, card-like templates. The earliest version was the Collaborative Analysis of Requirements and Design (CARD) technique later developed into a more general tool. The card-based practices used pieces of cardboard about the size of playing cards. Each card represents a component of the user's work or life activities, including user interface events (e.g., screen shots), social events (conversations, meetings) and cognitive, motivational, and affective events (e.g., the application of skill, the formation of goals or strategies, surprises and breakdowns, evaluations of work practices). The cards were used by diverse teams in analysis, design, and evaluation of work and technology. Because the cards were novel object to all the participants, they occasioned third-space questionings and negotiations, resulting in new shared understandings and co-constructions. Often, teams used the cards to prepare a kind of story board, narrating the flow of work and technology used and annotating or innovating cards to describe that work. The resulting posters formed narratives of the work that were demonstrated to be understandable to end users, corporate officers, and software professionals, and which led to insights and decisions of large commercial value

Using Photographs for story telling

Stories can be told in many ways. One approach that has informed recent PD work is end-user photography through

- (a) taking pictures and
- (b) organizing pictures into albums.

These activities allow end users to enter into a kind of native ethnography, documenting their own lives. In keeping with the issues raised in the preceding "Stories" section, it is important that the informants themselves (the end users) control both the camera and the selection of images . They thus become both authors and subjects of photographic accounts of their activities. This dual role leads to one kind of hybridity, in which the photographic activities partake of both the world of common social life, and the world of documenting and reporting on working conditions.

Photo documentaries were used as a means of providing familiar, concrete artifacts to enable design collaborations. Photo documentaries are used as one component of a set of user-composed diary techniques, with a subsequent user created collages to serve as a rich source of discussions.

End-user photography is an interesting case of hybridity and the production of third spaces. Photography is a good example of an "in-between" medium—one that is part of many people's informal lives but that is also an intensively studied medium of communication and

argumentation. Photography occurs at the margin of most people's work, and yet can easily be incorporated into their work.

Discussions around the photographs, and combination of the photographs into photo narratives or collages can lead to mutual learning and new ideas, particularly through the inclusion of the voices of the photographers, the viewers, and especially the people depicted in the photographs *Benefits*. The use of end-user photographs appears to be new and experimental, and there are few strongly supported claims of benefits. Informal claims of success and contribution include the following:

- Richer, contextualized communication medium between end users and designers. (In some cases, the designers were not, themselves, software professionals.)
- Stronger engagement of designers with end-users' worlds.
- Enhanced sharing of views and needs among end users, leading to stronger articulation by them as a collective voice.

The informants should make their own decisions about what was important, and therefore what they should photograph.

Dramas and Videos

Drama provides another way to tell stories—in the form of theatre or of video. One of the important tensions with regard to drama in PD is the question of whether the drama is considered a finished piece, or a changeable work-in-progress.

Many PD drama-practitioners make reference to Boal's Theatre of the Oppressed. Boal described theatrical techniques whose purpose was explicitly to help a group or a community find its voice(s) and articulate its position(s).

The most influential of Boal's ideas was his Forum Theatre, in which a group of nonprofessional actors performs a skit in front of an audience of interested parties. The outcome of the skit is consistent with current events and trends—often to the dissatisfaction of the audience. The audience is then invited to become authors and directors of the drama, changing it until they approve of the outcome.

Changes in work patterns and work-group relations were acted out by software professionals in the end-users' workplace, using cardboard and plywood prototypes, in anticipation of new technologies, the workers served as the audience, and critiqued the envisioned work activities and working arrangements. The drama was carried out iteratively, with changes, until it was more supportive of the skilled work of the people in the affected job titles. The researchers made repeated visits with more detailed prototypes, again using the vehicle of a changeable drama, to continue the design dialogue with the workers. This work was widely credited with protecting skilled work from inappropriate automation, and leading to a product that increased productivity while taking full advantage of workers' skills.

Muller et al. (1994) presented a related tutorial demonstration piece called Interface Theatre, with the stated goal of engaging a very large number of interested parties in a review of requirements and designs (e.g., in an auditorium). In Interface Theatre, software professionals acted out a user interface "look and feel" using a theatrical stage as the screen, with each actor playing the role of a concrete interface component.

Dramatic approach brings a strong overlap of the world of end users and the world of software developers, showing concrete projections of ideas from one world into the other world—and, in most uses, allowing modification of those ideas. Drama is marginal to the work domains of most

software professionals and most end users, and thus moves all parties into an ambiguous area where they must negotiate meaning

and collaboratively construct their understandings. Agreements, conflicts, and new ideas can emerge as their multiple voices and perspectives are articulated through this rich communication medium.

Benefits

- Building bridges between the worlds of software professionals and users.
- Enhancing communication through the use of embodied (e.g., acted-out) experience and through contextualized narratives.
- Engaging small and large audiences through direct or actor-mediated participation in shaping the drama (influencing the usage and design of the technology).
- Increasing designers' empathy for users and their work.
- Simulating use of not-yet-developed tools and technologies to explore new possibilities.
- Fuller understanding by focus group members, leading to a more informed discussion.

3.6 GAMES

From theory to practice, the concept of games has had an important influence in participatory methods and techniques.

Ehn's theoretical work emphasized the negotiation of language games in the course of bringing diverse perspectives together in participatory design. In this view, part of the work of a heterogeneous group is to understand how to communicate with one another.

The work of heterogeneous teams is, in part, the "mutual validation of diverse perspectives"

Games have been an important concept in designing practices, with the convergent strategies of enhanced teamwork and democratic work practices within the team.

When properly chosen, games can serve as levelers, in at least two ways. First, games are generally outside of most workers' jobs and tasks. They are therefore less likely to appear to be "owned" by one worker, at the expense of the alienation of the non-owners. Second games are likely to be novel to most or all of the participants. Design group members are more likely to learn games at the same rate, without large differences in learning due to rank, authority, or background. This in turn can lead to greater sharing of ideas. In addition, games can help groups of people to cohere together and communicate better.

One of the purposes of games is enjoyment of self and others—and this can both liven a project and build commitment among project personnel.

"Design-by-playing" approach, introducing several games into PD practice:

Examples include:

- Specification Game, a scenario-based game based on a set of "situation cards," each of which described a workplace situation.

Players (members of the heterogeneous analysis/design team) took turns drawing a card and leading the discussion of the work situation described on the card.

- Organization Kit and Desktop Publishing Game, in which cards illustrating components of work or outcomes of work were placed on posters, with annotations.
- CARD, a card game for laying out and/or critiquing an existing or proposed work/activity flow
- PICTIVE, a paper-and-pencil game for detailed screen design
- Icon Design Game, a guessing game for innovating new ideas for icons (this game assumes subsequent

refinement by a graphic designer).

- Interface Theatre, for design reviews with very large groups of interested parties
The games emphasize hands-on, highly conversational approaches to discussing both the user interface concept itself and the work processes that it was intended to support..

The Technology Game adds simple shapes that stand for technologies, again playing those shapes onto the work environment in the Landscape Game.

Finally, the Scenario Game moves back to the real world, enacting possibilities based on new ideas from the preceding three games. The enactments may be video recording, both for documentary purposes and to generate further video material for another cycle of the four games.

Each of these games would take all of its players outside of their familiar disciplines and familiar working practices, but strategically reduced the anxiety and uncertainty of the situation by using the social scaffolding of games. Each game requires its players to work together through mutual learning to understand and define the contents of the game, and to interpret those contents to one another in terms of multiple perspectives and disciplines. The conventional authority of the software professionals was thus replaced with a shared interpretation based on contributions from multiple disciplines and perspectives.

Benefits. Participatory design work with games has been claimed to lead to the following benefits:

- Enhanced communication through the combination of diverse perspectives.
- Enhanced teamwork through shared enjoyment of working in a game-like setting.
- Greater freedom to experiment and explore new ideas through flexible rules and redefinition of rules during the game.
- Improved articulation of the perspectives, knowledge, and requirements of workers.
- New insights leading to important new analyses and designs with documented commercial value.

3.7 CONSTRUCTIONS

Preceding sections have considered hybridism in participatory activities, such as site selections, workshops, stories, photography, dramas, and games. This section continues the survey of participatory practices that bring users and software professionals into unfamiliar and ambiguous "third space" settings.

Collaborative construction of various concrete artifacts comprising:

- Low-tech prototypes for analysis and design.
- Cooperative Prototyping

Low-Tech Prototypes that includes participatory prototyping:

Low-tech prototypes may lead to "third space" experiences because they bring people into new relationships with technologies—relationships that are "new" in at least two important ways. First, the end users are often being asked to think about technologies or applications that they have not previously experienced. Second, in *participatory* work with low-tech prototypes, end users are being asked to use the low-tech materials to reshape the technologies—a "design-by-doing" approach

In this way, participatory work with lowtech prototypes involves much more user contribution and user initiative than the more conventional use of "paper prototypes" as surrogates for working systems in usability testing

The UTOPIA project provided impressive demonstrations of the power of low-tech cardboard and plywood prototypes to help a diverse group to think about new technologies, office layouts, and new working relations that might result from them.

Benefits. The low-tech participatory prototyping approaches benefits include:

- Enhanced communication and understanding through grounding discussions in concrete artifacts.
- Enhanced incorporation of new and emergent ideas through the ability of participants to express their ideas directly via the low-tech materials, and through the construction of artifacts that can be used in other techniques, especially drama and video documentaries.
- Enhanced working relations through a sense of shared ownership of the resulting design.
- Practical application with measured successes in using low-tech design approaches to real product challenges, achieving consequential business goals.

Cooperative Prototyping

This last section on participatory methods is concerned with software prototyping.

The potential of cooperative prototyping in several projects, using different technology infrastructures led to enhanced communication

with end users, improved incorporation of end-user insights into the prototypes, and stronger collective ownership and collective action planning by the team. Also observed is the time consuming breakdowns in the design process itself, when new ideas required significant programming effort.

In a different prototyping approach, a system is delivered to its end users as series of iterative prototypes, each of which gradually adds functionality

What appears to be critical is that the prototype functions as a *crucial artifact* in the end-users' work, such as,

- (a) a resource of documents for librarians
- (b) an online event checklist that served as the crucial coordination point for the work of diverse contributions or
- (c) a database supporting funding work in a nonprofit organization . Trigg (2000) provided a series of observations and tactical recommendations about how to engage the users in the evaluations that both they and the software professionals had agreed were needed.

This very brief survey of cooperative prototyping and "iterative delivery" approaches shows several aspects of hybridity. In the case of cooperative prototyping, the cooperative work may be done in a physical third space that is neither the end-users' office nor the software developers' office

In the case of the delivery of iterated prototypes, each prototype is presented in the end users' setting, but is unusual and only partially functional, and thus occasions reflection about its nature, its role in the end users' work, and, ultimately, the work itself. In both cases, the invitation (or perhaps the necessity) of the end-users' actions to help shape the technology becomes an important means of refocusing their attention, as well as the attention of the software developers. The ensuing conversations are concerned with the interlinked feasibility of changes to technology and to

work practices, with attributes of hybridity including polyvocal dialogues, challenging one another's assumptions, and developing plans for collective actions.

Benefits. Some of the virtues of the low-tech prototyping approaches have also been claimed for the cooperative prototyping and "iterative delivery" approaches as follow:

- Enhanced communication and understanding through grounding discussions in concrete artifacts.
- Enhanced working relations through a sense of shared ownership of the resulting design.

Additional claims for software-based prototypes include:

- Earlier understanding of constraints posed by the practical limitations of software.
- Improved contextual grounding of the design in the end-users' work practices.

3.8 Brainstorming

The most well-known idea generation technique is brainstorming, introduced by Osborn (1957). His goal was to create synergy

within the members of a group: ideas suggested by one participant would spark ideas in other participants. Subsequent studies

challenged the effectiveness of group brainstorming, finding that aggregates of individuals could produce the same number of ideas as groups. They found certain effects, such as production blocking, free riding, and evaluation apprehension, were sufficient to outweigh the benefits of synergy in brainstorming groups. Brainstorming, is an important group-building exercise for participatory design; designers may brainstorm ideas by themselves.

Brainstorming in a group is more enjoyable and, if it is a recurring part of the design process, plays an important role in helping group members share and develop ideas together.

The simplest form of brainstorming involves a small group of people. The goal is to generate as many ideas as possible on a pre-specified topic: quantity, not quality, is important.

Brainstorming sessions have two phases: the first for generating ideas and the second for reflecting upon them. The initial phase should last no more than an hour. One person should moderate the session,

keeping time, ensuring that everyone participates, and preventing people from critiquing each other's ideas. Discussion should be limited to clarifying the meaning of a particular idea.

A second person records every idea, usually on a flipchart or transparency on an overhead projector. After a short break, participants are asked to reread all the ideas and each person marks their three favorite ideas.

One variation is designed to ensure that everyone contributes, not just those who are verbally dominant. Participants write their ideas on individual cards or Post-it notes for a prespecified period. The moderator then reads each idea aloud.

Authors are encouraged to elaborate (but not justify) their ideas, which are then posted on a whiteboard or flipchart.

Group members may continue to generate new ideas, inspired by the others they hear.

Another variant of brainstorming, called "video brainstorming" is a very fast technique for prototyping interaction: instead of simply writing or drawing their ideas, participants act them out in front of a video camera. The goal is the same as other brainstorming exercises, i.e., to create as many new ideas as possible, without critiquing them. However, the use of

video, combined with paper or cardboard mock ups, encourages participants to experience the details of the interaction and to understand each idea from the perspective of the user, while preserving a tangible record of the idea.

Each video brainstorming idea should take two to five minutes to generate and capture, allowing participants to simulate a wide variety of ideas very quickly. The resulting video clips provide illustrations of each idea that are easier to understand and remember than hand-written notes.

Video brainstorming requires thinking more deeply about each idea than in traditional oral brainstorming. It is possible to stay vague and general when describing an interaction in words or even with a sketch, but acting out the interaction in front of the camera forces the author of the idea and the other participants to consider seriously the details of how a real user would actually interact with the idea. Video brainstorming also encourages designers and users to think about new ideas in the context in which they will be used. Video clips from a video brainstorming session, even though rough, are much easier for the design team to interpret than written ideas from a standard brainstorming session.

Unlike standard brainstorming, video brainstorming encourages even the quietest team members to participate.

3.9 UNRESOLVED ISSUES IN PARTICIPATORY DESIGN:

- Participation by non-organized workforce. The field of PD has long been concerned about how to engage in meaningful participative activities with workers or others who are not organized into a group with collective bargaining power or other collective representation.

- Evaluation and metrics. One of the weaknesses of the literature on participatory practices is the dearth of formal evaluations.

There is a small set of papers that have examined software engineering projects across companies, and have found positive outcomes related to end-user participation

There are no formal experiments comparing participatory methods with non-participatory methods in a credible workplace context. Such studies would be difficult to perform, because they would require that a product be implemented and marketed twice (once with participation, and once without).

The problem is made more difficult because measurements and metrics of organizational outcomes, user participation, and user satisfaction are currently vexing research issues

4.0 CONCLUSION

Participatory design (PD) is a set of theories, practices, and studies related to end users as full participants in activities leading to software and hardware computer products and computer based activities

Hybridism is at the heart of PD, fostering the critical discussions and reflections necessary to challenge assumptions and to create new knowledge, working practices, and technologies. When we consider HCI as a set of disciplines that lie between the space of work and the space of software development, we see that the hybrid third spaces developed within PD have much to offer HCI in general.

5.0 SUMMARY

In user-centered design, users are taken as centers in the design process, consulting with users heavily. In participatory design, workers enter into design context while in ethnography; the designer enters into work context. Both make workers feel valued in design and encourages workers to 'own' the products.

Participatory design in software development is the user involvement in design, Distributed Participatory design (DPD) is a design approach and philosophy that supports the direct participation of users and other stakeholders in system interaction analysis and design work.

The ethics involved in the participatory socio-technical approach devised by Mumford, states that the system development is about managing change and that non-participants are more likely to be dissatisfied. There are three levels of participation: consultative, representative, and consensus.

Design groups including stakeholder representatives make design decisions and job satisfaction is the key to solution

6.0 Tutor Marked Assignment

1. Differentiate between the following pairs of terms User design and User Centered design
Ethnography and Participatory design
- 2(a) What are the benefits derivable from a distributed participatory design exercise?
(b) Briefly describe the characteristics of the Participatory design
3. What do you understand as the "Third Space Concept" and "Hybridism" in participatory design?
4. In participatory design exercise, the designers are either brought to the workplace or the workers are brought to the design room at a different site from the work place. Briefly itemize the various benefits accruing from selecting any of the options.
5. Describe the workshops of participatory design as an alternative to other site selection. What are the obvious benefits of this alternative arrangement on participatory design?
6. What are the advantages of stories and story telling in participatory design?

7.0 Further Readings / References

- Grudin, J. (1993). Obstacles to Participatory Design in Large Product Development Organizations: Schuler, D. & Namioka, A. (1993). Participatory design: Principles and practices. Hillsdale, NJ: Erlbaum.
- Kensing, F. 2003. Methods and Practices in Participatory Design. ITU Press, Copenhagen, Denmark.
- Kensing, F. & Blomberg, J. 1998. Participatory Design: Issues and Concerns In Computer Supported Cooperative Work, Vol. 7, pp. 167-185.