DESIGNING THROUGH THINGS: OBJECTS AS CATALYSTS OF CHANGE

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ABSTRACT

This paper explores and discusses prototypes as a participatory activity. It includes a case study, which describes a series of transformations, where low-tech rope-making machines play pivot roles as catalysts of change. As a designer researcher working in a "non-design context", namely in Kisumu, Kenya, the approach was to "*design through things*". The designed objects functioned as mediators, triggering the users to act. The paper argues that material based prototype-objects can, if strategically designed, be successful participatory tools, because they can be directly implemented and tested together with the users in real life situations. When the prototype-objects are adapted to the local situation, the users can easily build on to the design concepts themselves. Through that, the users can become the future designers, a key approach in Design Infrastructuring Theory.

1. INTRODUCTION

"If vehicles are treated as mediators triggering other mediators, then a lot of new and unpredictable situations will ensue (they make things do other things than what was expected)" (Latour 2005; 59)

1.1 DESIGN PROTOTYPES

A Prototype can be described as the first or preliminary version of a device or vehicle from which other forms are developed[1]. The activity of prototyping has traditionally been about making physical artefacts to represent a 'product' before it is completed. The design prototypes were often high finished models presented in the very end of the design process. Today prototypes are rather seen by some as a *participatory activity*, which is taking place throughout the entire design process. (Sanders, 2012) In the very early stages of a design process, Post-It Notes and rough cardboard models are often used as prototype tools. But in certain situations, as the one described in the case, these tools are "alien" and somehow useless to the users involved because they don't have a social impact and make a real difference. The paper instead suggests the use of material-based prototype objects, designed to be adapted to and used in the local context as strategic means that materialize potentials and create a common understanding in practice. Their role is to act as mediators, triggering new processes to start where the users take ownership and can become the future designers themselves.

1.2 AIM, GOAL AND CONTRIBUTION

The aim of the study was to explore the designer role, and the role of objects as catalysts of change, when acting in a participatory development process in a former "non-design" context. The study contributes to the emergent field of design research placed in the intersection between Co-design and Actor-Network Theory (Storni et al, 2014). It builds on to Participatory Design research as explored by Björgvinsson, Ehn and Hillström through their Living Labs projects, which explores the concept of Design Infrastructuring. (Björgvinsson et al 2012). Their research is influenced by Actor-Network Theory, where theorists such as the Philosopher Bruno Latour explore the role of objects as social actors (Latour, 2005).

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[1] The Oxford Dictionary, 2014

I first introduce the background and motivation behind the research, and then introduce and summarize a few theories that act as the foundation to be able to discuss my work. After, I explain how I have worked, and then describe the case, explaining how the different prototypes where designed and used. I end with a discussion on the findings, which I hope can contribute to new perspectives on existing design research within the field of participatory design.

1.3 BACKGROUND AND MOTIVATION
In 2012 I started as a doctoral student in design connected to a transdiciplinary research platform in Kisumu, Kenya, funded by SIDA[2] through Mistra Urban Futures[3]. I had no earlier experience of working in "non-design contexts", but had over 15 years experience of working as an industrial designer, primarily as a free-lance designer with focus on strategic concept development. My research focus was to study how and through what means design could support the local crafts industry in the Kisumu region with focus on Women's Economic Empowerment.

1.3.2 THE RESEARCH CONTEXT – CHALLENGE OF THE WATER HYACINTHS
Kisumu is Kenya's third biggest city situated by Lake Victoria, which is one of the poorest areas in Kenya. One of the societal challenges for the fisher folk communities along Lake Victoria is the water hyacinths, a seasonal, invasive plant that decreases the access to the lake since it block harbours and beaches. The plant also reduces the water quality, which affect the eco-system in the lake. It attracts malaria mosquitos and other insects, and is a good environment for breeding snakes, crocodiles and hippopotamus. Since the communities along Lake Victoria are depending on fishing as a source of livelihood, my scope was to support the development of alternative sources of livelihood based on using the plant as a resource in crafts production.

Figure 1 The water hyacinth plant make it difficult to access the lake since it for example blocks harbours

1.3.3 THE DESIGN PROJECT: TO STABILIZE A PLATFORM FOR CRAFTS PRODUCTION
A key issue was to support market access and to up-scale by linking different initiatives and actors together. The idea was to establish a "marketplace platform" for cooperative knowledge production, as a way to build infrastructures. By using a development programme as a project platform, funded by a Swedish faith-based organization, we started an entrepreneurial program involving four communities in craft and business training activities. A Swedish design company specialized in design, production and sales of global craft was involved as a business partner, designing products for local production in Kenya and sales in Sweden. A system of local organizations connected to the faith based organization, were supporting the communities in training and coordination of the work. Since last year (2014) the production is now up and running with the Swedish market as an in initial market.

1.3.4 LACK OF TOOLS AND EQUIPMENT FOR PRODUCTION EFFICIENCY
The concept to develop a rope -making machine sprung from the idea of finding ways to simplify and make effective the time consuming activity of making ropes by hand made from the invasive water hyacinths. Rope making is a traditional craft in the region. Usually sisal has been the local resource used, but since the hyacinths appeared in the end of 1990s, making ropes from hyacinths has increased as source of livelihood. The ropes are used to weave different kind of craft objects as baskets, trays and furniture. The rope-making activity is a process that transforms the raw material to the finished crafts products and includes several steps: 1.Harvesting 2. Transportation 3. Cleaning, 4. Drying, preserving and storing 5. Rope making 6. Design. 7. Production of Frames for weaving 8.Weaving. Rope making was identified as the less efficient part of the process.

Figure 2.Rope-making by hand from water hyacinths, a time consuming activity. Photo: Helena Hansson

1.3.5 THE ROPE MAKING MACHINE

Another identified challenge was the lack of tools and equipment's to support the craftsmen to effective their work, make it safer but also to support them in producing more highly-finished goods. I therefore decided to explore different possibilities of how to simplify the rope making by using a simple muscular driven machine, to secure low-cost production and to get access to a reliable energy-supply. In an earlier design project, I had got in contact with the rope making museum close to Gothenburg, where traditional rope making techniques and tools were documented and performed through public co-craft activities. I got fascinated both by the machine, the ropes and the process behind, and I saw a potential to use the simple machinery and try it with the hyacinth fibre.

2. LITERATURE AND THEORY

The following theories are acting as the foundation to be discuss the findings:

2.1 ACTOR-NETWORK THEORY: OBJECTS AS SOCIAL ACTORS

Law, Callon and Latour developed the Actor-Network Theory (ANT) concept in the mid 1980s. The origin of the ANT approach can be found in the need for a new social theory adjusted to Science and Technology Studies, STS (Latour, 2005). According to Latour the social should be seen as an assemblage of heterogeneous elements, rather than *"a stabilized state of affairs"* (Latour 2005; 108). Crucial in ANT is that objects, devices and documents, what Law called "the silent ones" (Law 1994:23) also should be defined as social actors and therefore should be given agency to act (Porsander, 2003:14). By tracing and describing the actions of objects, we as researchers can learn about the society as a whole (Czarniawska, 2014). A key concept in ANT is the mediator-actors. Referring to Latour, mediators are actors that are characterized by that they induce others to act. The Mediators *"transform, translate, distort and modify the meaning or the elements they are supposed to carry"* (Latour 2005:39).

2.2 THE CHALLENGE OF PARTICIPATORY DESIGN

A key characteristic of scientific approaches that focus on contributing to sustainability is participation (Polk, 2014). Participatory Design is characterized as an approach to involve users in the design process, a way to meet the challenges of envisioning use before actual use (Redström, 2008) The concept of Participatory Design was developed during the 1970s from the standpoint that "*those affected by a design should have a say in the design process*" (Björgvinsson et al, 2012). According to Björgvinsson et al, the challenge for Participatory Design is that the efforts of design often are limited to the on-going design project. To reach a sustainable development over time, designers also need to consider future users and what is coming *after* the actual design project, so called Design-for-Design or Design Infrastructuring. (Björgvinsson et al, 2012). In the article, they introduce the concept of "project time" and "use time" where "Project time" is connected to the on-going design project while "use time" is the time after the actual design project. The researchers mean that designers should use the actual project time to design platforms and infrastructures to secure future development even *after* the project is over. Practically this means that objects must be designed with an open-ended approach to support the present users to get ownership, so they can become the future designers themselves. (Björgvinsson et al 2012).

2.3 PROTOTYPING AS PARTICIPATORY DESIGN TOOLS

Through the years, Participatory Design tools have been developed as a way to externalizing the visualization process, to support the participants "envisioning the future" (Sanders 2013). Referring to Sanders, a Prototype is a design visualization tool, initially used in for example industrial design and architecture projects to communicate ideas and product concept to clients. The activity of prototyping, from a was about making physical artefacts to represent a 'product' before it is completed. The design prototypes were often highly finished models presented in the very end of the design process. According to Sanders, the prototyping today rather should be seen as a participatory activity, which is taking place throughout the entire design process. The prototyping process starts already in the "fuzzy front end" of the design process where visualization tools as for example Post-it notes and rough cardboard models often are used. As the process progresses, progressively more realism is introduced as the process continues (Sanders 2012).

2.4 SMALL CHANGE AND FRUGAL INNOVATIONS

Nabeel Hamdi, an experienced Development designer, has another approach to participatory prototyping. He instead uses "real" objects as prototypes in the very beginning of a development process. Hamdi call this prototyping concept "Small Change". The function of the Small Change is to act as catalysts to make people come together, build trust and get organized (Hamdi, 2004). In the book "Small Change", Hamdi describes several examples of these kinds of prototypes, for

example a bus stop. By implementing the bus stop prototype, it created a market place hub, which activated the local community and facilitated a collaborative change process over time (Hamdi 2004) Using material based prototypes implemented directly in practice, make it easier for the participants to engage and evaluate a concept, since it looks, and acts real. But it is necessary that the prototypes are adapted to the local context and should therefore be not too "finished". The concept of "Frugal Innovation" described in an article by Sarika Bansal (2014) can be useful when trying to explain the role of Small Change prototypes. According to Bansal, a "Frugal innovation" approach means to design products specifically to meet the needs of the world's poorest people. It challenges designers and innovators to do more with less. *"The creators of frugal innovations strive for them to be affordable, sustainable, lightweight and rugged. Wherever possible, they should be made locally with renewable materials and most important, they should be developed with the end user in mind".* (Bansal, 2014)

2.5 Summary

Both the designer and the designed objects have important roles as mediators in the participatory process, they should trigger others (the users) to act. (Latour 2005) The prototypes are real, but rugged in their design. They are not yet fully developed material based objects, strategically designed to be adapted and used directly in the local context. (Bansal, 2014) The design is meant to be open for others to continue developing from. Through this, they can support an Infrastructuring process where the users get ownership and become designers of small change themselves (Björgvinsson et al, 2012; Hamdi, 2004, 2014).

3. DATA AND METHODS

3.1 OVER-ALL APPROACH
Working in a design research project with a "social" approach is complex since it often involves multiple stakeholders. In my case Academia, Civil society, Government and Industry were represented. Due to the multiple stakeholder involvement, the project had multiple framings. The participants in my case came from both Sweden and Kenya, but the project and the project team have emerged over time. The design process has been open-ended and has been based on improvisations. There were no identified roles or fixed objectives from the beginning. Many development research projects end with few practically implemented results. As a practice-based design researcher with an action-research approach it was important that our work should both produce academic results for the research community, but we were also obliged to produce knowledge to be implemented in a real life situation. As the development project was initiated and funded from the outside, one of the challenges had been the risk that the "users" become dependent on our external support. I therefore needed to think about what is left when the

research project is over. Another challenge was that I worked alone, primarily at a distance. I therefore needed to think of how to build a platform to work from acting from a distance.

3.2 DATA COLLECTION
The data was collected between April 2012-December 2014 through several practice based design interventions and prototyping activities. During this time I visited Kenya four times, for 2-3 week periods. In between the visits in Kenya, I have had almost daily contact with the stakeholder involved through social media, primarily Facebook, SMS, and e-mail. The virtual data collection has been an important source of information, but also as a tool to communicate and test ideas. A closed Facebook[4] group has mainly been used, where about 25 participants from the process have been included. The group was set up as a way to communicate in-between the field study periods in Kenya. Through Facebook we have easily been able to communicate and interact in an informal way, even if separated by distance. The virtual activities have both been a way to keep the dialogue alive, but have also acted as a way to collect data (interviews and observations) when working primarily distance based.

3.3 DOCUMENTATION
The process was documented and reflected on through self-observations and through participant observations as shadowing (Czarniawska, 2014). During the whole process, I documented the process using primarily my IPhone. The pictures have worked both as "memory triggers" and inspirational material that have been shared with the participants in a closed Facebook group,

3.4 PARTICIPATORY PROTOTYPING
The key method used has been participatory prototyping. The focus have been to "stage" material based prototypes, to observe and get feedback from the participants. I experienced early in the process that prototyping tools as Post-it notes and rough cardboard models were not enough as "change activators". These "alien" tools were too abstract for the participants and were not culturally anchored. Many of the involved participants could not read or write, and we did not speak the same language. Therefore, an alternative approach was needed. Prototyping with material based objects was identified as a way to gather people. The prototypes described in this process were designed and developed in Sweden, but were based on locally identified needs and preconditions. I developed the prototypes in close collaboration with colleagues with complementary skills primarily with a Swedish innovator. To "stage" the prototypes was a way to test ideas and potentials could be made visible together with

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[4] Facebook is well established in Kenya and was therefore easy accessible for all the different project participants.

the stakeholders. From that, we could get inspiration of how to continue.

4. EVALUATION OF DATA

4.1 INITIAL TESTS
 Together with students from Conservation department, an innovator and the staff at the museum, we did several tests with the fibre and different kind rope-making tools. We were initially disappointed when we realized it did not work. We could conclude that the fibre was too weak to be handled by the machines. But I still saw a potential in using the simple rope-making machine. In Kenya, rope making is a well-known craft technique. Many other local materials were used in crafts production, for example, banana fibre, sisal and also re-cycled plastic. There was a potential in adapting the rope-making process to effect the processing of the other materials, but also to use the actual rope-making process as a collaborative activity.

4.2 THE FIRST ROPE-MAKING MACHINE
After the initial tests at the museum, I gave the innovator a specification to design a hand driven machine. The task was to use no other material but standard or re-cycled elements to be locally found in Kenya. The first prototype was a small handheld portable machine made of a squared wooden plate with three rotation hooks and a handle. The bearings were re-cycled from discarded roller skates. The focus was to make the machine simple and cheap to produce, so it easily could be adapted and implemented. The aim was to bring it to Kenya for tests, and if there was an interest for it, leave it there to be replicated and supporting the further development.

Figure 3 The second rope-making machine made out of pieces from re-cycled bicycles, Gothenburg 2013. Photo: Helena Hansson

4.3 THE BICYCLE ROPE-MAKING MACHINE
 I also asked the Swedish innovator to design a second machine by only using old bicycle elements. Bicycles as a "raw material" were easy to find locally in Kenya. Through Facebook, we managed to find three old bicycles that we could get for free, and the inventor started to experiment building a new machine. This machine was much bigger, and we knew it was not possible to bring it to Kenya (at not least in this present situation) but we wanted to see what we could do starting from using the bicycle as a technical principle.

4.4 TESTING THE FIRST PROTOTYPE IN KENYA
In October 2013, I brought the small portable machine to Kenya to test it together with the students from the conservation department that were acting as my assistants. We already knew we would not be able to be use it in the water hyacinth rope-making production, but still wanted to test it and see what it could be used for. The students that were studying a Bachelor Program in Leadership in Handicraft, were interested in the social aspects of craft, and had learnt how to use the machine. They wanted to practice the rope making tool and process as a way to interact and communicate through craft.

Figure 4: The Students introducing the Rope Making machine using -cycled cloth, October 2013. Photo: Helena Hansson

4.5 A PARTICIPATORY ACTIVITY WITHOUT WORDS
The first test was when we visited a small fisherman's village outside Kisumu, one of the "prototype sites", connected to the project. At the site, we met a group of women engaged in craft activities. We already knew the crafts women did not speak English, and we wanted to use the machine to introduce ourselves through making, as a way to break the ice between "us and them". Without too many words, we started to use the machine. The crafts women first curiously watched the process of making, and then eagerly joined us to try themselves. Through the hands-on making, and could work together as equals, without using words. The process was all open-ended. We used some material we had brought from Sweden (Re-cycled cloth) Later we tried material that was found locally on the site (Sisal). The activity showed to be a great introduction to start to talk about the over-all crafts project. A local inventor had a look at it and said he could make one similar. This was an evidence of that the product was so easy to "read" that it could easily be replicated and implemented without written instructions or technical drawings. The group kept the machine, to be able to make a replication of it and test it further.

4.6 A SECOND TEST

Some days later, we brought the machine to another of the villages connected to the project, a fishing-community who had a lot of children visiting as day-tourists. In the village there was no formalized crafts group, but only a loosely connected net of women and men interested in crafts production as an alternative of livelihood to selling fish. One of the craftsmen was also connected to an organization for tour guides working with eco tourism. We tested the machine together with the crafts group, on the beach. Like in the other village, we wanted to use the existing local material. We therefore tested to use bicycle tubes, which transformed to a strong elastic rope with a delicate finish. One of the men immediately started to use the rope as an exercise tool. A group of schoolchildren flocked around us. But it was not them, but their teachers that stepped forward to test it. The teacher said, they had a lot of old bicycle tubes that could be used for making ropes, and he was asking for replications. Noticeable here was the collaborative aspect of the process. Normally, rope making is an individual activity, but this times the participants needed to collaborate and synch their efforts. Men, who usually were not involved in the actual rope making process, were very eager to be part of the process and test the machine.

Figure 5: The first Rope Making machine tested in Dunga with sisal fibre, October 2013. Photo: Helena Hansson

4.7 THE THIRD TEST

Some days after, we used the machine again at the same place in a collaborative playground-building workshop. We took already existing ropes of sisal, and transformed them to thicker ropes that were used to making swings. The children were not allowed to be part of the actual building of the playground, but they gathered around us, curiously watching. I initiated we should make skipping ropes from the left over material, to invite them in the process. Suddenly there where several groups of children and adults skipping ropes around us. We realized the skipping activity became a relaxation activity, a break from the daily work, where the villagers could get some exercise An old women came up to us and said: "this makes people come together. The day after, us the research team went back home, but we left the machine with the crafts group to see what would happen with it.

4.8 IMPLEMENTATION I: ROPE-MAKING AS AN ECO-TOURISM ACTIVITY

A month later, another research group connected to the same project were at site. They were primarily working with the ecotourism organization, supporting the local organization to develop and package tourist tours based on local activities. The rope - making was identified as an activity to engage tourists in a co-creative experience. Since the tool was new to them, they wanted to show it to and test it with the tourists. The result was that international tourists were not very interested in the activity. They were more looking for something "authentic" but for the local tourists, two Kenyan families with small children, the machine and the co-craft activities was a new and unique experience. The children and their parents enjoyed the making together. A few weeks later I asked one of the most active craftsmen on Facebook, if and how the machine was used, and he told me he have continued using it in workshop situations as a pedagogical tool. He showed and engaged visiting school children in the process of transforming waste to a resource.

4.9 IMPLEMENTATION II A FISHERMEN'S TOOL

A few month later I got a post on Facebook from one of the local partners in Kenya (the one that was working with coordinating the craft activities on all sites) He told me he had given the machine further to a group of fishermen, since he had seen them making ropes of re-cycled nets by hand. He had introduced the machine to them and they could see that their production was more efficient and reduced the time of making from 45 minutes to 2 minutes.

4.10 IMPLEMENTATION III A PEDAGOGICAL TOOL

In a parallel process in Sweden, the students that had assisted me in Kenya started to use the machines in school programs for children. The school children were to bring waste materials as t-shirts and old sheets to school, and through rope making they could make things from it. The teacher then discussed environmental issues as consuming and re-cycling with them based on the hands -on activity. They later used the ropes in Maths class to measure how much material that was needed to create one metre of ropes. The Leadership in Handicraft students let develop a new machine them selves, because they used it so much. The new machine built on to the same principle as the bicycle machine.

4.11 IMPLEMENTATION III AN EQUIPMENT TO PRODUCE MATERIAL/CO-CREATIVE TOOL

In another situation, the bicycle machine was used as an inspiration for a Furniture design project at a Design school. The Furniture's were to be produced and exhibited at the Furniture Fair in Stockholm. The project was called UNDESIRABLES and the idea was about transforming waste into something useful and

desirable. After an introduction at the rope-making museum, where the principle of rope-making techniques was introduced, the students were free to explore ropes, and rope making. The bicycle machine was handed over to the student was to be used as a material production tool in their project. The student's furniture's were exhibited first in Stockholm, where they also brought the rope-making machine to engage the visitors and to make visible the process behind the high finished furniture's. The design students were later invited to the Milan furniture fair, to exhibit with well-known design companies, showing potentials of using waste as a resource.

Using the Rope-making machine in Co-creative activities with visitors at the Furniture Fair in Stockholm, February 2014.

4.12 ON-GOING WORK
Right now we are waiting for a low-tech rope-making machine ordered from China to be tested for making ropes of water hyacinths. We believe that this new machine can be suitable for making ropes from the hyacinth fibre. If it does not work we will rebuild it and re-use it for other material utilization, for example using organic material as banana fibre and sisal or non-organic material as re-use of plastic. The further development and implementation will be done in close collaboration with an organization called "Engineers without Border". It is a student organization where young engineers engage in social development projects. They have shown interest in working further with the rope-making concept and implement it further in the local context.

The faith-based organizations have shown interest in continuing the craft development project, and expand it to Tanzania and Uganda. They have identified that working together with multiple stakeholders have given successful results. The potential is to start a sub-project within the over-all development project to develop new machinery and tools both for production efficiency and as participatory activities as a trust building activity.

5. RESULTS AND DISCUSSION

5.1 AN INFRASTRUCTURING APPROACH FOR LONG TERM DEVELOPMENT
According to Björgvinsson et al, the designer focus in a design infrastructuring processes, is to use the actual "project-time" to stabilize a platform for development to take place *after* the actual design project (use-time"). My intent during the process has been to use the project-time to identify actors with motivation and commitment and link them together in a network. By engaging the participants in activities with a Small Change approach, as for example the rope-machine prototypes, a platform of trust have been stabilized. The key strategy has been to support the recruitment and relation-building activities so the relations are settled when the project is over. The intent has been that when the project is over, the participants then have ownership of their own process. Crucial for me have been to use my existing network in Sweden and link them to the project as external resources. By recruiting new resources and competences to the project, the potential to be able to scale up increased.

5.2 SMALL CHANGES: MATERIAL BASED PROTOTYPES WITH AN OPEN-END APPROACH
Using material based prototypes as a participatory activity, was a strategy to continuously make visible potentials and test ideas in order to mediate the establishment of the platform. Instead of using "fuzzy" design studio prototype tools as for example Post-it notes, I suggest that material objects (things) should be used as participatory prototypes as early as possible in the design process. These Small Change catalysts (Hamdi 2004, 2014) bridge the gap between idea and reality. By showing tangible results, the participants can experience immediate change, which creates motivation to be able to take the next step. The prototypes should be locally based, rugged, affordable and useful with direct implementation[1]. The aim is rather to inspire and motivate the participants to build on to the existing concept and develop the ideas further, then to make "perfect solutions". The open-end and "frugal" approach invites the participants to become future designers themselves, an from that induce others to act, a key aspect in the field of Design Infrastructuring (Björgvinsson et al. 2012)

5.2 BUILDING TRUST BY MAKING TOGETHER
To be able to make real change, the stakeholders must be engaged and be actively involved participants. They must have ownership and be motivated to drive their own process of change. By making things together by hand as equals, through prototyping in full-scale, both local human and non-human resources can be activated. The boarders between "us and them, professionals and amateurs" become blurred (Von Busch, 2008). Everyone involved, including the designers, get a direct feedback and can immediately experience change. The prototype activities create trust, motivation and commitment to continue, which makes it more truly that the process continues even after the designers have left.

The relation-building process stimulates, which supports the stabilization of a future platform for development built on trust.

5.4 SUMMARY AND CONCLUSION

The aim of the study was to explore the designer role, and the role of designed objects as catalysts of change when acting in a development process in a "non-design context" with multiple stakeholder involvement. It builds on to theories about participatory design and to use participatory prototyping as means to build infrastructures to secure for future development where the project users become the future designers themselves. The case study describes a process of several transformations, where simple rope-making machines play pivot roles in the open-end design development process. The machines were initially developed to refine the principle of making ropes by hand in a more efficient way. But during the process, the objects changed role and functions several times. They induced the users, which in several cases took ownership of the object, and continued the development process themselves as designers.

The paper shows that strategic material based prototyping with real objects as the rope-making can be very useful in the development process as means to create a common understanding to be able to take the next step in the process. By having an open-minded and an improvised design approach, objects can act as mediators and induce others to act where the users get engaged as future designers.

OTHER INSIGHTS

Changes take time and require trust, loyalty and commitment among the stakeholders involved. Designers must learn the skill of adaption, and start to the themselves as a support-function, not be the ones sitting in the driver seat. Strategic thinking with a participatory approach should be combined with practical knowledge of making to be able to implement change for immediate feedback. The practical hands-on making demands a complementary virtual project space, to be able to continue the relation building activities by sharing inspiration and interact even when the participants were many separated by distance.

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