

TRANSFORMATIONS, ENACTMENTS AND DISTRUST IN PROMOTING MULTIPLICITY IN DESIGN PROCESS

A. BAKI KOCABALLI¹, PETRA GEMEINBOECK², ROB SAUNDERS¹, ANDY DONG¹ & LIAN LOKE³

¹THE UNIVERSITY OF SYDNEY, ²THE UNIVERSITY OF NEW SOUTH WALES, ³THE UNIVERSITY OF TECHNOLOGY, SYDNEY

{BAKI.KOCABALLI, ROB.SAUNDERS, ANDY.DONG }@SYDNEY.EDU.AU, PETRA@UNSW.EDU.AU, LIAN.LOKE@UTS.EDU.AU

ABSTRACT

Our research aims to develop an approach to technology design that will support relational nature of human agency, i.e. the human capacity for action. To this end, we developed six design qualities to be integrated into design process. In this paper, we report on two exploratory design workshops, in which we aimed to promote one of these qualities, multiplicity. In addition, the focus of the workshops was upon various forms of togetherness between humans and technologies. The two workshops involved various activities in which participants could create connections with other participants, various materials and technologies. We explain the very different ways in which different sets of participants translated our design inscriptions in each workshop. We discuss three important effects that we observed: transformation of workshop space, enactments of technology, and distrust of design process.

INTRODUCTION

Our research aims to develop an approach to technology design that will support relational nature of human agency, i.e. the human capacity for action. Supporting relationality requires a different approach from the ways in which we have hitherto performed design practice. Rather than trying to control, predict or prescribe actions and relations of users, designers may design for actions more emergent and relations more fluid.

Our aim is not to replace existing design approaches but rather to complement them by developing sensitivities in the form of design qualities. Qualities are used in a similar way in the study of Bardzell (2010). Bardzell developed a “constellation” of design qualities as a part of a feminist interaction design program focusing on values like agency, empowerment, diversity and social justice. The qualities we propose are similar to those which Bardzell has developed. However, different from the Bardzell’s approach, our qualities primarily focus on ways of promoting relational agency: more in the nature of process-oriented qualities characterizing how a design process might embody a relational view of agency, these qualities provide conceptual lenses through which to gain a relational understanding of the situation. As well, they aim to increase the designers’ awareness of relationality, i.e. the relational, embodied and situated characteristics of human action, allow them to *tune* their practices to accommodate the diversity and richness involved in human agency and to perform more responsible and ethical design practices. Relationality, visibility, multiplicity, accountability, duality and configurability are the six qualities that form the basis of our relational design approach referred to as Agency Sensitive Design (ASD). For an extended discussion of these qualities, please see (Kocaballi et al. in press).

In this paper, we report on two workshop activities in which we integrated these qualities into design process in varying extents. We aimed to assess our design qualities’ value and relevance in these particular design situations and identify challenges and potentials. The workshop activities were situated in an early explorative phase of an open-ended design process. In the scope of this paper, our focus is upon the quality of multiplicity. We discuss how our strategies of facilitating multiplicity were translated by different socio-technical arrangements in two workshops.

BACKGROUND

The quality of multiplicity refers to multiplicity in ways of knowing and representing, which entail participation of multiple and heterogeneous sources of influence in the design process (Kocaballi et al. in press).

Multiplicity, as a quality or value in design has been employed in various studies. Gaver et al. (2003) emphasize the generative value of the multiple meanings evoked by ambiguity; Senger and Gaver (2006) explicate how multiple interpretations in design can fruitfully coexist; and, Bødker and Buur (2002) demonstrate how multiple perspectives can be employed constructively using prototypes in design. Schiphorst (2007) brought together practices from the field of somatics and employed them in different stages of design process. She conducted workshops involving various performative activities in order to explore and evaluate design ideas (Schiphorst 2007). Johansson and Linde (2005) used playful explorative design games for collaborative analysis that uses video snippets from the field study in order to build future scenarios.

OUR APPROACH

In our workshop studies, we used various game-like activities providing opportunities for the people to explore a design concept in multiple ways. Ehn suggests that participatory design can be seen as “participative, entangled, meaning making design-games” (Ehn 2008: 4). Our design activities are what Ehn describes as “specific performative ‘design-by-doing’ and ‘design-by-playing’ design-games” (Ehn 2008: 4). The focus of our workshops was upon concept of togetherness and the multiple ways of making connections between humans and between humans and technologies. We considered togetherness to be a suitable concept for our quest of accommodating a relational view of agency in design process as it enables us to focus on *relations* between the entities rather than on the entities themselves

After this workshop, we are planning to do two more workshops with interaction designers and music performers. By working with the participants with different backgrounds, we aim to identify different dimensions of the design concept, and as well, some aspects of our design approach that we need to be sensitive to when working within different socio-technical arrangements.

All of the sessions were photographed and video-recorded. Our analysis was based on our in-situ notes, video sequences and transcriptions of the discussion sessions: we analysed the workshop sessions using an Actor-Network Theory (ANT) vocabulary (Latour 2005). We use two important concepts of ANT: inscription and translation. The technical content of the objects embodies a script or inscription similar to a film script, defining the actors, roles and their settings (Akrich 1992). A script involves, in varying strengths, “programs of action” that are “translated” in practice (Akrich 1992; Callon 1986). However, these inscribed programs of action may not succeed should the translation processes vary; in addition, actual interactions between entities may unfold in unexpected ways. Translations are processes in which “the identity of actors, the possibility of interaction and the margins

of manoeuvre are negotiated and delimited” (Callon 1986: 203) in practice.

Our inscriptions are in the form of design process constructs or materials. We use inscriptions to integrate design qualities into the design process. In other words, we aim to inscribe ASD qualities into design process. The multiplicity was the main ASD quality we aimed to inscribe. For example, in the final session of the workshop, we used 4 different inscriptions as movement constraints: slow & stationary, slow & mobile, fast & stationary, and fast & mobile. These inscriptions or design constructs allowed us to provide multiple frames of reference for the participants to improvise movements. Use of a large A0-paper sheet in the poster session is an example of material inscriptions, which aim to support collaboration between the participants.

THE WORKSHOP SESSIONS

There were four sessions in the workshop: silence session, physical sensitivity session, rich-poster session and machine-mediate performance session. The activities in the sessions were selected according to their potential of facilitating different ways of engaging with a design concept. However, the important point is not about this particular set of activities but about bringing together a diverse set of activities and facilitating multiple ways of knowing, performing and relating. Thus, other kinds of activities can be added or some extant activities might be removed. What is important is to keep the multiplicity as a quality in design process.

In the silence session, participants were asked to close their eyes and concentrate on the existence of their own and their partner’s body and space. This session aimed to increase the participants’ awareness of themselves and of others’ selves through a non-visual way.

In the physical sensitivity session, participants performed physical exercises encouraging interaction through body movements. These exercises were structured to help participants to understand and analyse elements and qualities of touch-based connections between the bodies.

In the rich-poster session, participants made a collage of pictures, texts and objects on an A0-paper sheet. The aims of this session were to understand what “togetherness” meant to participants, to increase their awareness of the concept and to see different forms of connection on a shared medium. After making the collage, participants briefly talked about each material used in the collage and why each was chosen.

In the final machine-mediated performance session, participants performed five short activities using three technological devices: two wearable devices with tilt and distance sensing capabilities and one webcam with image processing capability. The aim was to explore different forms of connection with other bodies and space through technologies, which allowed participants to create various sound effects through their body movements. Participants played with the technological

tools and experimented in different ways to communicate with their partners and co-compose sound effects.

TRANSLATIONS OF TWO WORKSHOPS

For the purposes of the paper, our focus is upon only two sessions of the workshop between which we observed some important differences.

The major differences between the workshops happened in the physical sensitivity session and the final machine-mediated performance session both of which required participants to use their bodies intensively. The first workshop went very well in terms of the level of engagement of the participants and the richness of the outcomes. Participants performed all activities and engaged in the activities in a very well motivated way. In the second workshop, the participants, especially one of them, found the activity structures and goals “pointless”. Furthermore, they felt frustrated about not being able to perform the activities in an inscribed way and, consequently, could not complete the activities of the last session. There were also some disputes about the inclusion and omission of some exercises in the physical sensitivity session. Although, the second workshop was not engaging for the participants and made them feel frustrated. The discussions were very valuable and highlighted some important concerns related to the design process.

WORKSHOP 1: PILOT WORKSHOP

The first workshop was a pilot workshop in which we aimed to identify some problems and opportunities, and areas that might need to be revised. We recruited two people with backgrounds in humanities. They were selected because of their availability and enthusiasm towards the workshop. Two researchers with backgrounds in interaction design conducted the workshop. The workshop lasted for four hours.

The participants did not have any difficulties in performing the tasks in the first three activities. In the final machine-mediated performance session, they found the tasks challenging but dealt with the complexities of the tasks quite comfortably and creatively. They employed various strategies to communicate with each other and coordinate their movements. They made their own judgements on the success or failure of performing the tasks. Although the goals of the activities were clear, they felt comfortable to modify the goals according to their in-situ experience. Thus, being unable to achieve the original inscribed goal did not make the participants feel frustrated. Instead, the participants looked for alternative ways of creating other meaningful experiences and exchanges with their partners. The complexities were considered as resources for discussions. This continuous appropriation of the goals played a key role in maintaining the participants’ creative engagement with the each activity. The workshop was very successful in terms of our intended

usage of design inscriptions. We did not aim to use the inscriptions to impose particular patterns of actions or strict goals. Rather, we wanted them to provide a frame of reference or a common ground for participants to use and expand their unique capacities for action. After the first activity, they identified two main motivations for guiding their actions: creating connections via sound effects and creating connections via movements. Although the inscribed goal was “creating connections via sound effects related to a theme”, their translations demonstrated that it was not always possible to achieve the original goal. For this reason, they translated the original goal slightly differently in each activity. Their translated goals were “creating a harmony in sound composition”, “creating movements related to a theme”, “creating sounds related to a theme” and “dancing together”.

WORKSHOP 2

The second workshop was conducted one week later than the first pilot workshop. We recruited two dance performers, P1 and P2, with an expertise in movement improvisation. We had met one of the dance performers, P1, before the pilot workshop in order to consult her possible exercises to be performed in the physical sensitivity session. We met her at a café and discussed the aims and goals of the workshop. We explained to her our intentions for the physical sensitivity session. We said that we wanted to have some physical exercises that were going to help the participants to develop a sense of reciprocity of our relations. We also asked her whether our activity prompt/inscription of “explore the different forms of togetherness with other bodies and space” was too fuzzy or vague for a person who does not have a background in dance. P1 said that non-dancers may not feel very comfortable in movement improvisation and suggested that using different speeds of movements and levels of proximity as the movement constraints might be helpful for guiding the participants. P1 said that we should not use very sophisticated or demanding physical exercises for safety reasons. Then, she suggested three simple activities involving touch-based connections between the participants. Later, she said that the final activity might not be very suitable as it is a bit complicated. Thus, after our meeting with P1, we decided to use only the first two exercises and dropped the third one because of its complicated nature. We did not inform P1 about the change. We also used P1’s suggestions to shape the structure of the machine-mediated performance session and created an activity construct for the machine-mediated session involving speed of movements and mobility of the bodies as parameters or constraints. We thought that use of mobility of bodies could serve us well in terms of experimenting with various levels of proximity between the bodies in space. From two parameters, we generated a 2x2 matrix of four activities: slow & stationary movements, fast & stationary movements, slow & mobile movements, and fast & mobile movements. We

also included a free activity, which did not involve any movement constraints.

The participants, first, performed the silence session and then continued with physical sensitivity session. When P1 came to the workshop, she did not know the changes in the physical sensitivity session that we made after the pilot workshop. She assumed that there were no changes in the session structure, and she was going to perform three exercises in the physical sensitivity session. We were planning to ask P1 to suggest us a suitable exercise for replacing the third exercise that we dropped. We wanted to have an exercise involving proximity of bodies as a parameter guiding the movements of bodies. However, this situation caused confusion. We asked P1 to suggest an exercise related to the proximity right after the second exercise when she was expecting to continue with performing the final exercise, which was dropped by us before the workshop. P1 complained about the lack of information about the changes and particularly the timing of our request. P1 considered the timing of the request as inappropriate and as an indication of dishonouring what was happening on the “stage”.

We included a transcript of the discussion in order to show how the understandings of the workshop space could change very instantly from a research space to a performance stage, and how this change might cause confusions (see excerpt 1). We used a simple transcript notation, which is a sub-set of that published in Vine et al. (2002). The discussion happened just after the second activity of the physical sensitivity session. P1 was expecting to perform the final exercise, which was a derivation of the first two exercises. But, we asked her to suggest us a new exercise about proximity to replace the original third activity.

In the first 5 lines of the excerpt, R1, Researcher 1, and P1 talk about structural aspects of the workshop. Then P1 continues with the third exercise. At that moment, a space of research turns into a space of performance. This transformation of the space is also parallel with the transition of the research modes from a mode of research on process and structure to a mode of research on felt experiences. However, the transitions between the modes of research was not so smooth and comfortable for P1 as she later explains her difficulty in engaging with the activity and her concerns about not valuing what is happening on the stage. At the line 27, P1 points out the importance of separating the two modes of research. While the researchers were comfortable in having discussions about two modes of research anytime, the participants considered it quite unusual. Thus, according to P1, discussing the structural matters during an activity was totally inappropriate and ruined the performance and possible gains from the experience of the performance. In fact, this conflicting situation was also related to participants’ and researchers’ different perceptions of boundaries between activities. While the three short activities were somewhat independent and separable from the point of the researchers, they were closely connected to each

Extract: Workshop2/Physical Sensitivity Session	
01	R1 for the proximity () can you suggest an exercise?
02	P1 are we not going to the next exercise
03	R1 you talked about the proximity as a parameter-
04	P1 but are we not moving to the next exercise now? because there was a plan for the next exercise+
05	R2 the physical exercise?
06	P1 yeah+ the next one is++ [P1 starts doing the activity. P1 both talks and performs simultaneously and then their performance starts.] so with this one+ um I can take your body your crown in any direction and you just follow [P1 and P2 perform the exercise.]
...	
07	R1 this is really a nice exercise but I think+ I’m not sure what I was thinking may be really about++ err understanding the experiences of different proximities of bodies [R1 performs some movements].
08	P1 but then you need to tell me what opening up from what we agreed I understood that we’re going forward on the basis of what we agreed
09	R1 yeah yeah
10	P1 and then if that’s the case that’s but- so then- but if we are changing exercises, that’s fine
11	R1 mhm uhm+
12	P1 that’s what I’m understanding we are doing that
13	R1 yeah it was for the other people you know you mentioned about three exercises and we agreed on the first two, the palm to crown.
14	P1 yes these were the two that we agreed on.
15	R1 yeah
16	P1 yeah
17	R1 okay++ uhm may be I did not talk about the proximity thing we decided to do it after the first pilot workshop because in the next exercises we will be experimenting with different proximities with technological tools so what we thought is that it would be good to have+ an exercise about it here before the next sessions
18	P1 but I need to know because I cannot work in the middle of a vacuum I need to know where you want to go so you cannot just say to me give me a proximity exercise it means nothing to me because you know we are barely engaging what we are doing
19	R1 yeah
20	R2 why don’t we just continue and then at the end of the session we can-
21	P1 if for example I understand that we left off somewhere and then you’ve done a pilot workshop and it sounds like there are some other considerations that I do not know about but if you want me to feed back on those and give you some other /suggestions\ we should do that
22	R1 /yeah\ yeah
23	P1 but then don’t confuse that with what we are doing now () because we are supposed to be utilizing the experiences+ we talk structurally here
24	R1 yeah please do so it is very important
25	P1 but you need to honour what is going on here [points to the stage] if this is going to be a workshop about understanding what is coming out of experiences of participants and then the most important thing is to hear that++
26	R1 yeah
27	P1 so separating between that and then if we are going to talk about structural considerations then I suggest we come of the floor and talk
28	R1 yeah okay mhm
29	P1 just as recognition of something happens here but if we are going to talk the structure let’s go elsewhere

Excerpt 1. Discussion of a change request

other and part of a larger performance according to the participants.

After the discussion, the participants completed the physical sensitivity session in the way in which it was planned before, and then they reflected on their experience. In the final session, the participants were only able to perform the first two activities and could not complete the session because of some perceived technological deficiencies. In fact, we used the same technological devices, but the participants considered the devices incapable of doing what they are supposed to do. In the first activity, the system did not capture P1's large movements as required, and hence P1 could not understand the relation between the sound feedback and her movements. As a result, the P1 got frustrated because of not being able to get the feedback properly. In the second activity, the participants found the mapping between the sound and movements complicated, and again, they felt frustrated. Thus, we decided to stop the activities and continued with the participants' reflections and suggestions.

In addition to the complexities involved in technology design, the participants' insistence of achieving the goals of the activities played an important role in the frustration of the participants. They didn't try to modify the activity goals according to the conditions they perceived but preferred to perform the activities in an exactly inscribed way. P1 criticized the low sensitivity of technological devices for performing the goals. In fact, there were various factors shaping the participants' perception of the low sensitivity of technology. For example, in the first activity, the distance between P1 and camera, P1's dark clothes, and movement inscription of making slow movements created an effect of insensitiveness. Moreover, the effect of insensitiveness was further amplified by P1's insistence of strictly following the inscribed programs of actions of the activity. In the first workshop, the participants modified the goals of the activities, and this lessened the need for high sensitivity.

P1 later questioned the workshop design constructs and found them meaningless because of impossibility of achieving the tasks in the final session. When we said that the participants of the previous workshop modified the tasks, P1 again criticized the flexibility of design constructs. According to P1, if the constructs could be changed, then there was no point to act within the design constructs or inscriptions. She considered the constraints of design constructs as strict procedures rather than general guides for their actions. Eventually, the flexibility of the process caused a distrust of overall research aims and methods.

DISCUSSION

In this section, our focus is upon the findings of the process-oriented aspects of our research rather than that of workshop's theme, i.e., the forms of togetherness. Because, we think that our findings on research process

are more scalable and relevant to participatory innovation community. We identified three main effects that deserve attention: transformation of workshop space, enactments of technology, and distrust of design process.

TRANSFORMATIONS OF WORKSHOP SPACE

In our workshops, we run two parallel streams of research: a research on ways of integrating multiplicity into design process and a research on various forms of togetherness between humans and technologies. For this reason, we evaluate two streams: we evaluate the forms of togetherness and, as well, our ways of exploring the forms of togetherness.

Particularly in the workshop 2, we observed two workshop spaces: a space of research, and a space of performance. When the researchers and participants were talking about research process or structural aspects, the space was a space of research. However, when the participants started to perform the activities, the space turned into a performance space, in fact, a stage. The space as a stage is quite different from a space of research. On the stage, the roles of participant and researcher transforms into that of performer and audience respectively. Changing roles may ask for different forms of interactions between the participants and researchers and require different sensitivities. The transformations of the spaces and the roles might be instant, and every actor might not capture them. Thus, a higher level of sensitivity is required in the workshop cases when people from different professions participate in such multi-stream researches.

ENACTMENTS OF TECHNOLOGICAL PROTOTYPES

Orlikowski (Orlikowski 2000) uses the notion of enactment instead of appropriation for analysing what people do with technologies. According to Orlikowski, appropriation assumes existing structures of technology, whereas enactment looks for emergent structures of technology. The notion of enactment is based on a relational view of agency. Orlikowski (2000: 4) writes that:

Technology structures are thus not external or independent of human agency; they are not "out there," embodied in technologies simply waiting to be appropriated. Rather they are virtual, emerging from people's repeated and situated interaction with particular technologies.

In our two workshops, the same technological prototypes were enacted very differently. In the first workshop, the prototypes were enacted variously as musical instruments, as independent sound generators, and tools for movement choreography. However, in the second workshop, they were enacted as only musical instruments that were not suitable for creating desired sound effects. The different enactments of the prototypes also affected the perception of sensitivity of the prototypes. While there were very little problems related to the sensitivity of the prototypes in the first workshop, there were long discussions about the

insensitiveness or “bluntness” of them in the second. This suggests that the sensitivity of technology is also a relational phenomenon. Thus, use of the technological prototypes in workshop design activities may not be very straightforward. The prototypes can be enacted very differently, and different enactments may result in confusions, mismatches, and frustrations. The roles, capacities and enactments of the prototypes are highly dependent on socio-technical arrangements in which they are situated.

DISTRUST OF DESIGN PROCESS

As part of our research on ways of integrating ASD qualities into design process, we preferred to not have a strict structure for the workshop process. We wanted the process to be shaped by the participants in order to be sensitive to the concerns of participants that may emerge from different situations. This is why we supported the modification of the goals by the participants in the first workshop. While this flexible process strategy worked well in the first workshop, it caused confusion in the second. The participants questioned the changeability of particular design constructs. According to the participants, if it is possible to change the design constructs, and then there is no point in trying to achieve the goals within the specified design constructs. As a result, our strategy of being sensitive to the emergent concerns in the workshop caused a negative impression or distrust of overall research rationale, goals, and methods employed. Some important questions can be asked about the flexibility of design processes: How much flexibility is needed for design processes to prevent any distrust of research rationale? How to manage the changes needed during the design activities? How much should we open up design process and design decisions? What should/should not be open to negotiation?

Finally, although we advocate the inclusion of multiplicity as a quality in design, there might be some undesired effects of multiplicity on design process. One participant vocalized her concern about engaging with multiple activities and multiple media in the activities:

Ultimately, we are transferring, transferring and transferring through different media. But, in that transference, we are getting further and further away from proximity to actual sensitivity and composition.

This was an important criticism on using multiple activities and multiple mediums in a single half-day workshop. The participants could only spend short periods of time in each activity, and this limited participants' capacity to obtain a deeper understanding about their relations with other participants, materials, and technologies. Multiple activities might enable researchers and designers to get a broader perspective on many dimensions of a design concept or problem, but the knowledge obtained from these short-lasting

activities might be imprecise, shallow and scattered. This might be a disadvantage for design projects with a more specific focus. However, it might be advantageous for the design projects at an early explorative stage in which getting a broader perspective on many dimensions of a design concept or problem is very valuable.

REFERENCES

- Akrich, M. 1992. The De-Description of Technical Objects in Bijker and Law (eds.) *Shaping Technology/Building Society: Studies in Sociotechnical Change*: Cambridge, MA, The MIT Press.
- Bardzell, S. 2010. Feminist HCI: taking stock and outlining an agenda for design. *Proc. of CHI'10*
- Bødker, S., & Buur, J. 2002. The design collaboratorium: a place for usability design. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 9(2), 152-169.
- Callon, M. 1986. Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. *Power, action and belief: A new sociology of knowledge*, 32, 196-233.
- Ehn, P. 2008. Participation in design things. *Proc. of the Conference on Participatory Design*.
- Gaver, W. W., Beaver, J., & Benford, S. 2003. Ambiguity as a resource for design. *Proc. of CHI'03*.
- Johansson, M., & Linde, P. 2005. Playful collaborative exploration: New research practice in participatory design. *Journal of Research Practice*, 1(1), Article M5.
- Kocaballi, A.B., Gemeinboeck, P., Saunders, R. and Dong, A. in press, "Towards a Relational Approach to Design Process", *Proc. of ANZAScA*
- Latour, B. 2005. *Reassembling the social: An introduction to actor-network-theory*: Oxford University Press, USA.
- Orlikowski, W. J. 2000. Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. *Organization Science*, 11(4), 404.
- Schiphorst, T. 2007. Really, really small: the palpability of the invisible. *Proc. of the ACM SIGCHI conference on Creativity & Cognition*.
- Sengers, P., & Gaver, B. 2006. Staying open to interpretation: engaging multiple meanings in design and evaluation. *Proc. of Designing Interactive systems*.
- Vine, B., Johnson, G., O'Brien, J. and Robertson, S. 2002. *Wellington Archive of New Zealand English Transcriber's Manual*