Introduction

In working with stakeholder requirements or user needs in design, various design methods in requirements engineering (RE) and human computer interaction (HCI) are finding ways to deal with "soft issues", "social issues", "people issues" or values. At the same time, applied ethics has begun to pay attention to design. We believe that many of the approaches can complement each other in useful ways.

The first international workshop on Values in Design "Building Bridges between RE, HCI, and Ethics" brought together researchers and practitioners from academia and industry to share knowledge and insights about how to account for values in designing technology. Through panel discussions and group work, workshop participants worked towards integrating approaches, taking first steps towards putting value-conscious design into practice.

The structure of the workshop

Preparation

Leading up to the workshop, we contacted a number of researchers from academia and industry to be part of a program committee. We distributed a call for papers to major mailing lists in human-computer interaction, requirements engineering, and ethics, inviting research papers and position papers on a range of topics, including value elicitation, designing for specific values and experiences from value-oriented projects. Nine submissions were accepted.

Workshop activities

The workshop was divided into two halves: a morning session that included a keynote talk and panel discussions, and and afternoon session that included group work. Below is a brief summary of key points from the talks, discussions, and group work.

David Hendry, Keynote

- About VSD – interactional stance, iterative and integrative (conceptual, empirical & technical) approach.
- The notion of value in VSD is intentionally left underdetermined. It is what is important to an individual.
- Challenge for VSD: integrative and iterative approach involves a huge amount of knowledge
- Progress, not perfection
- Presentation of design project for homeless young people (see CHI paper), methods used: value sketches, value scenarios

Panel 1:
Francien Dechesne:
- Challenges when designing reconfigurable technology, e.g. sensor technology for safety and security (STARS project, Rotterdam harbour)

- Context-dependency
- Deciding *when* and *how* technology functions

Engin Bozdag:
- Filter bubble: personalization of search results, Facebook EdgeRank
- Values at play: autonomy, freedom, control, transparency, identity
- Need to devise ways to make algorithms understandable/transparent to the users

Maria
- Digital design is not value-neutral
- Design/functions create normative behavior, change our practice and norms
- Need to unpack how digital design embeds norms
- Possibility to critically examine relation between norms and design

Pedro Sanches:
- ubiquitous data collection in mobile phone networks
- challenges with involving users in designing emerging technologies: network of stakeholders not defined, no existing experiences with technology to rely on, lack of knowledge of potential users
- possible approach: research through design, playful mirroring of how technology functions

Panel 2:
Alistair Sutcliffe:
- Attempt to create a generic taxonomy of values for use by requirements engineers and how this can be used in requirements elicitation and analysis
- Values are affect-laden beliefs, motivations
- Associating design issues with values (e.g., how much systems should monitor, interpret, and do)
- Bottom-up (grounded theory) and top-down (taxonomy) approach

Sven Koch:
- Use tailored interfaces to support people's different values
- People tend not to know their values, prefer not to talk about them, and it is too time-consuming to ask each user them them
- Use approximation of people's values by asking about task preferences
- Case study in medical domain

Robyn:
- The App Autopsy
- Visualization of constitutive technologies of a website
- Classification system for values associated with technologies

Panel 3:
Luke Stark, NYU
- How to build values into the construction of a could applications?
- case study of designing Lockbox (secure cloud storage service)
- designing for user empowerment, privacy, security, usability, mobility, availability, low cost

- combining symmetric and private keys

Aisling O'Kane, KTH
- new practitioners trust survey
- experience-oriented designs
- desgin qualities: ambiguity, transparency, open interpretations
- exploring trust with different prototypes

Andreas Woelk, Ebay
- Increase the perception of trust in the system design
- definitions of trust: meeting expectations, growing over time, rational and emotional, hard to build, easy to loose
- design principles for implementing trust in the eBay system/website

Panel Discussions Summary:
An important issue that arose in the panel discussions is defining concepts such as values and norms. One participant referred to values as a more abstract concept whereas norms are seen as a way of behaving to achieve a value.

How do we create a system that gives users a choice on how information is filtered for them without confining them too much by values of the designers? So, whose values are we designing for? There must be a way for users to what's going into the filtering. Turning it off is not an option. In the case of recommender systems you could add recommendations to open your eyes to other things.

Dealing with stakeholders is difficult when working with emerging technologies. You often know who the initial, direct stakeholders are. But it's unclear who the indirect stakeholders are. But you have to start somewhere, for example by having sessions with direct (known) stakeholders. Moreover, it is problematic that it is not always clear what the agenda of the stakeholders is. It is important to include stakeholders agendas.

The term stakeholders itself might be problematic - it implies having a stake, it might ignore those who do not have a stake. It might not be appropriate. There is a language issue there. The term might not be so useful for some of the rich projects discussed here.

One participant suggested not making a commitment to one stakeholder group or another with regard to their values, but making tensions between different positions visible and use that to see where you should direct your further efforts. Keeping track of own values, versus stakeholder values, versus values you are trying to support - those are helpful distinctions to make.

How should we as designers (and stakeholders) envision possible uses and reconfigurations? It is quite difficult. Future workshops are one way.

Should envisioning be done by designers or stakeholders. Designers often design for designers, so it is important to include stakeholders. The design itself should think of possible scenarios. There is also design noir, that considers uses that subvert systems.

There is a difference in designing a technology for a certain behavior and analysing a behavior that a certain technology produces.

People may have a mixture of values that vary over settings and times - people change. One participants sees values as underlying traits of personality that are persistent. With regard to tailoring interface to specific values (as described in Sven's talk) thoughts that came up were that people do not only hold one value but a combination of several values. However, studies showed that in a specific work domain people tend to hold a small set of values relevant to that domain.

In some psychology research, values are seen as stable personal constructs. It's important to recognize what you're using values for when designing a system. If you're designing a very personal system (such as personalized interfaces) then understanding an individual's value is very important. When you're designing something more group like, then it is very different - group values and context become important.

A difficulty with looking into personal values is you have to research every single person. One way of finding or eliciting values could be through games such as Black and White, where the game changes according to someone's behavior and choices. But an issue with this type of approach is that people are using an avatar that stands between them and other people. Another technique for elicitation is value personae.

The App Autopsy was designed for users online to see how back ends of programs worked. It could also help non-governmental organizations. Also, it was intended for people programming, especially when designing with specific values in mind.
Has anyone tried to block App Autopsy inquiries into their sites? There could be an escalation there, it is interesting to think what one would do about that.

The level of detail of information that App Autopsy makes available is you can see which plugins or frameworks are used for a site.

Group Discussions Summary:
Discussion of the word ethical - it can be used in a normative sense, to make technology ethical. Technology is not value-neutral, it can go either way and it is not clear how much is in the implementation and how much of it can be controlled by design.

What could be done in the future to make technology more ethical, value-sensitive or good? For example, nuclear power was developed without a way to get rid of the waste. Maybe it is possible to develop principles of good technology and one of them is the principle of undoing, if you develop a certain technology you should develop it with a way to get rid of harmful effects.

Before you can concretize values, you have to think of different contexts for the word "values" for different practitioners.

Designing by starting with examples and shared narratives might be best way to go about translating between different disciplines and professions.

This is a dynamic process, in that new designs might lead to new values being imparted. So, technology can produce new values.

Once you have these points of shared experience, beginning to work concretely to build on those links you can build up to a higher level of abstraction.

Identify key stakeholders. Get business requirements versus user needs, which you need to reconcile. Start with a motivation which is often financial or efficiency, but also building trust and user experience.

Research and industry are not entirely different, but there are some differences. Motivations are different. In research values can be at the forefront, but in industry focus does not have to be on values. It can be more exploratory.

How do you bridge the gap between research and industry? Research might have a different vocabulary from industry. Research should make vocabulary more useful for industry. Transferring methods from research to industry could be interesting.

In industry you have time constraints. How could research be leveraged in an interesting way? There could be mutual benefit there. Academia could also have use from seeing their research put into something concrete and having it brought out and shown to actual customers.

On the one hand there is the idea of issues (things you should look at), which are quite tangible. But one also needs stories, narratives, etc. Beyond that you have best practices, guidelines. There are interesting links between concepts such as engineering, values, and notions such as transparency.

Examples of where research has been transferred to industry include Agile development, in which there is talk about values of software development, values in development and values in product and engineers can then see how their product stacks up to them.

Andreas worked together with Piotr Cofta to work on implementing trust, coming from industry to back it up. They worked on a model for intentionally building trust with eBay seller community. It was very close cooperation with the theory and the practical side. And it is not hard to interest people from industry in this type of thing.

Group Work Summary:
Design case: Creating a design plan for the implementation of an ambient system to improve the quality of life of elderly people by enhancing their mobility and supporting an independent

lifestyle in their own homes. The task was focused on identifying direct and indirect stakeholders and their values relevant to the given context as well as brainstorming possible functions and creating a design plan for the course of 3 years. The participants split into 4 groups that worked independently for 60 minutes on the case. Each group had a set of envisioning cards that they could use in the group work as desired.

Ideas: Ideas for the design of such a system ranged from concrete ones like a chair measuring a person's vitals and manipulating the lighting in the room, digital frames used as "soft" reminders of appointments to more general functions like scheduling, cleaning or dating services. A prevailing idea was to embed the system into already existing, familiar devices, e.g. TVs, photo frames or have it wearable, e.g. as a fashionable necklace. One group divided the system into triggering and receiving devices used by different stakeholders. In this context notifications for neighbours were discussed as well. More general reflections, often triggered by an envisioning card focused among others on sustained friendship leading to thoughts about the impact of the system on the elders' relationship to their relatives and unintended use, e.g. by grandchildren who would play with the system for pleasure.

Stakeholders: Direct stakeholders identified were: relatives/family, health care providers, elder and caregivers. Indirect stakeholders were: society, government, other elders and neighbours. Two groups identified the developers/programmers as stakeholders, one as direct and one as indirect.

Values: A number of values was identified by most groups, including safety, mobility or privacy. Many values focus on the direct stakeholders, the elderly, including the ones above as well as autonomy, humanity, fashionable (aesthetics), dignity, community and quality of life. Some groups also looked at values of other stakeholders, such as accountability given specific functions require that the e.g. the neighbour are notified in cases of emergency or hedonism with regard to grandchildren using the system (unintended use).

Design plan: Generally, the groups spend less time on a detailed design plan. High level steps like developing concept, verify concept, implementation were mentioned. One group looked at design methods including ethnographic observation, using simple objects to enquire the stakeholders and participatory design, another talked more concrete about prototyping and user testing.

Envisioning cards: Each group used the Envisioning cards in a different way. One group chose a card per color and looked at the pictures on the card, the theme and the assignments. In another group one person browsed through the cards and picked the ones that he found most relevant to the design case and brought the cards up whenever the discussion ceased. We also noticed opposing experiences with the cards. Whereas one group found them to be limiting their creativity and confusing as the formulations on the cards seemed to refer to an existing design, another group reported that the cards opened up the brainstorming. The latter group used the left side of the cards (the themes) and did not stay true entirely to the cards.

Overall insights, future work directions
One of the most fundamental insights gained from the workshop is that the concept of values is used in different ways by different practitioners (e.g., psychologists, designers, philosophers). Different definitions of values will yield different requirements for value elicitation methods, different results when eliciting values and when implementing them. Moreover, different parties' definitions could get in the way of a shared understanding of the issues at hand. A lack of shared understanding could, in turn, get in the way of bridging the gap between business requirements and user needs, research and industry, and ethics and design practice. What is needed is a common vocabulary in order to communicate values and transparency regarding the values and norms that technology embeds and that users hold.

A further challenge to bridging the gap between research and industry is the agility of methods used to account for values in design. Industry faces time and cost constraints that make extensive user studies impractical. On the other hand, not accounting for values can cost time and money in making things right after damage has been done. Furthermore, there is a need for experience with transferring methods from research to industry to give insights into how to transfer these methods. Such transfer of methods could be mutually beneficial to research and industry.

There are more specific trade-offs that have to be made in applying value-conscious design methods to industry. For example, transparent search algorithms might be a way to deal with issues of search engine bias and the 'filter bubble', but they conflict with industry's interest in keeping trade secrets and even with usability.