

Imagining and experiencing in design, the role of performances

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ABSTRACT

Several works have been published describing group performances to experience ideas during early design phases. Beyond practical accounts, performances have been poorly considered in the design literature. By analysing some of these works along with ours, we have inferred three roles of performance in the design of interactive systems: exploring, communicating, and testing. Starting from this categorization we discuss concepts that might be useful for a deeper understanding of the role of performances: the creation of a fictional space, the role of imagination, and interactional creativity.

Keywords

Design of wireless services, group performances, participation, scenarios

INTRODUCTION

Moving from automation of well-defined procedures of work towards supporting more open-ended life situations by wireless services and intelligent environments poses severe challenges for design methods. Moreover, in the design of mixed realities imagination is gaining new roles and relevance compared to the case of designing for the desktop computer. As users we will engage with these technologies in a more physical way compared to how we do by interacting with a keyboard, a mouse and a screen. Imagination has a new role, given the unprecedented possibilities offered by these new technologies that open design from the virtual to the physical.

Envisioning what we can do with a system and implementing it requires not only imagination. Concepts evolve in an iterative process where people experiment first with mock-ups and later with prototypes to feedback the implementation. Particularly in early phases there is a growing need to validate the design experiencing concepts

and scenarios. Concept design activities, early prototyping and iterative design are showing this new role of imagination that evokes industrial design and other design areas.

Several works have been published on ways of engaging people in design and experiencing ideas in early design phases. Examples range from exploring scenarios with mock-ups using “Wizard-of-Oz techniques” to testing scenarios with prototypes.

Because of the growing attention given to these performative activities we propose a reflection on the role of performance in design. We start showing how performance is the object of study of several disciplines in the social science providing relevant references. We then review the discussion on representing practices in design observing that performances have been considered poorly in the design literature.

To discuss the role of performances in the design of interactive systems we have considered works that have been published lately where performative design sessions are described. We have grouped these works along with ours in three groups that correspond to three different roles of performance: exploring, communicating, and testing.

Performance and Practice

The notion of performance has been the object of a wide discussion in the social sciences (anthropology, social psychology, linguistics, etc.). Beside the several definitions that have been attached to the term, performance has been considered with different focuses looking at social reality. For example, performance has been considered as a display of expressive competence or virtuosity by one or more performers in presence of an audience [2,3]. Turner [31] has considered social dramas as units of harmonic or disharmonic social processes arising in conflict situations. Another perspective maintains that there is something fundamentally performative about human being in the world. The focus of performance is in this case not only in extra-daily activities but in everyday life as well [17, 28]. In particular performance has been considered inherent in any human activity [28], and theatrical metaphors have been

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NordiCHI 10/02 Århus, Denmark

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applied to study social interactions (see Burke's Pentad or Goffman's work [17]). In particular, according to Goffman human intentionality, culture and social reality are fundamentally articulated in the world through performative activity.

Although perspectives on practices as proposed in PD, CSCW and HCI have not considered performance in our everyday life, it has been considered to some extent in the discussion around representing practices and in participatory design. We think that the advantages of considering more explicitly performance is not much in understanding practices in general. The HCI and design field provides well established approaches for that (e.g., activity theory, ethnomethodology, distributed cognition, etc.). The advantages are clearly more relevant for understanding and developing design practices where performative activities have a special role in the process of evolving interpretations of design artefacts and ideas.

In the following we will recall some of the discussion on representing practices to show how performance has been considered and to lay a basis for the discussion. Then we will define what we mean by performances in design.

Representing Practices in Design

Performance in the HCI and design literature has been considered as a context of use of representations. Some examples are mock-ups and work-situation descriptions [23,9]. In the seminal work of Ehn [16] we find the Wittgensteinian view that what a picture describes is determined by its use. This brings Ehn to rethink descriptions as reminders of past experiences, as representations to be used in the language games of design. In the same line Suchman [30] considers that representations of work should not be taken as "proxies for some independently existent organizational processes but as part of the fabric of meanings within and out of which all working practices – our own and others' – are made" ([30], p58). Representations of work involve perspectives and interests and representational practices are shaped historically, materially, rhetorically, institutionally, and politically. The further representations are removed from work "the more simplified, often stereotyped" the view of work becomes. According to Bannon [1] the issue around representations of work is not "whether some level of abstraction and formalization of work processes is possible or desirable, but rather, whether such techniques could in principle capture all that is required, and how to manage what is left out." Representations are seen as interpretations and as constructions tied to particular purposes and use by particular people. These problems have stimulated researchers to bring into view the lived experience of workers left out of standard representational forms [30].

In cooperative design open-ended representations allow users to simulate future work by creating hands on

exploration of emerging design: "artefacts including representations, develop over time based on use." [23] As examples of representations of work Kyng mentions work situations descriptions and use scenarios. The former are reminders of situations and the latter are not detailed descriptions of artefacts and their use but try to "recreate a context for experienced worker to exercise the mock-up/prototype". This is a first clear reference to performance.

According to Bødker [9] representations have a mediating role between stakeholders in design. The particular view provided by Bødker is that representations are containers of ideas. Representations cross boundaries between various design and use activities, however because they are not self-contained, they are open to interpretations and are not successful boundary objects. Thus it is necessary to provide better means establishing the context of representations or "to create more portable contexts of the representations." Bødker proposes to use scenario to set the stage for tests [10] in different phases in design focusing on what in that phase is relevant. For example there are two other strategies for scenarios use in prototype tests: in early testing of overall design ideas with prototypes, but also to "do more focused testing later, based on what design needs to deal with at the particular point in the process".

As a particular practical device scenarios are an example of use of representations. Scenarios are stories about people and their activities [11,12]. "Good scenarios are not a detached description of user tasks and actions, but selective scripts or stories that stage user actions with a future artefact." [10] They are usually descriptions in form of textual and visual narratives. They can have several roles and objectives, for example supporting the generation of ideas, evaluating a proposed design, cover all system functions, to situate the use in a larger context, and to deliver requirements [cfr. 22]. The discussion on scenarios in design in the literature has handled several topics [11 and 12, 10]. For example: the characteristic elements of a scenario, setting, actors, and their goals; scenarios as means to evoke reflection to coordinate design action and reflection; work-oriented communication among stakeholders (designer team, users); scenarios as promoters of multiple and alternative views of an interaction; abstraction and categorization and rubrics of task oriented abstractions.

In conclusion, this literature has pointed to the importance of the context and the use of representations in elaborating and investigating their meaning, which is not pre-determined. In general, the scope of these considerations has been restricted to relatively well-defined work domains where the purpose of the work is greatly helping to define goals, motivations, roles etc. that support in giving meanings to corresponding representations. But when we move away from well-defined work situations towards the

services in wireless networks and "products for pleasure", this support is no longer available to the same extent. There is a need for more intimate ways than scenarios, for example, to access situations in everyday life "as it unfolds", and we believe, that performances are a promising candidate for that.

How does performance relate to representations? As we will see in the next section, there are several practical accounts of staging and acting out scenarios or other performances in form of staged sketches or on-site trials with mock-ups. However, a reflection on the role of performance in design and an analysis on the mechanisms operating between participants have not been attempted yet.

PERFORMANCES IN DESIGN

As we mentioned at the beginning of the paper performance in the social science has been considered from very different perspectives. In the same way we could choose different perspectives in looking at performance in design. In the following we restrict our focus to particular types of activities.

Even before describing new design practices based on performance, we should note that performances do already exist in traditional design practices. In fact, performative practices can be most typically found in design in every situation in which:

1. there is an observer and an observed, or
2. designers do more or less explicit performances while discussing what one should imagine/design/use, or
3. users perform usage (e.g., in usability testing, interaction testing,..).

In cases 1, 2, and 3 we can describe rituals, symbolism, imagination, by observing actors and their embodied activities. We would like to restrict the focus to concept design activities like trials with Wizard-of-Oz techniques or prototypes, improvisational theatre to explore future scenarios, or staged scenarios to communicate ideas or to collect feedback. The objectives range from focused testing of design ideas or artefacts to providing input for brainstorming about design ideas where the designers get a feeling for use (present and future) by acting out scenarios.

As to the relation between performance and representations a scenario for example is a static snapshot, a permanent verbal and visual narrative. Performance is ephemeral and alive, "they create their effects and then they are gone – leaving their reverberations (fresh insights, reconstitutes selves, new statuses, altered realities) behind them" [28]. People experience a situation engaged in action. Action is explored in a physical non-verbal way. In the last fifteen years anthropologists interested in cultural performances have moved away from studying performance as systems of representations (semiotics as in Eco [15], symbolic anthropology [32]) to looking at them as processes of

practice and performance [31]. According to Schieffelin this suggests to take a more ethnographic approach.

Performance in the examples we will show, first of all delivers an experience to participants. The role of performance can be further discussed grouping the examples in three groups, Performance can support *exploring* and inventing ideas, in other can help representing and *communicating* a scenario, or is useful in *testing* and experimenting with a test subject. For each group we will provide three cases including one example from our projects. The nine cases further show differences in the role of participants and in the influence of staged or real context. We have not included some of our previous work where we used role-play in a toy mise-en-scene that can be found in [18,19].

Exploring

Case 1: *Drama and Props* The work of Brandt and Grunnet [5] is inspired by the improvisational theatre techniques of Johnstone [21] and the Forum Theatre of Boal [4]. In developing electronic services for refrigeration technicians, Brandt and Grunnet [5] used performances to understand work situations and build up characters of users. As a way to identify problems and getting ideas, the design team also dramatized scenarios generating cardboard mock-ups of tools. The users were later involved using Forum Theatre. In the Dynabook project aimed at developing concepts for electronic books, dramatized scenarios based on field studies were used in a brainstorming session. Props were used to indicate the room and the particular character. The scenarios were performed with reflective breaks where discussion occurred. Case 1b: *Bodystorming*. Informance Design [7] is a visualization technique where scenarios are rendered as plays and interactive environments. Designers are actors that "bodystorm" as users with simple prototypes in a staged user environment. "Informances, like user testing, are enactive and evaluative. Unlike user testing, they are intended to explore design ideas in ways that are generative rather than analytic."

Case 2: *Experience prototyping*. Buchenau and Suri [6] as part of they call experience prototyping investigated the needs of passengers for a new rail service. The team, taking train journeys, explored different type of travellers in several situations (entering the station, buying the ticket,...). Each scene was introduced with a card containing the scene's rules, explaining the goal, and the role of players and audience.

Our Case (3): *Situated and Participative Enactment of Scenarios*. In SPES the designer follows a member of the user group, the SPES participant, during daily activities. This participant is provided with a very simple mock-up of a future device, the mock-up is called the magic thing to help the imagination and not restrict the mind of people to current electronic devices. The magic thing is used to envision ideas of services and product features. The

designer and the participant in the SPES session, act out use scenarios as interesting situations arise.

SPES is applied after brief information gathering activities like a photo diary of 24 photographs maintained by the user for one week, and an interview. After this the designers have some understanding of the users and are able to organize the SPES sessions. According to the activities of the participant the designer prepares some future scenarios and ideas as well as a mock-up. Each session can last several hours and can extend over more than one day. The session unfolds during the ordinary activities of the participant. By particularly interesting situations or incidents the spect-actors invent and act out scenarios of future services (as shown in the following pictures).



Figure 1. The exchange students meet sometimes in some of the buses (20 min.) to the campus. During breakfast Thomas envisioned a system that would allow him to notify through the magic device his preference for the bus and check the preferences of the rest of the group.



Figure 2. Matteo wants the magic thing hooked on the bike. In the campus he can check if there are friends in the cafeteria while he is speeding past it.



Figure 3. Diana is visiting Helsinki as a tourist. She uses the magic thing as a shopping assistant to keep track of type and price of trousers in different shops. The shopping assistant also remembers the location of the shops.



Figure 4. Diana enters in a post office and has to take a number for the cue. There are several buttons to push for the numbers according to the service. Beside each button there is an explanation in Finnish, Diana scans the words with her magic thing, which are translated into English.

The designer is equipped with a digital camera, a diary to record user activities and take drawings about the user mobility. The participant is equipped, in addition to his/ her things, with a simple mock-up, the magic thing, that represents a future device and is invited to carry it around everywhere.

Case 3b: In the Dynabook [5] project designers visited users in their home environment where they were asked to perform scenarios of possible use for the electronic book.

Communicating scenarios

Case 4: *Focus Troupe*. In Focus Troupe [24] dramatic vignettes are presented to an audience of potential customers. The product concept is featured like a prop or dramatic element in a familiar situation adapted to the new invention. After the play, the audience of potential customers forms small groups engaging in several conversations about the concept.

Case 5: *Improvised video scenarios*. Buur, Binder and Brandt [8] report of various ways to use video as a design material together with users. One of the case presented are improvised video scenarios of use with a mock-up. The design was focusing on a mobile device for plant operators. The operators suggested situations, which provided good test cases.

Our Case (6): *Shooting videos to communicate scenarios*. This work reports of a concept design aiming at exploring the use of mixed reality in a common environment like a Café [20]. One of the concepts resulting from the project was the ScreenTray, which is presented in the next paragraph. This example describes design sessions where we shot several short videos to represent and try out ideas. We organized shooting sessions in one public Café and prepared basic paper prototypes according to plot ideas we had. The participants were not acting on a script but were improvising according to a plot. We present here two of the video scenarios in form of storyboards, the pictures are taken from the videos.



Figure 5. In one Video Marika arrives in the Café and finds an interactive table that takes her order.



Figure 6. Through her mobile device the table loads her personal settings.



Figure 7. Through a touch screen she is able to order.



Figure 8. She pays through the mobile devices and gets feedback on the table.

In another Video Jaime is in the Café with Thomas who is reading. They are both waiting for Marika.



Figure 9. Jaime is bored and checks the music selection offered in the Café through his wireless device and wireless earphones.



Figure 10. He finds something interesting.



Figure 11. Meanwhile Marika Arrives



Figure 12. Jaime is asked what he is listening to and he shows the display to his friends.

These group performances were based on very simple plots. In the last video it was agreed that Jaime is bored while waiting for Marika as his friend sitting beside him is studying. Jaime would start listening to music offered by the Café through his wireless device, and then Marika would arrive at a not predefined moment.

The dialogues were improvised and showed the successful attempt of the performers to render the performance accountable as an everyday situation. By symbolizing actions like wearing the earphones and staring at the device Jaime made observable to the others that he is listening to music. When Marika asked him what he was listening to, he shows the device to her. This symbolizing action is interpreted by Marika as the fact that the display is reporting information about the music. After this Marika suggests that is possible to buy the music directly from the device. This example makes salient the interactional character of creativity in group performances.

Testing Scenarios and Concepts

Case 7. In Kyng [23], mock-ups as representations of the future system, work situation descriptions, and future use scenarios are used in participatory workshop for the simulation of future use.

Case 8: *Performance Art for design*. Particularly interesting is the work of Steve Mann in the design of wearable computing applications [33]. Using performance art in public places, the wearable computing is presented “in a deliberately unusual manner where it is left up to the people interacting with the device wearer to imagine the intent of the device”. Designers interpret the reactions and comments of the public when they interact with the device and the wearer.

Our Case (9) *Testing Scenarios with the ScreenTray*. Doing concept design for mixed realities in the Café, one of the concepts that resulted out of several user centred design activities, is the ScreenTray. The ScreenTray is used to carry food and beverage from the counter to the tables and

is augmented by an integrated touch screen and a “orientation-aware” pointing device. We organized three SPES sessions where seven people participated. We followed the participants through a typical Café visit and suggested them that the ScreenTray could be used to explore the vicinity of the Café.



Figure 13. Claudia is visiting Helsinki again. In the Café she meets Peter and they decide what to do next.



Figure 14. They use the ScreenTray to look around. Claudia imagined a new feature of the ScreenTray, that it would be aware of its orientation and the maps are shown with the right orientation.



Figure 15. With the pointer Claudia explores places in one direction. She gets a list of places like a museum, opera, and shopping centre.

She selects the museum. Information is shown about the exhibits. A map is also rendered describing the way.

In this group performance a mock up and a plot was provided to two participants in the Café. According to the plot they were asked to purchase coffee and food as they usually do but using the ScreenTray instead of the usual tray. The plot suggested that they would use the pointer to explore the vicinities of the Café to decide what to do next. The purpose of the session is to get Café customers to actually perform the plot and in case suggest enhancements or changes. As an example, a change that was suggested was to have a self-orienting map on the screen. By turning the tray the map would orient itself on the right direction.

In this performance, the participants were facilitated by a more constrained unfolding of events. Claudia is buying coffee as usual and also knows what kind of functionality she will use of the ScreenTray. What she has to create are the details that will embody the plot in the performance. For example what she would like to visit with Peter after the break and how they are going to explore this with the ScreenTray.

DISCUSSION

We started the paper by defining what we mean by performance. Performance has been considered as a context of use for representations. In particular, active participation of people in design has been considered as an antidote to the problems of over reliance on representations of work [1]. The works in other disciplines that have been studying performance have brought us to consider performance explicitly as a design activity, and to focus on the particular creative process rather than on its product. Sawyer [27] observes that improvisational performance as been neglected by many fields, like in psychology and philosophy, studies of creativity and the arts. Attention has been instead given to product creativity, activities that result in objective ostensible products, which remain after the creative process is completed.

From the analysis of the cases we have inferred three roles of performance in design of interactive systems: supporting the exploration of new ideas, helping to communicate concepts, and supporting testing. The review of cases was also useful to appreciate the width of possible uses of performances looking at two different qualities: the roles of participants and the context (real or staged).

Given these simple observations about current qualities what are concepts that help a reflection on the role and mechanisms of performance in design?

In the discussion we want to start this search for concepts introducing: the creation of a fictional space, the role of imagination, and interactional creativity.

Fictional space

What fictional space? Why do we need the performances to create such a space?

By the fictional space we refer to the representation of actions and human conflicts that participants create by performing and reacting to each other. It is fictional because it is not a substitution of reality, but it is a representation. It is created by imagines that are free from the rules of reality and conventions. It has a perspective. It is a space because one can be in it or out of it. In fact, there are rules of being, and behaving when one 'takes part' to a fiction. And in order to stay in it, one cannot simply go wherever. Furthermore, from inside one can look outside, and vice versa. In some cases with performances we aim at such a space because in order to set the imagination free, we need to change some of the rules of reality. Hence we inevitably fall into fiction.

The fictional space featured in very different ways in the cases we presented. For example in Cases 1 and 4 the performance was staged using minimum props. In Case 2 the stage tries to recreate an environment. In Cases 3, 6, 8 and 9 the performance took place in a real context.

Imagination

What is the role of imagination in the cases we reviewed? Considering the success of the performance we are interested in the creation of ideas that:

- can be interpreted and 'reacted to' by some other participant (Case 1, 2, 3, 7, 8);
- can be part of the fictional space in which practitioners are performing, as it is interpreted by some participant, (Case 1, 3, 4);
- are inspired by the performance of physical actions in everyday contexts; (Case 3, 8, 9);
- produce an intervention in the physical world during the performance that is inspiring or enlightening (Case 3, Case 8).

These conditions concern both the way those ideas are imagined (roughly speaking, by group performances instead than in isolation and all in the head), and how they can be represented and interpreted (roughly speaking, through an enacted and timely condensed fictional space, such as theatre).

Hence, not everything that comes to mind to participants can be fruitful to the performance. Furthermore not everything that comes to mind and that can be represented in the performance can stand on its own in order to be fruitful. It must be interpreted. And there is more: not every idea that can be represented and interpreted will be likely to originate an observable change in the fictional space unless it will be reacted to by some other performing participant.

Interactional Creativity

Hence, participants need to interpret performers' offers as actors and spectators do in theatre: actions, symbols and

props that are introduced into the scene are interpreted in the light of the unfolding action. This is necessary for the completion of the collective endeavour that can lead to the construction of the fictional space. This completion is achieved by other actors reacting to offers. In other words, interpretations are not only the product of the imaginative activity of a single participant. Rather, what makes them valuable during group improvisations is their interactional character or, as Sawyer calls it, the collective emergence [26].

This highly dynamic and interactive endeavour that sustains a fictional representation is what constitutes the imaginative ground to which participants contribute with their performance. Obviously, every contribution or reaction can potentially constitute an imaginative or creative achievement of some sort. And it can be produced by a variety of kinds of cognitive processes. Nevertheless, it is not a free imagination. Every product of participants' imagination that will not become part of the representation can be ignored or constitute an obstacle to it.

How interactional creativity features in the cases is connected to the roles that participants have in the performances.

Different strategies in user involvement or participation are visible in different roles of designers and users in the performances. In usability testing the performer is prospective user acting upon a script. Cases 7 blur the separation between users and designer. In Cases 1, 2, and 4 participants mostly designers, may have traditional actors roles as in theatrical improvisation, allowing every participant to contribute with new ideas. Case 3 is again different as the performance happens while one of the participants (the willing prospective user) is engaged in her daily activities.

In Case 8 the performance in public spaces either willing and unwilling participants are not given a choice. They can have aversion for performance or find it amusing, in any case they may contribute in an interesting way

FINAL CONSIDERATIONS

The limits of Anticipating use

Finally in all these examples there are at least two concerns for designers. On the one hand they are concerned with anticipating some aspects of future practices. On the other hand they are concerned with the sustainability in time of what they are performing. The concern is that what they are performing is relevant not just at the present time but it points to a promising design concept. These concerns are clearly evident in the third group of examples where the main aim is testing. When staging the test of the mock-up of the ScreenTray in the Café (Case 6), the designers hope to anticipate some aspects of the future use of a product to feedback the design. On the other hand they are also interested in developing a concept and performing use

situations that will be considered relevant in the upcoming design phases.

During every day life activity our expressivity is less in control than in extra-daily activities (cfr [28, 3]). In daily activities we are more unconscious and our actions follow the principle of “less effort”. However the issue is also that our expressivity belongs to a specific situation. As Schieffelin argues any performance is “inherently a contingent process”. Contingency resides in the socio-historical circumstances in which it takes place. Performance is a contingent process because it is also made unique by its quality, for example the extent to which it was successfully carried out in aesthetic or practical terms. Performance in this sense is interactive and risky as it may always fail [28]. The concern in design is not only accomplishing the performance successfully but overcoming the contingency to create something which is sustainable in time. Performance is valuable for the design if its underlying idea is sustainable in time. This is the case if it is possible in the future for participants to recreate the performance in some of its aspects and still to recognize the value of the underlying idea.

When considering the sustainability of design concepts it should be remembered that product use and practice are evolving. One of the aims of design is to deliver systems that can be appropriated by people in real life. The process of appropriation through which things effortlessly mingle with our everyday life [13] is an open-ended and complex process. We therefore need to be conscious of the limitations when trying to anticipate aspects of future practices. In particular we need to be aware of the fact that, since performances are contingent, the relevance of performances is tied to the moment in which they are created.

Methodological implications?

We started considering that the design of new, open-ended personal, physical services will need methods with which we can access everyday life as it unfolds in more intimate ways than already established methods allow us to do. In the experiments we carried out we have attempted to show that performances are a promising candidate for that, and that there are a number of ways through which performance can in principle contribute to design.

However, even if there has been no attempt so far to turn theatre performances into a design methodology, this is not within our scope. Moreover, theatre performances include a too vast variety of approaches and there is to notice that no discussion has been initiated on more favourable ones. In one case theatre genres or styles of dramatic activities have been pointed to and specifically applied (as in [5]) but no discussion is open on why they are preferable. Insights for design from such activities are not easily obtainable just by applying any techniques or by step-by-step procedures or assignments of roles to actors and designers. Yet we can

recognize and report on some types of performative activities, which under certain circumstances can inform design in a number of ways. It is still not clear whether and to what point contextual features can be pointed out, so that some generalizations can be inferred about designers' opportunities for intervention or inquiry. However, we can aim to favour them and define some characterizing features by referring to certain situations that have been experienced in the past.

Through engaging in a discussion on the nature of such performances, we have proposed a terminology and referred to relevant concepts in the literature on system design and theatre. The intention is to contribute to outlining the relevant features of this highly contextualised, emergent, and artful activity in design.

Acknowledgements

Thanks to Jaime Vizcaya, Marika Vuorenmaa, Katri Jäntti Thomas Lindberg, and Kristian Lukander, for the work on the ScreenTray. Thanks to all participants of the SPES sessions. The authors would like to thank Anu Mäkelä and the Maypole Project for providing some of the mock-ups.

REFERENCES

1. Bannon, L., The politics of design representing work, Communication of the ACM September 1995, Volume38, Number 9, 66-68.
2. Bauman, R., Story, performance, event, Cambridge University Press, 1986.
3. Barba, E., Savarese, N., A Dictionary of Theatre Anthropology: The Secret Art of the Performer, London: Routledge 1991.
4. Boal, A., Games for Actors and Non-Actors, Routledge Press, 1992.
5. Brandt, E., Grunnet, C., Evoking the Future: Drama and Props in user Centred Design, In: the proceedings of the Participatory Design Conference, Cherkasky, T., Greenbaum, J., Mambrey, P. (eds), New York, November 28-1 December 2000, CPSR, pp 11-20.
6. Buchenau, M. Fulton Suri, J., Experience Prototyping, In the Proceeding of the DIS2000, Designing Interactive Systems, New York City, USA, ACM Press, pp. 424-433.
7. Burns, C., Actors, Hairdos & Videotape: Informance Design, CHI' 94: Conference on Computer Human Interaction, Boston, ACM Press 1994.
8. Buur, J., Binder, T, Brandt, E., Taking Video beyond 'Hard Data' in User Centred Design', In the Proceedings of the Participatory Design Conference, New York, CPSR, December 2000.
9. Bødker, S., Understanding Representations in Design, In: Human Computer Interaction, Volume 13, pp107-125, Lawrence Erlbaum, 1998.

10. Bødker, S., Scenarios - setting the stage for reflection and action in user-centered design, HICSS 32, In the proceedings of the Hawaii International Conference on System Science, 1999.
11. Carroll, J., M., ed., Scenario Based Design: Envisioning Work and Technology in System Development, John Wiley and Sons, 1995.
12. Carroll, J., Making Use: Scenario-Based Design of Human-Computer Interactions, MIT press 2000
13. Ciborra, C. U., Groupware & Teamwork Invis ible Aid or Technical Hindrance?, Wiley & Sons, 1996.
14. Dourish, P., Button, G., On "Technomethodology" Foundational Relationships Between Ethnomethodology and System Design, Human-Computer Interaction, 1998, Vol. 13, pp 395-432.
15. Eco, U., Semiotics of Theatrical performance, Drama Review 21/1, Mar 1977, 107-117.
16. Ehn, P., Sjögren, D., From System Description to Scripts for Action, In: Greenbaum, J., Kyng, M., Design at Work: Cooperative Design of Computer System, Lawrence Erlbaum Associates Pp. 241-269.
17. Goffman, E., The presentation of self in everyday life, Garden City, NY, Doubleday, 1969.
18. Iacucci, G., Mäkelä A., Ranta, M., Mäntylä, M., Visualizing Context, Mobility and Group Interaction: Role Games to Design Product Concepts for Mobile Communication, In: the Proceeding of COOP'2000, Designing Cooperative Systems Conference, 23 -26 May 2000, IOS Press, 2000, pp. 53-65.
19. Iacucci, G., Kuutti, K., Ranta, M., On the Move with a Magic Thing: Role Playing in the Design of Mobile Services and Devices, In the Proceeding of the DIS2000, Designing Interactive Systems, New York City, USA, ACM Press, pp. 193-202.
20. Iacucci, G., Jäntti, K., Lindberg, T., Lukander, K., Vizcaya, J., Vuorenmaa, M., The ScreenTray as augmented physical object in the Café: Concept design through Observations, mocking-it-up and Performing Scenarios with People, in the proceedings of cast01 //living in mixed reality, Conference on Communication of Art, Science and Technology, September 21 -22, 2001 Sankt Augustin (Bonn), pp 305-310.
21. Johnstone, K., Impro : Improvisation and the Theatre, Theatre Arts Books, 1989.
22. Kuutti, K., Work Processes: Scenario as a Preliminary Vocabulary. In [11].
23. Kyng, M., (1995), Making Representation Work, In: Communication of the ACM September 1995, Volume38, Number 9.
24. Salvador, T., Sato, S., Playacting and Focus Troupe: Theater techniques for creating quick, intense, immersive, and engaging focus group sessions. Interactions of the ACM, Sept. + Oct. 1999, Pp. 35 -41.
25. Sawyer, K., Creativity as mediated action: a comparison of improvisational performance and product creativity, Mind Culture and activity vol 2, No. 3 Summer 1995.
26. Sawyer, K., The emergence of creativity, Philosophical Psychology, Vol. 12, No. 4, 1999.
27. Sawyer, K., R., Improvisation and the creative process: Dewey, Collingwood, and the Aesthetics of spontaneity. The Journal of Aesthetics and Art Criticism 58:2 Spring 2000. 149-161.
28. Schieffelin, E. Problematizing Performance. In Ritual, Performance, Media. Hughes -Freeland, F., Editor. 1997; 194-207.
29. Schön, D., The Reflective Practitioner - how professionals think in action, Ashgate Arena, 1991.
30. Suchman, L., Making work visible, Communication of the ACM September 1995, Volume38, Number 9, 56-64.
31. Turner, V., Drama Fields and metaphors. Ithaca: Cornell university Press, 1974.
32. Turner V., From Ritual to Theatre, the human Seriousness of Play, PAJ Publications 1982.
33. Garabet, A., Mann, S., Fung, J., Exploring Design through Wearable Computing Art(ifacts), Interactive Poster at the CHI 2002, Conference on Human Factors in Computing Systems, Minneapolis Minnesota USA, April 20-25, 2002, Conference Proceedings, ACM Press, pp. 634-635.