Toying with time: Considering temporal themes in interactive artifacts

ESCAPING THE OBVIOUS: SKEWING PROPERTIES OF INTERACTION

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ABSTRACT

Most design methods used within interaction design originate from other disciplines. As a result, there are few methods which can focus on designing or redesigning interaction in itself. In this paper we present a structured ideation method called Skewing, which is based on changing already identified, interaction-related properties of an artifact. Hereby, designers can generate interesting re-designs whose interaction design differs from the original product. Moreover, the structured approach in Skewing helps in finding the unusual design solutions in the outer rims of the design space. Lastly, Skewing can also be used as a means to teach the materiality of interaction.

INTRODUCTION

The interaction designer, being at the core of the process of inventing and developing interactive artifacts, is naturally using a toolkit of ideation design methods to support this work. Interestingly, most of these methods are adapted from other fields, and several are just "general" design methods, as found in for instance Jones (1990), Martin & Hanington (2012) and several others. Arguably, some methods that are commonly used by interaction designers were developed in an interaction design context, e.g. Extreme Characters (Djajadiningrat et al 2000), Cultural Probes (Gaver and Dunne 1999), personas (Cooper 2004), bodystorming (Burns et al 1994), 6-3-5 (Löwgren and Stolterman 2004) and many more. Despite their origin in interaction design, none of these methods, targeted specifically towards inventing and shaping interactive artifacts, are particularly focused on *interaction per se.* Overall, there are very few such methods.

Addressing this issue we here present a new ideation method and design exercise that can be specifically targeted towards interaction and interaction-related properties of interactive artifacts. The method is called *Skewing* as in shifting, changing, or turning, and this is the core of it. In short, an existing interactive artifact is being analyzed using a framework of terms or properties describing interaction, and then these properties are deliberately changed.

Skewing first originated as a teaching method, and it has been tested in a teaching context. As a result, the paper has the following structure: First, we will describe ideation methods related to skewing. Second we will frame this research in an action research context, grounded in our teaching. Thereafter we will describe our work with Skewing, which includes exploring possible frameworks to use. Lastly we will describe the method in itself, and discuss its pros and cons.

BACKGROUND: RELATED METHODS

The first steps of most design processes are focused on framing the problem. After the problem has been defined to a satisfactory degree, the designers must come up with creative ideas that address the problem. This phase is also known as the ideation phase, although Jones (1992), refers to it as transformation. Shah et al. (2003) suggest a classification of ideation methods into two discrete groups: logical and intuitive. Logical methods are based on a systematic approach in order to decompose and analyze the problem at hand. This is accomplished by utilizing already collected information, such as preexisting solutions. Intuitive methods instead aim to break mental blocks by using various mechanisms. We see Skewing as such a mechanism. Shah (1998) and Shah et al. (2000) have further classified intuitive methods into five types: Germinal (generating ideas from scratch) Progressive (improving an idea using repetitive steps), Organizational (grouping of ideas), Hybrid (combined methods) and Transformational (idea generation by modifying existing products or solutions). We see Skewing as a transformational method, albeit with some traits from germinal methods.

Below, we will describe the methods we have found to be the most close to Skewing; a comparison will be made in the Discussion

Two transformational methods, suggested by DeBono (1970), are the PMI Method and Random Stimuli. The PMI-method helps designers list Plus, Minus and Interesting aspects of a situation or action, to widen their view. In Random Stimuli, the designers' objective is instead to think of a random object and link it to their design goal by using characteristics of the random object as inspiration for design, e.g. a paper clip can be used to hold papers together which in a photo-app could be interpreted as being able to make collections of photos. This characteristic makes Random Stimuli similar to Interaction Relabeling (Djajadiningrat et al. 2000), albeit the latter focuses on transferring interaction in itself.

Another transformational method is SCAMPER—Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Reverse." (Chulvi et al. 2012). The method requires an existing artifact, and aims to produce ideas by pushing the design team to alter features of the artifact. Example questions are: 'what can be substituted?', 'what can be combined?' etc.

Looking at similar methods focused on widening or exploring the design space we find Critical Incident Technique, Morphological Charts, and Boundary Searching. Of these, The Critical Incident Technique (Martin and Hanington 2012) helps to open up the design space by looking specifically at critical incidents, i.e. when interacting with an artifact results in a surprising outcome that can be either delightfully positive or disappointingly negative. The designer then, redesigns towards the positive incidents and tries to omit negative ones. Another method to widen the area of search for solutions to a design problem is Morphological Charts (Jones, 1992). Here, designers identify the functions that a satisfactory design solution *must* be able to perform, and then create a chart of many possible ways of performing each of these functions. Finally, an acceptable combination of sub-solutions is selected. The charts therefore combine an ideation method with an evaluation method, since ideas that do not seem to serve pre-identified important functionality do not make the cut. Boundary Searching (Jones, 1992) is similar in that design teams search and attempt to define the range of the design space within which acceptable solutions exist, and then limit design solutions to the defined space. The difference between the two latter methods is that Boundary searching defines the design space in terms of parameters, whereas Morphological charts is more specific in that possible, suiting sub-solutions (already within the boundaries) are evaluated.

Both Morphological charts and Boundary Searching can be considered as germinal methods (Shah et al. 2003). Many germinal methods are based on brainstorming (Jones 1992; Martin & Hanington 2012), which has been criticized for not addressing specific domains, user needs or specifications (De Bono 1995). There are a therefore a series of techniques that modify brainstorming in different ways, either in improving the process in itself or by adding means to sort, evaluate or refine brainstormed ideas, or refining them, e.g. The KJ-method/Affinity diagram (Kawakita, 1982) , the 6-3-5 (Löwgren & Stolterman, 2004), and various Brainstorm graphic organizers (Martin & Hanington, 2012). This is interesting since it points towards a need for structure when generating ideas.

Albeit several of these methods above deal with idea generation, an opening of the design space, and the transformation of an existing artifact – aspects which Skewing fulfills, only *one* of them, Interaction Relabeling (Djajadiningrat et al. 2000), focuses on interaction-related properties, albeit applied to everyday things as opposed to interactive artifacts. Arguably, there are other methods that are designed specifically for application on interactive artifacts, e.g. Animal Expression Transfer (Landin 2006, Lundgren 2007) where animal traits and behaviors are mapped onto an artifact, or Temporal Themes (Lundgren and Hultberg, 2009), where only the temporal behaviors of an artifact are changed. Firstly – and unfortunately – these methods are not commonly used within interaction design, despite their interaction focus. Secondly, these methods are more specific and less structured than Skewing. Thirdly, this sums up to only four ideation methods (counting Skewing) explicitly focused towards interactive/interaction design aspects of products.

RESEARCH METHOD: ACTION RESEARCH

Since Skewing originated as a design exercise, it has been used and developed in an educational context. We are thus framing this study as an action research project. In short, action research is an iterative process where an active practitioner first studies her or his practice, framing an area of improvement. Using whichever facts available (observations, suggestions, ideas, analysis), a change is introduced, and after analysis and reflection, the iteration begins anew, until the initial issue has been resolved (Costello 2003). As stated by Carr and Kemmis (1986) the action part is the part of the cycle when a change is introduced, i.e. when reflection is turned into action.

Action research has the benefit of being directly applicable to the teacher's own teaching situation (Costello 2003, pp. 15-26), but it is often being criticized for not being general or scientifically valid enough. Ways to counter this can be to very explicitly describe the context of the study, so that others can judge if the findings are useful for them. As a means to increase reliability and validity, one can attempt to triangulate the data used for analysis (Costello 2003, p. 45; Herr and Anderson 2005 p.56, 61). In this study, the different data sources are observations made during teaching, the designs, and students' reports on the designs, i.e. rationale, analysis and scenarios.

BACKGROUND: THE ORIGINS OF SKEWING

Teaching interaction design is to a great extent coupled to design methodology combined with learning about

the materials one is designing with, and the people one is designing for. As for interactive artifacts, it has been argued that apart from physical materials, they also consist of ephemeral materials like code, behavior and interaction, all of which are closely intertwined (Cooper et al. 2007), Hallnäs and Redström 2006, Lim et al. 2007, Löwgren and Stolterman 2004, and many more). In conclusion, students in interaction design need to learn about interaction as being one of the materials they shape. This is a complicated endeavor since interaction is invisible and appears "only in use" (Löwgren and Stolterman 2004). Moreover, it can only be *afforded* in design (Baljko and Tenhaaf 2009, Landin 2009, Norman 1998 and many more), and to make matters even more complicated, the actual interaction carried out can be unexpected and unwanted (see Landin 2009, . Lim et al (2007) conclude: "*To develop such insights about material properties is not easy, especially when it comes to interaction. […] The material we need to understand for interaction design is flexible, ungraspable, and phenomenal*."

As in any other teaching, teaching interaction-as-material benefits from a deep-learning stance. Deep learning (see Marton and Säljö, 1976a, 1976b) has been advocated within pedagogy for a long time, and states that the desired aim within teaching/learning is to attain deep learning by promoting activities such as interpretation, meaning-making and relation of concepts, rather than learning facts, figures and processes (Ramsden 1992; Bowden & Marton 1998; Marton et al 1986). Biggs (2003) specifically lists cognitive demanding activities, like analyzing and explaining, as a means to achieve deep learning. In design teaching, the application of concepts coupled with analysis and reflection on the outcome has always been a common approach (Baumann 2004; Wick, 2000), e.g. Baumann (2004) found that exercises seem to be the most common teaching activity across design disciplines.

As a response to the issue of teaching material aspects of interaction, we set out to design a design exercise aimed towards understanding and utilizing different interaction-related frameworks – this was the origin of Skewing as a design method. Being an exercise, it would contain many of the activities resulting in deep learning.

IN SEARCH OF A SUITABLE FRAMEWORK

Several approaches have been taken when it comes to describing interaction in itself. Rullo (2007) has explored ambient systems and for these, she proposes what she calls soft qualities of interaction, related to dynamics like access, interferences, varying visibilities, separation/interpenetration, overlapping, layering etc. Looking at interaction from the viewpoint of movements, and based on Laban's denotations (cf. Hutchinson 1977), Vedel Jensen et al. (2005) discuss aspect like flow, weight, space and timing.

Djajadiningrat et al. (2004) also take the approach of looking at interaction as movement, and introduce the concepts Freedom of Interaction, Richness of Motor Action and Interaction Patterns. Building on the same work, Vensween et al. (2004) present an interaction framework called frogger: here a product's reaction to a user's interaction are coupled to time, location, direction (of movement), dynamics, modality and expression. These "unification aspects" are then used in a framework, coupling action to different types of information on possible means of interaction. In a similar vein, studying the "interaction gestalt", Lim et al (2007) list in total twelve gestalt attributes, expressed as bi-polar scales.

In addition to the approaches mentioned above, there are two frameworks that were used by us, and thus deserve a closer explanation. Firstly, the set of use qualities listed by Löwgren & Stolterman (2004). These come in five categories, and are as follows:

- ***Motivational*** qualities: Anticipation, Playability, Seductivity, Relevance, and Usefulness
- ***Interaction*** qualities: Pliability, Fluency, Immersion and Control/Autonomy
- Qualities related to ***social relations****:* Social Action Space, Identity and Personal Connectedness
- ***Structural*** qualities: Transparency, Efficiency and Elegance
- Qualities of ***meaning-making****:* Ambiguity, Surprise and Para-functionality

As the name suggests, use qualities appear in use, and are experienced by the user. Secondly, we have used Lundgren's interaction-related properties (2011). This is an attempt to merge many of the previously mentioned sources as well as on others. The result is a list of 30 interaction-related properties expressed as scales, divided in the following six categories:

- Properties related to ***Interaction per se****:* Input modalities, Interaction flow, Directness, Freedom of Interaction, Precision and Tasking
- Properties related to ***Expression****:* Output modalities, Presentation, Clarity, Feedback and Information Order
- Properties related to ***Behavior****:* Approach, Level of Dependency, Forgiveness, Robustness, Adaptability and Openness
- Properties related to ***Complexity****:* Posture, Versatility, Predictability, Connectivity and Difficulty
- Properties related to ***Change and Time****:* Evolution, Movement, Response Time and Temporal aspects
- Properties related to ***Users****:* Company, Locality of Users, Privacy and Behavior analysis

To some extent we also incorporated Landin's (2009) expressions of interaction into the exercise. She has discussed unexpected or unwanted use, exploring possible interaction forms – the relation between interaction and function – and expressions of

interaction: *"how people might relate to the interaction with a device"* (ibid, p. 46.). The listed expressions of interaction were not used as a part of the design process, but only as a tool for analyzing the outcomes.

SKEWING EXPERIMENTS

Skewing has been carried out in different variants in three different classes of interaction design students. The exercise originated during a literature session where we discussed interaction frameworks, and the students stated that they did not quite understand. This resulted in a spontaneous analysis of a software using one of the frameworks, which was much appreciated. Next year, a light-version of this was used in an exercise were students brought one specific property to a design, which meant that they only learnt that single property well.

Based on these pre-observations, the Skewing-exercise was created. Throughout the years we have experimented with different settings as is shown in Table 1. Despite the differences in setting, designs were similar between iterations, meaning that Skewing as design method seems to be rather stable. The collected material consists of 37 designs, designed by 68 students working in pairs or groups of three. The exercise has several steps:

1) Analyze the given object with the given framework
2) Ideation: redesign the object using the framework
3) Describing and discussing design ideas
4) Refinement of a chosen design idea
5) Analysis of refined design ideas using the given framework.
6) Deliver concept description, a scenario of use and a reflection which properties (in the framework) had changed and how use, and situation of use, had been changed accordingly

OBSERVATIONS

Already in the analysis-phase, it became evident that students got acquainted with the terms since they needed at least a brief understanding of them in order to carry out the analysis. There was sometimes a lively debate on whether, or to which extent, a certain quality or property existed. This of course opened up for an inherent issue with briefly described frameworks: different interpretations of a certain concept, and that a general concept sometimes can be hard to apply on a specific item. We do not see this as a negative issue since it opens up for discussion, analysis, and reflection, which are deep learning activities.

Throughout the process, and in the task description, students were encouraged to do "wild and crazy" things in order to explore not-so-obvious properties or combinations of properties.

Some general observations were made for all classes. Firstly, some students had a hard time breaking free; they believed the focus of the exercise was idea generation, rather than exploring the materiality of interaction. As a result, they tried to stick to sensible ideas, rather than just any designs. We had to repeatedly point out that efficiency or a working product was not the goal. Others reveled in the lack of boundaries and very explicitly toyed in designing strange, useless or provocative devices (see "Outcomes" below).

Secondly, when asked to write scenarios, students were typically over-optimistic. In at least half of the cases where social exchange of some sort had been added to the artifact, the two protagonists in the scenario fell in love and lived happily ever after. This is another effect of wanting to design products that "work".

In 2010 and 2012a, students had rather strict boundaries; they were to change one, and only one quality at a time, but as it happened, others changed accordingly. The last group of students were instead asked to change several properties more or less at once. First, they should choose about five properties from at least four different categories and change them, and in

Table 1: How the Skewing-exercise changed over the years. It ran twice in 2012, but with different groups of students. In 2010 and 2012a, strictly speaking there was one group of three, and the rest worked in pairs. Bold text indicates changes from previous year.

Year / Students	***Framework(s)***	***Artifact***	***Analyze***	***Ideation***	***Describe, discuss***	***Refine***	***Analyze***
2010 / 13	Use qualities (Löwgren & Stolterman 2004)	Mp3-player	In pairs	In pair, 5 designs as result of skewing one quality per category	In pair	Alone	In pair
2012a / 13	Use qualities (Löwgren & Stolterman 2004)	Mp3-player	In pairs	***Alone,*** 5 designs as result of skewing one quality per category	In pair	Alone	In pair
2012b / 42	A subset of Lundgren's (2011) Interaction-related properties	Mp3-player ***or camera***	***In groups of three***	Alone, 2 designs. One design by skewing five properties. One by skewing all properties in one category.	In group	***In group***	In group

their second design they should change all properties in one category. As it turned out, they started changing one and let others "tag along" as an effect of the change. This too, was an effect of students wanting to create feasible designs. This approach was possible since most of Lundgren's properties can have more than two states, i.e. it is not so simple as to say that an artifact has, or does not have a property. Therefore, the students' approach of changing one property in a category and then let the others change accordingly worked. If one really strives for unusual designs, one should probably clearly state – before starting the ideation process – which property to change, and to what state.

OUTCOMES

The handed-in conceptual designs were in the form of rationale, scenarios, sketches and analysis, and point towards an understanding of the properties used in skewing. In total, 37 re-designs were produced. Of these, roughly ten were designed for enhancing social interaction – there was a strong influence from the social media-realm. In most of these designs, users could spot nearby users with similar taste in music with which they could then make contact in order to share songs.

Thirteen of the designs featured input devices other than buttons. Some were context-aware, using various sensors as means to change what music they were playing, e.g. picking up the user's pulse whilst running and playing faster/slower songs accordingly. Others toyed with more tangible input means, e.g. shaping the player itself as an input command.

Six concepts were critical designs (Dunne & Raby 2007). The reason could be that students had done a critical design exercise in the same course, but also that many of them were passionate music lovers and wanted to make anti-mainstream designs. In one of the designs, the player adapted itself to a mainstream music taste as a comment on the power of record companies. In another, users ran the risk of getting a small electric shock if they skipped a song. Another approach in this vein was to retro-design back to the cassette player's limited interaction abilities in that you could not skip songs easily, had limited playlists etc. Other types of critique dealt with laziness and required users to move along or dance with the music. Another design presented music as an addiction, by rewarding users with nicotine(!). Five of the designs were also outright useless, designed for non-efficiency and non-relevance.

Out of the 37 designs, there were a few that are promising or interesting. One is a social player, designed by Elin Lindberg. Unlike most social players students came up with, it is designed for people that are already acquainted. In her design, friends agree to share a playlist, which they both listen to simultaneously. Both can edit the playlist, which opens up both for flirting, sharing and regular "song wars." (Note that this design was made before Spotify's service of sharing playlists!) In her design, Elin addressed the lack of Social Action Space and Identity; when adding these she to some extent weakened Anticipation and Efficiency, adding Surprise. These design changes moved the player from a tool to play music towards a tool for communicating and expressing oneself.

Several groups designed cameras that could fly or be thrown around corners, or that photographed social spaces, and in all cases uploaded the images on the fly. In all cases, the property of being dependent (i.e. awaiting user's actions) was changed into an autonomous behavior, and similarly the property of not being connected changed to being connected to the internet. As a result users' relation to, and interaction with changes from seeing the camera as something that requires their attention and guidance to something that one might potentially want to avoid; a tool that can be both fun and scary in its unpredictability. Note that regardless the ethical issues, there are already similar products (for more extreme situations like burning buildings, crime scenes and warfare).

Other interesting designs were a social/context aware player by Mikael Hjorth. His *geoPod* picks up the soundscape of the city, i.e. the songs that are being played often in a certain neighborhood. As such, the design rhymes well with thoughts on sustainability and openness towards new ideas. In his design, Mikael toyed with Control/Autonomy, moving towards Autonomy. As a result the design now features Ambiguity and Surprise. In combination, these changed properties turn the *geoPod* from an efficient tool for music playing into a tool of exploration – and possibly reflection on the inhabitants in an area; instead of controlling it, users get insights from it.

Lastly, Sara Johanna Nilsson has designed a music player with personality: "*The iPod has its whims. Some days it might only play rock, or classic, or British 90's pop. Some days it might not play at all. The more differentiated your taste, the less extreme the whims.*" Sara aimed for increasing Surprise in her design, as a result also moving from Control towards Autonomy. Again, we see a shift from the player as an efficient tool for playing music into a suggestive tool that encourages exploration rather than control.

CONCLUSION

In conclusion we have strong indications that Skewing works well as an exercise for understanding various interaction frameworks. Firstly, it requires that students engage in deep-learning activities such as analysis, application, comparison and reflection. Secondly, the observations in class as well as the written material students handed in, point towards them having understood the various concepts used in the used frameworks.

Despite the fact that skewing interaction properties was conceived for teaching interaction frameworks, the method has also shown promising results as a

structured, easily steered ideation tool that can produce a multitude of ideas, some of which can be very promising in solving the design issue at hand.

SKEWING: THE METHOD

Many of our students commented on the exercise as also being a design method for coming up with new and interesting ideas, and as shown by some of the examples above, several of the designs presented have become, or could become products. Also, some redesigns turned the music player into another product, e.g. a radio or cassette player. This indicates that by skewing, one may well end up with something useful.

Given our findings from observing Skewing in action these 37 times, we can summarize it as containing the following steps:

1) ***Select an interactive artifact to redesign.***
2) ***Select a suitable framework for analysis and redesign.*** The choice of framework, or the selected parts of a larger framework (or, as in the case with Lundgren's 30 properties) serve as a steering instrument in how the designs will be geared. If using frameworks primarily describing movement and movement patterns (e.g. Vedel Jensen et al. 2005, or Djajadiningrat et al. 2004), naturally the focus, and the changes, will regard movement. If selecting Lundgren's (2012) user-related properties, "social" designs may appear – or disappear, if already existing.
3) **Analyze the chosen artifact using the chosen framework.** Here, it is not extremely important that the analysis is entirely "correct", which is a benefit if the terms in the frameworks are sparsely described. The important thing is that designers know what they mean when they attribute a certain term to the artifact – because they will then change it.
4) **Start the skewing process by changing one or more properties**. This can be done in three ways, all observed in the exercises.
   a) Skew one, and only one property at a time and see what happens.
   b) Skew a property and let others change accordingly.
   c) Select five random properties and skew all at once. This approach will generate the most of odd ideas.

   Write down all design ideas collected this way.
5) **Select the most promising/odd/interesting ideas or changes**. Explore these further by constructing negative and positive scenarios of use.

In Jones' (1992) design process model Skewing fits within the divergence methods. As such, results from skewing require the use of convergence methods – feel free to replace step 5 – in order to be tailored towards specific user needs and other potential requirements.

DISCUSSION

Initially we stated that the interaction design community lacks design methods related to interaction per se, and we have argued that Skewing in fact does this by use of the interaction-related frameworks. However, we also presented other similar methods already used by interaction designers, and one may question whether there is really a need for yet another method.

As for the Random Stimuli-method (De Bono 1970), as well as for Animal Expression Transfer (Landin 2006, Lundgren 2007) these are in comparison much less structured – the success of the method to a great extent relies on finding a good "random" object or animal from which mappings work. Moreover, Random Stimuli focuses on *any* property (material, appearance, use) of the stimuli object, not specifically interaction. The same argument goes for SCAMPER, which in other ways is very similar to Skewing.

As for methods targeted towards exploring and widening the design space, Skewing and the Critical Incident Technique share some common ground in that they both discuss and utilize fringe conditions. In Skewing however, these are however created in the skewing process, not passively looked for via bservation. In comparison with Morphological Charts (Jones 1992) instead, Skewing intentionally pushes designers into exploring ideas that might seem irrelevant to the limitations that the design requirements impose – strange ideas that once in a while can be very good. These are the novel ideas that are hard to foresee, and it is in this that skewing excels, and charts fall short. Another important difference is that charts-generated ideas are limited to perceived usefulness whereas skewing-generated ideas are limited to the interaction-related properties that have been chosen. Similarly Boundary Searching (Jones 1992) limits designers to design within the boundaries of the requirements, whereas Skewing allows for breaking them; they are tackled with at later stages in the design process.

Both Skewing and Brainstorming are geared towards producing a wealth of ideas that could potentially solve a design problem. Skewing however differs in that it focuses on interaction properties of pre-existing artifacts; it is therefore only suitable for redesigns. Another differentiator is that Skewing can be used with different, targeted frameworks. This characteristic makes skewing a method that can focus on different types of design depending on the property framework that is being used with it.

In conclusion, Skewing has a place in the range of structured, transformational ideation methods, and it definitely has a place within the interaction designers' toolkit, since it can be utilized to focus on redesigning interaction and interactivity.

Note that while Skewing in itself is not limited in its potential design uses, if an interaction design framework is selected, the Skewing focuses on redesigning interactions; the focus of the method is strongly coupled to the chosen framework.

Even though Skewing has many uses and offers certain advantages, it is equally important to recognize the limitations of the method. Firstly, it is as good as the framework that it is used with. It is the framework that sets and limits the properties that can be skewed and this greatly impacts the quality of the produced ideas. For instance, the framework needs quite clearly defined terms, rather than overarching concepts; e.g. the idea of using Löwgren's (2009) four aesthetic interaction qualities (Fluency, Pliability, Rhythm and Dramaturgical Structure) was abandoned at an early stage since they are too generic.

Additionally, since Skewing does not take user needs and other requirements into account, many of the ideas that are produced may not be realistic and may not correspond to the design requirements. However this is the case – should be the case – for any initial ideation method. Also, when it comes to designing as opposed to re-designing, Skewing does not work since it requires pre-existing artifacts. Finally, at least when applied by students, we have observed a trend to lean towards wishful thinking in how well the designs would work in a real-life context. This is however not an issue coupled to Skewing in itself.

With that being said, Skewing has the advantage of being easily adaptable to different design disciplines and approaches given that one has a sufficiently capable framework to "feed" into the method. For instance one could use Jordan's (2002) dimensions of product personality as a means for designing for specific emotions e.g. designing for joy as in "How would you change the properties of the artifact so that users will experience joy when using it." Again, the possibilities are only limited by the framework that is being used, and by the imagination of the design team. Moreover, Skewing is very affordable as it can be carried out in a few hours without any special tools.

CONCLUSION

In this paper we present an ideation method, called Skewing – skewing as in shifting, changing, or turning. The method is particularly useful within interaction design, since the main idea is to explore interaction-related properties of an artifact. The artifact is analyzed using a framework of terms or properties describing interaction, and then these properties are deliberately changed.

Albeit limited to redesign and to the applied framework, Skewing is a cheap, fast method that helps designers find unusual design solutions otherwise overlooked.

Additionally, although Skewing was created and has only been tested as an interaction design method, there are no set limits that prohibit Skewing to be used with other types of frameworks in a variety of contexts. As long as the limits and capabilities of Skewing are understood, designers can have one more tool in their inventory of methods, to help them navigate the chaos that is the design process.

ACKNOWLEDGMENTS

Thanks to all present and former students at the Interaction Design & Technologies master programme students at Chalmers University of Technology, for taking part in the various versions of the Skewing exercises – especially Elin Lindberg, Mikael Hjorth and Sara Johanna Nilsson for letting us describe their work in this paper. Thanks also to or reviewers for excellent suggestions as to how improve the paper.

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