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Setting the Stage for Responsible Design

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Abstract: Designers have responsibility by the very nature of their activities; bringing new products and services into the world of the user. Recently there is also raising interest in specifically addressing social issues by deliberate design interventions. Within the University of Twente we strive to shape this responsibility in the context of the design of Human Technology Relations, combining human-technology interaction with scenario-based, user-oriented product design. The research groups associated with design have each developed their own perspective on how to implement this responsibility in design research and practice. Three different design approaches, each of which are strengthened with methods and tools. Although these three perspectives are complementary, they also have their limitations. In this paper we describe how we broadened the three research strands into a multidisciplinary research agenda through a workshop with a diverse group of participants. Providing the stage for a “Twente School” in responsible design.

Keywords: responsible design; design for society; transdisciplinary design; diversity

1. Introduction

Designing requires enormous social and moral responsibility as we are surrounded by products and services that shape – and simultaneously get shaped by – the way we live. Not only do these products and services serve utilitarian functions, but they also influence our norms and values in multiple and often unforeseen ways. Consider, for example, the dockless rent-a-bike mobility services that were introduced in many cities. They provide locals and tourists with the opportunity to explore the city in a healthy and environmental friendly manner. However, at the same time they flock the streets with broken and abandoned bikes. Papanek has appropriately phrased design’s influence on society in his seminal book, *Design for the Real World*, originally published in 1971:

“It is important to remember that architecture and design are the social arts par excellence. It is possible to avoid theatre and ballet, never to visit museums or galleries, to spurn poetry

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and literature and to switch off radio concerts. Buildings, settlements and the daily tools of living however, form a web of visual impressions that are inescapable.” (Papanek, 1995, p. 174).

In other words, designers have a responsibility towards others as what they create has inescapable consequences for nearly every living being in the world. This responsibility can also be extended to future generations, as design is a future oriented activity. To broaden the concept even further, everybody can be considered a designer. This is voiced by leading design thinkers and researchers such as, Tim Brown, the CEO of global design agency IDEO:

“Whenever we do something to improve the state of the world, we’re designing,” [...] “Design is everywhere, inevitably everyone is a designer.” (Tim Brown, cited in: Lavender, 2014).

and pioneer of emotional design Donald Norman:

“We are all designers. We manipulate the environment, the better to serve our needs. We select what items to own, which to have around us. We build, buy, arrange, and restructure: all this is a form of design. When consciously, deliberately rearranging objects on our desks, the furniture in our living rooms, and the things we keep in our cars, we are designing.” (Norman, 2004, p. 224)

Considering the omnipresence of design, we perceive this as a call to everyone, and most importantly to designers, to explicitly consider the responsibility of what we are doing everyday: i.e., the responsibility that comes with changing the world we live in. In our local context, which is the Industrial Design Engineering programme of the University of Twente, we explore questions surrounding the responsibility of designers in the Human Technology Relations track (Eggink, 2014; Eggink & Bijl-Brouwer, 2010). This exploration is embedded in the vision of the University, phrased as High Tech – Human Touch, wherein the organisation has set out design as one of the central themes in the development of the institute. Very broadly, “High Tech” refers to disciplines in natural sciences as well as applied and engineering sciences; and “Human Touch” refers to social sciences and humanities. In this vision, design is meant to be the ‘binding glue’ of the two kernels of our university. On the one hand, the technological advances are researched and created in our technology oriented departments, and on the other hand, insights in contemporary developments of society are researched by our department of Behavioural, Management and Social Sciences (Eggink, 2015a). Note that this vision is to be understood as high tech and human touch, instead of high tech or human touch. This also means that technology cannot be understood independently of its social influence. In this perspective, a technology is not valuable when it is not made applicable for users.

In addition, this vision has also been adopted by the DesignLab, the University’s cross-faculty eco-system for ‘connecting technology and society through design’ (Eggink, 2015a). As designers’ attention has expanded to addressing societal challenges beyond designing products and services, new research is required to examine the role of design in facilitating new ways of working with other disciplines to successfully unpack the historical, cultural, and technological issues underpinning such challenges. DesignLab forms a interdisciplinary platform for accelerating this type of research.

Following the arguments of Papanek, Brown and Norman, our goal in this paper is to provide a starting point for examining what Responsible Design means as an emerging research field. We address the questions: *what is responsibility?* And *how can it be handled* using a bottom-up, interdisciplinary approach? First, we discuss a preliminary definition of Responsible Design in connection to literature in fields that also utilize responsibility as a central concept, such as Social Design, Design for Behaviour Change, Participatory Design, and Critical Design. Next, we share the results of a workshop on ‘Co-creating Responsible Design’ conducted to reveal the pressing research questions related to this theme in our local context. Finally, we discuss our findings on how our understanding of Responsible Design differs from and contributes to existing discussions on the topic.

2. Responsibility & Design

We first start by taking apart the term ‘Responsible Design’ to better illustrate what can be meant by it. The term ‘responsibility’ contains the verb ‘to respond’ and can be interpreted as the ability to respond to the needs of and challenges faced by the society. ‘Design’ is to be interpreted both as a process – i.e., the act of designing – and the outcome of that process – i.e., the designed artefact. Noteworthy here is that the term design is used in its broadest sense and applies to the creation of ‘design interventions’, including but not limited to products, services, spaces and systems.

What marries these two terms – Responsibility & Design – is that the change brought about by design should be for the better. This simultaneously raises multiple questions such as: What is better and for whom (or what)? How to evaluate what’s better? And how to deal with unforeseen consequences or unwanted side-effects of design interventions?

One of the ‘responses’ of the design discipline to the aforementioned questions is to deliberately design interventions to address social issues and societal challenges (Dorrestijn & Verbeek, 2013; Tromp et al., 2011). Examples include health related issues such as how can products encourage people to exercise more to fight obesity? Or to consume less to reduce waste? How should a robot system that supports people with dementia behave? And what does this mean for existing care-givers?

Another response to the broader question of responsibility is raising awareness through the encouragement of reflection. Critical Design, for instance successful in this by showing radical alternatives for common practices (Malpass, 2010). A more constructive response is the consideration of all consequences of design by incorporating stakeholders in the development process through Participatory Design (Ehn, 2008). Yet another response comes from interaction technology in the form of Value-sensitive Design, where the answer to “what is right?” should be understood from an ethical standpoint (Friedman, 1996).

These approaches are all unique in their goals and ideologies. What’s similar is that they – implicitly or explicitly – account for the notion of responsibility as a core design concept. Based on examining the nuances among these approaches, we offer three categories on how to think about responsibility more explicitly. These categories first emerged when we started

to think about how we, as a design department, dealt with responsibility in the context of a research grant proposal (Eggink, 2015b). These three strands are:

1. Designing in a socially responsible manner by organizing the design process in a responsible way.
2. Designing in such a way that the responsibility of the user is addressed through the designed artefact.
3. Designing in such a way that the outcome (product or service) encompasses social responsibility.

2.1 Three Strands of Responsible Design

We will further explain these three strands of Responsible Design and how they are currently implemented in research and design practices in our local context:

1. Designing in a social responsible manner by organizing the design process in a responsible way.

Designing is a complex process that requires not only a creative problem solving attitude – but also the integration of multiple perspectives, values, and wishes. This means that all stakeholders who ‘have a stake in the matter’, should be involved in collaboratively defining ‘what is better?’. Traditionally, this is mainly the terrain of methodologies such as the aforementioned Participatory design and Value-sensitive Design. In our local context, this strand is researched within the chair of Human Centred Design which builds on the ideas of the participatory Design Movement (Garde, 2013), combined with developing theories from Scenario Based Design (Bijl-Brouwer & van der Voort, 2009). Especially, the question “what is better, and for whom?” is also addressed by Dilemma Driven Design (Ozkaramanli et al., 2017).

2. Designing in such a way that the responsibility of the user is addressed through the designed artefact.

Don Ihde argued that a product that is not used is ‘just a piece of junk’ and that the meaning of an object is only determined by the interplay of object and user (Ihde, 1993). One can say that the way of using a product is never fully defined in the product itself, and therefore the designer can also not be fully responsible. On the other hand, any design offers certain affordances for a typical type of use (Rietveld & Kiverstein, 2004) for which the user can not be held fully responsible. By deliberately balancing these two mechanisms one can shape responsibility by sharing it between designer and user. In our local context, this strand is represented by the idea of Open Script design (Stam & Eggink, 2014) which is developed within the chair of Interaction Design. In Open Script design, responsibility is shared between the designer and the user by leaving the exact use of the product (more) open to interpretation by the user (Stam, 2015). In the ideal situation then the answer to the question “what is better?” is also shared. Moreover, the answer can also still develop and be given more meaning during the use of the product.

3. Designing in such a way that the outcome (product or service) encompasses social responsibility.

This is mainly researched by investigating the impact of products in society and social context. Thinking about the consequences of new technologies is traditionally the domain of Philosophy of technology. Especially after the so-called Empirical turn, these consequences are also investigated for specific products (Brey, 2010). Imagine, for instance, the influence of the Walkman on the ongoing individualisation in society. In this case, the question “what is better?” is not directly answered but rather actively reflected upon from the expected consequences of design. In our local context this strand is primarily based on the collaboration between design research and philosophy of technology in the so-called ‘Practical Turn’ (Eggink & Dorrestijn, 2018). Within this collaboration, the impact of products can not only be investigated and reflected upon, but it can also actively be explored through design. Important instruments within this collaboration are, for instance, the Product Impact Tool by Dorrestijn (Dorrestijn, 2012; Dorrestijn & Eggink, 2014) and Mediation Theory by Verbeek (2005, 2011, 2015). In addition, the impact of technology can also be explored by the use of the aforementioned Critical Design (Lee et al., 2019) and the akin Speculative design (Lindley et al., 2018).

Although these three perspectives -or strands if we like to call them- are complementary, and can be powerful in supporting Responsible Design, they also have their limitations, namely:

1. Focusing on the process of designing, and incorporating input from all stakeholders gives less control over the actual outcome of the design process. At the same time, end-users and stakeholders are not always aware of what they really want, and thus, fully focusing on stakeholders can inhibit radical changes (Norman & Verganti, 2014).
2. Shared responsibility between the designer and the user means that the control over the outcome of the design intervention is also shared. This further limits the agency of the designer (Tromp et al., 2011).
3. Focusing on the impact of the product or service itself relies on the analysis in hindsight: these theories are mostly applicable to products or services that are already in use (Raub et al., 2018).

Covering Responsible Design in this context thus becomes a balancing act. To develop the notion of Responsible Design further and to address the issue that the responsibility is not limited to Industrial Design Engineering, we organized a workshop with participants from various disciplines in our local context.

3. Co-Creating Responsible Design Workshop

The goal of this half-day workshop was to do the balancing act together. We therefore wanted to explore how the participants dealt with responsibility in their own discipline and how they connected to Responsible Design. We also wanted to raise awareness for

Responsible Design and work towards developing research questions. As a result, we dealt with two main questions in the workshop:

1. How do you handle ‘responsibility’ in your work?
2. What might be the pressing research questions for ‘Responsible Design’?

3.1 Method

A total of 19 persons participated in the workshop, from which eleven were researchers from the university, five were students and three were the facilitators. From all the participants, six identified themselves as doing work in a design-oriented discipline. Backgrounds outside the design discipline ranged from Science and Technology Studies, Computer Science and Communication Science, to Public Administration.

Following a short introduction to the topic and the goals of the workshop, the participants engaged in discussions in randomly assigned groups with equal sizes to address the research questions. We structured the discussions in two main phases of approximately 1 hour each. The first phase focused on the question “How do you handle ‘responsibility’ in your work?” First, the participants were asked to share their individual perspectives, and next, to reflect on and discuss the similarities and differences in what they heard. They were asked to summarize their conclusions in a template that corresponded with the three strands of Responsible Design (see Figure 1).

Responsibility can be created / shaped in three main spheres:

1. Designers, 2. Society, and 3. Objects (technologies).

Can you categorize the ways in which you handle responsibility in your work according to these three main spheres?

1	2	3
<p>Designers acting responsible – relating to participatory design, co-design, being reflective, designing with empathy, gender neutral design, and inclusive design.</p>	<p>Enabling others in society to act responsibly, to be informed, to reflect and to make decisions – relating to open script design, critical design, design for democracy.</p>	<p>Creating objects that do not destroy the world – relating to sustainability and circularity in products, and also to the objects that make these possible.</p>

Figure 1 Template for the first exercise

The second phase focused on the question: “What might be the pressing research questions for ‘responsible design’?” The participants were first asked to brainstorm about possible important research questions to move this research agenda further, and next, to reflect back

on the discussion and choose the three ‘most exciting’ research questions, to be filled in at the a second template (see Figure 2).

What are the pressing research questions for 'responsible design'?
Use this side of the template to write the 3 '**most exciting**' research questions you came up with as a group.

1 _____

2 _____

3 _____

Figure 2 Template for the second exercise

In addition to the pre-prepared templates, we used the flip-over sheets and post-its to capture the insights from the discussions. In addition, a photographer captured the interactions among participants and a visual artist captured repeating remarks or heated discussion points in illustrations.

Following the group discussions, all participants could individually vote for the most interesting research question using round stickers. As input for a plenary discussion and reflection, we displayed the three research questions with the most number of stickers on whiteboards. To stimulate an engaging discussion, we used the format of a famous Dutch children’s television show (Ren je Rot: Run like Hell) to engage the participants with the selected research questions. Using this format, participants ‘ran to’ and stood in front of the research question they found the most exciting. We ended the workshop with a plenary discussion and reflection. This also served as a starting point for matchmaking and further collaboration plans.

3.2 Findings

Figure 3 and 4 show an example outcome of the group discussion addressing the question ‘how do you handle responsibility in your own work?’ We noticed that, in general, the participants did not experience difficulties thinking about the notion of responsibility in terms of the three strands in their own work. However, a common remark was that the three strands overlap.

Responsible Design can (tentatively) be defined as the act of questioning and shaping responsibility. Use this side of the template to record the similarities and differences in what you heard from each other about **how you handle 'responsibility'** in your project(s) / topic / expertise.

Figure 3 Example of poster with post-its addressing responsibility in the own practice of the participants.

Responsibility can be created / shaped in three main spheres:

1. Designers, 2. Society, and 3. Objects (technologies).

Can you categorize the ways in which you handle responsibility in your work according to these spheres?

Figure 4 Example of a poster "How do you handle 'responsibility' in your work?", created by one of the groups.

Figure 5 shows a photo from the group discussions demonstrating the collaborative work between students and academics from various disciplines.

Figure 5 Participants of the workshop discussing (photo Enrico Bertolotti).

In addition, the sequence of images by the visual artist nicely summarizes the narrative of the group discussions, from problem identification to research statements (Figure 6 - 10). Seeing a visual summary of the discussions helped the participants to articulate concerns on the topic better and to build on what was captured (and not captured) through the illustrations which gave depth to the discussions. The captions illustrate the explanation that was provided with the images.

Figure 6 “Responsible design is open and inclusive” (image by Hugo Freutel).

Figure 7 “Responsible design is about considering the consequences, by addressing the user” (image by Hugo Freutel).

Figure 8 “Addressing the user not always leads to the desired outcomes (because the user is only a partial expert)” (image by Hugo Freutel).

Figure 9 “Unintended use is a form of sharing the responsibility, however not always in a desirable direction” (image by Hugo Freutel).

Figure 10 “If we are all designers, we also have to feel that we are capable of designing/have control over the design outcomes (?)” (image by Hugo Freutel).

In the second phase of the group discussions, the participants developed four sets of possible research questions within the same groups. Figure 11 shows an example of such a group result.

Figure 11 Example of a poster "What are the pressing research questions for 'responsible design'?", created by one of the groups. The black and blue dots (stickers) represent the votes.

All the research questions are gathered in Table 1. For each research question, the total amount of votes (i.e., stickers) is listed in the score column.

Table 1 Formulated research questions, with scores

Research question	Score
1.1 How to define RD from different perspectives?	4
1.2 How to create urgency for stakeholders to embrace RD?	1
1.3 How to make RD a mainstream concept?	3
2.1 How would you combine all the different visions on responsibility and make a responsible design?	4
2.2 Can we design a tool(kit) / checklist for responsible or co-creational / participatory design? If yes; how?	7
2.3 What is the nature of responsibility and how can we implement this in design?	2
3.1 How to include ethical reflection and human-technology interaction in design methods and design thinking?	2
3.2 How to make responsible design accessible for university research groups? (Values that matter plus awareness of ethical questions)	5
3.3 How to anticipate and evaluate future impacts of technologies?	5
4.1 How do [our] (working) conditions/contexts/incentives enable and constrain responsibly designing?	4
4.2 What is the range for which we can take responsibility (circle of influence)?	7
4.3 How to make visible the consequences of un-responsible behaviour?	4

During the workshop we decided to combine two popular questions that looked similar [e.g. 1.1 and 2.1] and selected two other ones that scored high [2.2 and 3.2]. The “Ren je rot” exercise showed that the resulting questions all sorted comparable interest of the participants. In the heat of the moment we oversaw one of the highest scoring research questions [4.2]. However, during the evaluation of the workshop, we came to the conclusion that this question could also be related to the first question about the different visions and perspectives on Responsible Design, which was then extended with defining the goals of responsible design.

3.3 Research agenda

Based on our findings, we arrived at a set of research questions that could form the basis for expanding the notion of Responsible Design within our academic environment. These three research directions with accompanying questions are:

1. How to combine all different visions? Or in other words: how to define Responsible Design from different perspectives? This aims at defining the **goals of Responsible Design**.
2. How to make Responsible design accessible for university research groups? Which aims at defining or developing a **practice in Responsible Design**.
3. Can we design a toolkit/checklist for responsible (co-creation / participatory) design? And if so, how? Thereby aiming at **making Responsible Design applicable**.

After the workshop we were also able to refine our definition of Responsible Design into the following:

“Responsible design is the act of questioning and shaping responsibility. This responsibility is uniting, open and inclusive. This responsibility is visible by addressing three main lines: designers, society, and objects (technologies).”

We also learned from the workshop that the threefold characterisation can work effectively to organise and structure the discussions, practices and research questions around this complex topic. Therefore, we will use these three categories as a starting point for further investigation:

1. **Designers acting responsibly:** relating to participatory design, co-design, being reflective, designing with empathy, gender aware or inclusive design.
2. **Enabling others in society to act responsibly** (to be informed, to reflect and to make decisions): relating to open script design, critical design, and design for democracy.
3. **Producing things that do not destroy the world:** relating to sustainability and circularity in products, but also to the objects that make the previous thing possible.

We aim to research the three strands in such a way that we can combine the pro’s and

minimize the con's to come to a better understanding of doing responsible design. For this, our research at the moment encompasses three consecutive (?) activities:

1. A systematic literature review on what types of design approaches may fall under these three strands.
2. Using these three strands in a generative manner to evaluate the adoptability of the strands in design activities
3. Synthesis of a shared interdisciplinary framework based on the outcomes of the step 1 and step 2.

4. Discussion

In the first half of the workshop, the participants agreed that responsible design is important and should be diverse and inclusive. As can be seen in the images by the visual artist, the “challenges of responsibility” were also shared. The workshop method worked well in the sense that it yielded important research questions with a shared understanding of what they should deliver. Moreover, it showed that the questions designers and design researchers ask themselves about responsibility in design are shared with various other disciplines.

On the other hand, one can argue that by presenting the threefold approach as a frame of reference for the exercises steered the participants heavily in this direction. During the exercises the participants did question the three strands, as some reported to have difficulty with putting aspects of their work in either of the three categories. Leaving out the categories however would make the subject less graspable. This confirmed our idea that the three strands should not be seen as separate categories, rather as three different perspectives on the same topic. The strands form a framework for structuring discussion, reflection and development of the principles and practices of responsibility (and not to be interpreted as a taxonomy of responsible design).

Another point of discussion is the relationship between the proposed Responsible Design strands and other approaches. Fortunately, taking responsibility is not unique. The goals of Responsible Design are very akin programmes like Responsible Innovation (Grunwald, 2011) and Responsible Research and Innovation (Owen et al., 2012) so a lot can be learned from these programmes. The latter even has a three-fold characterisation:

“We [...] identify three distinct features that are emerging from associated discourses. The first is an emphasis on the democratic governance of the purposes of research and innovation and their orientation towards the ‘right impacts’. The second is responsiveness, emphasising the integration and institutionalisation of established approaches of anticipation, reflection and deliberation in and around research and innovation, influencing the direction of these and associated policy. The third concerns the framing of responsibility itself in the context of research and innovation as collective activities with uncertain and unpredictable consequences.” (Owen et al., 2012, p. 751)

Although Responsible Research and innovation makes a slightly different distribution, we see the same topics emerge: involving stakeholders (being democratic) as in our first strand;

anticipation and reflection, and being responsive. The last statement about uncertainty and unpredictable consequences is also related to the issue of impact and unintended use as raised in the workshop. Although directed at influencing the direction of innovations and policy, we think that the pro-activeness of design as a direct shaper of responsibility is not so apparent. Another difference is that Responsible (Research and) Innovation is still rather technology oriented, in the sense that it looks at future technology-society relations from a 'technology-driven' perspective rather than a 'people-driven' perspective.

Working together with the other disciplines in the workshop also yielded suggestions for possible practices. One approach that surfaced in the workshop is Constructive Technology Assessment, aimed at actively managing technology development in and with society (Albert de la Bruhèze & Oldenziel, 2009; Rip et al., 1995; Robinson, 2010). Although not particularly aimed at design, the advantage of this approach is that it has already a long track record in consulting 'society' through direct and indirect stakeholder involvement. Another promising direction is Citizen Science, which is also based on the participation of stakeholder groups (Phillips et al., 2013; Wiggins & Crowston, 2011). With the advantage that it is also targeted at real world problems, rather than technology oriented innovation (Cohn, 2008). Some Citizen Science projects are also geared towards impact and change (Jiang et al., 2016; Nascimento et al., 2014). However, there is still work to do in developing and integrating these approaches in the broader concept, as the report of the 2016 European Stakeholder Round Table on Citizen and DIY Science and Responsible Research and Innovation states: "For acting more responsibly, only including citizens is not enough." (Göbel et al., 2017, p. 10).

5. Conclusion

We have proposed a three-fold perspective on Responsible Design, emerging from our research and design practice. From the elaboration in a workshop with multiple colleagues from a wider field, we were able to rephrase our proposal for application within a broader notion of design. Based on the workshop we also pointed out a research agenda for our initiative. We expect our research to result in a framework that combines and/or integrates the three different strands of incorporating the notion of responsibility in design and beyond. This framework should also encourage the integration and collaboration of other disciplines with design by strengthening the mutual understanding of the topic.

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