EXPLORING THE ROLE OF ROBOTS: PARTICIPATORY PEFORMANCES TO GROUND AND INSPIRE INNOVATION

KYLE KILBOURN
Dept. for Technology and Innovation
University of Southern Denmark
kki@ib.sdu.dk

MARIE BAY
Dept. for Technology and Innovation
University of Southern Denmark
mbb@ib.sdu.dk

ABSTRACT

In performing collaborative scenarios of potential ideas, relationships from the future are brought into play as both objects for critique and enhancement. We see that a design anthropology that supports, facilitates, and provokes through these types of participatory activities as an essential shift from anthropology "of" towards an anthropology "with" people as part of design processes, and as part of this transition relies on setting up a space for reflection of goals and interests within the project rather than instigating critique only from the researchers. In this paper, we introduce a welfare technology project and our early attempts at performing relations in the context of robotics and automation, assumed to be an integral part of sterilization work for medical instruments. We focus on several aspects of the project: relations between work within and outside of the project, the translation of performances towards deliverables, and the role of the researcher in such activities.

INTRODUCTION
INNOVATION ISLANDS AND RETAINING GROUNDING OUTSIDE THE PROJECT

This paper takes place on an island. Yes, there are physical islands involved - Zealand, Funen, and Als, Denmark- in which events and activities have taken place. Yet, the island of interest is an innovation project in which five public hospitals, five companies and five knowledge institutions and networks are engaging in an innovation triple helix (Etzkowitz, 2008) space. The DEFU-STEPP Project, after the Dan- ish name which translates to "The fully automatic sterile supply and packing procedure" or as we refer to it – The Sterilcentral Project - is one of eight product development projects as part of the region of Southern Denmark's push to become the world-renown center for welfare technology, a twist on healthcare and social services technology with the drive towards reducing work burdens of public employees so that "warm hands" are closer to the care of citizens resulting in a higher quality of care.

This particular innovation project is tasked with developing concepts for technologies in hospital sterile supply wards and to develop novel ways of re- packaging instruments used for surgical operations (Welfare Tech Region, 2010). These hospital wards clean, sterilize and package reusable instruments needed for operations, and are increasingly tasked with other service functions within the hospital, from single-use device warehousing to instrument purchasing.

Within the project island, we can characterize the participants in several ways. Those coming from the public sector maintain a strong non-hierarchical work culture, in which responsibility is a collaborative effort as employees grow knowledge and skill throughout the sterilization ward. The industrial sector exudes an entrepreneurial spirit to match technology to an opportunity. Both type of participants have expressed the wish to see immediate and applicable results from the project. Fruitful collaboration seems to be a forgone conclusion. In proposing the project as an island, we suggest a partial isolation from daily concerns in an effort to find mutual areas of collaboration. In some ways, this accurately portrays aspects of project work. Workshops are convened in which invited participants gather to produce outcomes, not necessarily part of anyone's day-to-day job duties to bring forth a future in which all

can see, in some respect, as desirable. At least that is the goal. Yet, as part of this "island culture" there stands a possibility of becoming too insular that the deliverable misses its mark, in spite of everyone's best intentions. The tension arises in the relation of the island to external relationships – the work of sterile assistants and technology investments – and requires balancing diverging interests. We explore these external relations through a tool in which we engage sterile assistant who are not part of the project team.

RESEARCHER AS EXPERT, OBSERVER OR SHEPHERD?

How do we as researchers "embedded" into these triple helix mutations (public sector + industry + research) position ourselves? Are we the expert voice that highlights obstacles and particular values? This suggests a patriarchal role, a "we know better" attitude. But then do we take a step back and observe the innovation process, as it happens, to document the steps taken? To remain the neutral observer suggests an even larger negligence of duties. Or perhaps should we conceive of ourselves as shepherds of innovation trying to ensure emergence of novelty through inspiration? We show our attempts at both grounding the project to current practice while simultaneously framing inspiration as a way to think beyond the immediate.

Anthropology confronted its own detachment from contemporary society by experimenting with new forms and modes of ethnography (Marcus and Fischer, 1999) and in exploring approaches and practices of design anthropology, we seek to put into practice a form of anthropology *with people* rather than *of people*, as Ingold (2008) argues defines the field from other disciplines. The distinction for us between anthropology and design anthropology is that the latter is about getting at practices that have yet to exist. In design and innovation, concepts appear to address one particular aspect of a problem space, yet the interconnected nature of social life gets left behind when implemented. Design anthropology can be used to expose the seams of these future practices by studying with people. In this sense, performances are a crucial way of making explicit understandings of current relationships and

how one imagines them to be in new constellations of socio-technical possibilities. In this paper, we explore ways of working with project participants through performances as a form of self-critique, or perhaps a more literal reflection-in-action (Schön, 1987), to avoid the insular effects of innovation islands.

KINDS OF PARTICIPATORY PERFORMANCES

As the project continues to weave its way over its three-year life span (2010-2012), we have worked with performances on different levels and different contexts. One is within the work sites of the sterilization assistants as a way to envision experiences of new technology. The second and third is with "official" project participants in acting out robotic solutions to perceived problems and finally by setting up tensions through storytelling. We present these three example performances to illustrate how we have timed our moves within the project as a way of generating knowledge and understanding amongst the participants.

FUTURE FIELDWORK: PRE-KICK-OFF
In planning a course for the project, we relied on the project proposal and identified five large events in which all participants would collaborate. It started with the kick-off meeting, workshops 1 through 3, and ended with the final conference. To help orientate ourselves to the context of the sterilization ward, we setup visits to two hospitals before the kick-off. In some ways, this can be thought of as the gathering of field materials in order to setup a provocation (Buur and Sitorus, 2007)

Name	Ability
Super Strength	You can lift 10x your own weight.
Super Speed	You can move really fast.
Total Recall	You can remember everything.
Duplication	You can make copies of yourself.
Shape Shift	You can change your shape.
Time Shift	You can slow down or speed up time.
Microscopic Vision	You can see micro-organisms.
Telekinesis	You can move things with your mind.

Table 1: Superpower cards and the associated ability.

with the technologists, in line with an anthropology of people. And certainly this was the case in that we collected video of sterilization work for further analysis. We also wished to stretch our understanding of who were the project participants to include those workers not invited to the meetings, an implicit invitation of the excluded. In doing so, we asked how could we help them envision robotic technology that they have yet to experience in any context? The technique is simple in that we created a set of "superpower cards" which we asked the workers to select and prioritize the top three and explain what it would mean for their work if that special ability in fact did exist. The listing of cards in Table 1 shows the possible choices. The selection of superpowers was to ensure there might be techno-

Figure 1: Experience juxtaposing as a way of comparing work practices now and in the future. Superpower cards as a tool-to-think-with in exploring robotic technology while still in the field.

Figure 2: Experience prototyping the incorporation of robotics as part of future work practices. This scenario is for a robotic vision system to search for instrument defects and protein residue as validation after the washing cycle.

logical possibility within the project (for example, "microscopic vision" reflects the interests of one of the company partners), but also to highlight were technology did not yet exist.

We have come to think of this as *experience juxtaposing*. The purpose of such a tool is to explore potential experiences while firmly present in the here and now. Imagining such a possibility is, of course, not the same as having the experience, but the power comes from the comparative aspect. We took this approach as we wanted to understand what role robot technology would have on the worker's practice. While visions of technology often turn out much more mundane than anticipated, by pushing the hospital worker into the central role with the "choice" to wield technology as a power we could get closer to what it would feel like if technological solutions were implemented. This is a solo performance, while the next example is more collaborative and in so, approaches that of drama.

REHEARSING PROJECT VALUES: THE KICK-OFF

Going into the project's kick-off meeting, we had two research interests. How could we encourage the public and private sector to collaboratively innovate without getting lost in the "this is mission-critical and not the area to experiment" mentality? As well as how can we reduce the barriers and politics of change and transformation through transparency? One way to tackle these

large issues was to stage the kick-off as a dress rehearsal of the real project, but in a day as inspired by Mattelmäki et al (2009). The goals for the day were to get to know each other and our unique competencies, rehearse the project and define the outputs collaboratively. In other words, laying our cards on the table at the beginning of the project. There were two main parts of "The Rehearsal" as we called the kick-off meeting. The first part, *experiencing the field*, was an exposure to the sterilization context (especially for the company partners who do not currently work in this space) by watching several

video clips we had gathered from the field. After the short observations, each group generated areas for exploration. The four areas were: optimizing visual inspection, ensuring the quality of instrument lubrication, streamlining the cleaning process and minimizing personal movement and transport. The second part, *designing from experience*, was when the participants imagined future robotic systems in the sterilization ward. It was here where we had the four groups in the meeting perform a scenario from the future, as if our project resulted in an implementation of a robotic and automation technology. Through this performance presentation, we hoped that these scenarios of completed solutions would show conflicting visions for the project and the interactions of the workers to the new technology. As a twist to ensure robotics were incorporated, we asked that at least one person play the role of the technology (Figure 2). These embodied performances, while effective at seeing a system in use, struggled to illustrate the tensions in introducing new technology (and nearly everyone turned out to be a robot) so at the next event, we tried a new approach.

BRINGING TENSIONS TO LIFE THROUGH STORYTELLING: WORKSHOP 1

We framed the next meeting, Workshop 1, as "the Puzzle" where the participants start to piece together the core of sterilization work by looking

Figure 3: Observing the field in many ways. In this project, we have tried several ways of getting company participants to experience the field, from self-organized field visits, watching video clips from multiple wards and guided tours. The focus was not on describing the field, but structuring enough experiences to allow for the performances to be grounded at some level within the work practice.

Figure 4: Storytelling the conflict between villains and heroes within the sterilization ward as a way of making tangible unspoken assumptions for all project participants.

at the breakdowns and the well-functioning aspects. We were interested in exposing the seams of the system and the hidden or taken for granted work. As homework, we encouraged teams to visit sterilization wards before the workshop as a way to engage with the field. This was met with mixed success and so we also scheduled a tour of the sterilization ward that was our host for the workshop so that everyone had the opportunity to observe a working ward and make observations (Figure 3).

After the tour and a round of sharing stories and insights, each group chose a theme to take further in framing the tensions in the opportunity by personifying them. We asked each group to enter into a new world filled with a villain and heroes in an effort to make tangible these unspoken tensions (Figure 4). Through workbooks, each group created a villain with certain motivations and effects on people that reveal themselves at particular moments. The heroes were to be given a superpower that had a particular effect and values with one weakness. The last page of the workbook framed the "gadgets" the heroes might possess as a way to encourage converting the make-believe world of superheroes into technological concepts. One group had us entering the world of "missing process overview" where Mr. No Process was a villain because of his preventing opti-

mization, right choices and ergonomically correct work environments. His nemesis was the hero Mr. Brain who used his super smarts to combat Mr. No Process, but sometimes using resources inappropriately in his battles. There was an interesting tension that manifested between the groups (and possibly within). One group had a villain of Big Brother who was controlling, inflexible and impersonal, while another had one called Drake, who made estimates based on personal, subjective evaluations. The dilemmas of developing new technology surfaced through the storytelling process.

DISCUSSION

Returning to our island metaphor, what consequences have our various performances had on unfolding the relations between the Sterilcentral Project and work practice? Has it been successful at weaving the conflicting perspectives of the project participants? A final answer is unknown as we are still in the midst of the project and are currently in the process of creating and selecting sub-projects. But there are hints that the performances have influenced the initial proposals. One idea frames the solution as "semi-automated" rather than "fully-automated" perhaps in response to the identified notion of role and experiences of the workers. Another proposal centers on a system for

identifying protein residue, perhaps a result of the robotic performances? One of the interesting challenges for us as researchers is ensuring appropriate framing of the time-space in which we work. The tendency seems to be that these private-public collaborations focus on immediate needs rather than longer-term challenges, foregoing revolutionary ideas. We will continue to trace the results of the performances moving forward.

REFLECTION ON THESE PERFORMANCES

Through the three performances we can make some initial observations that distinguishes them. The first centers on the unit of collaboration. Using the superpower cards, the workers gave a solo performance to us researchers. This resulted in a more reflective mode that, despite the outrageous look of the cards, prompted thoughtful critique on self-practice within the sterilization ward, although limited to aspects depicted in the cards. Whereas, the mode of performance in the kick-off meeting (the robotic performances) was more embodied and because of the nature of activity found its form in the moment, often deviating from a preconceived plan, a form of improvisation. This allowed for technological assumptions to become unquestioned in an effort to deliver a cohesive piece as part of collaboration between many performers. The storytelling of heroes and villains came to life through the efforts of not only the group creation process, but the presenter's skill of enacting the conflict between the two, often with comic timing. Collaborative performances do run the danger of playing to the audience, yet by making the performance tangible and available for repeated viewing (through video) mitigates this effect in that these aspects are highlighted. The strength of working with performance tools in an innovation space is that the social web (including people and their environment) quickly gets interweaved through their telling to allow for critique, questioning and further analysis before full-scale implementation.

A ROLE FOR FACILITATORS

A design anthropology "with" places emphasis on performances as a way to expose and critique relations from the future. However, if researchers take

too strong of a position, they run the risk of being perceived as hostile to the innovation process. Yet if you embed into the process a reflective space, where the tensions are taken into account through the collaboration, it may be possible to avoid the pitfall of technology that coerces rather than supports practitioners.

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