

# Dolls as props representing users in design: physical qualities and their application

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## ABSTRACT

Doll based design constitutes an emerging design approach where users and use is represented via props in the form of dolls and doll play in design sessions.

This paper contributes to the development of Doll based design by presenting five central physical qualities of dolls which support the representation of users via dolls in design sessions: *manageability*, *appropriation*, *human appearance*, *placeholder* and *accessories*. The aspects have emerged through a grounded theory approach where two workshops have been analysed with respect to how the physicality of dolls supported the representation of users through Doll based design: one workshop utilised ludo pieces to represent users and the other used paper silhouettes of human bodies. Based on the identified physical qualities of dolls, the paper offers practitioners' a guide of how to take the physicality of dolls into consideration during the planning and conduct of Doll based design, in order to support the representation of users via dolls in design sessions.

## Author Keywords

Doll based design, Representing users, Props in design, User centred design, Design process.

## ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

Representing users during design is central to the development of novel technology. This paper focuses on the emerging approach of representing users via dolls and doll play in design sessions: an approach coined Doll based design (Jakobsen, 2012).

In order to develop Doll based design as a practical design approach, there is a need for exploring how dolls can be

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understood and utilised as representations of users in design.

In this paper Doll based design is viewed as prop utilisation. As term, 'prop' is particularly known from theatre, where it denote physical objects used by actors during performance. When brought into the context of design, the term denotes physical objects utilised in design sessions. Mock-ups (Ehn, et al., 1991) and prototypes (Lim, et al., 2008) are among the most significant props utilised in order to represent systems in design sessions and it is recognised that the physicality of props is central to the outcome of design sessions (Brandt and Grunnet, 2000; Lim et al., 2008). In this paper dolls are regarded as props and the term dolls are used as a synonym for props.

This paper reports from case studies of two Doll based design workshops. In this context the physicality of two different kinds of dolls (ludo pieces and paper dolls) has been investigated in order to understand how the physicality of dolls supports the representation of users via dolls in design sessions.

The paper contributes to the development of Doll based design by presenting five physical qualities of dolls which the case studies suggest support the use of dolls as user representations in design sessions: *manageability*, *appropriation*, *human appearance*, *placeholder* and *accessories*. Based on the identified physical qualities of dolls, the paper offers practitioners a practical guide of what to consider during the planning and conduct of Doll based design, when users are represented via dolls.

The paper is structured as follows: First related work of *Representing users in design* is highlighted and focus on the physicality of dolls is motivated in the section *Representing systems in design*; subsequently the *Research method* is unfolded followed by a description of the *Research context*; next the *Physical qualities of dolls* are presented and based on this designers are offered a *Practical guide* for the planning and conduct of Doll based design; finally, the *Conclusion* sums up the contribution and relates it to existing research on props representing users and props representing systems in design.

## REPRESENTING USERS IN DESIGN

Numerous approaches exist of how to represent users in design processes. Personas (Cooper, 2003; Pruitt and Adlin, 2006), scenarios (Carroll, 1995; Howard et al., 2002; Lerdahl and Pedersen, 2002), combinations between them (Mikkelsen, et al., 2000; Loke, et al., 2005), cultural- or empathy probes (Gaver, et al., 1999; Mattelmäki et al., 2002) and drama (Salvador, et al., 1998; Kantola, et al., 2007) represent a few examples with different purposes and formats.

An additional approach of representing user in design is through the use of props. Props, as representations of users have been utilised in a number of cases in order to e.g.: talk about operator roles in the context of exploring new ways of improving wastewater treatment processes and create ideas for future products within the wastewater industry (Pedersen and Buur, 2000); serve as basis for dialog between designers, children, parents and employees when understanding everyday life in kindergartens (Lerdahl and Pedersen, 2002); and as a means at taking into account a) group activities and interactions, b) the mobility of participants during interaction and c) the context of each participant in terms of artefacts, tools and environment, when designing mobile services and devices (Iacucci, et al., 2000).

In addition with small scale environmental representations, objects representing users have been found to support participants in keeping a context perspective on design tasks and allow many scenarios to be explored in a short timeframe (Iacucci, et al., 2000; Lerdahl and Pedersen, 2002). Moreover it is reported that the use of objects as representations of users help the process of projecting players into a future situation and makes it less scary for them to talk about themselves and their practice (Lerdahl and Pedersen, 2002). Different objects have been utilised as representations of users in design whereof foam pieces (Lerdahl and Pedersen, 2002), game pieces (Brandt and Grunnet, 2000) and lego characters (Pedersen and Buur, 2000) represent a few. This paper focusses attention towards dolls which represent users through a bodily representation – a characteristic which is similarly found in Pedersen and Buur (2000) lego characters.

Dolls have been found useful in creating a common language between stakeholders in collaborative design sessions (Halse, et al., 2010). Studies suggest that the use of dolls in design sessions can be understood unfolding through perspective- and role-taking, where dolls are vitalised through successive chains of intermixed perspective taking and seamless shift of roles (Jakobsen, 2012).

This paper aims at supplementing the above research of how to understand and utilise dolls as user representations in design sessions. The study is inspired by research which concerns the representation of systems via props in design.

## REPRESENTING SYSTEMS IN DESIGN

In design research props often represent emerging design ideas explored under names such as mock-ups (Ehn, et al., 1991), artefacts (Mogensen, et al., 1992), representations (Kyng, 1995), prototypes (Lim, et al., 2008) and props (Howard, et al., 2002).

In the early years of Participatory design, a breakdown experienced in the UTOPIA project (Ehn, et al., 1991) was central to the rise of physical props as utilized to represent emerging design ideas in collaborative design sessions today. It was experienced, that traditional system descriptions were hard to understand for future users. As a result users were given physical cardboard mock-ups in order to get “hands on experience” as opposed to “eyes on a system description” (Ehn, et al., 1991). Thus, physical mock-ups were introduced into the field of systems design.

The physical, tangible features of system enable them to be held, placed and pointed at, help users see aspects of their current work in new ways, and build the future at the same time (Mogensen, et al., 1992; Bødker, et al., 2002). Thus, they not only support evaluation but are also generative which enable designers and/or users to reflect on design activities, and explore the design space.

The qualities of system representations have been divided into representational and non-representational (Kyng, 1995). Representational qualities refer to that which the prop represents, whereas the non-representational qualities refer to the physical aspects of the props such as size and material. Studies suggest that non-representational qualities open up a space of possibilities for improvement and additional uses (Kyng, 1995). A similar study propose prototypes to be understood: as filters, filtering out aspects of particular interest in a particular design session; and as physical manifestations of design ideas (Lim, 2008). Prototypes as manifestations can take almost any form, shape and appearance based on the choice of material and it is found that the material chosen for a prototype has direct implications on users’ perceptions when it is used for evaluating a design concept (Lim, et al., 2006).

In addition to the representation of systems, other representational props have been found fruitful in design as well. Brandt and Grunnet (2000) report from a study where props from fairy tales were used as ‘dream tools’. These enabled participants to see, for instance, whatever they wanted using a ‘crystal globe’ made from a bulb as inspiration to evoke ideas for future designs. Another way to use representational props in design, is as a way to represent business models. Mitchell and Buur (2010) propose tangible business models as an approach to facilitate meaningful participation of people without specialist business training in discussions concerning the offering and business viability of a proposed innovation. Tangible business models represent components of a business and important relationships with other entities. As example, a tangible business model was made from four

spinning wheels. The wheels represented hobbies and interests of different users of an online photo sharing service, and interests of the advertisers of the service.

Brandt and Grunnet (2000) report that detailed props foster focused discussions opposed to less detail props. Furthermore, they state that less detailed props seem to open up solution space whereas detailed props can help narrow down the solution space and create coherence in the design process. A similar insight is found by Howard et al. (2002) who state that props 'push' design innovation through their constraining and triggering effects.

As illustrated above the physicality of various kinds of props has been explored and found important to the outcome of design session. When users are represented via dolls in design, it is interesting to explore how the physicality of dolls can support the successful representations of users via dolls. In the following, the physicality of dolls is investigated with the aim of giving designers a guide of how to support the physical qualities of dolls during the planning and conduct of Doll based design. This research interest has been pursued through the following research method.

#### **RESEARCH PROCESS AND METHOD**

Case studies of two workshops have served as empirical foundation of the contribution of this paper. The workshops are described in detail in the section 'Research context', while this section focuses on documenting the research process and method.

The two workshops together with this study represent a learning process within our design and research team. In the first workshop dolls were instinctively provided in order to evoke participants' reflections on users and use through an ideation workshop. Through the workshop it became apparent, that representing users via dolls is not straightforward: the use of dolls was limited just as participants' considerations on users and use. Based on this realisation, the second workshop was set up as an attempt to develop an initial understanding of how dolls can be understood and utilised in order to represent users in design sessions. Both workshops were documented by video and note taking of designers.

The second workshop served as the initial object of analysis of this study. NVivo and a grounded theory approach was utilised in order to analyse the workshop. Three hours of video material was transcribed and imported into NVivo, a program for qualitative analyses. NVivo displays the video and transcript in parallel enabling the physical use of dolls and corresponding verbal utterances to be analysed in conjunction. Via NVivo the material was analysed via open coding where every passage of the video, where the physicality of the dolls support the representation of users in the Doll based design workshop, was coded. Subsequently, in an iterative process the open codes were condensed into five physical qualities of the doll.

Subsequently, the five physical qualities were utilised in order to analyse the use of dolls in the first workshop. This were done in order to enhance and enrich the understanding of physical properties and resulted in the grounding and creation of the five physical qualities proposed in this paper.

#### **RESEARCH CONTEXT: THE FUTURE LIBRARY**

*Mediaspace* is the name of the future municipal library building (figure 1) which is currently under development. The library will be placed centrally at the waterfront of Aarhus, Denmark, and will link life in the city with life of the harbour area. Besides the library, *Mediaspace* (the building) will also include the Citizens service department and the expected amount of daily visitors is 3500, resulting in more than a million guests a year.



**Figure 1 - Mediaspace, the future technology enhanced library**

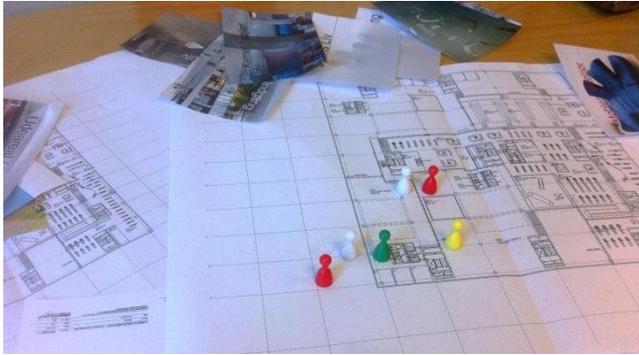
A core value of the library is to build a bridge between citizens, technology and knowledge and offer state-of-the-art of information technology. The following two workshops have served as empirical foundation of this study and have feed into the process of creating unique technology enabled experiences for future library users.

#### **First workshop: Representing users via ludo pieces**

In the first workshop users of the future library were represented via ludo pieces with different colours (figure 2). In the everyday context of a ludo game, ludo pieces would not be categorised as dolls. In the context of this workshop, however, ludo pieces were utilised as props representing the body of users'. Thus, ludo pieces are regarded as doll in the context of this paper.

The workshop was conducted in the context of a single one day ideation workshop, where the overall purpose was to identify potential areas where technology could enhance users' experiences of the future library.

The result of the workshop was 12 concept ideas which were described and visualised in an inspiration-catalogue subsequent to the workshop. The catalogue served as attachment to funding-applications of the technology design



**Figure 2 - Ludo pieces representing users**

project, which the municipality, as project owners of the future library, applied for.

*Participants*

The workshop contained forty participants with different backgrounds and interests including: participants from the municipality as project owner of the Mediaspace project (project management, contractors, librarians and the city architect); library staff from diverse departments of the present library, staff from the citizens service centre, citizens as future users of the library, agents from diverse technology firms and design researchers.

The participants were divided into six groups prepared in advance by the project management of Mediaspace. The groups were assembled so that they contained both a professional and interest-related wide, emphasising multidisciplinary competences.

*Workshop setup*

Tables for each group were arranged by the designers with ludo pieces placed on top of A3 sized blueprints in order to simulate users of the future library. Moreover, the table contained postcard-sized inspiration cards (Halskov, et al., 2006) with pictures of different existing technological concepts and architectural renderings of the future building. The groups were told to generate concept ideas supported by the elements on the table. No specific guidelines were given regarding how to use the ludo pieces.

As mentioned in the section, Research method, it occurred through the workshop, that representing users via ludo pieces in design is far from straightforward. The use of ludo pieces was limited; only two groups fleetingly used the ludo pieces by placing them on the spot of the blueprint where design discussions were centered. Predominantly, the final concept ideas mainly focused on building aspects, lacking the focus of users and use. In order to improve our understanding of how dolls can be utilised in order to represent users in design sessions, the workshop, which serves as the second case of this study, was arranged.



**Figure 3 – Paper dolls representing users**

**Second workshop: Representing users via paper silhouettes**

In the second workshop users were represented via paper silhouettes illustrating human bodies (figure 3). These bodily representation were chosen over the abstract ludo pieces, as studies in the intertwining fields of Psychology and Play theory stress that not all people have the ability to handle the mental leap required for pretending that an abstract prop (such as a ludo piece) is a human (Bretherton, 1984).

Besides the research focus, this workshop was conducted as initial attempt at establishing a design project with the aim of developing design concepts supporting the creation of a unique technology enabled experience for future library users. The partners of the project were the municipality as architectural project owner and design researchers from the research centre Digital Urban Living. The purpose of the workshop was to create a shared understanding of the future building and visions of use, between the partners of the project, in order to serve as common ground for collaboratively establishing the design project. Based on the workshop, the design project was established with particular focus at users' experience in the entry area of the future building.

*Participants*

The workshop contained seven participants from the municipality (one man and six females age 29-54), with different backgrounds and interests in relation to the construction of the future library building. The participants included: the project manager of the architectural project; librarians from the children's department, non-fiction department and from the desk area of the current library; an employee from the citizen service centre and a development consultant from the library. Moreover three design researchers participated as facilitators of the workshop.

The participants were divided into three groups: a group containing three persons and two groups containing two persons. The groups were arranged so that they contained participants with different competences and interests.

### Workshop setup

The workshop consisted of three activities: *doll creation*, *doll play* and *scenario presentation*. During doll creation, the groups created self-invented fictional doll characters, from plain paper dolls. The plain dolls were made by the designers before the workshop in order to save time during the workshop. The participants personified the dolls by drawing clothes, hair and faces onto their paper body. Subsequent to the doll creation, a designer demonstrated how the participants were expected to play with dolls on AO sized blueprints, by acting out scenarios of their doll characters visit in the future library on the blueprint with the dolls. Finally, the participants presented and shared their doll scenarios in plenum. The workshop evoked several ideas for how to support future users' visits in Mediaspace through technology.

In this workshop, the dolls as representations of users were extensively used compared to the first workshop. There can be many reasons for this, whereof the continuing focus on the dolls, participants' engagement in doll creation and designers instruction in their use, is obvious.

The representations of users in the two above workshops did not provide valid knowledge of users. In both workshops the intention was that the dolls should provide a use perspective as foundation for dialog among stakeholders. In a future study it could be interesting to investigate the applicability of Doll based design in engaging users as puppeteers animating dolls which represent themselves.

### PHYSICAL QUALITIES OF DOLLS

This section presents five central physical qualities of dolls which support the use of dolls as representations of users in design sessions: *manageability*, *appropriation*, *human appearance*, *placeholder* and *accessories*.

As described in detail in the 'Research method' section, the above described workshops have served as empirical foundation upon which the physical qualities have been identified through a grounded theory approach. In the following the workshops will serve as empirical grounding illustrating the importance of taking these qualities into consideration in Doll based design workshops.

#### Manageability

The studies suggest that the manageability of the doll constitutes the foundation of their use as representations of users in design. In this concern, particular two aspects of dolls have been found central: the *size* and *stability*.

The size of the dolls is interesting in relation to the representation of the surrounding environment and participants handling of them.

In the case where ludo pieces represented users, they were chosen based on the resemblance of their size in correspondence to the scale of the blueprints. Contrarily, the paper dolls did not correspond to the scale of the

blueprint: the paper dolls were 18,4 centimetres while they would have been only 0,9 centimetres if they were to correspond to the size of the blueprints (figure 4). The paper dolls were approximately 20 times bigger than the scale of the blueprints which was not observed to affect the doll play. Dolls were envisioned walking through the entry door and climbing the stairs without reference to the conflicting dimensions. The size of the dolls in relation to the scale of surrounding environmental representations does not necessarily have to correspond.

In the two cases a more important aspect of size was identified, concerning the relation in size between the dolls and the workshop participants. The small size of ludo pieces had the disadvantage of being difficult to manage as it challenged the fine motoric skills of the participants. Additionally, small ludo piece disappeared in the hands of the participants holding them which made them invisible to other participants. The larger paper dolls were easier to handle and were visible to participants all the time. However, manageability of dolls not only relates to size but also to stability of the doll.

The case studies show that stability of the doll is important to its use as user representation. Both ludo pieces and paper dolls were challenged with regard to stability which resulted in the dolls easily tilted. Ludo pieces are industrially fabricated to be able to stand; however, their size can challenge the action of making the ludo piece stand, as fine motoric skills of participants get challenged. The paper dolls were equipped with supporting feet made from paper (see figure 5 at next page). These were, however, not

solid enough, which resulted in frequent collapse of the

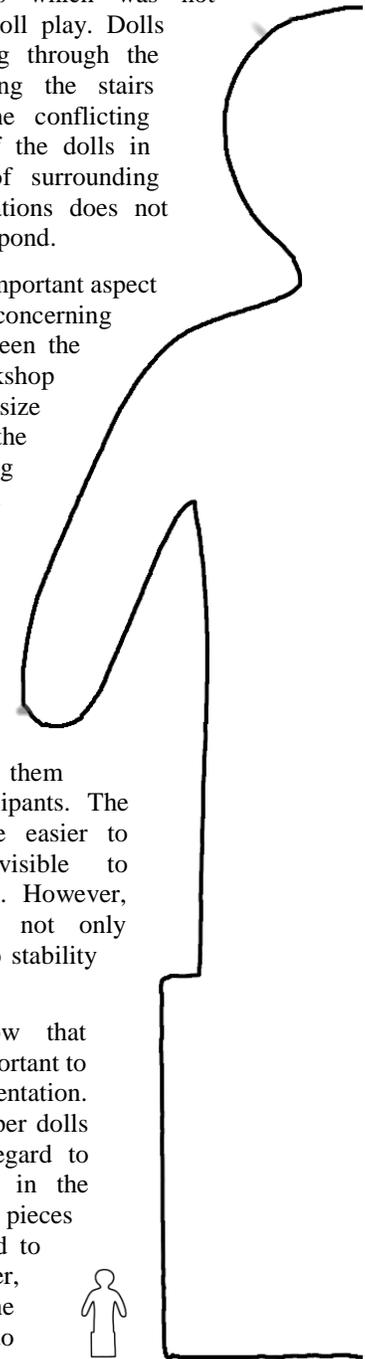
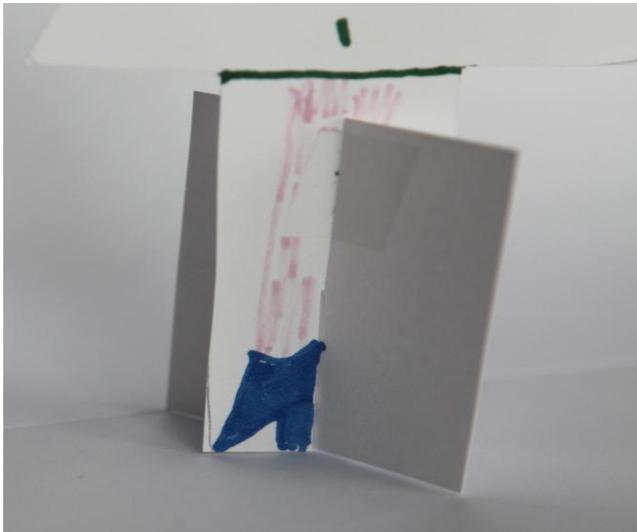


Figure 4 – The used paper doll (right) and a paper doll corresponding to the scale of the blueprint (left)



**Figure 5 - Supporting foot of the paper dolls**

dolls. In groups envisioning the scenario of one doll this seemed to be a minor problem, as they solved the instability by holding the doll by hand. In groups, however, which envisioned the scenario of more dolls at a time, the instability of the dolls resulted in that dolls were let aside, which cause distracting misunderstandings between participants, a topic which will be unfolded in a later section.

The manageability of the doll constitutes the foundation of their use as representations of users in design and support the successful implementation of the following four aspects which will be presented. It is, however, important to note, that that the size of the doll and its relation to the corresponding environment may have different implications in different design cases. If for instance the relationship between the doll and the surrounding landscape is important an oversize doll might give an expression of free sight contrary to the reality of the use context, or if a building is represented with roof, walls, doors etc., an oversized doll might not be the ideal solution. If this is a topic in a design case, designers should be aware of the relation between the sizes of the dolls in relation to the environmental representation. While this is an interesting topic, it will not be investigated further here.

### **Appropriation**

Most people have a relation to doll play and knows how to play with dolls; this, however, is not enough to ensure their applicability and success as representations of users in design sessions. In order for participants to engage in doll play, the case studies suggest that participants' appropriation of the dolls is central. During appropriation, participants build a relationship to their doll which supports them to vitalise and empathise with their doll. Two equally important aspects have been found to support participants in appropriating and building relations to their dolls: the *materiality and size* of the doll and the *workshop setup*.

The materiality and size of dolls come in numerous variations. The two cases utilised quite different types of dolls: mass produced plastic ludo pieces, a few centimetres high, and pre-cut paper dolls from 12 (dolls representing children) to 18 (dolls representing adults) centimetres high. The plastic dolls were not appropriated whereas the paper dolls were appropriated extensively both before and during doll play.

The case studies suggest that a central point concerning the materials of mock-ups (Ehn, et al., 1991) also apply to the materials of dolls: the materials of dolls have to lend themselves to modification, be familiar to participants and participants have to have the competences to modify them. It is very difficult to manipulate plastic, whereas, paper and the possible operations on this material, using pens and scissors, is well known to everyone in our culture. When choosing dolls, this study suggest that, it is relevant to choose dolls of materials which support manipulation and thereby appropriation: materials which are familiar and formable to workshop participants.

The size of the doll is central as it has to be manageable in order for participants to appropriate it. If the doll is too small it is both difficult to hold and appropriate it. Drawing face and clothes onto the 18 centimetre paper doll is considerably easier than drawing it onto the small ludo pieces. The point is simple: dolls needs to be big enough for appropriation to occur and be visible.

If the workshop setup does not support doll appropriation, the materiality of the doll are unlikely to be touched. Doll appropriation can; however, be supported before and during doll play in design sessions.

Before doll play the workshop can support participants in creating a relation to their dolls through personifying the doll. In the case using paper dolls, this was accomplished by letting the participants create their own doll. First they choose a plain paper doll from a doll stack in the middle of the table and subsequently they appropriated the doll by giving it a name, creating a history around it including for instance family-relations, interests and profession, and drawing hair, face and clothes onto the doll. The creation and personification of the dolls lasted 40 minutes.

During the workshop, doll appropriation can be supported by providing tools for participants to manipulate the doll. In the case of ludo pieces no tools were provided opposed to the case of paper dolls. During doll play participants used pens to appropriate their dolls, for instance by drawing an iPhone onto the hand of a doll. The drawn iPhone developed the scenario on a very concrete level and at the same time maintained the envisioned phone which invited participants to incorporate it into subsequent scenarios of the doll.

The central point of supporting appropriation during doll play is that it maintains and makes it visible to doll play participants. In this way appropriation increase doll play

complexity and support continuing considerations on modified or added aspects such as for instance - how visiting a library of the future would occur if the visitor has an iPhone.

Some groups created their dolls in collaboration while other groups created a doll character each. Comparing observations of the different groups and taking in mind the case of ludo pieces, it is clear that participants who appropriate dolls create a closer relation to the inanimate object than participants who do not appropriate their doll. The appropriation of dolls both prior and during doll play helps participants to get a relationship to the doll and thereby support the representation of users through Doll based design.

### Human appearance

The appearance of people is individual and shift dependent on the situation, mood, lifestyle, shifting seasons etc. Through the case studies, the human appearance of dolls was found to support the use of dolls as user representations. Three different aspects of the human appearance of dolls were found to support the use of dolls as user representations: *facial expression*, *body* and *clothes* of the doll.

In the case where ludo pieces represented users, the prop did not represent an individual person but was a generic representation all alike. In the case with paper dolls, the dolls, however, had individual characteristics.

The case study of the workshop using paper dolls revealed that facial expressions of the doll can support participants in considering the affective state of the user representation. During doll creation, the participants draw faces onto their dolls, including hair, eyes, nose, mouth etc. During doll play, the facial expression of the doll, Jan-Henrik (figure 6), which included a smiling mouth, evoked the participants to consider how he would feel when he realised that he would not be able to visit the roof of the library, which was the object of his visit due to his interest in the solar cells on the roof. Considerations evoked by the facial expression of the dolls during doll play occurred in two out of three groups.

In addition to the affective state, the face of the dolls was also found to support group dynamics during doll play. Eyes drawn onto the faces of the dolls served as pointer which directed and guided the next move of the doll play to the co-player/s. This occurred in numerous scenarios where puppeteers faced the dolls towards specific places or objects: For instance a puppeteer turned the doll, Jan-Henrik, towards the Citizens service centre and the co-player instantly responded by referring to the Citizens service centre and how Jan-Henrik experienced this area. The eyes give the doll a direction, unlike ludo pieces. Thus participants can, by following the eye direction of the animated doll respond meaningfully to the pretend play by referring to the place or object which the doll is directed at.



Figure 6 – Doll with a smiling face



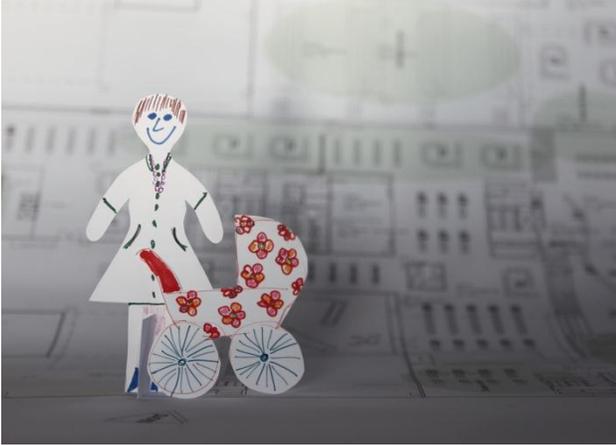
Figure 7 - Doll wearing a t-shirt with short sleeves

The body of dolls can support participants in considering aspects which relate to the age of the represented user. In the case of paper dolls, three different sizes of dolls were provided representing: adult (large dolls), teenagers (medium size dolls) and children (small dolls) of the future library. Moreover each category both contained male and female dolls, illustrated by letting the silhouette of female dolls wear a dress. The relative size between the dolls, for instance the large doll representing adults in relation to the small dolls representing children, supported considerations relating to the age of the represented user.

The body of the doll can also, as the facial expression, support participants in considering the affective state of the doll. This for instance occurred in the doll scenario of Karen-Margrethe, a middle-aged woman. It was envisioned to be her first visit in the new library, and the participants discussed if she would feel insecure. The participants agreed that with her size, referring to the size of the doll, she would not feel insecure. Thus, the body size of doll supported the participants in deciding the affective state of the doll.

Besides the affective state of the doll, the body of the doll evoked considerations on the lifestyle of the represented user. In a doll scenario of Anders, a young student, the participants referred to the body of the doll during the envisioning of Anders: “See how fit he is – I think he is very sporty.”

Through the case studies it was found that the clothes of the dolls can support participants in considering different topics such as season, perception of temperature and vanity. Season and temperature occurred in the doll scenario of Mohamed. Mohamed was envisioned standing in an area of the library which was designed for relaxation with comfortable armchairs and with a large window and a fantastic view over the harbour. Evoked by a t-shirt with short sleeves drawn onto the doll (figure 7), the participants considered the time of year and decided, that as the doll wore such a t-shirt it was summer. Subsequently, they considered if, even though he wore the t-shirt, it might be too hot to sit in this area. The topic of vanity was evoked by stilettos painted onto the legs of a new mum by participants prior to the doll play (figure 8). The participants agree that she had



**Figure 8 - A baby carriage assist the user representation**

chosen to wear stilettoes, as she would like to be smart, even though she had just had her baby.

Neither the facial expressions, the form of the body nor clothes of the dolls were created purposefully with the aim of supporting particular considerations during doll play. However, as seen above the human appearance of dolls supports the enrichment of doll scenarios and makes the represented user more vivid for participants.

#### **Placeholder**

When more than one person is involved in doll play, misunderstandings is more likely to occur with regard to which doll is in play and where the play is situated. The case studies show, that the physical manifestation of the doll in the represented environment serves as placeholder for the represented user and its location. The doll as placeholder is supported through *animation* of the doll.

In the case with ludo pieces, animation of the dolls was limited: reasons are likely to be found in the fact that no guiding was provided of how to use the dolls and, moreover, the dolls lacked the fundamental manageability. In the case with paper dolls, however, the participants were instructed to animate the dolls and during doll play, the participants animated the dolls extensively.

When a doll scenario contained only one doll the animation was mostly successful, and the doll served as placeholder especially with regard to the location. For instance a participant in the three person group came back to the on-going doll play from a quick break and asked the co-players: “where are we now?”. The co-players responded by pointing at the doll, which was standing on the ramp which connects the first and the second floor of the library.

With only one doll, no confusions occurred with regard to which doll that was in question. However, in scenarios with multiple dolls involved, participants were challenged due to a lack of hands in the animation process, and it was found that these scenarios were affected more when the dolls lack manageability. As an example, the family consisting of four

dolls were left lying beside the blueprint due to instability of the supporting feet of the dolls, and a participant used a pen to point at the ramp area where they envision the dolls standing. When a participant suggested that the father would like to stay on the ramp, it caused confusion in the group as the other participants thought that the father was still in the entry, and not at the ramp with the children. This resulted in confusion among the participants with regard to which dolls they were talking about and where the individual dolls were located. When the dolls were animated there were no confusion and the dolls acted as effective placeholders for both the represented users and their locations.

As placeholder the case studies showed that dolls mark the user and its location to participants during doll play. This has been found particular valuable, as it makes it visible to all participants who are centre of attention and where, and thereby support meaningful dialog between participants. The case studies, furthermore, showed that animation of dolls supports progress of doll play and makes misunderstandings between participants less likely.

In order to ensure the animation of dolls as props in design sessions, animation can be supported by the facilitators’ intentional staging of animation. It also supports animation if the dolls are manageable and can stand on their own.

#### **Accessories**

In our everyday lives we carry a lot of different accessories, e.g. bags, umbrellas, laptop etc., depending on the situation and environment wherein we are located. When users are represented via dolls the case studies suggest that assisting dolls with accessories support and enhance the doll play. Accessories of dolls can be *drawn onto the doll* or *made from additional material*.

In the case utilising ludo pieces, accessories were not applied and no considerations occurred concerning accessories of future users. In the case with paper dolls accessories were supported by the workshop setup and several applications of accessories occurred and supported the considered complexity of the user representation and its envisioned day.

One group drew a laptop onto their doll during doll creation. During doll play the laptop supported participants in considering what it would be like to bring a laptop in the future library. The laptop among other things evoked fruitful reflections on accessibility to power plugs and internet access. Turning to an example where accessories of the doll were made from additional material, a group created a baby carriage for the doll, Sarah, who was envisioned being a new parent (figure 8). The baby carriage similar to the laptop evoked fruitful considerations during doll play. When Sarah for instance was envisioned arriving at the future library, the baby carriage evoked reflections concerning if it would be possible to climb the stairs with a

baby carriage, and if she could, it may be problematic to get past the revolving doors.

In the two examples, accessories are made by participants before the doll play activity. Accessories can, however, also be created during doll play such as in the case where an iPhone was drawn onto the dolls hand, mentioned in the section, 'Appropriation'. Assisting dolls with accessories supports participants in considering the complexity of the daily life of users and use in a concrete situation.

## **PRACTICAL GUIDE**

In order to support the use of dolls as props representing users in design, this section offers a practical guide of what to consider during the planning and conduct of Doll based design. The guide is based on the above presented physical qualities of dolls which support the representation of users in Doll based design. The guide is structured relative to the point of time in which the designers have to take the physical qualities into consideration: *Planning Doll based design* and *Conducting Doll based design*.

### **Planning Doll based design**

The planning of Doll based design concerns considerations on *preparing dolls* and *planning and preparing the workshop setup*.

#### **Preparing dolls**

A central part of conducting Doll based design is to prepare the physical dolls.

In the cases of this paper commercial (ludo pieces) and 'homemade' (paper silhouettes) dolls were utilised. When designers prepare dolls for Doll based design, whether commercial or 'homemade', the case studies suggest, that the following aspects may be taken into consideration:

**Manageability** - Create the doll in a size which supports that it is manageable and visible to all participants. Consider in relation to the specific design situation, if the scale of the doll in relation to the environmental representation is important. Ensure that the doll can stand by itself.

**Appropriation** - Chose dolls of a material which lends itself to modification by the participants and ensure that the size of the dolls supports appropriation.

**Human appearance** - Consider how the facial expression, clothes and body form of the doll best support those of the represented user in the specific situation.

#### **Planning and preparing the workshop setup**

When planning and preparing the workshop setup, the following aspects may be considered:

**Appropriation** - Consider how your workshop setup supports participants' appropriation of the dolls and the relation building between the participants and their doll. Prepare tools for the participants to manipulate the doll (e.g. scissors, pens, glue).

**Placeholder** - Plan how to ensure that the dolls are animated during your Doll based design session. If for instance the doll is made by more than one participant, consider who has the role of animating the doll and how this should be staged in the workshop.

**Accessories** - Consider if users should be assisted by accessories which affect the specific use situation in question. Plan the workshop setup so that it supports the production of accessories, and prepare materials and tools for the production.

### **Conducting Doll based design**

Subsequent to the planning of Doll based design, a major part of the session should be running, - only a few considerations are important to have in mind during the conduct:

**Appropriation** - Provide participants with tools to manipulate their dolls. Encourage participants to appropriate their dolls.

**Placeholder** - Encourage participants to animate their dolls.

**Accessories** - Provide participants with materials for creating doll accessories. Encourage participants to create accessories for their dolls.

If addressed, the five physical qualities above can support the representation of users via dolls in Doll based design sessions. This is, however, no guarantee for avoiding breakdowns in doll play. If breakdowns occur, previous work by the author (Jakobsen, 2012), suggests that designers can resume doll play and ensure its continuing progress by focusing the participants attention back on the doll.

## **CONCLUSION**

Doll based design is comparable with techniques such as persona (Cooper, 2003), scenarios (Carroll, 1995) and drama (Salvador, et al., 1998) which concerns the representation of users and use during design. Unlike the textual and visual format of persona and scenarios the physical tangible nature of dolls makes the technique both engaging and dynamic for participants. Compared to drama, however, doll play obviously does not provide the rich bodily experience of acting in the envisioned use situation; and the detail of events supported through the format of Doll based design is less rich and complex as drama conducted in the wild. A central value of dolls and doll play is that it provides participants with a bird-perspective on use situations; this, give participants a full overview of events and settings, and enable them to explore and discuss simultaneous acts of different represented users across unlimited envisioned distance.

This paper investigated the physicality of dolls as props representing users in design sessions, and presented five physical qualities of dolls which were found central to the successful use of dolls as representations of users in design:

*manageability, appropriation, human appearance, placeholder and accessories.*

This paper suggests that manageability is paramount to the use of dolls in design sessions. The second case study, using paper dolls, support Iacucci, et al. (2000) and Lerdahl, et al. (2002) in the experience that props representing users can help the process of projecting participants into the future situation and help them keep a context perspective on design tasks. Adding to this, the study propose that *appropriation* provides a practical tool to support the projection while dolls as *placeholders* helps keep a context perspective on design tasks. Research on the representation of systems via props in design, report that detailed props foster focused discussions opposed to less detailed props (Brandt and Grunnet, 2000). In line with this, the case studies of this paper clearly demonstrate that *human appearance* and *accessories* of dolls focus discussions in design sessions opposed to generic dolls.

At the present time, Doll based design is in the exploratory phase and more research is needed in order to further explore the applicability of the technique (for research potentials see, Jakobsen, 2012).

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