Designing Exploratory Design Games
a framework for participation in participatory design?

Eva Brandt
Center for Design Research
Danmarks Designskole
Strandboulevarden 47
DK-2100 Copenhagen Ø, Denmark
eva.brandt@dkds.dk

ABSTRACT
The dogma of Participatory Design is the direct involvement of people in the shaping of future artefacts. Thus central for designers within this field are the staging of a design process involving participation of people. Organising collaboration between people having various competencies and interests is challenging and therefore designers need frameworks, which can accommodate this work. This paper discusses the use of exploratory design games to organise participation in participatory design projects. Examples of different exploratory design games as sources of inspiration are presented. Through a comparison of different exploratory design games the paper sheds light on the repertoire of possibilities for designers to be aware of when creating their own exploratory design games.

Keywords
Designing exploratory design games, game pieces, rules, participation, framework, participatory design processes.

ACM Classification Keywords
H.5.m: Participatory design, participation, designing explorative design games, framework. H.5.2: User-centered design.

INTRODUCTION: EXPLORATIVE DESIGN GAMES AND PARTICIPATION
Participatory design implies active involvement of the people designed for and other stakeholders in the design work. Several authors have argued that designing is a social process which involves communication, negotiation and entering compromises (see for instance [10, 23, 24]). They emphasize that designing the design process itself is just as important as designing the artefact. We share this view, which stresses that organising participation is one of the cornerstones of designing.

Many have used the game metaphor as a way of understanding and/or organising participation. On a general level the philosopher Wittgenstein sees the notion of language-games as constituting human practices. Rather than individuals formulating exact statements, the intertwining of different voices in specific situations shapes language and herby the practice [42]. Ehn has used the meeting of language-games as a productive way of seeing participatory design [16].

Ehn stresses that designers should keep in mind, that artefacts do not exist in isolation. Designing includes both designing the artefacts and a set of rules for its use, which probably will affect the setting and activities within the context it is situated. In order to design new artefacts that are useful in other language games, Ehn mentions three conditions. The designers "have to understand the language games of the use activity, or users have to understand the language game of design, or users must be able to give complete explicit descriptions of their demands" (ibid. p. 108). Even though the latter expresses the common assumptions behind most design approaches, Ehn notes that this approach seems to be the least valuable in participatory design. In stead game playing is recommended as a good basis for mutual learning between designers and users.

This paper discusses exploratory design games as a framework for organising participation in participatory design projects. The aim is to investigate a number of exploratory design games to discuss various characteristics and their usefulness in design. The goal is to illustrate a broad array of 'handles' that participatory designer's can use when creating their own exploratory design games.

In general games are frequently described as a play with props following specific rules and often with an element of

competition between players and decided by chance, strength, skill or a combination of these. For example in sport games like football and tennis strength and skill is very important whereas chance and luck decide the outcome of card games, most family board games and any kind of lottery game.

When we talk about exploratory design games in design work the players seldom compete in order to win a specific game. Participants in exploratory design games often have different interests and preferences but instead of utilizing this by competing the aim is to take advantage of the various skills and expertise's represented and jointly explore various design possibilities within a game setting.

In the next section examples of exploratory design games as sources of inspiration are presented. Then various exploratory design games are compared in order to identify the characteristics of powerful design games. In the end the main conclusions are summarized.

VARIOUS KINDS OF EXPLORATORY DESIGN GAMES
This section describes four kinds of exploratory design games, which all relates to various aspects of designing; games to conceptualise designing, the "exchange perspective"-design games, the negotiation and work-flow oriented design games, and the scenario-oriented design games. It is important to note that the groups should not be viewed as categorical but as examples for inspiration.

Games to Conceptualize Designing
The first kind of exploratory design games concerns research in design theory. Habraken and colleagues [23] have developed nine '*concept design games'* all with the aim to understand, conceptualise and improve designing buildings and urban environments. Habraken et al. argue that designing is a social activity among people who have different expertise and responsibilities and therefore the participants negotiate, make proposals, and set rules for the work to be done. Thus in order to understand designing it is necessary to study how designers "manipulate and transform complex configurations, while making agreements and rules as to how to go about their work" (ibid. book 2, p. 1-2). The purpose of the games is to be a tool for research.

All the games deal with creating configurations using game pieces on a game board. Purposefully neither game pieces nor the game-boards refer to any real-life artefact. Everything is abstracted and stylized to eliminate the functional knowledge and experiences that designers have and usually bring to their work. The games provide the possibility to create an environment that is manipulable and well bounded. By creating and playing the games it is possible to learn about the concepts the game makers and the game players hold.

The concept design games are primarily about what they refer to as 'dominance' or 'territory'. Control in the games

equals the ability to manipulate pieces. Habraken et al. have played the games with professional designers. The Silent Game presented below is one of their concept design games.

The Silent Game
Silent Game is to be played in silence. The two players are not allowed to speak to each other while playing. Thus the game is about implicit understanding among the players through their design moves. For the first player the assignment is to invent a pattern. The second player is to try to understand the pattern, expand the pattern by following the same principles and eventually to invent a personal pattern for player one to follow etc. The game pieces can be anything from pieces of wood over nails to buttons in various sizes, shapes or colours. What is important is to have a large array of game pieces to choose from, and to have several of each kind so it is possible to copy the other players moves.

The Delta Game
Within the field of engineering design Bucciarelli has argued that an important part of the development process involves communication, negotiation and entering compromises, which can not be solved using solely technical rationality [10]. In 1991 he introduced "*the Delta Design Game*" which is meant for teaching engineering design students [9]. It is played by four people each having different roles; an architect, a project manager, a structural engineer, and a thermal engineer. Their common task is to design a residence suitable for inhabitants of an imaginary world – the Delta Plane. The features of the imaginary Delta-world are all different from our own world. Each player gets a script with a detailed description of the role to play including instrumental methods, and attributes, which belongs to his or her object world [11].

Viewed from a participatory design perspective neither of the games presented above include users. What is interesting though is how the authors have created abstract game universes, which investigate various aspects of design practice. From using such games in educational settings we have been impressed about how a combination of game rules and resources used in a game format can bring about new insight.

The Exchange Perspective Games
From the 1920'ies the surrealist movement in art, literature, and film used chance and surprise as the guiding principles in their work. The surrealists created games to explore imagination and intensify collaborative experience by subverting methods borrowed from for instance sociology, anthropology, and psychology [21]. Often the starting point was everyday objects but many techniques and playful procedures for inquiry were inspired by the thoughts and visions of the subconscious mind. An example of a technique was to work with open-ended fragments like in the game of the *Exquisite Corps*. Here a group make a

drawing together by taking turns while the paper is folded in such a way that only parts of the drawing is seen. Each person continues the drawing from what is not hidden; fold the paper so the next player only sees a minor part of the drawing to continue from. Today many family games including Monopoly and card-games involve elements of chance (see e.g. [41] for an overview).   Also several creativity techniques are based on combining elements, which normally do not fit together.

The 'Nordvest' game
Recently a group of design students from Danmarks Designskole created an exploratory design game to learn about local peoples likes, dislikes, aspirations etc. in order to improve public space in a region in Copenhagen[1]. They had a booth situated at a public square and the players were people passing by accident. The Nordvest game consisted of 70 images from the region, and a big dice with questions written on each side; 1) What would you like to see more or less of in the region of Nordvest? 2) If you should advertise for Nordvest what image(s) would you choose? 3) What makes Nordvest to something special? 4) What do you think about when you see the images? 5) Where do you see qualities that characterize Nordvest? and 6) What image is not from Nordvest?[2] The game pieces were placed on a table up side down like in memory games. The rules of the game were that the player should start by flipping ten images, throw the dice and use the images as inspiration and help when answering the question. The aim of the game was to spark dialogue with the inhabitants. While playing the game the students asked further questions to continue and deepen the dialogue.

Common for games inspired by surrealism is to have an eye for the unexpected. They use elements of chance, and are based on a wish to get out of habits, see and experience new and be taken by surprise.

Negotiation and Work-flow Oriented Design Games
In the early days of participatory design the design games developed were often workflow-oriented and focused on creating a common understanding of the work context to design for. The games involved future users and perhaps other non-designers. They typically explored existing use of technology and other artefacts and the boundaries between various employees work tasks. These games involved for instance simulations of use worlds or practices, everyday experiences and the like. Usually the participants played themselves. Probably the most well known is the pioneering

---

[1] Anette Højlund, Troels Degn Johansson and Jens Kruse were the teachers responsible for the four week course named: "The identity of places: Why is a place a place, and what do we do with it for whom?"

[2] ©2005 by Fredrik Ibfelt, Katrine Lihn, Petter Odevall, Johan Thermænius, Stine Bloch Tranekjær, Linn Westergren, Mari Louise Børlund Larsen and Christian Smed. All design students at Danmarks Designskole.

work by Ehn and Sjögren [18]. The main objectives were to engage workers in change processes where they could create a common language, discuss existing reality, investigate future visions and make requirement specifications on aspects of work organisation, technology and education. For instance in the UTOPIA project Ehn and Sjögren developed the Organisational Kit game, which will be described in more detail below.

The Organisational Kit game
Typographers, journalists and other people involved in newspaper production, played the Organisational Kit game. The aim was to define the basic functions in the production flow and identify the artefacts and materials that might be used. Beforehand the designers had made observations and interviews with the employees about their work, and studied two newspapers publishers from USA, which recently had introduced new technology. Their primarily findings were turned into cards (game pieces), which were produced in paper in various sizes and colours. The game was played by placing cards on a game board, discuss their meaning and create a common understanding of the current organisation including how problems could be supported.

The primary aim with the negotiation and work flow oriented design games is for the designers to understand existing work practice. Game boards and game pieces are produced in paper. The outcome of game playing is often flow diagrams showing relations between people and various work task or tools.

Scenario Oriented Design Games
The creation of scenarios in design is widespread. According to Schön scenario constructing is a design move in the sense that it restructures the current situation to provide new insights [38]. Caroll stresses that scenarios have the advantage of being both specific and flexible, which makes it easier to manage the fluidity of the design situation. A scenario describes a particular interpretation of a use situation, but being deliberately incomplete it is also open for negotiation and change [14]. We will argue that enacted scenario construction can be viewed as an exploratory design game because it involves a play with props, takes place within a pre-defined location, is limited in time, and follows specific rules.

In relation to participation in scenario construction we have found inspiration from *Forum Theatre* [2]. Here a group of actors play a conventional piece of theatre. The audience are asked to suggest changes in the play according to their preferences, and after a debate the play with incorporated changes is performed again. When using the principles and rules of Forum Theatre in designing the users or other stakeholders can be players, audience or both. Another source of inspiration is "*The magic if*" technique created by Stanislavskij [39]. When creating a role the actress has to ask herself questions like: "what if the character was in this or this situation – how would she react?" In design projects

it is easy to ask similar questions for instance focusing on user experiences or when exploring use contexts. Following is an example of a scenario game from the Dynabook project [5].

The Dynabook scenario game
The aim of the Dynabook project was to develop concepts for electronic books for children, teenagers and adults. First field studies were conducted that involved observations and interviews with potential users in their home. In order to generate ideas an exploratory design game including dramatised scenarios was played. The staging of the game was simple. The room had a scene with an indication of different rooms in a home and a group of chairs in front to the participants. The rooms were illustrated with the use of props like a hat-and-coat stand (the hall), a toothbrush (the bathroom), tablecloth and coffee mug (the kitchen). One of the designers acted out the scenarios and used props (teddy bear, cap, and sunglasses) to illustrate various users. A rule were that the exploratory scenario games were performed with breaks included where the participants reflected on and discussed a particular sequence in the scenario, and suggested ideas for how the Dynabook could be useful. Then the altered scenarios were played again.

Enacting exploratory scenario games by using simple props are playful and well suited for generating and exploring various design ideas. Often focus is on the functionality of the artefact to be designed and the fit within the context of use.

Four kinds of exploratory design games have been presented as sources of inspiration. The intention is to illustrate that the purpose of participation varies and can be framed and staged in many ways. When designing exploratory design games the choice between for instance various game pieces and rules depends on the intention and the people to be involved. In the next section we will compare various exploratory design games and share experiences from game construction and game playing.

WHAT CHARACTERISES POWERFUL DESIGN GAMES?
In this section we will focus on using design games as the overall structuring framework and try to capture what distinguish powerful exploratory design games from the less powerful ones. The aim is to shed some light on the repertoire of possibilities; the 'handles' the designers can turn in order to create their own design games. It is important to stress that we do not believe that there is one generic exploratory design game, which fit all projects and situations. Rather our experience is that the process of designing the game is important and rewarding in itself for which reason designers should not grow into the habit of using the same games time and again. On the other hand it can be helpful to have and use some guiding principles when organising participatory design processes. In earlier work we have named our design approach *The Design Lab* which involves both (potential) users and other stakeholders

in a 'conversational' design practice based on a series of design events focusing on collaborative inquiry and participatory design [3, 6]. The Design Lab events share two main features. First is a working process that focus on three aspects of designing – *staging, evoking and enacting*. Second is the collaborative creation of *design artefacts*. In essence the exploratory design games are how the Design Lab events are organised and made workable in practice. They are the frameworks within which participation, dialogue and negotiation takes place.

To see design collaboration as games suggests certain ingredients and frames in relation to how to stage participation. We have named three of the games developed within the Space Studio, the Interactive Institute: The 'User game', the Landscape game', and the 'Enacted scenario game'. In several projects they have been played one after the other and have hereby been the framework for participation. However in the following these exploratory design games is compared and discussed against other kind of design techniques or exploratory design games[3]. Hence the progression from game to game becomes more vague.

Creating Common Images of the Users
First we will address the creation of common images of intended users. Typically we involve three to five potential users throughout the projects. We begin by conducting field work by observing and interviewing intended users while at work or outside work or both for half a day, one or two days. Everything is video-recorded. A few weeks later the same people are invited to play exploratory design games in the Design Lab together with designers and other stakeholders (e.g. companies). The first game to play could be the User game.

The User game
While playing the User game the participants create a shared image of intended users grounded in field data. It is based on 20 – 40 short video-snippets (30 seconds to two minutes long) from the ethnographically inspired field studies. To make tangible game pieces a key frame from each video-snippet is printed and laminated. We have named these cards 'Moment-cards'. Numbers on the images are used to associate each game piece with the digitized video. The second kind of game pieces are 'Sign-cards' each having a word printed on. The purpose of the Sign-cards is to provide a conceptual framework for the interpretation and stories created by the participants in the game. We have generated a general set of 30 Sign-cards including words like 'zones', 'closeness', 'pace', and 'despair' but these can easily be exchanged for other words that is found suitable.

One way to play the User game is to get acquainted with the field material by watching and discussing all the video-

---

[3] The author has experience with all games and techniques mentioned.

snippets first, deal the Moment-cards between the players (3-5 people) and put the Sign-cards on the table. The first player chose at least five Moment-cards and creates a story while placing the cards in line on the table. The first story should include basic characteristics like name, age, occupation, interests etc. The second player creates a new story that elaborates the image of the user. The rule is first to choose a Sign-card and hereby a label for the story. Then a story is created and told by placing two to four Moment-cards are chosen and placed so they intersect with the first line of Moment cards on the table. The Sign-card is places in line with the story.

Figure 1. The User Game.

The Moment-card at the intersection between the two stories must be part of the second story. Several rounds are played creating a crossword-like structure on the table the importance being that each new story has to include a Moment-card, which is already on the table. Thus during the User game the participants create a web of stories that give examples of situations the user are part of and actions taken. To read more about the game see [7, 27, 28]. Figure 1 shows images of game pieces and people playing the User game.

Personas
Cooper has introduced the term 'persona' as a technique to describe and communicate users to others [15]. The aim is to overcome the difficulties in communicating users' needs to designers and to get the designers to understand users. Jordan view the creation of personas as a way to develop empathy and understand the people who the design is for, as something else than statistics [31]. In the literature personas are typically constructed by a usability specialist or a team of consultants and thereafter handed over to the design team. The content of a persona description is suggested to focus on work related areas: work flow and goals, context and the personas attitudes. Maybe one or two personal details can be added [15, 22]. More recently Pruitt

and Grudin [36] have been concerned about the link between field data and the persona descriptions. They suggest that the descriptions also include demographic information, an account of a typical day, lifestyle and leisure activities, roles and activities in relation to work, and finally attitude towards technology and computer skills.

The structure and content in persona descriptions varies but lists seem to be a very popular format, which is critiqued by Nielsen [34]. With reference to Bruner [8] Nielsen argues that lists and quotes do not support the ability that stories have for long-term storing in the reader's memory. To overcome this she suggests a framework to assist the creation of what she calls *engaging personas* where the descriptions should include: a bodily expression, a psyche, a background, present emotions, oppositional character traits and peculiarities [34]. Nielsen is interested in how the persona descriptions are used in the further design work and suggest a framework for how to do so. It is described as having three steps: persona, needs & situations, scenario, and discussion in between the steps. In all summarized as a process with five phases.

Discussion
When comparing the persona technique with the User game both concern creating common images of intended users, but there are also several differences. Firstly it is notable that the design teams who are to use the persona descriptions in their work are not the persons to create them nor are potential users directly involved in the process. In the cases where personas are created as part of a group process on the basis of field material (questionnaires or qualitative interviews) the usability expert have beforehand interpreted the material and made a summary to be worked with [34].

The debate among persona supporters seems primarily to focus on the content of the final persona descriptions and much less on the processes of creation (including who should participate and how to organize the process). It is noted time and again that designers find it difficult to identify with and use the descriptions in practice [34]. The explanations given and reacted upon is that personas should not be caricatures but described as real people putting more emphasis on the content and end result. The framework suggested by Nielsen reflects the need for discussions and levelling of divergent views. It is interesting however that in the model the discussions are situated between steps and not as part of the activities taking part within each step. Discussion is presented as separate phases. And there are no suggestions about how to stage and guide the process.

Our strategy is different. To ensure that the design team keep the users in mind while designing we make sure to organise events where they both meet and collaborate with intended users. The intended users participate in the process and take active part in interpreting field material and negotiating understanding and implications with the other participants. By using open-ended video fragments from

field data more room for interpretation is created while exploring the material collaboratively [30].

From observing persons working in groups to create persona descriptions the lack of rules about how to do this in common or the lack of having tangible pieces to make suggestions and views visible seem to cause that one of the group members become dominant for instance by being the one writing the description on paper or computer. Instead using the game format and providing rules like turn taking and game-pieces for everybody to make moves with seem to make everyone participate on more equal terms. It can also be debated if a well-written persona description is better stored in the designer's memory than meeting and working collaboratively with intended users face-to-face.

Staging Explorative As-if-worlds
The core of designing is to envision possible futures. For projects to be successful it seems important to rapidly be able to explore not only one but several imaginary futures. We think that it is an advantage to involve users and other stakeholders in these more creative and innovative parts of designing. In this section we will focus on the staging of three design games to support the creation of what we will call exploratory as-if-worlds.

Future workshops
Future workshops are a well-known technique to create visions by structured participation [32]. It has three parts. First is a Critique phase where the participants e.g. criticise the current work practice. The responses are clustered into a number of problem areas. Second is the Fantasy phase in which the participants create visions and come up with ideas about how to deal with the problems identified in the previous phase. In the Implementation phase they return to the present to identify obstacles and plan activities and make estimates about what resources are needed in order to realize aspects of the vision. In all phases large pieces of paper are used to write on so everyone can follow the progress. There are rules to be followed in each phase. For instance it is not allowed to critique anything in the vision phase.

Kensing and Madsen report from using Future Workshops in relation to system development [33]. To be successful people attending "should share the same problematic situation, they should share a desire to change the situation according to their visions, and they should share a set of means to that change (ibid. p. 157). Kensing and Madsen suggest that the facilitators running future workshops intervene from time to time on the content level by introducing metaphors as a mean for broadening reflections. For instance in a project about a public library they suggested viewing the library as a warehouse, a store and a meeting place.

Workplace making games
Horgen et al. [24] give an example of how structured participation can be organised within architecture. The framework is divided into four parts. First the architects visit the buildings that are to be re-build and conduct what they call a *Walk Through*. They take a walk though the entire building together with one or more persons working within the specific environment. During the introduction to the office space and the people working there they take photographs. The next part is a workshop where the photographs taken are assembled in worksheets including questions for the participants to work with. The participants are the people to design for and other stakeholders. In groups of two to three persons they discuss and answer the questions both in writing and by drawing on the photographs using various colours. Each question has a specific colour code. The questions are: What do you like about this place? What do you dislike about this place? What is unsafe? What do you want to keep for the future? What do you want to change? Based on the learning's from filling out *the workbooks* the participants make drawings of *the ideal work place*. In the last part they play what Horgen et al. call the *Interactive Organisational Design Game*. Here the participants are given an assortment of cardboard pieces in various colours and sizes. The task is to create and explore various future office spaces, functions, communication between people etc. A rule is that the pieces can represent any chosen objects or functions they chose.

The Landscape game
The aim with the Landscape game is to create context for the persons created in the User game. Hereby focus shift from developing stories about persons, their doings, behaviour, interests and relations to involve the surroundings. In the Landscape game the task is to create as-if-landscapes for the persons highlighting physical surroundings or elements that augment various activities in the person's everyday life.

The game material includes the Moment-cards described in the User game, game-boards and game-pieces that we have called 'Trace'-cards. The Trace-cards are pictures from the field material illustrating parts of the physical surroundings. In contrast to the Moment-cards the Trace-cards are not placeholders for video-snippets. The game boards have varied from being various generic conceptual maps (like illustrated in figure 2) to for instance a specific office layout. Sometimes we have given the generic game boards names, which simultaneously became a rule for how the to play the game. In other Design Lab events making sense interpreting the game boards were part of game playing and hereby completely handed over to the players.

In the Experimental Office Project the task for the participants was to create images of future office environments. For this game to be played we also had game pieces with images of intended users. It was the same "users" who took part in playing the game together with

representatives from various companies and the design team. Three groups were playing in parallel and the Landscape game started by having to choose between three different game-boards (figure 2). The game boards were named as follows: Concentric circles had the label 'important things in the middle', an outlines square frame with the label 'everyone will sit by the window', and several radial circles were described as 'many centres'. This evoked discussions about how the various players interpreted the game boards and the labels given. After choosing the game-board the game was played by deciding which game pieces to include, taking turns placing the images of users, Moment-cards, and Trace-cards on the game-board and discussing the various configurations that emerged. The game finish when the players agree on the configurations created. To learn more about the experiences with playing the Landscape Game see [7, 19, 20, 29].

Figure 2. The Landscape Game.

Discussion
The three exploratory design games presented are all aimed at creating future visions and they function as a framework for how to organise events that include the people designed for through processes, which are purposefully structured. The staging differs but each game has explicit rules for participation and carefully prepared activities for how the progression between these should be. The assignments are all open-ended giving the participants the possibility to interpret and influence what to focus on in the design. All this seems to be important for participatory design games to be successful. It is also important that the games engage the participants and that they are played in an informal atmosphere. When looking at the game-pieces Future Workshops are easiest to prepare, as they only require large sheets of paper and pens. Thus while taking part in a Future Workshop the participants solely use language. When they critique the present (work situation) or create visions of the future what they have to play with is what each of them remembers from their work and their associations to the other participant's expressions. This is also the case when including metaphors in the way suggested by Kensing and Madsen. Taken together the game pieces of the two other exploratory games include images, video-snippets, game-boards and pieces in 3D. We will argue that images and video-snippets from the field are more powerful when inquiring into existing practice and collaboratively create future visions. Earlier we have argued that interacting with

tangible mock-ups and discussing the participants use their visual, auditory, and tactile senses, which evoke more reflections and comments than when limited by a design rendered on paper or in computers [3, 4]. The same argument is valid when comparing using language alone with the game pieces mentioned.

Both Future Workshops and the Workplace making games concerns creating ideal as-if-worlds whereas this is not explicitly mentioned in the Landscape game. Both the Interactive Organisational Design game and the Landscape game have connections to Habraken's concept design games by the use of stylized game-pieces. This seems to open up for interpretation and to prompt the individual participant to be explicit about their understandings and views when playing. While playing a game the game pieces are used as 'things-to-think with' where reflections from different participants result in re-seeing the design as to produce new meaning [35]. The game materials presented and the rules of the various games help bridging the gab between the various language-games the participants hold. The game-pieces functions as what Star [40] calls boundary objects. They are shared objects, which at the same time allow for different interpretations.

Enacted Exploratory Design Games
Using scenarios in participatory design have become increasingly popular. In this last section the games to discuss are enacted scenarios as exploratory design games. Their aim is twofold; to develop empathy for the users and the situations of use and to design while acting out scenarios in situ. During the years we have experimented with the scenario game format. As designers we have worked emphatically with scenarios by playing the roles as users and acted out the scenarios ourselves [5]. We have invited users into the Design Lab to create scenarios in collaboration with other stakeholders. At times these scenarios are first created using game-pieces and playing games like the ones presented in the previous sections. The game materials used to stage enacted scenarios in situ have most often been stylized versions of the artefact to be designed represented by simple card board or foam props, and we have asked the users to enact the scenarios in their own environment [1]. Often the design team have provided a number of generic props and asked the users to reflect on each of them before choosing the one(s) to be used in the game [1, 5]. In the example to follow we encouraged the users to produce their own props in foam [7].

Helle enacts how to produce personalized catalogues
Helle is fashion designer. She has her own shop, and is one of the users in the COMIT (Contextualization Of Mobile IT) project. When visiting Helle in her shop in order to create and video record enacted scenarios she was offered the possibility to produce new props representing artefacts to be designed in stead of using the ones produced at an earlier Design Lab event. She chose to make three new foam models; the image device, the image editing tablet and

a small portable printer. Helle enacts a scenario where she explores how to use the three devices to produce a personalized catalogue with annotation for a retailer. Elisabeth who works in Helle's shop acts to be the retailer. In short what is enacted is: Helle shows her new collection to Elisabeth, pretending to be a retailer considering to buy some of the clothes. Helle comments on the different garments. She tells about possible modifications and answers questions from Elisabeth. Helle takes photographs using her 'image device' of the garments Elisabeth is interested in. Helle annotates the images with comments regarding modifications, prices, colours, wash instructions etc. using her 'image-editing tablet'. Finally, Helle sends the annotated images from her 'image editing tablet' to her 'portable printer', and produces a personalized catalogue, which she gives to the retailer.

Discussion

Many use scenario construction as an important technique for creating, testing and presenting design ideas. In relation to enacted scenarios some focus on getting an understanding of subjective use experiences and advocate the enactment to take place in settings that are constructed [12, 13, 17]. Some prefer using professional performers to enact the scenarios [26, 37] and others are more in line with our approach where users enact scenarios in their own environment [25].

In our projects all enacted scenarios are video recorded. They are brought into the Design lab event as new game materials. In the following game they are debated and perhaps altered or refined in a larger forum, which make the resulting scenarios more thoroughly prepared. Having users to create and explore enacted scenarios in their own environment seems to put them on more equal footing with the design team [1]. Being in their own familiar environment also inspire creativity. Our experience is that when they use game materials produced for the occasion in parallel with their everyday artefacts in a setting where they feel at home it seems to evoke many new and valuable ideas. When using professional actors in a scenario game one seem to lose one of the essential elements in game playing namely the exploration of various views and negotiation of interests. It is important to notice that professional actors do not have anything at stake by taking part in a design project, and because of this the explorative enactment might not be as productive as it could be.

CONCLUSIONS

This concluding section is divided into two parts. First we will argue for why the notion of exploratory design games is a valuable framework for organizing participation in participatory design projects. Then we summarize a repertoire of possibilities that can be used when designing exploratory design games.

Exploratory Design Games is a Valuable Framework for Organising Participation

If one takes the dogma of participatory design seriously designers need to involve other people actively in the design process. Implicitly the other people include intended users but can also be other stakeholders having various competencies and interests. The design team itself include people with supportive competencies and different areas of interests and responsibility. Thus organising participatory design events that involve people with various expertises, interests and perhaps professional languages is not commonplace. To accommodate this designers need a framework that help organising participation in such a way that the various competences present in a event can be utilized, that everyone can make design moves and be part of exploring and negotiating views in order to create common images of possible futures and the prospective design work.

To use the notion of exploratory design games as a framework for participation seems valuable for several reasons. First of all we hope that this paper have illustrated that exploratory design games can be designed in many different ways. The idea is not that there is one specific and generic game, which fit all kinds of projects, but that games are designed for various purposes and with different means. Thus the framework is flexible and can include design projects within various design fields. The examples are from different application areas. Our experience is that one should no be too strict about where they are applicable or not. For instance we have used the 'workplace-making' games in projects about mobile computing.

Second the framework propose certain ingredients and frames in relation to how to stage participation. Essential ingredients are the use of rules and the use of tangible game pieces, which supports different participants in making design moves. The importance of game materials is to create a common ground that everybody can relate to. The game materials simultaneously become 'things-to-think-with' [35] where the reflections from different participants result in re-seeing the task, which gives new meaning. The game pieces become an inherent part of the language and herby the argumentation. Together with formulation of rules for how to play the game this contributes to levelling of stakeholders with different views leading to a more constructive dialogue [7]. When involving people with various backgrounds, competencies and perhaps professional languages the game materials need to function as boundary objects [40]. They need be shared objects with a core that the game players can relate to and simultaneously to be so rich that they allow for different interpretations.

Third an exploratory design game framework supports participants in *exploring* aspects relevant in the projects collaboratively in order to gain new insights and establish a common image about where the further design work should be heading. The framework suggested here include not only

one event in one project but series of collaborative events each organized in a game format with focus on staging, evoking and enacting. The outcome of playing each of the explorative design games is tangible design artifacts that help creating continuity. Another important aspect of this framework is the *game* part illustrating both how participation is staged (and herby how negotiation is supported) and the atmosphere and attitude within which the game playing takes place. Exploratory design games are engaging and fun for people to take part in. Game playing creates an informal atmosphere, which is the most productive in creative work.

Repertoire of Possibilities when Designing Exploratory Design Games

How to design an exploratory design game depends on the scope, the participants to be involved and available resources. When comparing various approaches in this paper the arguments are based on the assumption that design should be grounded in intended users practice but that it is important to challenge the conventional understandings and evoke the strange an unfamiliar [30]. The following is not an exhaustive list of game elements but an attempt to summarize from the examples given.

Powerful exploratory design games seem to involve the people designed for directly in both collaborative inquiry into existing practice and participatory design of possible futures. Using game pieces like images and video snippets from field studies seem to provide deeper knowledge of users and use situations, which the designers remember. To use open-ended fragments or questions seems to allow for many different interpretations leading to a more open and creative dialogue.

Design games based on chance focus on how to get out of habits and experiencing new. The example given were to use a dice with various questions where the players could not decide themselves what question to address. Another example is to combine words and/or images that normally do not fit together and hereby evoke new ideas.

The notion of scenarios is well established within participatory design. They are developed as a narrative with a beginning, middle and end but can be worked out in different ways and media. For instance as a story-board with drawings and text, a pure text version or enacted in situ and video-recorded. In this paper we have discussed enacted scenarios and argued for not using professional actors as players as they have nothing at stake in relation to the design. Still this should not prevent designers from getting a more bodily understanding by also enacting scenarios themselves.

Using stylised game materials seem to elucidate the participant's intentions and interests, as they are not implicit in the materials provided. Game rules like turn taking help levelling of the stakeholders playing the exploratory design games.

The choice of game pieces can also depend on resources. In the examples they have varied from text and images on paper, photographs, over 3D cardboard models to digitized video-recordings. The latter require video cameras and editing equipment and is more time consuming when producing the game pieces. On the other hand it is probably the best way to open for participation and inquire into existing practice and jointly create future visions than using verbal language alone.

REFERENCES
1. Binder, T. (1999). Setting the Stage for Improvised Video Scenarios.

2. Boal, A. (1974). *Theater of the Oppressed*. UK, Pluto P.

3. Brandt, E. (2001). Event-Driven Product Development: Collaboration and Learning. Department of Manufacturing Engineering and Management. Lyngby, *Technical University of Denmark*. Ph.D. dissertation.

4. Brandt, E. (2005). How do Tangible Mock-ups Support Design Collaboration? *Proc. Nordic Design Research Conference, 'In the Making'*. Denmark.

5. Brandt, E. and C. Grunnet (2000). Evoking the future: drama and props in user centered design. *Proc. Participatory Design Conference, CPSR*.

6. Brandt, E., M. Johansson, et al. (2005). The design Lab: Re-thinking What to Design and How to Design. In *Design Spaces*. Edited by Binder and Hellström, Edita Publishing Ltd.**:** 34-43.

7. Brandt, E. and J. Messeter (2004). Facilitating collaboration through design games. *Proc. Participatory Design Conference 2004*.

8. Bruner, J. (1990). *Acts of Meaning*. London, Harvard University Press.

9. Bucciarelli, L. L. (1991). "Delta game." from http://web.mit.edu/sp753/www/delta.html.

10. Bucciarelli, L. L. (1994). *Designing Engineers*. Cambridge, Massachusetts, London, England, The MIT Press,

11. Bucciarelli, L. L. (2005). Design Collaboration: Who's in? Who's out? In *Design Spaces*. Edited by Binder and Hellström, Edita Publishing Ltd.**:** 64-71.

12. Buchenau, M. and J. F. Suri (2000). Experience Prototyping. *Proc. Designing Interactive Systems*, ACM Press.

13. Burns, C., E. Dishman, et al. (1997). Actors, hair-dos and videotape: Informance design. *Presence Forum Royal College of Art. London*.

14. Carroll, J. (2000). *Making Use: Scenario-Based Design of Human-Computer Interactions*, MIT Press.

15. Cooper, A. (1999). *The Inmates are Running the Asylum*. Indiapolis, SAMS.

16. Ehn, P. (1988). *Work-oriented Design of Computer Artefacts*. Stockholm, Almquist & Wiksell International.

17. Ehn, P. and M. Kyng (1991). Cardboard Computers: Mocking-it-up or hands-on the Future. In *Design at work*. Edited by Greenbaum and Kyng, Lawrence Erlbaum Associates Publishers**:** 169-195.

18. Ehn, P. and D. Sjögren (1991). From System Descriptions to Scripts for Action. In *Design at work*. Edited by Greenbaum and Kyng. Hillsdale, New Jersey. Lawrence Erlbaum Associates, Publishers**:** 241-268.

19. Frost, P. (2004). Designdialoger I tidiga skeden – arbetssätt och verktyg för kundeengagerad arbetsplatsutformning. *Arkitektur, Chalmars Tekniska Högskola*. Ph.D. dissertation.

20. Frost, P. (2005). Representing Space: Designing Areas for Human Action. In *Design Spaces*. Edited by Binder and Hellström, Edita Publishing Ltd. p.74-84.

21. Gooding, M. and A. Brootchie (1991). *Surrealist Games*. London, Redstone Press.

22. Goodwin, K. (2003). *Perfecting your Personas*. Cooper.com.

23. Habraken, H. J. and M. D. Gross (1987). Concept design Games (Book 1 and 2). Design Methodology Program. *Department of Architecture. MIT*. Cambridge. Massachusetts 02139.

24. Horgen, T. H., M. L. Joroff, et al. (1999). *Excellence by Design, Transforming workplace and work practice*, John Wiley and Sons, Inc.

25. Iacucci, G. and K. Kuutti (2002). Everyday Life as a Stage in Creating and Performing Scenarios for Wireless Devices. *Personal and Ubiquitous Computing* 6: 299-306.

26. Ishii, H. and B. Ullmer (1997). Tangible Bits: Towards Seamless Interfaces between People. *Proc. CHI'97*.

27. Johansson, M. (2005). Participatory Inquiry – Collaborative Design. School of Engineering. Sweden, *Blekinge Institute of Technology*. Ph.D. dissertation.

28. Johansson, M. and P. Linde, *Playful Collaborative Exploration: New Research Practice in Participatory Design*. Journal of Research Practice, 2005. **1**(1): p. Article M5.

29. Johansson, M., P. Fröst, et al. (2002). Partner Engaged Design – New challenges for workplace design. *Proc. Participatory Design Conference 2002*, CPSR.

30. Johansson, M., J. Halse, et al. (2005). Between Estrangement and Familarization – Co-constructing Images of Use and User in Collaborative Design. In *Design Spaces*. Edited by Binder and Hellström, Edita Publishing Ltd**:** 128-136.

31. Jordan, P. W. (2000). *Designing Pleasurable Products*. London, Taylor & Francis.

32. Jungh, R. and N. Müllert (1987). *Future Workshops: How to create desirable futures*. London, Institute for Social Inventions.

33. Kensing, F. and K. Madsen (1991). Generating Visions: Future Workshops and Metaphorical Design. In *Design at Work*. Edited by Greenbaum and Kyng. Hillsdale, Lawrence Elbaum Associates Inc. Publishers**:** 155-168.

34. Nielsen, L. (2004). Engaging Personas and Narrative Scenarios. Copenhagen, *Samfundslitteratur*. Ph.D. Dissertation.

35. Papert, S. (1980). *Mindstorms – Children, Computers and Powerful Ideas*. New York, Basic Books Inc. Publishers.

36. Pruitt, J. and J. Grudin (2003). Personas: Practice and Theory. *Proc. DUX conference*.

37. Sato, S. and T. Salvador (1999). Playacting and Focus Troupes: Theater techniques for creating quick, intense, immersive, and engaging focus group session. *Interactions*: 35-41.

38. Schön, D. (1983). *The Reflective Practitioner*: How Professionals Think in Action, Basic Books.

39. Stanislavskij, K. (1988). *An actors work on himself*. Danish version: En skuespillers arbejde med sig selv, Nyt Nordisk Forlag Arnold Busck.

40. Star, L. S. (1989). The structure of Ill-structures Solutions: Heterogeneous Problem-Solving, Boundary Objects and Distributed Artificial Intelligence. *Distributed Artificial Intelligence* 2: 37-54.

41. Surrealist-Games. from http://www.boardgamegeek.com/game/14170#summary

42. Wittgenstien, L. (1953). *Filosofiska undersökningar* (in Swedish). Philosophical Investigations. Stockholm, Thales.